



Biodiversity Conservation at the Landscape Scale

A Program of the Wildlife Conservation Society

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Greater Madidi Landscape Conservation Area

Annual Report

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I. Summary of Activity Status and Progress

a. Introduction/Summary:

The Greater Madidi Biodiversity Conservation at the Landscape Scale (BCLS) Program aims to ensure conservation of the wild lands and wildlife of the greater Madidi area through a landscape conservation approach, working with other conservation and sustainable development projects active in the region. The landscape approach is designed to determine the needs of key wildlife species, assess human activities across the same landscape, and use the intersection of these to focus efforts on those areas and actions which emerge as key conservation conflicts or opportunities. The landscape species conservation hypothesis assumes that by meeting the needs of a suite of spatially and ecologically complementary landscape species, biodiversity in general will be conserved.

The Greater Madidi Landscape Program remains on track. To accomplish the long-term goal of biodiversity conservation at the Greater Madidi Landscape Conservation Area, we focus on five interrelated objectives: Establish baselines and monitor landscape species and the landscape context in which they are found; facilitate community-based natural resource management across the landscape; strengthen institutional capacity in natural resource conservation and management; promote the development of national policies that support the landscape conservation approach; and elaborate a participative, integrated landscape conservation action plan.

The Tropical Andes are incredibly diverse, and yet remain largely unknown and unstudied. Northern La Paz was almost bereft of quantitative biological information before the WCS team began efforts in 1999. Since then we have significantly increased the biological and ecological knowledge for the region, particularly in terms of mammals, birds and vegetation, including the discovery of new species, both for Bolivia and for science. In addition, we have established that this region is of significant importance for the protection of large, charismatic but unfortunately globally threatened species, such as condor, spectacled bear and vicuña and have begun to establish spatial and thematic priorities in terms of conservation interventions designed to promote their long-term survival in the landscape. Our experience in developing management capacity with a diverse array of local actors increases every year as together we face a range of situations and take series of steps towards managing the differing units of the landscape in an integrated fashion.

In terms of research, we remain at the forefront of conceptualizing the landscape conservation approach and developing useful landscape species tools that can be applied at an international level within landscape conservation initiatives. Thus, we have now added a population target element to our landscape species analysis. Given the general paucity of information regarding landscape species densities and current scientific debate over how many animals are required for a minimum viable population, we have chosen to adopt a multi-targeted approach. The initial results of population viability analyses indicate the importance of the neighboring

protected areas in Peru for spectacled bear, condor and jaguar conservation. This highlights the need to consider expanding our conservation efforts to southern Peru and northeastern La Paz Department in Bolivia for species such as maned wolf, marsh deer and giant otter. Our pioneering efforts to document Andean bear and Andean condor populations, both notoriously short of data, have proved successful and our ongoing efforts with jaguar, white-lipped peccaries and a series of special elements are now well-known in the international scientific and local conservation practitioners' community.

Our community natural resource management program is expanding rapidly with most initiatives now taking on a supra-communal nature. Start-up grants and continued technical support to these projects represents a socio-politically complicated activity yet it will also be critical for the long-term conservation of the landscape and the management units therein. The regional meeting that we hosted and financed in February underlined the support that communities will require in order to build a range of sustainable natural resource management initiatives. Fortunately several national sources of funding are becoming available for significant second phase funding to these initiatives, which is a major incentive for participating communities. Already handicraft, wild chocolate and native honey bee production have received such funding for scaling up and we anticipate that incense production, forestry and tourism may well be able to develop successful proposals in the next couple of years.

The processes and products arising from the Tacana Indigenous Communal Land (or Tacana TCO) project and the Madidi National Park management plan project have raised the bar on participation at a local scale. Our projects have been recognized by the relevant national bodies, CIDOB (national indigenous representative body) and SERNAP (protected area service) respectively. Indeed, the Madidi management plan is now considered a benchmark for other protected area management plans within the Bolivian protected area system, and we adopted the majority of the methodologies in the up-date of the Pilón Lajas management plan. Our technical team continues to work with local actors to develop innovative, participative and sustainable planning tools. This year the micro-zoning methodology for the Tacana TCO I and the PILCOL environmental brigades in Guanay are two such examples of locally produced processes.

Conflicts around Madidi increased this year because of the change in municipal authorities, in particular in San Buenaventura and Ixiamas. These mayors and some members of their municipal council, as well as the Departmental Councilor for Iturrealde province are promoting illegal mining, illegal settlements and timber extraction in the Tacana TCO, and illegal timber extraction within Madidi. Furthermore, conflicts around Apolo continue again because of illegal extraction interests. However, this example yet again highlights the need in all the regions of our landscape for a better understanding of democratic processes and the need for better availability of information and effective communication strategies for local people.

b. Highlights

- Biodiversity survey and jaguar population surveys at Alto Madidi have firmly established this site as a truly extraordinary place with abundant and apparently naïve fauna.
- Completion of Participatory Rural Appraisals for the communities in Pilón Lajas extended the human landscape model with accurate information for this protected area for the first time.
- Standard camera trapping methodology used to produce the first density estimate ever for spectacled bears.
- Jaguar density estimate produced along Heath River in bi-national initiative with participation from Peruvian researchers keen to use the methodology in the future.
- Primate naming auction raised \$650,000 for a dedicated Madidi trust fund.
- The Tacana Native Bee Honey Producers Association, in association with CIPTA, secured a \$32,500 grant to significantly increase production and establish a commercial operation.
- The proposed Madidi protected area tourism regulation was formally approved by the Bolivian government with implementation underway.

- Community forestry initiatives increased and under management within the Tacana TCO; all initiatives with formally approved management plans.
- A second competitive process for community natural resource management proposals was conducted with a number of proposals funded, and the overall quality of proposals improved when compared to the first round of funding.
- A first management plan for incense production produced for the Virgen del Rosario community and critical first steps taken to found an Incense Producers Association for the Apolo region.
- A regional symposium for community natural management initiatives was successfully held in San Buenaventura with a preliminary report identifying problems and opportunities for community initiatives.
- The Tacana receive ca. 42,600 hectares as additional compensation for the original 325,000 Tacana TCO land title. This area overlaps significantly with the park and also provides critical watershed protection in the area between the Madidi protected area and the previously titled TCO.
- Micro-zoning of the titled Tacana TCO completed and being prepared as a formal document for the Bolivian government as an approved land-use plan.
- Participatory Rural Appraisals, micro-zoning and planning processes completed in the second Tacana TCO in the northernmost regions of the Greater Madidi Landscape.
- The environmental conflict database and information system was established in SERNAP central office and Madidi and is going to be established across the SNAP over the next four months.
- Landscape species and their spatial needs are being formally included in the GAP Analysis for the Bolivian Protected Area System.
- Landscape conservation planning manuscript accepted and in press as case study of conservation in action within the seminal textbook 'Biological Conservation'.

c. Table of Activity Status

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II. Detailed Description of Progress

a. Key short and long-term program objectives for the reporting period (October 2004 – September 2005)

In one of the most biologically diverse landscapes on the planet, WCS intends to develop and implement long-term conservation measures at a landscape scale by working with key national, regional and local partners to address threats and opportunities they themselves helped to identify, and by focusing research and monitoring efforts on the conservation and wise management of wide-ranging and vulnerable ‘landscape species’. We aim to successfully implement and refine the landscape approach within the Greater Madidi Landscape, thereby promoting this concept in other biologically critical Bolivian landscapes. Ultimately, we aim to conserve these species and the greater biodiversity and ecological integrity that they represent.

In the medium term (about 5 years), our main objective is to capitalize on our working relationships with the plethora of actors in the region, promoting the development of the landscape approach with interested parties through the production of a participatory landscape conservation action plan. We also intend to add more detailed environmental planning experiences to this document, thereby creating a ‘living’ library of relevant landscape conservation planning documents. This process and the accompanying documents will explore mechanisms to integrate spatially distinct land-use planning initiatives (for example, community and inter-community zoning, TCO land-use plans, protected area management plans, local government development proposals, multiple municipality planning activities, private lands and forestry concessions) into an overall landscape conservation strategy. These landscape planning initiatives will allow a more strategic and collaborative approach to the design of conservation interventions and subsequent monitoring and evaluation activities by different actors working in the region.

Over the next two years, we intend to continue gathering and interfacing the biological and socioeconomic information necessary to refine spatial priority-setting models and determine management actions at the landscape scale. Indeed, for the Tacana TCO and Madidi, areas that are now both legally recognized and have developed management visions (in the form of a natural resource management strategy and a management plan respectively), the landscape program has increasingly shifted toward supporting and implementing high-priority interventions identified within these plans, as well as building the local capacity to manage these interventions.

OBJECTIVE 1: *Establish baselines and monitor landscape species and the landscape context in which they are found.*

Activity 1.1. Describe the Ecological Context of the Landscape

In coordination with the National Herbarium at the Institute of Ecology, we continued studies related to the availability of food resources for the white-lipped peccary at the Rio Hondo long-term research site. This research has focused on detailing the spatial and temporal distribution of key resources for peccaries, particularly a number of palm species present in the area. Three publications are at an internal review phase concerning: a) a characterization of the habitats, b) the phenology of frugivore fruit resources, and c) the

availability of frugivore fruit resources, particularly the density of palm species at the Rio Hondo. In addition, we have produced a preliminary vegetation map for the study area using satellite image interpretation and ground truthing-data from the vegetation plots.

Bennett Hennessey continued bird surveys in the Madidi region by visiting the Alto Madidi site in Madidi, and over the course of the year confirmed species for Madidi increased to 905 species. The Alto Madidi site revealed a reasonable bird community and the possibility of a new, as-yet undescribed bird species that remains under investigation. Meanwhile, Carlos Zambrana has completed his undergraduate thesis concerning the use of GIS models for predicting bird distribution and diversity in the Northern La Paz region. These studies will be used by the project team to complete a preliminary assessment of effectiveness of the umbrella function of the landscape species conservation thesis, assessing whether the conservation landscapes designed from the suite of species selected as landscape species for Madidi covers the full range of bird diversity in the area. The study will use GIS modeled bird distributions and known species presence.

The team continued studies to generate relative abundance and density estimates for medium and large sized vertebrates across the landscape with significant surveys at the Alto Madidi site between July and September 2004, and surveys ongoing at the Rio Hondo site and along the Rio Heath, as well as community-based transect information from Cachichira, Carmen del Emereo and San Antonio del Tequeje. Together with previously surveyed sites, this information is critical for building a picture of mammalian and bird communities that will serve as the basis for developing source-sink hunting management models across the landscape. The biological results from Alto Madidi highlight the importance of this unique site; wildlife was abundant and largely naïve and/or curious regarding the biologists, a relatively large population of giant otters (*Pteronura brasiliensis*) was also documented, and amazingly the research team observed jaguars on fourteen occasions over a two month study period. As a result of these findings we are working with the Madidi protected area to develop a high-end tourism venture to ensure the pristine quality of this park border site.

This year the program conducted a series of Participatory Rural Appraisals with 23 indigenous communities within the Pilón Lajas Biosphere Reserve and Indigenous Territory, as well as 13 appraisals with the campesino and colonist central communities of the Yucumo-Rurrenabaque road. The program has now gathered spatially explicit information for almost 100 communities across the landscape and together with databases on concessions, communities, roads and projected roads gleaned from government and non-government sources represents the most comprehensive GIS for any complex of protected areas in the national system. This database is extremely useful when managing conflicts within the management units, and critically is the basis of the human landscape layer that is used in intervention planning and conservation priority setting.

Activity 1.2. Research and Monitoring

Research to collect preliminary baseline data on our conservation targets is an important first step in terms of monitoring those conservation targets. Without it, we may miss the impact of key threats or fail to appreciate natural fluctuations in wildlife that affect wise management and use of wildlife. Data on landscape species are being used in the development of distribution maps, and in the construction of biological landscape models for landscape species, which in combination with spatial data on human activities and threats has enabled us to define the extent and location of the landscape in which conservation efforts should focus, as well as identify priority conservation actions in areas of critical conservation importance and conflict.

In August and September 2004, camera trapping to assess the applicability of this methodology for estimating spectacled bear population densities was conducted. This study generated a density estimate (8 animals per 100km²), which is the first such estimate for this species anywhere in the world. In combination with distributional information gathered previously by the program, this figure suggests that the landscape may be

home to around 1500 spectacled bears - firmly establishing the Greater Madidi Landscape as a regionally significant stronghold for this species. A manuscript reporting the results is currently under review.

At the long-term lowland study site in the Rio Hondo, the research team continues to radio-track white-lipped peccaries. Additional captures in December 2004 and July 2005 mean that eleven animals remain with collars, and preliminary home range estimates are between 40 and 100 km², confirming the wide-ranging behavior of this species. Density estimates for white-lipped peccaries have been gathered at four sites across the landscape over the last year: Carmen del Emero, Cachichira, Rio Hondo, and Alto Madidi. All density estimates in protected areas indicate between 5 and 20 animals per km², and around 5 animals per km² in the TCO. These results suggest that peccary populations are recovering within the park where they were relatively rare in the late nineties, and are able to resist current levels of subsistence hunting in the more remote areas of the Tacana TCO. These data will allow a landscape scale analysis of subsistence hunting using source-sink management models. Results from community hunting studies (detailed below) indicate that apart from being ecological engineers and a driving ecological force in lowland tropical forest dynamics, white-lipped peccaries are also very important sources of protein for local communities.

We have been unable to capture jaguars for radio-telemetry purposes, despite switching to the latest state of the art snare technology and in December 2004 inviting a worldwide expert to train our research team and field veterinarians in this technology. Meanwhile, the team has continued camera trapping with a campaign in Alto Madidi producing a fourth density estimate, and a campaign currently underway along the Heath River. Importantly the Heath River campaign is being conducted in collaboration with a Peruvian University Research Group that has been involved in wildlife research in the neighboring Tambopata and Bahuaja-Sonene protected areas and is also drawing on our ongoing strategic relationship with Amazon Conservation Association (ACA) that has been working in the northern portions of Madidi for the last two years. Sharing research methods and integrating our research priorities and activities over the next few years will be an important next step for these blossoming relationships. Results from Alto Madidi revealed the second highest forest density estimate for jaguar, and firmly established the Greater Madidi Landscape as a regionally significant jaguar stronghold. This research will add to our previous efforts and help us make a preliminary assessment of the effectiveness of the Madidi protected area for jaguar conservation.

Finally, initial efforts to document the Andean condor population in the Apolobamba mountain range using a series of feeding stations designed for a possible capture-recapture analysis have proved very successful. Results from the first of six station feeds indicated the presence of 22 condors, of which 19 were filmed for individual recognition. By the end of September the six stations will have been sampled and we will begin analyzing results. Andean condors are the least abundant of the landscape species, and given their regionally threatened status it is critical to get a handle on how many occur in the Apolobamba range.

Activity 1.3. Ecological Studies of Special Elements

Over the last year we have continued efforts to establish the taxonomic and conservation status of several primate species in the landscape. The new species of titi monkey, *Callicebus aureipalatii*, is being published in Primate Conservation in the fall. The on-line auction of the right to select its scientific name raised \$650,000 for the Madidi protected area, to be managed in a trust fund by FUNDESNAP. This will generate sustainable funding for the park and already there are several possibilities of matching funds to increase the Madidi dedicated trust fund. The woolly monkey (*Lagothrix* sp.) discovered in 1999 and collected in 2000 is still under consideration as a new species and requires further genetics studies in order to establish its taxonomical status. We have also continued our studies to establish the taxonomic situation and conservation status of two Bolivian endemic titi monkeys, *Callicebus modestus* and *Callicebus olallae*. In this light, we have established that the two species still occur in forest patches within southwestern Beni Department. *C. modestus* has an apparently larger distribution than *C. olallae*, which appears to have an extremely limited distribution along the Yacuma

and Maniqui Rivers. We are working to include the needs of these species in the environmental mitigation considerations of the major road improvement project that will affect this region in the near future. They may also figure as ‘flagships’ for the proposed municipal reserve around the Yacuma River, the major tourism attraction in the region.

Meanwhile, the program supported population studies at Alto Madidi site (northern La Paz) for the globally threatened giant otter (*Pteronura brasiliensis*). Five groups of giant otters were identified suggesting another regionally significant population, although worryingly only in the upper portions of the river near the protected area. We are currently documenting giant otter populations along the Heath River in the northern portion of the park. Finally, we supported Bennett Hennessey in his efforts to formally establish that the Palkachupa Cotinga (*Phibalura boliviana*) from the Apolo region should be considered a full species, thereby becoming a full endemic for Madidi. This included a trip to the Brazilian Atlantic forest to compare plumage patterns, vocalizations and behavior of the Swallow tailed Cotinga (*Phibalura flavirostris*) with the Apolo endemic.

OBJECTIVE 2: *Facilitate community-based natural resource management across the landscape*

Activity 2.1 Community-Based Natural Resource Management

In general the community projects continue to assume a supra-communal nature, as start-up or demonstrative projects extend to additional communities. This result in itself is a reflection of the power of these community projects, and for most initiatives this multi-community involvement is critical in terms of successful market development and production capacity. In addition, there are clear signs that our ‘start-up’ initiatives are beginning to apply for nationally available funds for the second phase, more significant funding that is necessary for scaling-up production. These community natural resource projects are important for the long-term conservation of the landscape, as they promote the concept of natural resource management at a local scale, improve the capacity of local people in the design and implementation of projects, and critically provide an opportunity for the development of community-based decision-making processes including internal regulations and controls. This capacity is a necessary foundation for effective local wildlife conservation and management. In this document we will report on all community projects in one unified section.

Two Tacana communities (Santa Fe and San Pedro) continued their efforts to produce **honey** from native bees, successfully increasing production and selling this to the local Ixiamas market. Unfortunately the Bolivian Biocommerce office \$16,000 grant to the Native Bee Honey Association to scale-up production for the Rurrenabaque eco-tourism driven local market never materialized, despite continued formal assurances that this funding was in the pipeline. Three additional communities, Tres Hermanos, Santa Rosa de Maravilla and San Miguel, have formally requested support for native bee honey producing projects and Tres Hermanos won the community-based natural resource project competition run by CIPTA with WCS funding. Local technicians from Santa Fe and San Pedro are now training community members from Tres Hermanos. Happily, with technical assistance, the Association, in conjunction with CIPTA, has now secured significant second-phase funding (at least \$32,500) from the PUMA Foundation to increase production potential and the number of participating communities. This will be critical in order to reach national and international markets.

The subsistence **hunting management** projects continue in Carmen del Emero, Cachichira, San Antonio de Tequeje, Villa Fatima and Esperanza de Enapurera, and we have received requests from three more Tacana communities (San Pedro, Tres Hermanos and Buena Vista) to extend these efforts. Carmen del Emero and Cachichira have restated their intention to reduce hunting pressure on locally threatened wildlife species: marsh deer, lowland tapir, black spider monkey and red howler monkey, and we are currently assessing whether this year’s hunting patterns have changed in response to these community decisions. Community members assigned the responsibility of collecting information on community hunting levels have responded well and have not caused conflicts in the communities. We are also beginning to verify the impact of hunting for wildlife species whose production harvest models suggest they are borderline in terms of hunting sustainability. To do this we

are undertaking three additional analyses: using hunting location information assessing whether distances of kills and attempted kills from the community is changing; calculating catch per unit effort of hunting for those species; and for peccary species that provide a large portion of the hunted wildlife biomass investigating the age-sex structure of hunted population through the examination of skulls. This year the results of this activity have been presented at three different international events. Community-based monitoring of fishing activities continued in 2005, through support to the fishing association from a MacArthur Foundation grant to the Coleccion Boliviana de Fauna (CBF). WCS technicians have provided support during workshops and meetings as required.

Support to San Miguel within the Tacana TCO and Asunción del Quiquibey within the Pilón Lajas Biosphere Reserve and Indigenous Territory has continued through the provision of training modules and events regarding **community tourism** guides, and the identification of wildlife based tourism attractions and the design of standard tourist routes and activities. Tourism guides from each community have received four-part in-situ training in order to provide them with more information, confidence and technical know-how whilst formalizing their own knowledge regarding the forest. Asunción is also continuing to participate in the hunting sustainability project.

We have provided the Madidi Protected Area Administration with a tourism specialist, through additional MacArthur funding, to assist in the implementation of the Tourism Program, the objective of which is “to contribute to the conservation of Madidi Protected Area, through the development of sustainable tourism.” Over the last year Jazmin Caballero has provided support and training to local stakeholders on topics related to tourism operations. Under her supervision and with counterpart funds from Conservation International’s ITTO Project, we carried out tourism training activities in San Buenaventura, Ixiamas, Apolo, Santa Cruz del Valle Ameno, and Asariamas. We also lent support, again through our technical supervision, to protected area staff to construct and equip tourism information booths in San Buenaventura, Ixiamas, and Guanay localities. These localities represent 3 of the main 5 entrance points to the protected area. All three booths are being constructed and equipped with municipal and protected area funds. Finally, we provided technical support in the design and follow-up of several communal tourism initiatives that are being financed by funds channeled through Conservation International and KFW’s BIAP project. BIAP is channeling additional resources of over \$400,000 USD to improve tourism management in the Tuichi valley. Our efforts include the design of trails and overnight stops along two trekking routes that terminate in the Tuichi valley, as well as work that combines community proposals by the communities of Queara, Pata, Virgen del Rosario, Santa Cruz del Valle Ameno, and Asariamas into the Ecotourism Project of Pelechuco-Apolo-Asariamas (PEPAA).

We have also continued technical support to the **Community Timber Management** initiatives across the Tacana TCO. Our team provided technical assistance to the Community Timber Management initiatives with formally approved management plans now in place for six initiatives (San Pedro, AGROFOR, APIAT, Machua, Carmen Pecha, and El Carmen in Napashi), as well as assisting nascent initiatives (initial Annual Forestry Plan) in Altamarani, Tres Hermanos, Villa Fatima and Santa Rosa de Maravilla. For the moment, this represents all community initiatives for forestry across the titled TCO. The CIPTA forester is coordinating with staff from CADEFOR working in Ixiamas with support from BOLFOR 2 in the development of strategies to improve management practices - and particularly to obtain improved market prices for TCO produced timber. Proposals are also being developed by CIPTA for processing timber at a TCO scale in order to assist in the implementation of a TCO-wide sustainable forestry vision. The forester is currently accompanying the CIPTA commission on location in the second Tacana territorial demand immediately adjacent to the northernmost portion of the Madidi protected area. As part of the participatory studies and process that is being conducted to develop a natural resource management strategy for this TCO demand in accompaniment with the legal consolidation, the forester and Tacana counterparts will be gathering critical data for the development of sustainable forestry plans in the future, including Brazil nut management.

Over the last year program staff have also provided important technical input to CIPTA-implemented projects that have outside funding. One example is that of Fundación Tropico and the commercialization of wild chocolate, a supra-communal initiative developed by four Tacana communities (Tumupasha, Carmen del Emero, Santa Fe, and Macahua). The LIL Indigena and Fondo Indigena also both provided funds to assist Tacana handicraft production in the region and strengthen the Centro Cultural Tacana in San Buenaventura. In the latter case our program support extended to provide some additional funding to cover workshops that had not been anticipated by these projects.

The five lower Beni Tacana communities have validated the proposed participative and preliminary management plan for the sustainable harvest of the **spectacled caiman** in the Tacana TCO. Productive activities that involve the utilization of wildlife will require the approval of the DGB. A condition of that approval will be the DGB's ability to monitor wildlife utilization and measure its impacts. In actuality the proposed Tacana management plan is conservative in terms of harvest rates and area under management in order to ensure sustainability. Unfortunately, this year we have been unable to begin the experimental harvest of spectacled caiman because of the politics of assigning the national quota for skins approved by CITES. La Paz Department was not assigned a portion of the quota and therefore the implementation of the plan will have to wait until the dry season of 2006.

CIPTA also launched a second competitive process for community-based natural resource management projects. After an assessment of 15 presented projects made by members of the program, CIPTA staff and community representatives, five projects were selected for preliminary funding at an average of \$3000 each: the Tumupasha integrated chocolate management project; the Tumupasha eco-tourism initiative; the Cachichira paca (*Cuniculus paca*) hunting management project; the San Pedro wildlife reserve; and the Tres Hermanos native bee honey production initiative. The implementation of these projects included a training program in administration of financial resources that was also extended to other natural resource groups in the Tacana TCO.

The program continued to support two communities in the Apolo region of the Madidi protected area (Virgen del Rosario and Pata) regarding sustainable incense harvesting in the montane forests of the region. This year this support was extended to a third community, Santa Cruz del Valle Ameno. On the basis of the results gathered regarding the size of the incense stands, the abundance of incense trees within them and the production capacity of those trees, the technical team has worked with local incense harvesters to produce a preliminary management plan for the Virgen del Rosario incense stands. The management plan proposes a monitoring program to assure sustainability of the harvest. In the next six months a similar plan will be complete for the Pata stands, and work is now beginning with Santa Cruz del Valle Ameno to begin the ecological studies that begin this process. In addition, the team is working with colleagues from Conservation International and CARE who have been assisting another community, Pucasucho, in commercializing incense marketing. This has included two meetings of incense producers from the Apolo region in order to explore the possibility of forming an Association of Incense Producers from Apolo. The Association will formally begin in late September 2005 when all communities will vote on their inclusion within the Association. Finally, two French volunteers have begun work with the communities to identify products and explore the possibility of marketing incense on international fair trade markets.

Due to local political complications in the Apolo-Azariamas region, specifically with the Sipia community, we had to suspend activities with the community-driven project to habituate and study the woolly monkey (*Lagothrix* sp.) of the montane forests of the Apolo region. This was because we were simply unable to visit the Azariamas community due to local political insecurity. Although this unfortunate situation continues, the

Azariamas community has expressed its interest in continuing the study of the monkeys, but they are aware of the problem and are waiting for the Sipia community to calm down.

The first local symposium on natural resource management for local communities was organized by WCS and held in San Buenaventura in February 2005. This event was the first of its kind in Bolivia and brought together representatives from over 30 communities in the northern La Paz region involved in different forms of natural resource management - from wildlife conflict and livestock conflict management in the altiplano of Apolobamba, to incense management in the Apolo montane forests, to sustainable forestry and hunting and fishing management in the lowland forest of the Tacana TCO. In total, 119 participants including 70 community representatives met for three days in San Buenaventura. Community representatives met and received presentations from government and non-government experts and potential sources. Each community project gave an oral presentation and produced a poster for the meeting. Working groups were divided as follows: wildlife, tourism and handicrafts, forestry, non-timber forest products and other productive initiatives such as coffee and honey, and developed a preliminary analysis of the situation in northern La Paz including opportunities, threats and priority actions. This meeting was extremely well received by participants and provided a unique opportunity for debate and analysis for natural resource management in the region. A second meeting is planned for March 2006.

Activity 2.2 Community Mitigation of Human-Animal Conflicts

This year we continued to support five communities in the Apolobamba protected area (Cañuhuma, Medallani, Caalaya, Lagunillas, Curva) to implement family level corrals for nocturnal livestock protection, as well as other measures designed to reduce livestock predation such as controlled use of firecrackers. This represents another community-based solution to human-animal conflicts. In each of these communities, the project is working with community members to investigate the amount of livestock owned by each family and monitor losses across the year. The project team is also implementing a standard questionnaire regarding the perception of the communities towards wildlife before the onset of the project. Initial results suggest that perceptions have improved since the beginning of the project, and that tested community proposed solutions are working. However, the project team is currently conducting field verifications, because although perceptions have changed some of the corrals have been poorly constructed and therefore may not represent a real barrier for the main problem wildlife species, the Andean fox. A comprehensive monitoring and evaluation strategy has been developed for this project, and in each community an elected community representative is conducting monitoring activities and will also be trained in basic domestic animal health issues. Indeed, the project technician is also assisting communities in initial health diagnostics for their livestock, as well as assessing existing local knowledge in the battle against disease-based losses, which in all communities are markedly more than those related to wildlife-based predation events.

This year program support ceased to the Pajan, K'apna and Huayrapata communities for the implementation of projects to reduce crop damage by wildlife. Due to the national social unrest in April, May and June which coincided with the corn season, the communities did not implement crop damage mitigation techniques in an integrated fashion and we were unable to document losses as in previous years as planned. However, members of each community participated in exemplary fashion in the Community Natural Resource Meeting in San Buenaventura (see Success Stories and Appendices).

Activity 2.3 Land Tenure and Territorial Planning

The second part of the land-titling process for the Tacana TCO has drawn to a close, with an additional 46,000 hectares titled in June 2005 representing the final escarpment slopes of the Andes, an area of critical importance in terms of watershed management situated between the TCO and the Madidi protected area. This was in addition to the initial 325,327 hectares that were titled in July 2003. The project has continued to provide financial and administrative support to the Tacana legal team in this process. The Bolivian government has

committed to a total of 406,000 hectares for the Tacana TCO, and as such there are still around 34,000 hectares that need to be assigned to the Tacana communities. We will continue to work with CIPTA to complete the titling process, although understandably the focus of CIPTA has now largely shifted to the successful management of the already titled lands. With program support CIPTA also continued with delimiting and marking the boundaries of the Tacana TCO. CIPTA and community representatives were able to prioritize vulnerable boundaries of the Tacana TCO, and community teams led by the CIPTA Secretary for Land and Territory and a professional topographer delimited large sections of the TCO.

The participatory process that drove natural resource regulation development highlighted the need for a ‘micro-zoning’ of the titled Tacana TCO. It is expected that such a zoning plan would double as an official territorial plan. Previous zoning was based on the territorial demand, and it is worth stressing that just as some of the titled TCO was not identified as community use areas in the original zoning process, there were also large sections of areas zoned in the original process that have not been titled in favor of the Tacana. This year the technical teams worked with CIPTA to conduct a detailed and participative micro-zoning process with 18 of the 20 communities making up the TCO. The process needs to be completed for the Villa Alcira and Eyoquibo communities. This was highly successful and CIPTA is currently negotiating with the Bolivian government to ensure that this micro-zoning is recognized as an official territorial plan. The micro-zoning process identified large portions of the Tacana TCO as wildlife reserves, tourism areas, or sustainable forestry and non-timber forest product extraction areas, further emphasizing the natural resource management vision of the Tacana and underlining the importance of the TCO as an important wildlife conservation unit.

Over the last six months we have been working with CIPTA in the development of a strategy to begin working with them and the four Tacana communities of the second Tacana TCO under demand and adjacent to the northern portions of the Madidi protected area. Drawing on our experience with the existing TCO, the strategy will again take a two-pronged approach: on the one hand working with CIPTA and INRA (the government land titling agency) toward the legal consolidation of the TCO II; and in a parallel fashion working with the communities to develop a management strategy based on natural resource management - particularly brazil nut and timber management. Work toward the development of a strategy began in late August 2005 and will continue over the next six weeks. Products of the CIPTA/WCS commission currently in the Tacana TCO II will be a revised census, Participatory Rural Appraisals for the four communities, zoning and micro-zoning, various technical diagnostics, a draft natural resource strategy, mapped boundaries and a distribution map of threatened wildlife.

Activity 2.4 Environmental Education

This year the team has provided follow-up support with School Yard Ecology participating teachers in Tumupasha, as in previous years responding to specific queries and planning needs as required.

OBJECTIVE 3: *Strengthen institutional capacity in natural resource conservation and management.*

Activity 3.1. SERNAP Institutional Strengthening

This year we have continued supporting SERNAP in the implementation and refinement of their integral monitoring system. In particular we have incorporated environmental conflict monitoring as another pillar, complementing conservation status, threats, management effectiveness and the yet-to-be-developed socioeconomic monitoring. We have improved the searching and reporting capacity of the database we had developed with previous USAID funds. In particular the database now permits ease of data entry of new conflicts, editing of information and exporting of information in order to permit decentralized monitoring at the level of each protected area whilst also allowing system wide analysis and follow up at the central office. Furthermore, specific reports can be generated easily such as, but not only: conflict summary (locality, actors involved, conflict state, natural resources implicated, etc); social actors involved in the conflict and their roles and actions they have taken at different moments; actions taken by the protected area and SERNAP;

institutional resources committed to managing the conflicts; partner institutions and their role; and management committee, it's members and role in the conflict. This improved database has been actualized with recent conflicts in the landscape and will be installed in Madidi and Pilón Lajas in the following weeks. This database will complement the reports generated from the protected area conservation status, key species and threats monitoring program, which we have developed for Madidi.

The Madidi conservation status and threats monitoring program received minor revisions by SERNAP central office and the datasheets and accompanying manual have finally been distributed to the park guards. We carried out an additional training workshop on monitoring this year at SERNAP's request, although in our perception the park guards could have begun data collection at least a year ago. Nevertheless, in order to ensure the incorporation of the monitoring results into the SERNAP planning process it is important that we respect SERNAP's leadership in this process. We will now provide follow up, including technical support for data input and management of a GIS linked to the program, in close coordination with the SERNAP/BIAP monitoring technician charged with these areas. One aspect that remains to be incorporated is socioeconomic monitoring, including monitoring of the benefits of the protected area to the local livelihoods. Furthermore, we are also in the process of incorporating tourism monitoring into the existing conservation status and threats monitoring, focusing on infractions of tourism regulations, tourist perceptions, and the economic benefits generated by the activity.

We have provided SERNAP with a consultant to support the conclusion of a communications strategy for the protected area system. This communication strategy has been developed on the basis of numerous previous diagnostics and through regional workshops with protected area staff in Tarija, Cochabamba, Santa Cruz and La Paz. On the basis of the results of these workshops and consultation with partner institutions we will develop a final document by October 2005. The communication strategy will incorporate the environmental education strategy in a single document and respond to a key weakness in SERNAP's capacity for managing environmental conflicts.

We have provided SERNAP with technical support in developing a proposal for incorporating environmental conflict management within their organizational structure, which is still in process. Additionally, specific actions have been taken to improve information management in Pilón Lajas and Madidi: Unfortunately the need to produce a system which does not require an information management specialist to set up and manage the system has complicated the programming requirements. However, we estimate that the information management system will be ready for Madidi and for replication in all protected areas of the network by December 2005. We anticipate that this may be the spearhead for improving information management within the central office as well.

Last year's support to the 2003 Management Effectiveness Evaluations in the landscape, and production of a document, has taken a whole year in the final review - during which time the document has evolved to a document presenting the application of the MEMs (Management Effectiveness Measurement) methodology used by SERNAP, and its results from 2001 to 2003. This methodology is an adaptation of TNC's Parks in Peril Scorecard methodology and identifies system wide weaknesses related to management plans, monitoring systems, land titling, training strategies, participation mechanisms, natural resource management, human and financial resources.

Finally, we have provided important inputs to the national level GAP analysis being carried out by a consortium contracted by SERNAP, in particular in identifying connectivity needs of protected areas based on the ranging requirements of landscape species. We developed a national conservation status map and distribution maps for all mammalian wildlife species with greater than 10 km² ranging requirements: Chacoan peccary (*Catagonus wagnerii*), maned wolf (*Chrysocyon brachiurus*), andean deer (*Hippocamelus antisensis*), guanacos (*Lama*

guanicoe), pampas cat (*Lynchailurus pajeros*), andean cat (*Oreailurus jacobita*), jaguar (*Panthera onca*), giant armadillo (*Prionodontes maximus*), puma (*Puma concolor*), bush dog (*Speothos venaticus*), white lipped peccary (*Tayassu pecari*), Andean bear (*Tremarctos ornatos*) and vicuña (*Vicugna vicugna*). On the basis of these two we identified connectivity needs of individual protected areas to maintain viable populations of these species (See Appendix 1).

Activity 3.2. Protected Area Support and Staff Training

This year we facilitated a meeting of the inter-institutional committee of Madidi to promote the idea of developing internal regulations for the committee, in order to improve coordination and ease of pooling of financial and technical resources to jointly implement the protected area annual work plan. However, because of tight schedules and the priority to deal with emergencies related to conflicts within the protected area, it has not been possible to make more progress. Nevertheless, we have participated in the Pílon Lajas inter-institutional committee and have been requested to provide technical support in organizing the next meeting.

We have developed new contents and carried out two park guard training events in the landscape aimed at improving their capacity in key topics for conflict management and prevention, such as leadership, communication, democratic culture and strategic planning. Two 4 day park guard training events took place on these topics, one in San Buenaventura where a total of 13 Madidi, 6 Pílon and 5 Beni Biological Station park guards participated. This was later replicated in Charazani with 16 Apolobamba and 6 Madidi park guards. These courses were coordinated with SERNAP in order to incorporate this experience into the process of reviewing the park guard training profile, to one more concentrated on outreach capacity.

In coordination with AOS (Swiss Workers Aid) and CI we produced and transmitted radio spots on the Madidi management plan, and participation in the park's administration and the management programs. We have also provided technical and logistical support to the Madidi management committee to discuss aspects related to mining in the area and co-management of protected areas. As a result of the mining information, the management committee drafted a letter to the Mining Vice Ministry asking for their support in dealing with the environmental problems caused by mining in the region. The management committee requested more detail and a document will be developed for distribution in the coming weeks. The co-management issues were initially forced by the new mayors of San Buenaventura and Ixiamas who demanded immediate co administration of the areas within Iturralde province by the municipal governments, fueled by pressure from mining and forestry interests. As a result of greater information, the management committee drafted a resolution stating that any decision regarding the protected area administration should come from consensus and involve all legitimate stakeholders.

The project team continued to provide substantial technical assistance to the implementation of the Madidi Management Plan, through participation in the technical committee - specifically supporting the implementation of the monitoring and research, this support included designing the monitoring program, mentoring the park guards in its application, linking the data sheets to a GIS database and now accompanying its implementation of the monitoring program; technical support in designing strategies for dealing with conflict management; implementing specific natural resource use projects and through this beginning the process of developing regulations for natural resource use in the protected area; and providing the technical expertise through Jazmin Caballero to implement the tourism programs. Project staff also continued working with SERNAP and CIPTA in coordinating activities related to the management of the lower Tuichi and Hondo Valleys, in particular centered on tourism management. The basis of an agreement between CIPTA and the protected area is being constructed, this agreement specifies conditions for use of the area where the TCO and protected area overlap by tourism agencies, once concluded this agreement can be replicated with San Jose de Uchupiamonas, since both CIPTA and San Jose have legal land titles over part of the lower Tuichi. It is important to clarify the conditions for use of this area to avoid conflicts between the TCOs and the protected area administration, as

well as between the protected area and tourism operators who may feel unfairly excluded from operating within the lower Tuichi. Furthermore, it is important to promote tourism operations in this region to build support for the protected area, in particular in the urban centers of San Buenaventura and Rurrenabaque.

Through an agreement with Conservation International, as of June 2004 the WCS team is updating the management plan for Pilón Lajas. A first draft has been produced, but the process was slowed down three months ago because of external interests within the T'simane and Moseten Regional Council, CRTM. Ideological positions presented by advisors to the CRTM argued that an indigenous territory is not compatible with a protected area. Furthermore, certain indigenous leaders were supported by these advisors in their illegal timber exploitation actions. Hence a separation between the protected area administration and the CRTM was created. It is important to highlight that at no point were the community representatives involved in this dispute and a weakness in the legitimacy of the CRTM decision-making processes became evident. Since the CRTM is now approaching SERNAP to continue with the process, it is important to prioritize interventions aiming to strengthen the CRTM and its ability to become co-managers of the reserve. The updated management plan produced to date is based on a participatory process involving three rounds of community visits, approval of the work plan and strategic components by the management committee, an evaluation of the previous plan, participatory zoning, an analysis of possible co-management structures, an analysis of the causes of success or failure of different natural resource use projects in the buffer zone, and an analysis of social dynamics arising from the colonization process, amongst others.

Activity 3.3. Wildlife Management Program (Institute of Ecology)

Our agreement with the Institute of Ecology and a small grant program for students of the Biology Faculty continues, with 13 undergraduate theses supported to date, 3 small research grants, scientific supervision of 3 masters theses, and 4 volunteer research projects for undergraduate interns. The process of reviewing the undergraduate biology curriculum has been completed with new courses concerning wildlife management and wildlife conservation research successfully incorporated. Discussions have just begun regarding how the technical team can contribute to mentoring students before they embark on thesis studies. A weekly journal club designed to promote critical thinking for the project team and wildlife students at the Institute, as well as to provide a means of staying in touch with current technical literature, has been institutionalized within the new curriculum and will commence again in August 2005.

Activity 3.4. Monitoring Strategy Implementation

In the context of updating the Pilón Lajas management plan we carried out an evaluation of land use changes along the Yucumo-Rurrenabaque road, complementing the analysis carried out along the San Buenaventura-Ixiamas road in FY2004. As a result, we have improved our information on the conservation priorities in Pilón Lajas and the human landscape, both in the indigenous and colonist sector. This analysis encouraged us to carry out a more specific sociological study of the changes in productive strategies and demographic changes in the population, both related to colonization, that are promoting an increasingly accelerating rate of forest loss along the Palos Blancos to Rurrenabaque road. It is clear that we need to work with the colonist sector in promoting sustainable productive activities, clarify land tenure and strengthen the CRTMs organizational structure to avoid further encroachment of the protected area and indigenous territory. Additionally, as a result of this effort, the Pilón Lajas administration now has similarly detailed GIS information as the Madidi protected area. The methodology employed by SERNAP to develop the Pilón Lajas monitoring plan is compatible with the one we developed for Madidi, and we have actively participated in and provided input to its development. We will provide assistance to Pilón Lajas in linking the monitoring data to the GIS database and input data once the monitoring program is concluded. Apolobamba has not yet initiated this activity and we hope to provide support to them in this fiscal year. The information management system we are developing for Madidi and Pilón Lajas will also strengthen monitoring efforts.

This year we have begun working with CIPTA, in collaboration with BOLFORD, in developing social indicators for the Tacana TCO. We have provided all the data to be analyzed for a study carried out by the Conservation Strategy Fund, evaluating the economic costs and benefits of Madidi protected area to the region and comparing the estimated benefits provided by different road options. In addition, alternative investment strategies related to productive activities, as well as health and education, are presented. A first draft of this study has been concluded and shows important benefits to the economy of the region and limited opportunity costs. We expect that this information will help build political support for the protected area from decision makers in La Paz and also help to clarify misconceptions held locally about the main beneficiaries of protected areas.

Activity 3.5. CIPTA Institutional Strengthening

A crucial element of the Natural Resource Use and Conservation Strategy for the Tacana TCO is to develop a governance plan and build the capacity of CIPTA to respond to the technical and administrative challenges of managing the TCO. Over the last year we have continued to work with CIPTA in the development of administrative capacity. This process has been developed in a participative manner with the CIPTA directorate, and capacity-building has extended to many of the natural resource management initiatives taking place in the TCO - funded by WCS, Ayuda Obrera Suiza (AOS), and nationally available funds such as the Tacana handicraft projects mentioned above. To date these courses have received very positive feedback from participating representatives and are seen as critical by CIPTA in order to ensure efficient and transparent financial management by representatives, who in many cases have limited experience or training in administration. Also, establishing administrative capacity is a critical long-term goal for improving the potential of CIPTA for generating direct funding.

We continue to assist CIPTA in the implementation of institutional processes developed during previous fiscal years. These include a transparent monitoring program for activities undertaken by CIPTA representatives, consisting of bi-monthly work plans and corresponding reports, organized under objectives within the overall TCO management strategy, that require pre and post-approval by the CIPTA directorate. CIPTA and the project team have continued developing a Natural Resource Management Office within the CIPTA organizational structure. This includes formal meetings, training and equipping in GIS techniques related to the management of the TCO, and in conflict management and prevention. Five people have received regular training over the last year in Tumupasha. The project also funded an exchange with CABI (Capitania de Alto y Bajo Izozog: the indigenous organization managing Bolivia's Kaa-Iya National Park) designed to expose CIPTA and other indigenous organizations of northern La Paz to: the organizational situation of CABI, which includes a technical branch and a representative branch; and the reality of co-administration in the Kaa-Iya National Park. In the longer term a full-blown CIPTA technical body will be required.

This year project support has extended to technical support to CIMTA (Tacana Women's Council). The project team has supported the implementation of two grants from national funding sources aimed at building the handicraft capacity in Tacana communities and consolidating the Tacana Cultural Centre in San Buenaventura. Although handicraft development is by no means an exclusively female occupation, it is dominated by women artisans and the Tacana Cultural centre is run by CIMTA. A project-financed consultant is currently documenting the abundance and production capacity of natural resources in the Tacana TCO, including plant species used in handicraft production.

Activity 3.6. Local Government Environmental Planning and Management Support

The local campesino federations (FESPAI) sustainable development strategy was approved by the community representatives, printed, and presented to conservation and development institutions in La Paz. In response to this strategy a course on developing communal land use plans (POPs) was carried out with the Agrarian Superintendence, but unfortunately because of political conflicts FESPAI did not participate. However, this course was carried out with the Tacana communities and has complemented the work on micro-zoning, since

technical staff from the agrarian superintendence explained how soils are classified and what elements the state uses to determine land use aptitude. In turn, CIPTA representatives compared the Tacana zoning process, and the complementarity between both instruments was discussed and understood by community representatives.

This year we began a participatory diagnostic of environmental conflicts in San Buenaventura and the Leco Indigenous District of Guanay Municipality, through agreements with the municipal governments. Unfortunately changes in municipal authorities in San Buenaventura resulted in the process being abandoned. However, PILCOL (Pueblos Indigenas Leco y Comunidades Originarios Larecaja) and Guanay have continued and an environmental management strategy for the Leco communities of Larecaja has been developed and is in the final stages of revision. This process has been strengthened through the creation of communication brigades, made up of young indigenous school graduates who have constituted a volunteer corps that has visited each community with basic sustainability and conservation messages. In the next three months they will replicate this, explaining concepts related to their indigenous organization, Madidi protected area, the Leco Environmental Strategy and the Madidi Management Plan. It has not been possible to work with San Buenaventura although the current mayor ran on an environmental platform. Indeed, in order to encourage the new municipal authorities of San Buenaventura to include environmental issues in their agenda, a debate cycle was organized between all the municipal candidates in November and transmitted through local television. Nevertheless, once elected the mayors of San Buenaventura and Ixiamas have allied themselves with the illegal timber and mining sectors. At present we are supporting the protected area to engage the municipal governments through tourism, including the promotion of a municipal reserve on the eastern side of the Madidi River. We are also lending assistance to the protected area in following the appropriate legal actions in response to the invasion by illegal timber extractors in Apolo and Iturrealde.

During this year Conservation International began participatory territorial zoning in Apolo municipality through a sub grant agreement from WCS, channeling additional funds from USAID Bolivia. This process will conclude by December.

OBJECTIVE 4: *Promote the development of national policies that support the landscape conservation approach.*

Activity 4.1. Policy Support

We have provided assistance to SERNAP by reviewing documents and strategic actions related to road improvement plans along the Yungas road to Rurrenabaque. We identified the main threats to Pilón Lajas protected areas arising from this proposal and developed an outline of a mitigation plan. At present CI, TNC, WWF and WCS are coordinating efforts to promote assurance that protected areas and biodiversity conservation issues in general are adequately taken into consideration by the strategic evaluation being carried out by DHV, a contractor for IDB and the Bolivian government.

At the request of the DGB, the project team has reviewed several versions of a new proposed national regulation for wildlife use, as well as a review of the more specific regulation for spectacled caiman management. Both of these proposals are nearing completion and we are still providing technical review to complete draft versions. The DGB is using a four-pronged approach to developing these regulations, with biological, legal, economic and social aspects being considered. The project team has mainly contributed to the biological and social aspects of these regulations. The team also pioneered DGB co-sponsored events on wildlife health issues and human-animal conflicts over the last twelve months. Both meetings resulted in informal discussion groups, and follow-up meetings are planned over the next year in order to continue placing these issues on the environmental policy agenda in Bolivia.

Activity 4.2. Financing Mechanisms

The project team continued to provide technical assistance to CIPTA in the development of a series of more specific proposals to finance their Natural Resource Management Strategy. Strong proposals to PUMA (Fundacion Proteccion y Uso Sostenible del Medio Ambiente) and the Belgian Cooperation are currently under consideration for native bee honey management and the installation of a Tacana TCO CIPTA-managed saw mill, respectively. This is a critical element of our institutional strengthening plan for CIPTA. We have been strengthening CIPTA's administrative capacity in order to improve their chances of managing funds directly. In addition, we have produced an eco-tourism strategy for the Tacana TCO and this will form the basis of a CIPTA proposal to a major national funding source in the next four months.

Finally, we have worked closely with SERNAP and FUNDESNAP to develop innovative ways of generating revenue for an endowment fund for the Madidi protected area. This has focused on using species discoveries as a way of generating publicity for the park, including information on financial needs for managing an incredibly diverse and huge wilderness. A unique public on-line auction for the scientific (latin) name of a new species of titi monkey generated an enormous amount of public interest across the globe, and significantly raised the profile of the Madidi protected area. In addition, the auction itself raised \$650,000 for the Madidi trust fund managed by FUNDESNAP, and various possibilities for a one-on-one match (which would double this amount) are currently being explored by FUNDESNAP.

Activity 4.3. Threats Assessment Working Group

This year we conducted an internal workshop with all of the technical team of the program. The workshop developed conceptual models and monitoring frameworks for each individual activity. This was an important step toward the full implementation of a coordinated monitoring system for the program, and is one of the crucial steps in the landscape species approach. The project team continued monitoring threats to the landscape through interpretation of satellite imagery, particularly the advance of the agricultural frontier in the Pilón Lajas area, identifying factors related to higher rates of habitat loss such as roads and population size. In addition, threats to the area are being discussed in three fora: the inter-institutional committees of Apolobamba, Pilón Lajas and Madidi; the Coordination Committee for the Amboró – Madidi Corridor (CCCAM); and by local actors in the Management Committee of Madidi.

Lack of rule of law and weakness within the local municipalities and grass roots organizations continue to be key threats to the landscape. In Madidi the municipal authorities in Ixiamas and San Buenaventura have engaged in illegal activities. Furthermore, the national government weakness has prevented appropriate legal action being taken and the park has had to look for logistical support to promote legal actions against these activities. Similarly in Apolo, where illegal timber extraction was camouflaged behind the road proposal between Apolo and Tumupasha, lack of appropriate legal action by the Bolivian state has resulted in a replication of the problem in Iturrealde. Luckily for Madidi, the indigenous support for the protected area has prevented illegal settlements.

In Pilón Lajas, the indigenous organization CRTM had distanced itself from the protected area and has only begun to approach the protected area administration again. This was also a result of institutional weakness because, despite the fact that the Pilón Lajas indigenous communities supported the management plan process and had participated actively, the leaders were misguided by their advisor who is philosophically opposed to the double category of the reserve - protected area/indigenous territory. Furthermore, a couple of the CRTM leaders had become engaged in illegal timber extraction deals and therefore opposed the protected area park guards. It is necessary to find ways to strengthen the CRTM's internal communication mechanisms, internal regulations and enforcement capacity, as well as to build other capacities to engage them in the co-management of Pilón Lajas.

OBJECTIVE 5: Elaborate a participative, integrated landscape conservation action plan.

Activity 5.1. Integrated Landscape Conservation Action Plan and Stakeholder Workshops

This year we have focused on working with PILCOL and CIPLA to develop strategic plans for their territorial demands. To date we have a draft environmental management strategy developed with PILCOL and a draft sustainable development and environmental management strategy developed with CIPLA. Both these documents were developed through community visits to more than 50 PILCOL and CIPLA communities in a process of self-diagnostics, carried out by indigenous leaders with our technical support. As a result of the work being carried out with 4 out of the 5 indigenous territorial demands neighboring or overlapping with Madidi, we were able to promote a coordination forum between the indigenous grass roots organizations of Madidi, to which the CRTM was invited because of its proximity. We organized a visit by two members of CABI to present their experience co-managing a protected area. Finally, this coordination has been formalized into an association of indigenous territories of the region. We have given additional assistance to this initiative in the development of an initial coordination plan with the protected area, based on the recommendations of the management plan. As a result of this, the first joint vigilance trip has been carried out between the Lecos and the park guards in response to reports of invasions by illegal loggers. We hope to assist in the development of a joint control and vigilance strategy between all 5 neighboring TCOs and Madidi protected area in the next semester.

Apart from the documents mentioned with respect to specific activities above, we have also produced a number of peer reviewed articles over the last year. Ten articles or management plans have been published, another 12 articles have been accepted and are in press, and 5 more are under review. One of these articles is a broad review of the landscape conservation process, being published as a case study in the celebrated new edition of the classic textbook 'Biological Conservation'. Meanwhile, the project team is busy working on further publications that will summarize our working relationship with CIPTA and the Tacana people, as well as a more detailed description of the planning process for landscape species.

III. Success Stories

The Landscape Conservation Strategies described above will not only contribute to the conservation of individual areas such as the Madidi, Apolobamba and Pilón Lajas protected areas and the Tacana Indigenous Land, but will also help to ensure that conservation strategies are less insular and more integrated at the landscape level. Most strategies to conserve biodiversity separate areas of protection from areas of use. Parks and reserves effectively protect biodiversity, but are imbedded in a landscape in which natural resource exploitation of all types occurs. Therefore, effective biodiversity conservation must integrate the areas of use and protection across the landscape. A sustainable landscape is one in which a mosaic of different land uses conserve biodiversity while allowing people to make a living. The conservation strategy must integrate parks, large forestry concessions, indigenous management areas, extractive reserves, agricultural zones, and even urban areas.

Legal Titling of the Tacana TCO

In June 2005, a second portion of the Tacana TCO was legally titled by the Bolivian government. Representing over 46,000 hectares of piedmont forest at the base of the Andes and directly bordering and/or overlapping with the Madidi protected area boundary, this was identified as a key compensation area by the Tacana because of various factors: traditional use areas of three Tacana communities (Villa Alcira, Tumupasha and San Miguel); importance as a cultural heritage site for the Tacana people due to religious significance of these hills; and the critical watershed protection of the hills for many of the lower lying villages within the TCO. The land titling process has lasted over seven years, with WCS and USAID support for 5 years, and was an extremely difficult and conflict-ridden activity. However, CIPTA and their representatives have shown great pragmatism,

persistence, patience and respect for the relevant laws, which finally paid off with their being granted legal title for a total of over 372,000 hectares to date. Although third phase titling activities for smaller portions of the original claim continue (up to 34,000 hectares more), CIPTA is aware that the challenge now shifts to the management of this area.

Spectacled bear density estimation

The spectacled bear is one of the most elusive species of the Andes, and virtually no information existed regarding population sizes previous to our efforts this year. Although this was a preliminary study and was not without problems, it has proven that camera trapping is a valid methodology for estimating spectacled bear densities. This is of paramount importance for a species that is considered regionally threatened due to increasing habitat loss and resulting problems of connectivity. We are hoping that more study sites will employ this methodology in the future in order to assess, in combination with distributional information, the real conservation status of this species.

Pilón Lajas Management Plan

This process has had difficulties mainly due to organizational problems within the Consejo Regional Tsimane-Moseten (CRTM). However, the process is almost complete and has used many of the methodologies used so successfully in the Madidi management plan process, as well as elements of our experience with CIPTA in the development of the Tacana TCO management plan. Critically, the management plan process is compatible with the Madidi plan. There is clearly much work to be done with the CRTM in the future, however, a critical first step toward integrating the protected area and the indigenous territory was the development of a management plan that embraces this dual status and also recognizes the influence of the colonist and campesino communities along the Yucumo-Rurrenabaque road.

Madidi monkey name auction

The naming auction for the new species of titi monkey found in Madidi generated globally significant and positive press coverage for Madidi, Bolivia, and the importance of wilderness areas in general. In addition, the auction raised \$650,000 to kick-start a trust fund dedicated to the long-term conservation of Madidi. Although decisions regarding how interest will be invested will be taken by SERNAP and FUNDESNA, to put that in perspective, the annual anticipated interest (around \$42,500) would pay for over half the existing Madidi park guards. Critically, FUNDESNA is currently working on two solid opportunities to match the \$650,000 one-to-one. If these came through then an auction to name a monkey will have raised around 10% of the overall long-term trust fund target for Madidi.

Community Natural Resource Meeting

The community natural resource management meeting held in San Buenaventura in February was an inspirational event, providing a first opportunity for communities to share their experiences, successes, failures and problems during the implementation of a wide range of initiatives designed to foster sustainable natural resource management. The meeting clearly galvanized participating projects, and provided the first step for this array of projects to provide policy recommendations for government and local government regarding how to regulate and support community-based natural resource management. The general discussions led to a number of priority issues that will be the subject of more specific meetings of this group in the future.

Biological Conservation Publication

Lilian Painter, Robert Wallace and Humberto Gomez were invited to write a case study regarding the Landscape Conservation approach being used in the Greater Madidi Landscape for the forthcoming Biological Conservation textbook. This textbook leads the field, and the case study highlights our integrated land-use planning approach, the need to respond to direct and indirect threats, the power of spatially explicit threat

mapping, and the development of priority conservation interventions as a result of landscape species spatial needs analyses.

Objective 6: New York Coordination Unit Strategy: Guide the design and testing of wildlife-focused planning, implementation, and evaluation tools for effective conservation at a landscape scale, and promote learning across sites and beyond

The NY-based Coordination Unit (CU) of the program is designed to develop and test wildlife-focused, landscape-scale approaches to biological conservation across multiple sites. To ensure the widespread utility of these new conservation approaches, the program is testing them within landscapes that encompass a diverse array of ecological characteristics, land-uses, resource-use issues, and jurisdictional arrangements. To develop new approaches, facilitate and harmonize testing and implementation among these core sites, and capture the synergistic benefits of diverse experiences, a central coordination unit is charged with designing and managing the program. This unit guides the development of landscape-scale conservation strategies, tools and techniques; assists in the design and development of cost-effective intervention and monitoring programs at these sites; promotes cross-site learning; and ensures communication among the sites, WCS staff (central and field), USAID (DC and missions), and the larger conservation community.

During FY 2005, the Coordination Unit accomplished most of its planned programmatic, technical, and administrative goals. The CU worked with field sites to design conservation landscapes for the Glover's Atoll, Maya Biosphere, and Madidi sites (design for the Eastern Steppe of Mongolia will be completed in FY06). CU staff refined and simplified the process for selecting landscape species, including development of software as a decision-support tool for analysis. The concept and rationale for using landscape species to focus conservation planning and monitoring at a landscape scale was disseminated to the conservation community through a peer-reviewed publication.

Activity 6.1 Provide technical assistance to site-based conservation

Members of the WCS/NY Coordination Unit worked closely with field sites to provide targeted technical input (help desk, and informal and formal training) throughout the year. In some cases this involved trips to sites as reported in the previous section of this report.

Activity 6.2 Design, implementation, and testing of decision support tools

Activity 6.2.1 Living Landscapes Program Technical Manuals

The Living Landscapes Program produced two new brief how-to guides, called Technical Manuals, after field testing and fine-tuning the methods at several WCS/BCLS field sites: one concerning participatory spatial assessments of human activities, and another one focusing on how to build conceptual models for a project. The manuals were also translated into French and Spanish, distributed to field staff, and made available on our website for wider use. We responded to requests from program staff of TNC, WWF and AWF and distributed copies of the threats assessment and conceptual modeling manuals, each of whom now have projects that have applied these techniques in the field. We have also made available our bulletins (brief conceptual guides on strategic approaches and tools) and technical manuals for the USAID Mission and Washington staff during their Agriculture, Environment and NRM training held in August 2005. These were enthusiastically received. In addition, we have written three additional manuals that are currently in review and will be published within the next few months. The three draft manuals are: Developing a monitoring framework from conceptual models; Building biological and human landscapes; and conducting household surveys. Enthusiastic uptake of the LLP bulletins and manuals continues to demonstrate the utility of the lessons we are learning under BCLS and are sharing with the larger conservation community.

Activity 6.2.2 Landscape Species Approach progress

6.2.2.1 Landscape Species Selection Software

Revisions to the landscape species selection software were completed, and version 2.0 was released and distributed to BCLS sites, other WCS sites, and conservation practitioners at large. The new version includes refinements of criteria used to rank candidate species for selection (e.g., heterogeneity of habitat use), provides more user-control of selection criteria, and includes an overhaul of the process of selecting species to maximize their complementarity.

6.2.2.2 Conservation Landscapes

As one of the priorities for this year, LLP staff worked closely with sites to design conservation landscapes that map conservation priorities within larger, undefined landscapes. During the last Living Landscapes Program Annual meeting, presentations were given from 7 sites where staff have conducted a preliminary round of designing conservation landscapes (Ndoki-Likouala (Congo); Madidi (Bolivia); Northern Plains (Cambodia); Adirondack Mts (NY-USA); Glover's Reef (Belize); Madison R. Valley (MT-USA); and Maya (Guatemala). For each, identification of priority areas within the landscape was based on: (1) spatially-explicit needs of selected landscape species (biological landscapes), and (2) mapped threats (human landscapes). Analytical methods for determining a set of priority lands that are sufficient for long-term conservation, while efficiently addressing threats, were described using several different methods, including MARXAN and C-Plan software. We were therefore able to compare such methods, and will be applying these to further landscape designs. Decisions were also made on population target levels that should be incorporated into final analyses, aiming at a minimum for populations that are demographically sustainable. Plans for finalization of conservation landscapes have been outlined for each of the 7 sites over the following year.

6.2.2.3 Testing the landscape species approach

Ad hoc assessments to-date have informed us that field projects use the Landscape Species Approach (LSA) tools with some variation, depending on the circumstances at different sites. Some have dedicated a great amount of time to landscape species selection and have done threats assessment with wide participation, while others have carried out both these exercises within a relatively short amount of time and with a handful of project staff. We would like to be able to draw some principles from these variations and be able to advise others on the utility of the approach, its individual steps, and the conditions under which it may or may not provide advantages to conservation.

With this in mind, LLP has engaged non-LLP WCS staff to work with us (both field-based and central) in reviewing the use of LSA at twelve sites that constitute the core LLP portfolio (including all BCLS/GCP sites – both past and present), and in assessing users' and other WCS' staff perception of its utility for site based conservation. The assessment will mainly be questionnaire based with some follow-up interviews with field staff. LLP intends to use the findings to better adapt our program and LSA tools for site-based planning. This assessment has begun, and will be completed in the first half of FY06.

Activity 6.3 Catalyze cross-site and cross-organizational learning, and communication

Activity 6.3.1 Living Landscapes Program Annual Meeting

The Fourth Annual Meeting of the Wildlife Conservation Society's Living Landscapes Program (LLP) took place from May 24- June 1, 2005 in Ruaha River Lodge, Ruaha National Park, Tanzania. A total of twenty-five WCS field and New York-based staff attended the meeting, including representatives of all but one of the

BCLS/GCP-funded sites¹ and from other WCS regional programs (Marine and Africa). Participants spent five days in a formal meeting setting and one day on a project field trip. In addition to continued group work on LSA tools, the group spent significant time discussing field topics identified both prior to and during the meeting. Topics included those centering on local socio-economic contexts (community-based wildlife management, addressing socially diverse landscapes, economic incentives as conservation tools, measuring the impact of outreach efforts), power & governance issues (dealing with national political instability, analysis of stakeholder power relationships), zoning as a conservation tool, and economic valuation of natural resources/wildlife. In addition to sharing experiences, ideas and perspectives on each topic, we agreed to distribute contacts and/or relevant literature as a follow-up to many of the discussions. Particular interest was raised in conducting stakeholder power analyses and economic valuation of ecological goods and services, and possibly undertaking direct payments to communities for conservation compliance. Report of the meeting has been distributed to meeting participants, and is available upon request.

Activity 6.3.2 CMP: leadership, design, writing and audits

David Wilkie and Craig Groves continued to represent WCS within the Conservation Measures Partnership. Groves and Wilkie contributed directly to the analysis of lessons learned during the pilot audits conducted in FY04-05 and are currently helping to draft a protocol for conducting multi-partner peer-reviews of conservation projects. Wilkie worked closely with other CMP partners to assess the feasibility of developing software to guide field staff through the steps in the ‘Open Standards’ for conservation planning and adaptive management. This CMP activity resulted in development of a business plan for software development. Wilkie and Groves will continue to provide technical guidance as tool modules are developed for the Adaptive Management software. The eAdaptive Management software is an attempt to integrate best-practices of conservation planning into a simple to use software package. The software will guide practitioners through the steps in effective planning and project adaptive management and provide a system for tracking conservation progress over time. WCS staff worked with TNC to ensure that our institution process for cataloging our field projects is compatible with the TNC Project Inventory website. In the next 3 months, WCS will complete a review of WCS efforts to implement activity-based cost accounting within the Gabon and Bolivia programs. This review is eagerly anticipated by a number of donors, including the USAID Congo Basin Forest Partnership program.

Activity 6.3.3 Cross-organizational Learning Initiative

At the beginning of September, the Landscape Ecologist and socio-economic monitoring specialist participated in a multi-partner workshop organized by WWF on Landscape Planning. They presented the Landscape Species Approach and participated in the process of applying different landscape planning tools, used by the different NGO partners, to the Samburu Heartland in East Africa.

6.3.4 Synthesis of Lessons from site-based conservation

6.3.4.1 Local engagement in conservation survey

After testing the survey design for the study on engaging local people to promote effective conservation of wildlife and wildplaces, the survey instrument was refined and finalized. Completion of the survey has been postponed for late 2005, and will be completed during the first quarter of 2006. Analysis of the survey results will be compiled and written up for publication in a peer-reviewed journal and as an LLP bulletin that outlines a set of guiding principles for engaging local people in conservation.

6.3.4.2 Survey of “protection” as a conservation strategy at sites

¹ The following BCLS/GCP sites were represented: Ndoki-Likouala (Congo); Yasuni (Ecuador); Eastern Steppe (Mongolia); Glover’s Reef (Belize); Maya (Guatemala). Madidi (Bolivia) was not represented due to insecurity problems in Bolivia prior and during the meeting.

The WCS Maya Biosphere Reserve Project conducted the survey of protection measures used by a number of WCS sites. However, response rates were limited, and due to other pressures at the project site, the finalization of the survey results analysis has been postponed until FY06.

6.3.4.3 Preliminary assessment of the human welfare impacts of establishing national parks (Parks and People project)

With funding provided by the John D. and Catherine T. MacArthur Foundation, LLP staff in collaboration with the WCS Gabon program and the Ministry of Forest Economy in Gabon conducted a baseline household welfare survey of 1,000 households living close to the borders of 4 national parks in Gabon, and an additional 1,000 control households living outside the influence of the parks. This survey is the first of three surveys planned over the next 5 years to assess the income, health, consumption, natural resource use, and family function impacts of establishing protected areas on local families. Results of the baseline survey will be analyzed within FY06 and will allow us to assess the role that market access plays in the welfare status of families proximal to and distant from the parks. Additional funds were secured from the National Science Foundation to support the Gabonese social science teams working on the Parks and People Project, and to assess the role that individual time preference (discount rates or patience) plays in investment in health care, education, savings, and sustainable use of natural resources. An article on the Parks and People project was accepted for publication in *Conservation Biology*.

Activity 6.4 Application of Living Landscapes Program tools beyond core sites

6.4.1 Training workshops in the use of LLP tools

Staff conducted a number of workshops to train field practitioners in the use of conservation planning tools throughout the year. In addition to holding in-service WCS training workshops on building conceptual models for conservation projects and using these as the foundation for monitoring conservation success, staff held such workshops for project partners in Madagascar (May 2005) and Gabon (March 2005).

In response to increasing demand for training in the conservation tools, the socio-economic monitoring specialist also ran a training of trainers workshop for WCS directors and program managers in August 2005. As demand for training opportunities exceeds the staff time available in LLP, we envision that participants from these workshops will in turn train and work with field staff and partners in different parts of the world. Such staff will be able to follow up with post-workshop support to interested partners, e.g., protected area staff in Madagascar and Gabon.

6.4.2 The World Conservation Congress

As part of the World Conservation Congress in Bangkok, Thailand in November 2004, the program director led a symposium titled “Applying Ecosystem Management for Biodiversity Conservation: A Wildlife-focused Approach”. The aim of the symposium was to draw out principles and, using case studies, outline the utility of wildlife-focused strategies and management that are integrated within complex environments of human influence. Emphasis was placed on current work from active conservation initiatives, and included a case-study presentation from the Madidi, Bolivia project – a USAID/EGAT funded project. The workshop was well-attended, and highlighted the value of wildlife targets for landscape-scale conservation planning and management.

Activity 6.5 Ensure coordination and communication services for the program

LLP Coordination Unit staff periodically met with staff from the core sites and other WCS large-scale conservation sites to discuss the development of the program, on-the-ground implementation of the Landscape Species Approach, and further development of tools relevant to the approach. The Outreach Coordinator and others continued to meet with collaborators, NGOs, governmental officers, and representatives of other

stakeholder groups to promote use of BCLS-derived strategies and tools, to assess their utility, and to determine whether additional tools would be of use to field practitioners.

CU staff worked with field staff in the preparation and review of annual reports and implementation plans. The CU staff also organized the annual GCP meeting in May 2005 where we presented the Landscape Species Approach and project cycle used by WCS. We feel that this was a particularly focused and useful GCP meeting.

Appendices:

APPENDIX 1: Identification Of Conservation Gaps And Possible Conservation Areas For Minimum Viable Populations Of Mammal Species