Biodiversity Conservation at the Landscape Scale

A Program of the Wildlife Conservation Society
Supported by the USAID/Global Conservation Program

The Eastern Steppe Living Landscape: Sustaining Wildlife and Traditional Livelihoods in the Arid Grasslands of Mongolia

Annual Report
October 2005 – September 2006

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I. Summary of Activity Status and Progress

a. Introduction/Summary:

The Eastern Steppe of Mongolia is perhaps the world's largest intact grassland ecosystem. At 250,000 sq km, the area is roughly the size of the state of Oregon. This vast wilderness is home to one of the world's last great spectacles of migrating ungulates, the Mongolian gazelle. Numerous other mammals live on the steppe, and there are many rare or critically threatened birds, including six species of cranes (almost half the world's species). The steppe is of international importance, and is a Global 200 Ecoregion, a Last Wild Place, and the location of Mongolia's first Ramsar site. Human populations on the steppe have historically been sparsely distributed and engaged in traditional nomadic livestock production, which had minimal impact on the ecosystem. This historical pattern of sustainable use of the steppe's resources has been disrupted by major socio-economic changes during the past fourteen years. Rising urban unemployment has increased reliance on the hunting of wildlife for subsistence and income, while declining markets for meat and other livestock products have increased poverty among herders. The country's economic needs are also driving oil, coal, gas and mineral exploitation of the Eastern Steppe. The WCS/USAID Living Landscapes Program strives to address these threats to biodiversity and wild places through the implementation of a participatory, wildlife-based strategy for landscape conservation. The program in Mongolia, "The Eastern Steppe Living Landscape: Sustaining Wildlife and Traditional Livelihoods in the Arid Grasslands of Mongolia," is funded by USAID's GCPII program.

The WCS/USAID Eastern Steppe Living Landscape program has played an expanding role in shaping wildlife management strategies and conservation policy in the Eastern Steppe since the program began in October of 2003. The project has expanded the information base used for conservation planning and it has facilitated communication across the agencies and institutions engaged in wildlife protection and conservation on the Eastern Steppe. In this, the third year of the program, we continued to respond to the requests for strategic planning and conservation priority setting assistance from provincial and national-level Mongolian officials, but also focused more of our attention on facilitating effective community-level wildlife conservation and management. An amendment to the Mongolian environmental law, as well as an increased interest on the part of the Mongolian government and the NGO community alike to explore the potential for community-based natural resource management in Mongolia, has resulted in an increasing number of opportunities for livestock herder communities to engage in wildlife conservation activities on the Eastern Steppe. The WCS/USAID focus on community-based

natural resource management on the Eastern Steppe is now an integral component of our on-going field research, conservation planning activities and networking among the governmental and non-governmental members of the conservation community, with the goal of advancing wildlife and landscape level conservation on the Eastern Steppe.

b. Highlights

Accomplishments for the program's third year:
A plan for natural resource management designed to conserve wildlife and to maintain rural livelihoods

- Selected Landscape Species for the Eastern Steppe Living Landscape, a suite of seven species of wildlife that represent the threats to biodiversity and the diverse habitats of the Eastern Steppe landscape. The application of the Landscape Species Approach on the Eastern Steppe supports stakeholders' goals of planning for natural resource management to conserve both wildlife and traditional nomadic pastoralism.
- Co-hosted a workshop series with the Eastern Mongolian Community Conservation Association designed to guide herder communities through the process of acquiring wildlife management and natural resource rights for their traditional grazing lands. Five Eastern Steppe herder communities have signed contracts with their local governments and the applications of 13 additional communities are under development. This initiative has the potential of expanding the protected area network on the Eastern Steppe by 200,000 hectares through community-initiated wildlife protection and management.
- Published and distributed four reports completed in FY2005 (Przewalski's Horse Reintroduction, Important Bird Areas of the Eastern Steppe, Wildlife/Livestock/Human Disease Interface, and Wildlife Trade in Mongolia), increasing the information base for conservation planning on the Eastern Steppe.
- Mapped the Important Bird Areas (IBAs) of the Eastern Steppe including the locations and descriptions of an additional 21 proposed sites. A proposal to create a protected area around Buir Lake (one of the proposed IBAs) has been submitted to the Mongolian parliament.
- Completed the second year of a marmot population survey on the Eastern Steppe. Data collected in year 1 have been used to document the rapid decline of this economically and ecologically important species and motivate local wildlife officials to call for an extension of the national hunting ban.
- Initiated a data exchange project with the State Specialized Inspection Agency designed to identify "hot spots" of poaching and illegal wildlife trade on the Eastern Steppe.
- Performed a range-wide survey of Mongolian gazelle on the Eastern Steppe. This effort produced a population estimate (1.3 million) which provides essential baseline information for future gazelle management and conservation.
- Expanded the breadth of the WCS Mongolian gazelle migration and population dynamics monitoring through a cooperative effort with the Aird Land Research Center of Tattori University, Japan; and engaged in monitoring the impact of the trans-Mongolia railroad in collaboration with the Mongolian Academy of Sciences.
- Continued the monthly conservation information and networking series, providing information on a wide range of environmental issues to a large and varied audience within Mongolia. Attendance has remained high (50-60) and demand for the opportunity to present at this forum has increased.

c. Table of Activity Status

II. Detailed Description of Progress

a. Key short and long-term program objectives for the reporting period (October 2005 – September 2006)

In what is perhaps the largest remaining swath of ecologically functional temperate grassland in the world, WCS is developing and implementing long-term conservation measures at a landscape scale. We are doing this by working with key national, regional and local partners to address identified threats and opportunities, and by focusing research on the conservation and management of wide-ranging and vulnerable Landscape Species that represent the diversity and integrity of the system. Over time, we plan to successfully implement and refine the Landscape Species Approach within the Eastern Steppe Landscape, thereby promoting this concept in other biologically critical landscapes in Mongolia.

Threats to the Eastern Steppe Landscape continue to be related to poor planning and management at the central government level and to deficits in the resources necessary locally and nationally to enforce existing environmental regulations and wildlife protection laws. Oil and mineral exploitation is expanding in the Eastern Steppe with little evidence of science-based decision making or serious consideration of the potential impacts of the oil/mineral extraction and related infrastructure development on the wildlife populations and communities of nomadic pastoralists living on the Eastern Steppe. There is also mounting evidence that poaching and illegal wildlife trade is decimating populations of fur bearers and large ungulates on the Eastern Steppe and across the nation (See Appendices A1 and A2, or view the report online at: http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEXT/EXTEAPREGTOPENVIRONMENT/0,,contentMDK:21019441~pagePK:34004173~piPK:34003707~theSitePK:502886,00.html).

To address poor planning and management at the central government level, the WCS Eastern Steppe Living Landscape program continues to have as one of its primary objectives the development of policy recommendations on a range of critical issues that can be instituted by the appropriate agencies and institutions to alleviate immediate threats to the steppe landscape and to the wildlife and human communities that depend upon natural resources for their survival. A second primary objective of this reporting period has been to encourage private enterprise-led and community-led wildlife conservation initiatives on the Eastern Steppe. To fulfill this objective, the WCS Eastern Steppe program has broadened our audience for policy and management recommendations beyond government agencies and institutions to private enterprises (Daqing Oil Company, Petro China), communities of livestock herders, and local NGOs (Eastern Mongolian Community Conservation Association) working and living in the Eastern Steppe.

The WCS Eastern Steppe program continues to develop and implement a landscape scale management planning process, using the WCS's Landscape Species Approach, by collecting and interfacing information about biological requirements of species and the human-caused threats necessary to guide management strategies and actions at a broad scale. Specific objectives this reporting period included: completing threats analyses, species selection, and hiring and training a Mongolian GIS and Remote Sensing specialist to apply GIS/RS techniques to landscape-level conservation and to continue to develop the WCS Eastern Steppe GIS database.

In the long term, the WCS Eastern Steppe program expects that our use of participatory initiatives for landscape conservation will produce a mosaic of wildlife-focused landscape-level conservation efforts initiated by the Ministry of Nature and Environment (Protected Area Administration), local governments, private enterprises and communities of livestock herders. The Landscape Species Approach will unite the efforts of the diverse stakeholders on the Eastern

Steppe and provide the guidance and tools necessary to implement more strategic and collaborative conservation interventions, monitoring and evaluation activities.

b. Activity Descriptions

OBJECTIVE 1: Develop and adopt participatory strategies to reduce threats to wildlife in the Mongolia Eastern Steppe landscape

Activity 1.1. Refocus efforts to refine an explicit model to articulate the causal relationships among conservation targets and threats and choose a suite of landscape species

Conceptual models clearly identify our goals and operational conservation objectives, and explicitly link both direct threats (e.g., poaching) and indirect threats (e.g., lack of effective laws) to our conservation goals. Conceptual models are also an essential step in the identification of strategic interventions that explicitly address key threats to the conservation of wildlife and the steppe landscape. The WCS Eastern Steppe project continues to collect information that will help further refine and adapt the initial conceptual model built at the initiation of the project in 2003. We are more accurately defining threats to the landscape using the growing database of information on targets and threats collected from field studies, workshops, and socioeconomic surveys. Data were collected via a systematic and participatory assessment of threats to wildlife; through a series of four threats workshops with local agency and NGO staff in each aimag and a 150-household threats survey to reach the herder community across the steppe. The data were summarized during this reporting period, and this analysis was used to finalize the Threats Assessment for the Eastern Steppe (Appendix A3). Eighty-seven percent of the herders surveyed reported that "environmental conditions" on the Eastern Steppe had declined in the past 10 years. When asked to describe perceived changes in the wildlife populations almost every herder surveyed specifically expressed their great concern about a decline in marmot numbers. The threats identified through the analysis of data collected were incorporated into the Landscape Species (targeted species for landscape conservation) Selection process which proceeded as planned (Activity 1.3.1). The conceptual model for the Eastern Steppe was reviewed internally by project staff. The original model includes the major threats identified at the beginning of the Eastern Steppe project. The model will be updated following a formal participatory review of the model at the beginning of the next reporting period as part of a species conservation planning stakeholder workshop.

Activity 1.2. Identify principal actors to address threats and evaluate their capacity to do so and engage them in specific interventions

The Eastern Steppe project maintained and continued to develop linkages within the environmental sector and across the development and political landscape to encourage collaborative activities, with the aim of lessening the negative impacts of poor coordination. This networking is intended to encourage better understanding among potential partners about the suite of threats to the Eastern Steppe and to forge common strategies for addressing them. We continued to use varied strategies in the identification and evaluation of actors and specific interventions to engage in together, including: individual meetings with potential partners, holding a monthly conservation networking event, interactions in field-based collaborations, attending monthly USAID-Mongolia coordination meetings and participating in workshops sponsored by WCS/USAID and other organizations working in the environmental sector. New partners identified during this reporting period include the following: the Steppe Forward Program associated with the Zoological Society of London (ZSL), the Eastern Mongolian Community Conservation Association, TRAFFIC (East Asia and Russia), Dr. Ito Takehiko from the Aird Land Research Center of Tattori University, Japan, Dr. Roland Fry from the Leibniz

Institute for Zoo and Wildlife Research in Berlin and the National Geo-Information Center for Natural Resource Management project (funded by the Dutch government and Ministry of Nature and Environment). Specific collaborative intervention efforts are described below.

Mongolian Mammal Biodiversity Databank: WCS participated in and contributed to the information gathered at a workshop, organized by the Zoological Society of London, the Steppe Forward Program and the National University of Mongolia in October 2005. IUCN (World Conservation Union) criteria were used to assess the regional conservation status of Mongolian mammals. The Mongolian gazelle, classified globally as "vulnerable" was moved up to a classification of "endangered" regionally, based on the rate of Mongolian gazelle population decline in Mongolia and the lack of initiatives to mitigate the threats that would change this trend. WCS/USAID project staff provided the majority of information gathered at the conference on the Mongolian gazelle. The information provided at the workshop was gathered through on-going WCS Mongolian gazelle research and conservation efforts (Activity 1.3.3).

Community-Based Natural Resource Management: WCS co-sponsored a workshop series with the Eastern Mongolian Community Conservation Association entitled "Procedures for Herding Community Natural Resource Ownership and Protection," from the 20th – 22nd of July at the "Shaazan Nuur" Eco-camp in Dornod aimag. This was a very successful initiative, with 13 new livestock herder community groups participating. Participating groups received guidance on the procedures for establishing their right to manage and conserve the wildlife and natural resources in their traditional grazing lands (Activity 2.2.2).

Enforcement of Wildlife Trade Law: WCS worked with the U.S. Embassy of Mongolia and TRAFFIC Russia and East Asia, an international organization focused on preventing the illegal trade of wildlife and wildlife products, to identify Mongolian participants to attend a training funded by the Bureau of Oceans and International Environmental and Scientific Affairs (OIES). This training was designed to address emerging issues surrounding illegal trade in wildlife resources (tigers, musk deer, saiga antelope, etc.), and the roles of China, Russia and Mongolia. Subsequently WCS, the U.S. Embassy of Mongolia and TRAFFIC East Asia collaborated on the drafting of a proposal to OIES for a Mongolia-based wildlife trade enforcement training program. The program would raise the awareness and capacity of Mongolian Customs officials and conservation partners in the border regions to identify illegal wildlife trade and to collaborate to reduce and prevent its occurrence.

Field Research Collaboration: Dr. Roland Frey, an evolutionary morphologist from the Leibniz Institute for Zoo and Wildlife Research in Berlin, worked with the WCS project in December 2005. He observed the Mongolian gazelle rut and collected the first high quality audio recordings of Mongolian gazelle vocalizations during the breeding season. The Mongolian gazelle has an extremely large larynx or voice box and its function and evolution is of great interest to evolutionary morphologists. WCS also worked with Dr. Ito Takehiko from the Arid Land Research Center in Tottori University, Japan, and the Mongolian Academy of Sciences Data to place satellite collars on four Mongolian gazelle captured to the east and west of the Mongolia-China railroad in October 2005. This collaborative effort will improve our understanding of gazelle movements and habitat requirements in this yet unstudied region of the Eastern Steppe, and will continue through 2006. Both projects contribute to the information base available on this important Eastern Steppe landscape species.

National Geo-Information Center for Natural Resource Management: WCS attended a workshop and follow-up meetings in April 2006 to provide input on the development of a Dutch government and Ministry of Nature and Environment (MNE) funded project to establish a

"National Geo-Information Center for Natural Resource Management" in Mongolia. The WCS-led effort to present an alternative to the construction of the bridge in the Nomrog Strictly Protected Area of the Eastern Steppe in 2003/2004 was used as an example of the importance of the application of geographic information systems (GIS) and analysis in the development and planning of wildlife conservation. The agreement for the establishment of the National Geo-Information Center for Natural Resource Management was signed in September.

Conservation Information and Networking Event: WCS continues to sponsor a monthly conservation information and networking event. The rationale for this activity is to encourage discussion, sharing of information, coordination, and collaboration among the many and disparate organizations and individuals involved in conservation. To this end, each monthly event includes a major presentation by an organization or individual involved in Mongolian conservation. At this early point in our activities, it has been difficult to observe any marked increase in collaboration, although continued high attendance (50-60 people typically) indicates sustained interest and potential for longer term benefits. A list of the topics and presenters at this monthly event is provided in Appendix A4. These meetings are regularly attended by Ministry of Nature and Environment staff, and members of the NGO conservation community and Mongolia's academic and research institutions.

Memorandum of Understanding: MOUs have been drafted between WCS and the National University of Mongolia and the Mongolian Academy of Sciences as planned, but the documents have not yet been finalized due to time constraints faced by all parties involved. Collaborative research and joint scientific capacity-building initiatives have gone forward as planned (Activity 2.4) and discussions of the current drafts of the MOUs were reinitiated in July 2006.

Mongolian Ministry of Nature and Environment: In March of 2006 a change of government in Mongolia resulted in the appointment of a new Minister of Nature and Environment and significant turnover among officials within the Ministry of Nature and Environment. The new MNE officials are interested in enhancing their working relationship with the WCS/USAID Eastern Steppe project, and quarterly meetings with the Strategic Planning and Implementation Department have been reinstituted. Plans for next year include continuing the quarterly meetings with MNE officials and a meeting with the Minister.

Collaborative Landscape Conservation Planning with the Nature Conservancy and World Wildlife Fund

Two of WCS' global conservation partners, The Nature Conservancy and the World Wildlife Fund (US), have expressed interest in initiating conservation programs in the Eastern Steppe (WWF Mongolia has historically focused on central and western Mongolia). TNC has initiated an Ecoregional Planning exercise for the Mongolia-Manchurian grasslands, of which most of the Eastern Steppe is a part, and WWF is interested in the steppe as a part of its larger-scale program to conserve the Amur watershed, which also includes large parts of China and Siberia. In collaboration with WCS' New York-based coordination unit, we have recently begun discussions with TNC and WWF over how to jointly support Mongolia's efforts to plan and prioritize conservation in the steppe, improve management and implement sound natural resource policy. WCS, WWF and TNC have the opportunity to implement conservation interventions with Mongolian partners based on the complementary strengths of the institutions. For example, while WCS is well equipped to work to mitigate hunting/poaching of wildlife, TNC and WWF have expertise in mitigating impacts of mining and managing freshwater hydrological systems. In a recent meeting in New York, WWF and TNC expressed interest in using the WCS' Landscape Species Approach and the information we have already compiled about biodiversity and threats,

to collaboratively develop and implement a landscape conservation plan. In late September, the three organizations will participate in meetings with others partners in the Mongolian conservation community, to further discuss collaboration and review WCS' progress on the Landscape Species Approach to date.

Activity 1.3. Develop an adaptive, participatory and spatially explicit strategy for threat abatement and landscape conservation

Activity 1.3.1. Choose Landscape Species through the WCS's Landscape Species Approach

The Landscape Species Approach is a wildlife-based strategy used to define ecologically meaningful conservation areas, identify where and why human-wildlife conflicts occur, design and undertake conservation efforts to curb or halt such conflicts, monitor program effectiveness, and adapt conservation efforts in light of these results. A suite of target species provides the backbone of the approach, and is identified based on criteria such as species' area requirements, use of different habitats, vulnerability to multiple threats, socio-economic significance, and ecological functionality. With guidance from the New York-based Coordination Unit, a suite of Landscape Species for the Eastern Steppe were selected in the spring of 2006. Participants in the process included WCS Mongolia staff, Mongolian and international species specialists with links to the WCS Living Landscapes project, and species specialists, including representatives from the Mongolian Academy of Sciences and the National University of Mongolia, whose expert opinion was sought when gaps of information on candidate species were identified.

Initially, the Landscape Species selected for the Eastern Steppe, in order of selection, included the Mongolian Gazelle, Eastern Moose, Gray Wolf, Siberian Marmot, White-naped Crane, Demoiselle Crane and Red Deer. After the initial species selection exercise, WCS staff and species specialists reviewed the candidate species list and selection criteria (threats, habitat types, and management zones). Species data were refined where necessary and it was determined that the list of threats needed to be expanded. Poaching was further defined and divided into three separate threats ("over-fishing", "illegal hunting" and "nest poaching") to more accurately describe the "hunting" threat to fish, ungulates and fur bearers, and raptors (especially falcons), respectively. The final "draft" suite of Eastern Steppe Landscape species selected is: the Mongolian gazelle, Eastern Moose, Gray Wolf or Siberian marmot, White-naped Crane, Demoiselle Crane, Red Deer, Saker Falcon and Taimen.

The suite of Eastern Steppe Landscape species will be presented for review and comment at a national-level workshop in Ulaanbaatar in October of 2006. The workshop will be led by WCS-Mongolia and New York-based Living Landscape Program staff. Ulaanbaatar workshop participants will include the following: 1) species experts from the National University of Mongolia, the Mongolian Academy of Sciences and selected international experts; 2) officials from the Ministry of Nature and Environment, Protected Area Authority, State Specialized Inspection Agency and representatives from the Environmental Policy departments of the Eastern Steppe Aimags; and 3) representatives from the Eastern Mongolia Community Conservation Association Non-Governmental Organization (NGO) and other organizations engaged in conservation activities in Mongolia including WWF, and TNC.

This suite of Landscape Species is being used to guide conservation planning on the Eastern Steppe by defining essential conservation lands and management priorities and ensuring that conservation interventions are directed at the most important threats to biodiversity and wild lands.

Activity 1.3.2. Develop a spatially explicit representation for threat abatement and landscape conservation

Qualified candidates for the GIS and Remote Sensing Specialist position for the Eastern Steppe Living Landscape project were interviewed in November and December of 2005. Mr. Ochirkhuyag Lkhamjav, a Mongolian national with extensive remote sensing experience and GIS skills, was selected and began his work with WCS in February 2006. He spent one month in New York working with the our New York-based Coordination Unit, receiving one-on-one training and working to organize and update the spatial data originally obtained from the Eastern Steppe Biodiversity Project dataset, which included over 700 individual data files, such as GIS files describing human land uses, natural vegetation cover, infrastructure, and species-specific distribution information.

Once the WCS GIS database was reorganized and updated we moved forward with the creation of explicit (map-based) landscapes for threats and biological attributes for the Eastern Steppe. In close collaboration with Dr. Karl Didier, Dr. Eric Sanderson, and Gosia Bryja from the New York-based Coordination Unit, threats landscapes are actively being built using the information gathered through previous Threats Assessment activities, and supplemented with information supplied by the State Specialized Inspection Agency (illegal hunting/poaching), the Ministry of Food and Agriculture, Veterinary Department (livestock disease data), the Mongolian National Statistics Office (human population distribution), the National Remote Sensing Center (maps, water and weather data) and the Geology Information Center (mining and exploration data). The detail of information necessary and quality of data available slowed down the mapping process considerably. Draft threat maps or "human landscapes" created include the following: Hunting and Poaching, Overgrazing of Pasture, Livestock-Wildlife Disease, and Mining and Infrastructure. These draft threats maps are included in the Threats Assessment summary (Appendix A3), and final versions will be completed by the end of October.

Preliminary biological landscapes have been also developed for the two Landscape Species for which WCS has gathered the most recent and in-depth biological data. These are the Mongolian gazelle and the Siberian marmot. These biological landscapes will be overlaid with the Threats landscapes and analyzed to identify areas of wildlife/livestock conflict and opportunities for conservation interventions.

Activity 1.3.3. Identification of points for critical action to conserve Eastern Steppe Landscape Species

Collection of basic biological information (population numbers, habitat preferences, reproductive rates, behavior, resource needs, etc.) on Landscape Species of the Eastern Steppe continues to be critical to the design of effective and appropriate threat-reducing interventions. The information below summarizes the activities of the two primary Landscape Species that are part of on-going field-based research and conservation projects on the Eastern Steppe.

Mongolian Gazelle

Mongolia's eastern grasslands have gained much positive attention for being the world's largest unspoiled grassland ecosystem. Our research efforts have revealed much about the ecology of this grassland, and our knowledge of Mongolian gazelle habitat needs and conservation threats have improved greatly, informing the development of conservation and management measures.

Range-wide Mongolian Gazelle survey: A near range-wide survey of Mongolian gazelle was completed in June of 2005, and subsequent data analysis produced a population estimate of 1.3 million. The aerial gazelle survey, originally planned for the fall of 2005, was cancelled due to the inability to identify a suitable plane. The logistical constraints associated with the aerial

survey, and expected reductions in the Eastern Steppe Living Landscape project budget, have resulted in a cancellation of the aerial survey. A summary of the range-wide survey is presented below:

A range-wide survey to estimate the population size of Mongolian gazelle east of the Beijing-Ulaanbaatar railroad was completed covering a total of 5,184 km's from 13 May to 14 June 2005 over a 223,000 km^2 region. Sampling was performed in four regions (Kherlen River North, Meningin Steppe, Central Steppe, and Western Steppe) along North-South lines at 30 and 60 kilometer intervals. Based on this survey and analysis, the population of Mongolian gazelle east of the railroad was estimated to be 1,290,000±16%CV. This potentially represents a near 50% decline in population size since 1994 when a range-wide survey was conducted using an Antonov 2 plane. A map of the location and size of Mongolian Gazelle herds detected is presented in Appendix A5.

Table 1. Regional population estimates and densities of Mongolian gazelle in May/June 2005.

Region	Area surveyed (km^2)	Estimate ± %CV	Density (gazelle/km^2)
Kherlen North	40,000	153,000 ± 23	4
Meningiin Steppe	17,000	Migrated to summer pasture.	
Central Steppe	64,285	835,000 ± 22	13
SW Steppe	102,158	302,000 ± 27	3

Collaborative Mongolian Gazelle Research: A proposal, "Resource predictability and movement strategies in ungulates: Does temporal uncertainty lead to nomadism?" has been re-submitted to the National Science Foundation to fund a collaborative multi-institutional (Smithsonian Institute, University of Maryland, University of Massachusetts, and Wildlife Conservation Society) project to continue Mongolian Gazelle research on the Eastern Steppe with the specific objective of developing predictive models of gazelle movements based on resource availability. A project, "**Mongolian Gazelle population genetic analysis**," is still underway at the Wait's Laboratory at the University of Idaho. DNA extraction from samples submitted is complete and a full analysis and summary of the results will be provided in 2006/2007. Dr. Seiki Takatsuki at the Tokyo University, Japan, continues to process fecal samples submitted by the WCS Mongolian Gazelle project in an effort to describe food resource overlap between Mongolian Gazelle and livestock on the Eastern Steppe.

Information gathered through on-going research and provided by the WCS/USAID Mongolian gazelle team at the Mammal Biodiversity Databank Conference (Activity 1.2) played an important role in justifying the change in the conservation status of the Mongolian gazelle from "vulnerable" globally to "endangered" regionally.

Siberian Marmots

Siberian marmots (*Marmota sibirica*) are important members of both the Mongolian steppe ecosystem and the local human economy. Recent declines in marmot numbers have forced the Mongolian government to ban marmot hunting for at least two years. The ban is scheduled to end in 2006. In June through August of 2006, the Eastern Steppe project repeated the marmot population survey conducted in 2005 to expand our understanding of marmot distribution and density in the Eastern Steppe of Mongolia (Dornod, Sukhbaatar, and Khenti Aimags), and to compare results with data collected in 2005 and 2006 in an effort to monitor the impact of the hunting ban and the possible recovery of Siberian marmot populations. A map showing the study area covered in 2006 is available as Appendix A6. Dr. Samantha Strindberg of the New York-based Coordination Unit, who assisted with the design for the 2005 marmot population survey on the Eastern Steppe, used the results of this first survey to revise and improve the design for the survey that took place in 2006. The report from the 2005 survey is available in Appendix A2.

Findings from the 2005 marmot study were presented to stakeholders in June of 2006 at a meeting held in Choibalsan, Dornod Aimag, with representatives from the Eastern Steppe Protected Areas Administration, the State Specialized Inspection Agency, leaders of the NGO-Eastern Mongolia Community Conservation Organization and the Dornod Aimag Environmental Department. Data from 2005 surveys on the Eastern Steppe indicate that the marmot populations have not yet rebounded from the catastrophic declines in the population brought on by over-hunting. At the conclusion of the meeting, a consensus was reached among the participants to lobby for an extension of the current ban on marmot hunting. The WCS Eastern Steppe project will lead this effort, and has already met with officials from the Strategic Planning Department of the Mongolian Ministry of Nature and Environment in late July to discuss the results of the marmot population assessment on the Eastern Steppe and to convey the interest of stakeholders on the Eastern Steppe to call for an extension of the national ban on marmot hunting. This meeting will be followed by a formal letter with signatures to be delivered in September before the Mongolian parliament reconvenes.

Important Bird Areas

Three of the seven Landscape Species on the Eastern Steppe are birds, signaling the importance of the Eastern Steppe in providing key nesting and breeding grounds for multiple species of migratory birds, many of which are critically endangered. In 2004/2005, WCS, in collaboration with the Royal Society for Birds, completed 3 field surveys of the Eastern Steppe to re-evaluate the use of existing Important Bird Areas (IBAs) and identify and propose new IBAs. This past year, we used this information to complete a map of currently identified and proposed IBAs (Appendix A7). To expand our involvement in the study and conservation of avian species in the Eastern Steppe, the WCS program has accepted a request from the soum (county) governor of Sumber soum in Dornod Aimag to assist with the efforts to protect and eventually manage Buir Lake, the largest proposed IBA identified in the 2004/2005 survey (see Activity 2.2.2).

Monitoring Ger locations

A critical piece of information for effective management of the Eastern Steppe is the shifting distribution of rural people and gers, Mongolian nomadic groups of 2-3 households. Ger households are critical players in livestock grazing, hunting, and community-based management and monitoring of natural resources. This past year, in collaboration with Dr. Scott Bergen from the New York-based Coordination Unit, we began a small project to try to map and monitor the location of Ger camps using satellite imagery. Locations of approximately 150 camps, collected during our household surveys (Activity 1.1 and Appendix A3), and satellite imagery were compiled this past year. These will be used in the upcoming year to see if it is indeed feasible to map ger locations using remote sensing techniques.

OBJECTIVE 2: Develop and implement sustainable and adaptive mechanisms to strategically address threats across the landscape

Activity 2.1. Establish necessary management mechanisms

Mongolian Gazelle Management and Action Plan: In 2005, a draft management plan for the Mongolian gazelle was produced (derived from results of the 2003 Workshop on Mongolian Gazelle Harvesting and Management, and the Mongolian Gazelle Research Symposium/Management Workshop held in October 2004) which included a priority-setting exercise to determine future research and conservation needs (led by Dr. Eric Sanderson from the New York-based Coordination Unit). In this reporting year, we completed a thorough review of the Management Plan with the following two aims: 1) updating and improving the quality of the plan by refining the biological data (population size, trends, breeding, migration, and behavior) based on information gathered since the 2003 and 2004 workshops; and 2) reviewing the feasibility of full implementation of the plan given current realities of the resources and mechanisms available in Mongolia to manage wildlife. This review was done by initiating dialogue with various stakeholders including conservation organizations, academics and management/enforcement officials. Ministry of Nature and Environment officials were very interested in receiving the draft of the management and action plan and have asked for WCS assistance in the drafting of management and action plans for other species including the saiga antelope; however, the capacity of the Ministry to implement the complete plan is limited.

Wildlife Trade in Mongolia: A extensive and detailed report on illegal wildlife trade in Mongolia, entitled "The Silent Steppe: the Illegal Wildlife Trade Crisis in Mongolia," has been written by WCS as a follow-up to the 2005 wildlife trade study implemented by WCS and funded by the World Bank's Netherlands-Mongolia Trust for Environmental Reform. The report indicates that the single greatest threat facing many species of wildlife in Mongolia is hunting for the commercial wildlife trade. Populations of both endangered and previously widespread species have declined dramatically in the past 10 years. The wildlife trade is not only devastating Mongolia's biodiversity, but is also threatening rural livelihoods - Mongolia has approximately 245,000 hunters, one tenth of the total population. The fur trade alone contributes an estimated US$100 million to the economy, possibly the third largest contributor behind mining and tourism. The report makes a strong case for addressing the problems associated with the wildlife trade in and from Mongolia; seeking solutions to conserve Mongolia's unique and diverse wildlife community; and ensuring that rural livelihoods are sustainable and not tied to a dwindling resource base (see Appendix A1). Follow-up activities to the wildlife trade study and conference initiated by the WCS Eastern Steppe Program include: 1) development of a collaborative wildlife protection program in partnership with the State Border Defense Agency in Nomrog Strictly Protected Area (Activity 2.2.1); 2) assistance in identifying Mongolian participants for a workshop on "Strengthening Enforcement of Wildlife trade Law Along China's Border with Russia and Mongolia" in collaboration with the U.S. Embassy in Ulaanbaatar and TRAFFIC East Asia; 3) development of a proposal to the Bureau of Oceans and International Environment and Scientific Affairs through the U.S. State Department, U.S. Embassy in Ulaanbaatar which would improve the capacity of the Mongolian Customs Agency to detect and prevent illegal wildlife trade; and 4) engaging with the State Specialized Inspection Agency at the national and provincial (aimag) level in an effort to gather information on illegal wildlife trade in Mongolia, and to improve the agency's capacity to monitor and evaluate the impact and scale of this illegal trade.

Brandt's Vole Management Recommendations: The report from WCS's Brandt's vole management workshop held in 2004 was printed and distributed in 2005. As a result of the recommendations drafted at the conclusion of the workshop, a decision was made by the

Mongolian Ministry of Food and Agriculture to discontinue the widespread use of Bromadiolone to poison Brandt's voles in Mongolia. Since then, The WWF-Mongolia program, with funding from the World Bank, has taken on the task of addressing the environmental impact of toxins, including the bromadialone, historically suspected of killing many non-target wildlife species. A new law on the use of toxins was passed by the Mongolian parliament in early 2006, placing further restrictions on the control and use of toxins in Mongolia. The WCS Eastern Steppe program has supported the efforts of WWF-Mongolia and continued to monitor the Brandt's vole management techniques utilized by the Mongolian government. In this reporting period there were no reports of the use of bromadialone or any similar compound that would put non-target wildlife at risk.

The Nomrog Bridge and Millennium Road: The WCS Eastern Steppe program has continued to monitor and react to on-going discussions surrounding the planning of the Millennium Road and the Nomrog Bridge. This constant attention and quick reaction has proven effective in putting pressure on the government to fully consider the environmental implications of the plans. However, the Mongolian media reported in June of 2006 that plans for the Millennium Road Bridge, connecting Mongolia to China across the Nomrog River in Dornod Aimag, will go forward. This information indicates a reversal of a decision made at the end of 2005 by a committee of ministry officials to halt the Nomrog Bridge project for economic and environmental reasons. The most recently proposed bridge site is apparently different from the original site proposed in 2003/2004 and will require a full Environmental Impact Assessment (EIA). The concern is that the newly proposed site, whether located within the Strictly Protected Area of Nomrog or not, will disrupt and fragment one of the most unique and bio-diverse areas of the Eastern Steppe. WCS has continued to inform the U.S. Ambassador of developments in this area and network among conservation organizations and concerned citizens to build pressure against this infrastructure project.

Activity 2.2. Enhance local capacity to implement the strategy

Activity 2.2.1. Enhance Local Institutional Capacity

Collaborative Wildlife Protection Program in Nomrog Strictly Protected Area: Following a 2005 assessment performed by Tony Lynam, WCS Asia Training and Capacity Development Director, the Eastern Steppe program designed and delivered a wildlife protection and law enforcement training course for Nomrog SPA as the 1st of what we hope will be multiple trainings and subsequent implementation of collaborative wildlife protection programs among the agencies and communities with jurisdiction for wildlife protection in the Eastern Steppe border regions. The goals of the Wildlife Protection Program include: stabilizing wildlife populations by reducing cross-border incursions, habitat encroachment and poaching by Mongolian and foreign nationals; enforcing and enacting more effective anti-poaching measures through training and improved protected area management; and strengthening protected area management by stimulating cooperation between Mongolian government agencies.

Preparatory work for this project, including individual meetings with all of the invited stakeholders, has been completed. An outline of the training program is provided in Appendix A8. A 15-module training handbook has been written, reviewed and printed in Mongolia. The training manual, a selection of field guides, and basic wildlife monitoring equipment will be provided to 3 teams of State Border Defense Agency guards and 1 team each from the Protected Area Authority and the Environmental Inspection Agency of Sumber soum. The specific objectives of the initial workshop were:

(1) Increasing awareness of the importance of wildlife and of the threats to wildlife from poaching and illegal trade.
(2) Increasing awareness of environmental laws and legislation relevant to wildlife and protected areas, and increasing capacity for law enforcement.
(3) Developing field skills, natural resource assessment and other practical skills needed for effective management of wildlife in the Nomrog SPA.

Participants learned through a series of classroom and field-based training activities. Quizzes and practical tests of knowledge ensured that training participants were brought to a standard level in all skill areas. Training participants included the following individuals:

- SBDA Ulaanbaatar Officials (2)
- SBDA Nomrog Guard posts (6 staff)
- SBDA Sumber (6 staff)
- PAA Nomrog SPA rangers (2 staff)
- State Inspectors (3 staff)
- Police (Dornod Aimag) (2 staff)
- Police (Soum) (2 staff)
- Sumber Soum law enforcement monitoring officer (1 staff)
- Buffer Zone Council members (3 staff)

The workshop raised capacity for wildlife protection through monitoring and environmental law enforcement, and at the same time fostered sharing of information and collaboration among the agencies concerned with reducing wildlife crime. The training workshop prepared government staff and buffer zone community members for the implementation of a new wildlife protection strategy for Nomrog SPA. The effectiveness of training will be monitored at periodic intervals in the Nomrog SPA, through assessments of staff capacity and the monitoring of threats, including hunting and wildlife trade.

Activity 2.2.2. Enhance Local Community Capacity

In a nomadic society, efforts to establish community conservation and sustainable natural resource management face the additional challenges of shifting grazing patterns and a complex system of land use that is influenced by both local government legislation and family tradition. In this reporting period, the WCS/USAID Eastern Steppe Program made great progress in identifying communities on the Eastern Steppe interested in community-based natural resource management. We have moved forward with the steps identified as necessary to put mechanisms in place which will allow and foster effective wildlife protection and community-based management of natural resources. Much of our success has been due to our association with the Eastern Mongolian Community Conservation Association NGO, the concept for which was developed under the scope of the former UNDP/GEF Eastern Steppe Biodiversity Program. The WCS/USAID Eastern Steppe program has been able to support and re-initiate the livestock herder community element of the NGO's original mandate and has significantly enhanced the wildlife and pasture management component of this organization's program. In addition, the WCS/USAID Eastern Steppe program has supported a proposal put forward by the soum government of Sumber soum and the communities of Buir Lake to create a protected area in and around the Buir Lake region. Progress in this area has been slow due to bureaucratic delays but initial response from local and national governments has been positive.

Community-Based Natural Resource Management: The Eastern Mongolian Community Conservation Association NGO was formed in 2005 as one of the final projects implemented by the United Nations Development Program's Eastern Steppe Biodiversity Project. The goal of the

project was to organize community groups with ties to protected areas, buffer zones of protected areas and/or nature reserves in the Eastern Steppe to conserve biodiversity through community action. Sixty community groups are members of the NGO. WCS staff visited four project sites of the Eastern Mongolian Community Conservation Association NGO. The project sites were four of thirty-four non-herding-based communities that have set up projects which have a biodiversity conservation component through a link to a protected area, an education and outreach program, or an alternative livelihood project for park and protected area residents. The thirty-four non-herding communities are groups of individuals in small towns or soum centers on the Eastern Steppe. The apparent effectiveness of the biodiversity conservation component of the four communities visited was mixed, but these non-herder community groups generally seemed to be organized and their proposed projects were underway. Twenty-six of the 60 community groups who are members of the Eastern Mongolian Community Conservation Association NGO are made up of livestock herders. In general, these livestock herder-based communities have organized themselves as a group but they have not yet undertaken any biodiversity conservation activities. The herder communities have the opportunity to use an amendment of the Mongolian Environmental Protection Law to apply for community management rights of their traditional pasture lands and wildlife resources. The WCS/USAID Eastern Steppe project, by organizing a 3-day workshop, supported the development of the applications (which include wildlife and pasture management plans) that the herder communities must present to their local governments to gain official management rights. A detailed report of the workshop, which includes profiles of all of the community groups, is provided as Appendix A9. Results of the workshop will form the basis of ongoing WCS/USAID support for this community-based natural resource initiative on the Eastern Steppe. The WCS/USAID program plans to support the environmental monitoring and wildlife protection components of the community land management plans by building the capacity of, and providing the tools necessary for, community members and community rangers to make sound natural resource management decisions. In addition, WCS will be investigating the feasibility of making amendments to the Mongolian Environmental Law that will further facilitate community resource management and law enforcement through a project funded by the World Bank's Netherlands-Mongolia Trust for Environmental Reform.

Community-Based Natural Resource Management Community Workshop: WCS supported a workshop series organized by the Eastern Mongolian Community Conservation Association (EMCCA) entitled "Procedures for Herding Community Natural Resource Ownership and Protection," which was held from 20–22 July at the "Shaazan Nuur" Eco-camp in Dornod aimag. The main objective was to inform and educate the representatives of herding communities about additions and changes to the Environmental Protection Law regarding herding community partnerships, and to educate the participants on how to prepare the required documents to present to the soum government for collective natural resource management. Representatives from 13 herder communities on the Eastern Steppe attended the workshop series. Topics included: changes to the Environmental Protection Law regarding herder community partnerships; creating contracts among herder groups; protecting natural resources; employing volunteer rangers; and calculating sustainable stocking rates of rangeland. There were multiple opportunities for information exchange among the herder groups, and the workshop series concluded with a session in which herder communities identified threats to wildlife and natural resources in their areas, listed the outcomes if those threats persisted and then listed management actions that should be taken to alleviate the threats identified, and determined a target date for management implementation and a person responsible for initiating the work. The full workshop series report (Appendix A9) details specific community-based natural resource management capacity building activities and initiatives that will be supported by the WCS/USAID Living Landscapes program. Herder communities were very interested in expanding the environmental monitoring and wildlife protection components of their community land management plans, and WCS plans to provide

the assistance necessary to enable communities to make sound natural resource management decisions.

Buir Nuur Lake: Buir Nuur is the largest lake in the Eastern Steppe. It has been designated as an Important Bird Area (IBA) and a Ramsar site (an internationally important wetland). In November 2005, WCS staff made an initial visit to Buir Lake to learn more about efforts, initiated by the Sumber soum governor and the local community, to designate Buir Nuur a National Reserve with additional protection for the spawning areas in the lake. The governor and community requested assistance from WCS in management of the future protected area. To date, the application for protection of Buir Nuur has received comment from the local government and it has been forwarded to the national government for review. WCS staff made a second trip to the Buir Nuur area in May to meet with community members and assess their capacity to manage the proposed protected area in light of the plan laid out in the current application. At the present time, the community capacity to manage the Buir Nuur resource is weak, because powerful commercial fishing companies currently have legal permits to fish the lake and these companies are competing with local fishers and depleting stocks. The WCS/USAID Eastern Steppe program will continue to support the effort to designate the lake as a protected area. We expect that if this occurs, our further assistance will be needed to develop and implement a community-based management plan. Our conservation plan and priority-setting tools will be critical. Ultimately, additional funding will be needed to support planning and to implement effective management.

Activity 2.2.3. Enhance Local Disease Management

A range of diseases, many of which are endemic in livestock on the Eastern Steppe, pose a threat to wildlife, local livelihoods, and the national economy. Foot and Mouth disease (FMD) has been a concern since the WCS/USAID Eastern Steppe project began, given the potential direct and in-direct threat this livestock disease poses to Mongolian gazelle populations. In addition, outbreaks of highly pathogenic avian influenza (HPAI), in both domestic and wild birds in Asia and beyond, have raised levels of concern within the conservation community about the potential impact on Eastern Steppe migratory bird populations that congregate on wetlands on the Eastern Steppe every year. The WCS/USAID Living Landscape program, in collaboration with the WCS Field Veterinary Program (FVP), has successfully identified funds to support critical wildlife disease monitoring activities on the Eastern Steppe. These activities are an essential component of wildlife health policies and programs designed to minimize outbreaks and prevent widespread impacts of disease.

Disease at the Interface of Mongolian Gazelle and Livestock: In November of 2005, the WCS-Mongolia program, in partnership with the WCS Field Veterinary Program, conducted viral and serological surveys for FMD in Mongolian gazelles. Seventy-five tissues and serum samples were collected, stored and transported to the Plum Island Foreign Animal Disease Laboratory in the United States in May 2006. The program is currently awaiting the testing results, which will inform our understanding of how the FMD virus is transmitted in Mongolia's gazelle and livestock populations. This study represents the first attempt to determine whether Mongolian gazelle are reservoirs of FMD virus, or simply carriers in the event of an outbreak in livestock (as previous data suggest) – an important distinction for both local livestock production and for conservation of gazelles. The survey was funded by the American Zoo and Aquarium Association (AZA) Conservation Endowment Fund.

In May 2006, the WCS gazelle research team completed a 12-month parasitological and serological survey of both Mongolian gazelle and livestock to determine the degree to which parasites are shared among the two populations and to assess changes in FMD viral antibodies in livestock over a full year. Samples, numbering 120 per month, were collected from herds in Ekhen Khudag of Dornod aimag, Matad soum. The project is a collaborative effort between the WCS gazelle project and veterinarians from the Dornod Aimag Veterinary Clinic and Mongolian State Veterinary Laboratory, with funding from the WCS Field Vet small grants program. Preliminary results indicate that livestock have an abundance of *Strongylus* and *Nematodirus* species of parasites while gazelles are infected with comparatively few intestinal parasites, indicating that domestic and wild species of ungulates on the steppe may not share parasite burdens. A total of 480 samples were collected from livestock for FMD testing, with an additional 30 samples collected from Mongolian gazelle calves. Final results of both studies are expected in late 2006.

The Interface of Livestock, Wildlife and Human Health: The proposal for a long-term project focused on research and capacity building in the area of the interface of livestock, wildlife and human health submitted to the USAID Sustainable Agriculture and Natural Resource Management (SANREM) Collaboration Research Support Program (CRSP) was not funded. A report for the conference supported by the SANREM CRSP planning grant and held in Ulaanbaatar in June 2005 was published and distributed to participants and core agencies and institutions in the veterinary, ecology and public health fields in Mongolia (copies of this report are available upon request).

Avian Influenza: In July-August 2005, a multi-disciplinary team of Mongolian scientists and overseas experts were assembled by the WCS country program to conduct a pilot field survey of wild migratory birds for avian influenza in central and western Mongolia. Funding was provided by WCS FVP, the Food and Agriculture Organization (FAO) of the United Nations and diagnostic support was provided by the USDA, Southeast Poultry Research Laboratory, USA. Based on the success of the 2005 study (Appendix A10) in which highly pathogenic avian influenza (HPAI) H5N1 was later confirmed in a Whooper Swan from Erhel Lake, Khovsgol aimag, the WCS program applied for funding to expand the migratory bird surveillance program in Mongolia in 2006. The brief project plan is provided below with a summary of activities to date:

1. *Repeat and expand the surveys conducted in summer 2005.*

   Over the last year there has been a clear increase in the overall number and geographic distribution of wild bird outbreaks of HPAI. However, our understanding of the natural history of the virus is still limited. Specific objectives of the expanded and repeated surveys include:
   - Maximizing the diversity of species and number of individual birds sampled. Samples collected will include fecal swabs obtained from congregatory species without capture, serum, choanal/cloacal swabs from wild-caught birds, and tracheal/cloacal swabs and formalin-fixed tissues from *post mortem* specimens where decomposition allows.
   - Survey a large number of locations in an attempt to detect outbreaks, provide more complete denominator information (counts of live and dead birds) and a more detailed understanding of the natural history of the virus.

By repeating and expanding surveys in 2006 we hope to address the following questions:

1. Will H5N1 persist in wild bird populations?
2. How widespread are wild bird outbreaks in Mongolia?
3. What species are (or are not) competent carriers of the virus?
4. What parameters (eg. species composition, hydrology) influence the location of outbreaks?
5. Does the virus in migratory birds in Mongolia pose a risk to:
    a. Human populations?
    b. Agriculture (poultry/swine)?
    c. Conservation status of endangered avian species?

2. *Cultivate established partnerships into a long-term national wild bird surveillance program.*

   The 2005 field surveys clearly demonstrated the potential for cooperation between disciplines of health and biology in the development of a national wild bird surveillance initiative in Mongolia in the long term. There is a strong case for prioritizing wild bird surveillance in Mongolia on health grounds. During 2006, field surveys will continue to include training for both biologists and veterinarians in wild bird surveillance and handling techniques. On-going work in Mongolia will allow WCS to network with key stakeholders and continue the development of a lasting inter-disciplinary partnership for a national surveillance strategy, to the benefit of both the conservation and health sectors.

WCS 2006 Avian Influenza (AI) Surveillance Effort: The majority of funding for follow-up work in the area of Avian Influenza in Mongolia has been provided by USAID. Coordination meetings were held in March–May of 2006 with Mongolian and international agencies engaged in avian influenza work in Mongolia to ensure that the WCS-led efforts were complementary and not duplicative. Preparations for AI field surveillance of wild bird populations began in June in collaboration with the Mongolian Academy of Sciences (MAS) and the State Central Veterinary Laboratory, and coordinating with the National Emergency Management Agency in an effort to complement the national avian influenza activity plans. Field surveillance began when the initial WCS-led team left Ulaanbaatar for Hentii aimag, then joined an expedition from the MAS in Dornod aimag. In late July, two scientists from the U.S. Geological Survey Western Ecological Research Center assisted with efforts to place satellite transmitter tags on a sample of swan geese. The team has successfully tagged and recorded movement data from 10 swan geese captured in Hachine Tsagaan Nuur in Dashbalbar soum, and these birds will be followed throughout their migration. A second WCS team arrived in Mongolia in late July, joined the team currently in the field, and are attempting to capture and tag Whooper swans and continue the nationwide avian influenza surveillance effort.

The surveillance for AI in Mongolia's wild bird population is funded through USAID as part of the Wild Bird Global Avian Influenza Network for Surveillance (GAINS) program, with additional support provided by USGS and the Food and Agriculture Organization of the United Nations. The WCS-led multi-agency team is working in collaboration with the Mongolian Academy of Sciences and the State Central Veterinary Laboratory. In addition to the organizations indicated above, survey results will be shared with the National Emergency Management Agency, other Mongolian institutions and agencies involved in AI surveillance in Mongolia, and the United Nations Development Program.

Activity 2.2.4. Enhance Local Scientific Capacity

The WCS/USAID Eastern Steppe program continues to incorporate the enhancement of local scientific capacity in all aspects of programming. The project works primarily with the National University of Mongolia (NUM) and the Academy of Sciences to identify ecology and biology students who will benefit from participation in on-going WCS field research programs. In FY05, two students from the NUM were engaged full-time as part of our Mongolian gazelle project and 3 students were engaged part-time with the Siberian marmot study. The NUM administration is interested in formalizing the relationship between their students and the WCS program in the form of a summer internship program. The delay in the signing of an MOU with the NUM (Activity 1.2) has also delayed the formalization of the internship program, but WCS does not anticipate any resistance to moving forward once the MOU is signed. A Mongolian anthropology/environmental studies student from the University of Michigan joined the WCS program as an intern in the summer of 2006, gaining exposure to issues of wildlife/livestock conflict, other threats to wildlife, and herder-based community conservation efforts in the Eastern Steppe.

The GIS and Remote Sensing specialist for the WCS/USAID Eastern Steppe program received an intensive month of training with the WCS Living Landscapes core staff at the Bronx Zoo in New York where he learned some basic ecological principles and was exposed to the application of GIS/RS to wildlife and landscape-level conservation. We will also continue to acquire conservation and wildlife management journals and texts and work with the Asia Foundation to donate them to the National University of Mongolia's new Science Library. In this reporting period, a copy of the textbook *Conservation Biology* was donated to the Ecology section of the library.

Activity 2.3. Implement mechanisms for measuring success and adapting the landscape strategy

Mechanisms identified to date for measuring success in adapting the landscape strategy have been focused on assessing the populations of wildlife that the program is working to protect and conserve. Siberian marmot population surveys have proceeded as planned in this reporting period (Activity 1.3.3). The population assessment methods used have been broadly disseminated and local wildlife management officials have expressed an interest in adopting the methods and making the yearly surveys part of their programs of work. In the next year, the WCS/USAID program plans to focus on developing marmot population assessment methods which can be used by herding communities and tested.

The aerial survey of Mongolian gazelle, originally scheduled for the fall of 2005, was cancelled. The logistical constraints in identifying the appropriate aircraft and arranging for permission to fly were coupled with more recent budget cuts, and the result has been the decision to cancel the aerial survey. This will mean that, in the absence of additional funding sources, we are not able to complete a population-wide survey of the Mongolian gazelle and will instead rely on the "range-wide" ground survey which was conducted to assess the population east of the Russia-Chinese railroad.

The cost and time associated with measuring success of landscape strategies (wildlife population surveys and assessments) will continue to be high. Proposals have been submitted to the National Science Foundation to continue support of range-wide gazelle monitoring activities and assistance has been solicited from academic researchers in U.S. institutions to identify funds to

continue the monitoring of the Siberian marmot population and other Eastern Steppe Landscape Species.

Activity 2.4. Identify and strengthen constituencies for conservation at local, national and international levels to help ensure effective strategy implementation

The WCS/USAID Eastern Steppe program has continued to strengthen constituencies for conservation at multiple levels. In addition to the collaborative efforts highlighted in Activity 1.2, WCS has supported a workshop designed to improve the educational materials produced by the Museum of Natural History, which has branches in the aimag capitals of the Eastern Steppe. In July of 2006, WCS staff met with Christopher Myers, of Dragonfly workshops and Earth Expeditions, and contributed to a plan to create community radio programs with a focus on conservation and local knowledge in Mongolia.

Efforts to expand the WCS/USAID program's outreach to individuals beyond the wildlife conservation and environmental sector have been limited and educational materials have not been created as planned. Initial discussions with two children's book authors, a playwright and a documentary film maker have not yet led to a full project plan. The reasons behind the slow progress in this area are due primarily to a lack of resources to hire specialists in this area, time constraints of current staff and the lack of an educational outreach specialist as part of the Mongolia program team.

OBJECTIVE 3: Learning and teaching best practices in the Mongolian Eastern Steppe landscape and beyond

Activity 3.1 Using economic valuation of rangeland and water resources as a tool for site-based conservation: a comparison of the Eastern Steppe of Mongolia and the Rungwa-Ruaha Landscape, Tanzania

Engagement with communities in the Eastern Steppe (Activity 2.2.2) has initiated the relationships with community natural resource management groups necessary to carry out the rangeland and water resource valuation activities originally planned for this reporting period. The community groups have mapped the natural resources within their proposed community-managed areas (Appendix A9). These initial maps, and the information that they contain, will serve as the starting point in a discussion of rangeland and water valuation which will lead to an economic valuation exercise planned as a component of the next community workshop on the Eastern Steppe. Although delayed, this activity has been initiated through what is hoped to be a longer-term and more meaningful relationship with herder communities on the Eastern Steppe.

Objective 4: 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, also known as the Living Landscapes Program: LLP) 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 in landscapes that encompass a diverse array of ecological features, land-uses, resource-use issues, and jurisdictional arrangements. To develop new approaches, facilitate and harmonize testing and implementation among these core sites, and to capture the synergistic benefits of diverse experiences, the central coordination unit

is charged with designing and managing the program. This unit guides 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 FY06, the Coordination Unit continued working with field sites to further develop their conservation landscapes, and provided assistance to the process of building monitoring frameworks from conceptual models. We have now refined and simplified the process for selecting landscape species, including revisions of landscape species selection software as a decision-support tool for analysis, and have drafted an accessible 'how to' quick reference guide that will complement the more comprehensive online help system that accompanies the selection software. We have also formally compared the Landscape Species Approach with landscape planning approaches of other international conservation organizations, with support from the Learning component of the USAID/GCP LWA. In addition, with complementary support, we assessed our field staff's strategies for identifying and promoting effective local actors in conservation.

Activity 4.1 Provide technical assistance to site-based conservation

Members of NY Coordination Unit worked closely with field sites to provide targeted technical input (punctual advice and informal and formal training in conservation planning, monitoring, geographic and quantitative analysis, and specific conservation issues) throughout the year. In a number of cases this involved trips to sites as reported in the previous sections of this and the other three site-specific reports: Madidi (Bolivia), Maya (Guatemala), Glovers (Belize), and Eastern Steppe (Mongolia).

Activity 4.2 Design, implementation, and testing of decision support tools

Activity 4.2.1 Living Landscapes Program technical manuals

Based on field work to date, the Living Landscapes Program (LLP) continued to generate brief how-to guides, called Technical Manuals, after field testing and fine-tuning the methods at several WCS field sites. In FY06, we finalized and disseminated three technical manuals: *Measuring our Effectiveness- A Framework for Monitoring*; *Household Surveys- a Tool for Conservation Design, Action and Monitoring*; and *Building Biological and Threats Landscapes from Ecological First Principles, a Step-by-Step Approach* (see Appendices B1-B3) We also produced a further technical manual on selecting landscape species that is currently in review (see Appendix B4). These manuals are designed to provide to field practitioners clear and practical instructions on implementing a number of conservation tools. The manuals will also be translated into Spanish and French, and disseminated to WCS projects, partners (government, NGO and local), and other conservation colleagues.

In FY06 we also produced a WCS Working Paper based on a field staff "writers' workshop" that was conceived and organized by LLP and supported, in part, by a grant from the Tinker Foundation. The working paper is titled *Casting for Conservation Actors: People, Partnerships and Wildlife* and characterizes a framework developed through adaptive management by our field staff to identify the most appropriate mix of actions and institutions needed to effect conservation within any landscape or seascape (currently in production, for draft see Appendix B5). Lastly, in

FY06 we produced two new LLP bulletins stimulated by the field work of our GCP portfolio: 1) *Setting Population Target Levels for Wildlife Conservation: How Many Animals Should We Save?* (Appendix B6), and 2) *Sharing Valued Landscapes: Conservation Through the Eyes of Wildlife* (Appendix B7).

Activity 4.2.2 Landscape Species Approach progress

4.2.2.1 Building Conservation Landscapes
LLP staff working at several sites in our portfolio continued to refine methods for setting geographic conservation priorities within a landscape, a process known as designing conservation landscapes. Design elements that were completed this year included: (1) using existing decision-support software such as Marxan, Sites, and C-plan to facilitate priority setting; (2) including the impact of potential future threats on conservation planning; (3) building potential activity costs into conservation landscape design, thereby leading to realistic and efficient strategies for conservation; and (4) developing a logic for setting wildlife population targets (i.e., how many animals do we want to conserve?) and incorporating these targets into geographic priority setting to assure that landscapes are large enough to conserve population targets. For this latter design element, we have developed a 4-tier system for setting population targets (for more on this approach, see Appendix B6).

We have reached the end of the design stage for building conservation landscapes, and are now pushing for sites to implement the procedures and produce products. Overall lessons learned from pilot tests at the GCP sites are being compiled into a technical manual that will be published early in FY07.

4.2.2.2 Review of the Landscape Species Approach
A preliminary review of the utility of the Landscape Species Approach (LSA) for conservation priority-setting was completed (for an excerpt from the conclusions of the review, see Appendix B8). Findings are being used to better adapt our program and LSA tools for the practice of site-based planning and implementation.

Activity 4.2.3 Develop monitoring frameworks at sites

Creation of monitoring frameworks from project conceptual models continues to expand within LLP test sites and more broadly across WCS. A relational database that integrates conceptual modeling, monitoring, workplan, budgets, and reporting has been drafted by LLP and will be tested in FY07.

Activity 4.2.4. Develop rules of thumb for intervention planning

Based on further input from LLP field sites, the LLP coordination unit reassessed the need for an intervention prioritization tool. Field staff felt that the challenge was not so much in choosing among intervention options; rather, it was in identifying interventions that had a high probability of success in a given context. Field staff asked LLP central staff to explore how to make available a catalog of best-practice conservation interventions cross-referenced with indirect and direct threats and ecological and socio-political systems. To move this activity forward, LLP staff worked with the Conservation Measures Partnership to finalize a typology of conservation actions and to explore with The Nature Conservancy how using a standard approach to describe conservation projects might help create a distributed database that could be used as a catalog of cross-referenced actions and threats. This work will continue to evolve in FY07.

Activity 4.3 Catalyze cross-site and cross-organizational learning, and communication

Activity 4.3.1 CMP: leadership, design, writing and audits

LLP/CU staff continued to play a leadership role in the identification, design, and implementation of Conservation Measures Partnership (CMP) activities. This was particularly important this year as there were several changes in organizations' representatives to the CMP. We continued to work closely with Foundations of Success to identify best-practice tools to use as models for development of eAdaptive-Management modules. We also continued to provide technical input for specifying measurable Global Indicators of Biodiversity status both within CMP and more broadly in support of CBD through collaboration with the Zoological Society of London and the Cambridge Conservation Forum. In FY06 we completed a brief analysis of WCS experience with activity-based accounting (see Appendix B9). Drs. David Wilkie and Craig Groves participated in the first CMP meeting (in Gland) that included IUCN as a member. This meeting provided a valuable opportunity to share CMP lessons learned with a large number of conservation practitioners. Drs. Wilkie and Groves also participated in a ½ day presentation of CMP products to WWF International staff.

LLP also participated in another USAID GCP supported learning project to compare the landscape planning approaches of 5 conservation NGO's. We participated in 2 workshops, which compared how the conservation target selection procedures of the organization worked in a case-study landscape. We played a central role in producing and editing the report from the workshop, and are now working closely with a smaller group to produce a publishable manuscript.

Activity 4.3.2 Local engagement in conservation survey

LLP conceived and organized a 5-day writers' retreat for several senior WCS field staff. The retreat was designed to capture experience integrating local people into the successful practice of landscape scale conservation. This retreat followed up a more widely distributed questionnaire that was used to frame the theoretical and practical issues associated with effectively integrating local people into the practice of conservation. The report generated during the writers' retreat is being published as a WCS International Program Working Paper and will soon be available both as a PDF on our website and as a hard-copy document (see Appendix B5).

Activity 4.3.3 Preliminary assessment of the human welfare impacts of establishing national parks

LLP staff, in collaboration with the WCS Gabon program, the Gabon National Parks Authority, and Boston College, conducted the baseline household welfare survey. This was supported by the John and Catherine T. MacArthur Foundation and the National Science Foundation. LLP staff surveyed 1,000 households with traditional claims to natural resources within 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 planned over the next 5 years to assess the impacts of establishing protected areas on local families' income, health, consumption, natural resource use, and family function.. An extensive cross-sectional survey of over 2,000 households was completed in FY06, as was the first of two intensive surveys of household consumption. The 2nd household consumption survey will be completed in the first half of FY07 and will be analyzed soon thereafter. A manuscript from the project was published (Wilkie, D. S., Morelli, G. A., Demmer, J., Starkey, M., Telfer, P. & Steil, M. (2006) *Parks and People: assessing the human welfare effects of establishing protected areas for biodiversity conservation*. **Conservation Biology**, 20,

247-249, see Appendix B10).Detailed methods with a blank database and data dictionary were made available to the public (see Appendix B11). A second article on the topic of human welfare impacts of establishing protected areas is in press (Wilkie, D. S., Redford, K. H. & McShane, T. O. (2006) *Taking of rights for natural resource conservation: a discussion about compensation*. **Journal of Sustainable Forestry**, in press, see Appendix B12). With the leadership of our LLP staff, the Wildlife Conservation Society is in the process of drafting a "Code of ethics for the practice and science of conservation" and a policy statement on physical and economic displacement associated with conservation actions.

Activity 4.4 Application of Living Landscapes Program tools beyond core sites

Activity 4.4.1 Training workshops in the use of LLP tools

With WCS and other non-USAID support, a number of workshops were undertaken throughout the year to train field practitioners in the use of conservation tools that have been developed by WCS/GCP field sites and LLP/CU staff. We feel that GCP should be proud of increasing adoption of these tools across the globe.

- The LLP associate director held a 3-day workshop to train Zoological Society of London program staff in the use of LLP conservation planning tools.
- In January of 2006, we helped local and international partners in the Samburu-Laikipia Landscape in north-central Kenya to use LLP Landscape Species planning tools to come to a common vision for wildlife conservation in this complex dry savanna landscape.
- In December 2005, the LLP program director organized and facilitated a workshop for reserve staff, government authorities, and university experts on conservation planning for Huai Kha Khaeng/Thung Yai Biosphere Reserve in Thailand. A conceptual model was designed by the group, based on landscape species targets, and a monitoring framework design initiated. The work was completed and recently presented by Thai staff to a large wildlife conference, at which the Director of Thai Wildlife Services indicated an interest that all his departmental programs use the techniques.
- In March 2006, an LLP staff member traveled to Lao PDR to facilitate a successful Landscape Species selection workshop using the custom landscape species selection software. The process was completed during a three day Biodiversity Conservation Strategy meeting in Paxsan, the capital of Bolikhamxay Province, in collaboration with provincial counterparts. The goal of the subsequent visit of another LLP staff member in May was to continue the implementation of LSA tools by training WCS Lao staff in concepts and methodology of building biological and human landscapes and initiating their development for the selected species. Preliminary results of the landscape analysis were received with great enthusiasm during the meeting with provincial stakeholders. Landscapes will be finalized in Fall 2006 and will guide a new management plan for the Nam Kading National Protected Area in Bolikhamxay Province. The government of Lao counterparts expressed an interest in using LSA tools to guide their conservation planning at other sites. This activity therefore demonstrates both local and national interest in adopting LLP tools derived with support from GCP.
- Four LLP staff conducted a 5-day training workshop in Brazil to support adoption of conceptual models and monitoring frameworks by landscape scale projects in Brazil (Mamiraua, and Piagacu Purus), Peru (Yavari Mari), Ecuador (Yasuni), and Bolivia (Gran Chaco). These projects are supported by funds from The Gordon and Betty Moore Foundation.
- In July 2005, the LLP program director held a training workshop for conservation projects as part of the WCS Marine Regional Program Meeting. These projects are adopting conceptual models as the basis for their strategic planning.

Activity 4.4.2. Technical Manuals

We continue to make our series of technical manuals available to conservation practitioners and decision makers on our website, as hard-copy booklets and on CD. Manuals are available in English, French and Spanish (see 4.2.1 above).

Activity 4.5 Ensure coordination and communication services for the program

The LLP program director and program coordinator regularly meet 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. Program staff also met with collaborators, NGOs, governmental officers, and representatives of other stakeholder groups to promote use of the strategies and tools.

Throughout FY06, the LLP Coordination Unit assisted field staff in completing annual Implementation Plans, reporting on Performance Monitoring forms, and submitting Annual Reports. The program coordinator attended quarterly USAID/EGAT meetings in Washington DC and ensured regular reporting and updates to USAID. The program coordinator and associate director attended the GCP annual meeting organized by WCS at Cool Font, West Virginia. During the meeting, LLP staff gave presentations on: proposed learning topics for FY07, progress with FY06 learning activities, and Evaluations and Conservation Audits.

Branding and Marking

WCS followed USAID's most recent guidance on new branding requirements for documents and materials funded in all or in part with USAID assistance (see Technical Manuals, Bulletins, and Working Paper, in Appendices B1-B7 as examples). WCS also ensured that all LLP staff and sites gave proper recognition to USAID for its critical support to all LLP-related workshops.

III. Appendices:

A1. World Bank/WCS Discussion Paper: *Silent Steppe: The Illegal Wildlife Trade Crisis*
http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEXT/EXTEAPREGTOPENVIRONMENT/0,,contentMDK:21019441~pagePK:34004173~piPK:34003707~theSitePK:502886,00.html
A2. *Siberian marmots in the Eastern Steppe of Mongolia: A survey of marmots and their burrows*
A3. *Eastern Mongolian Ger survey-Threats Assessment summary*
A4. Wildlife Conservation Society-Sponsored Monthly Conservation Networking Event: Scheduled Presentations, November 2005 – September 2006
A5. Map of Location and Size of Mongolian Gazelle Herds
A6. Map of Transect Locations for Marmot Survey 2006
A7. Map of Proposed and Existing Important Bird Areas (IBAs) in the Eastern Steppe Region of Mongolia
A8. Contents of *Training Handbook for Mongolia Wildlife Protection Staff*
A9. Report from the workshop entitled: "Procedures for Herding Community Natural Resource Ownership and Protection"
A10. WCS Report on Avian Influenza in Mongolia

B1. LLP Technical Manual 3- *Measuring our Effectiveness- A Framework for Monitoring*
B2. LLP Technical Manual 4- *Household Surveys- a Tool for Conservation Design, Action and Monitoring*
B3. LLP Technical Manual 6- *Building Biological and Threats Landscapes from Ecological First Principles, a Step-by-Step Approach*
B4. LLP Technical Manual 5 (DRAFT)- *A Quick Reference Guide to the Landscape Species Selection Software version 2.1*
B5. WCS International Program Working Paper- *Casting for Conservation Actors: People, Partnerships and Wildlife.*
B6. LLP Bulletin 8- *Setting Population Target Levels for Wildlife Conservation: How Many Animals Should We Save?*
B7. LLP Bulletin 9- *Sharing Valued Landscapes: Conservation Through the Eyes of Wildlife*
B8. Excerpt from the Conclusions of the Review of the Landscape Species Approach
B9. *Activity-based cost accounting - two brief case studies within WCS*
B10. Wilkie, D. S., Morelli, G. A., Demmer, J., Starkey, M., Telfer, P. & Steil, M. (2006) *Parks and People: assessing the human welfare effects of establishing protected areas for biodiversity conservation*. **Conservation Biology**, 20:247-249
B11. Detailed methods, a blank database and data dictionary for *Parks and People*
B12. Wilkie, D. S., Redford, K. H. & McShane, T. O. (2006) *Taking of rights for natural resource conservation: a discussion about compensation*. **Journal of Sustainable Forestry**, in press.