



# 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 2003 – September 2004

### 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 about 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 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. Still more demand is driven by China, whose enormous resource needs are drawing them to the opportunities in Mongolia. The steppe is also the target of specific development interests from national and international interests and agencies. In the face of these myriad pressures, the development of a comprehensive conservation and natural resource management plan to preserve the integrity of the steppe, its wildlife, and the unique, traditional nomadic culture of its people is already overdue.

This report summarizes the first year results of the new WCS/USAID Mongolia Living Landscapes Program, "The Eastern Steppe Living Landscape: Sustaining Wildlife and Traditional Livelihoods in the Arid Grasslands of Mongolia," funded by USAID's GCPII program. This five-year program was developed to help protect one of the last intact grassland ecosystems in the world. The Mongolia Living Landscapes program officially began on October 1, 2003.

#### b. Highlights

Accomplishments for the program's first year include: hosting a two-day international workshop on Mongolian gazelle management which presented recommendations to the national government on hunting regulations and Brandt's vole management; starting and running a monthly conservation information and networking series; conducting a Threats Assessment and a Protected Areas Needs Assessment; conducting Mongolian gazelle research and three Important Bird Area surveys; and collecting and developing spatially explicit information on threats to the Eastern Steppe environment to inform analyses associated with WCS' planning approach for landscape conservation, known as the Landscape Species Approach. This level of work was supported by the establishment of a permanent office in the Mongolian capital, Ulaanbaatar.

## c. Table of Activity Status

Activity Number	Activity Title	Status	Page Number
<b>Obj. 1</b>	<b>Develop and adopt participatory strategies to reduce threats to wildlife in the Mongolia Eastern Steppe landscape</b>		
1.1.	Refine an explicit model to articulate the causal relationships among conservation targets and threats	Initiated	3
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1.3.	Develop an adaptive, participatory and spatially explicit strategy for threat abatement and landscape conservation	On track	6
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1.3.2.	Develop a spatially explicit representation for threat abatement and landscape conservation	Initiated	7
1.3.3.	Direct conservation activities toward the Eastern Steppe Landscape Species: the Mongolian gazelle	On track	8
<b>Obj. 2</b>	<b>Develop and implement sustainable and adaptive mechanisms to strategically address threats across the landscape</b>		
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<b>Obj. 3</b>	<b>Learning and teaching best practices in the Mongolian Eastern Steppe landscape and beyond</b>		
3.1.	Evaluate tools and best practices for site-based conservation and synthesize lessons for dissemination to a wider conservation community	On track	17
3.2.	Review and assess emergent issues in global conservation	Initiated	17
<b>Obj.4</b>	<b>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</b>		
4.1	Provide technical assistance to site-based conservation	On track	18
4.2	Design, implementation, and testing of decision support tools	On track	18
4.3	Catalyze cross-site and cross-organizational learning, and communication	On track	19
4.4	Application of Living Landscapes Program tools beyond core sites	On track	20
4.5	Ensure coordination and communication services for the program	On track	21

## II. Detailed Description of Progress

**Key short and long-term program objectives for the reporting period (October 2003 – September 2004)**

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 through working with key national, regional and local partners to address identified threats and opportunities, and by focusing research efforts on ensuring 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.

As the Eastern Steppe Living Landscape program began, it quickly became apparent that the greatest and most immediate threat to the Eastern Steppe landscape was poor planning and management at the central government level. This ranges from development schemes with no environmental or community-based accountability to a range of ongoing initiatives (e.g., poisoning for pest control, park management, hunting laws) that are either based on poor science or are being initiated with little understanding or care of the consequences. Therefore, in the short term (1-2 years), we have two major emphases. The first is to develop 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, wildlife and human communities that depend upon natural resources for their survival. We are providing valuable information to the central government on government-led development and management programs, initiatives, and directives so that environmentally sustainable international best practice is incorporated in plans for conservation, development and management of the Eastern Steppe. Our second emphasis is 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 that is necessary to guide management strategies and actions at a broad scale.

In the long term (4 years and more), we expect that our use of participatory initiatives for landscape conservation will allow us to continually develop strong working relationships with the range of actors in the region. Our landscape planning initiatives will help many different actors in the region design and implement more strategic and collaborative conservation interventions, monitoring and evaluation activities.

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

### **Activity 1.1. Refine an explicit model to articulate the causal relationships among conservation targets and threats**

The first step in the strategic planning process for conservation outlined by the Landscape Species approach is the development of a clear conceptual model. Conceptual models clearly identify our goals and operational conservation objectives, and explicitly links 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 is currently refining our initial conceptual model built at the initiation of the project in 2003. We are more clearly defining threats to the landscape using the growing database of information on targets and threats built over the last five years by ESBP and WCS, as well as information from remote sensing analyses (see Activity 1.3.2). We have begun by implementing a systematic and participatory assessment of threats to wildlife (see Activity 1.2 Threats Assessment), the results of which will be analyzed and summarized during the upcoming fall of 2004 and winter of 2005, and then used to refine the threats outlined in our conceptual model. We will also select our target species for landscape conservation (i.e., Landscape Species) this fall, and will use this information to more explicitly define our conservation targets (see Activity 1.3.1). A range of partners (e.g., National University of Mongolia, Mongolian Academy of Sciences, Protected Areas Administration, Eastern Steppe Biodiversity Project, etc.) have been solicited to join us in our threats assessments, selection of Landscape Species, and refinement of our conceptual model. We have specifically focused on the participation of agencies in the environmental sector and local communities, because these groups have very detailed and on-ground knowledge of threats.

### **Activity 1.2. Identify principal actors to address threats and evaluate their capacity to do so**

A number of principal actors on the Eastern Steppe were identified through previous work with UNDP-GEF ESBP and WCS Mongolian gazelle research activities. However, numerous agencies and organizations are active in Mongolia's natural resource sector, and it was critical to identify new potential partners and evaluate their capacity. Identification and evaluation of key actors has allowed the project to develop linkages across the political landscape, encouraged collaborative activities, and lessened negative impacts through poorly planned projects. This coordination 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. To identify partners, we used three principle strategies: individual meetings with potential partners, holding a monthly conservation networking event, and holding participatory threats assessment workshops.

**Meeting with potential partners and organizations:** An important first step in evaluating partners is simply to meet key people, and evaluate their interest and capacity in conservation. The project staff, therefore, met multiple times with various ministry and government personnel, including Ministry of Nature and Environment, Ministry of Health, Ministry of Food and Agriculture, Ministry of Foreign Affairs, the State Specialized Inspection Agency, and governors and staff of all three Aimags (i.e., provinces) on the Eastern Steppe. We also held meetings with numerous development, NGO, and academic organizations, projects and individuals regarding WCS activities and potential collaborative opportunities<sup>1</sup>. Through this process we have identified promising partners (e.g., the National University, Mongolian Academy of Sciences, the National Remote Sensing Center, the Protected Areas Administration, and ESBP) and have initiated a range of activities with several.

**Conservation Information and Networking Event:** A major threat to effective conservation in Mongolia, and particularly with regard to actors working in the Eastern Steppe, is a lack of awareness and understanding of the

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<sup>1</sup> Meetings included (highest level staff only): National University of Mongolia (NUM: Dr. Samiya, Chair of Biology Department); Mongolian Academy of Sciences (MAC: Badamjavin Lhagvasuren, Head of Mammalian Ecology Laboratory); Institute of Geography (D. Dorjgotov, Director); Union of Mongolian Environmental Organizations (Batbold, President); ICC National Remote Sensing Center (S. Khudulmur, Director); National Agency for Environmental Monitoring (M. Erdenetuya, Scientist); Sustainable Grassland Management Project (Altantsetseg, National Project Manager); Ornithological Society of Mongolia (Gombobaatar, Vice President); State Veterinary and Animal Breeding Department (Dorjsuren, Director); Environmental and Education Media Project (Bayarbaatar, Project Coordinator); Environ LLC (Edenesaikhan, General Director); State Veterinary Department (Chuluunbat Damdinsuren, Officer); Mongolian Nature and Environment Consortium (B. Erdene-Ochir, Executive Director); Steppe Forward Program (Kate Oddie, Director); Forest and Resource Management International (Stefan Teusan, Forestry Consultant); USAID through monthly COP meetings - presentations of monthly activities (US Ambassador often in attendance); World Bank (Tony Whitten, Chris Finch); USDA (Mike Layne, Economic Officer); UNDP (Elbegzaya Batchgaral, Project Director); Eastern Steppe Biodiversity Project (ESBP: Odonchimeg, National Project Coordinator), Asian Development Bank (Darius Teter, Deputy Country Director); The Nature Conservancy (Susan Antenen, Project Director); The Mountain Institute (Catherine Cooke, President and CEO); WWF (Chimeg Junian, Director); The Asia Foundation (T. Layton Croft, Mongolia Representative, B. Batbayar, Program Officer); IPECON (Keith Swenson, Sabine Schmidt, Program Directors); ITCNE (Dr. Heino Hertel, Governing Board Chairman); GTZ (Ariunjargal, Project Officer); American Center for Mongolian Studies (Peter Marsh, Director); Chemonics (Bruce Harris, Senior Business Development Advisor); ICI (Jim Wingard, President); Hovsgol Project (Dr. Clyde Goulden, Director); JICA (Suzuki Tsutomu, Environmental Specialist/Advisor). We have also met with a wide range of visiting scholars and researchers, including those from The Smithsonian Institution, The Wilds, Texas A&M University, Zoo Duisburg, University of Zurich, Zoo Koln, Marburg University, University Pierre et Marie Curie-Paris, American Museum of Natural History, and Denver Zoological Foundation

collaborative potential among different actors. The lack of awareness of what other people are doing results in redundancy, inefficiency, and failure to incorporate relevant, up-to-date information in management activities. Therefore, WCS initiated and is currently sponsoring and hosting a monthly series of conservation information and networking events that began in December. The rationale for this activity is to encourage discussion, sharing of information, coordination, and even collaboration among the many and disparate organizations and individuals involved in conservation. 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. Monthly events have included:

In December 2003, Peter Zahler of the Wildlife Conservation Society gave a presentation on the “The WCS/USAID Eastern Steppe Living Landscapes Program: Sustaining Wildlife and Traditional Livelihoods in the Arid Grasslands of Mongolia” to an audience of 65 members of the environmental community.

In February 2004, Ganbaatar of the UNDP-GEF Eastern Steppe Biodiversity Project gave a presentation on the proposed degazetting of protected areas in Mongolia entitled “Protected Area Management” to approximately 60 people.

In March, Batsaikhan of the National University of Mongolia gave a talk and presentation entitled “National University of Mongolia: Research and Collaboration in Ecology and Conservation” to approximately 50 people. The April meeting had keynote speaker Mr. Robin Grayson give a presentation on gold mining and the environment entitled: “Gold Rush in Mongolia: Environmental Price?” This was attended by 68 members of the environmental community.

In May, Dr. Karl Didier of the Wildlife Conservation Society gave a presentation in Ulaanbaatar to an audience of over 60 people on “Remote Sensing in Wildlife Conservation: Lessons Learned from a Reintroduction Assessment of Red Deer in the Eastern United States.”

In June, Mr. Layton Croft of the Asia Foundation arranged and introduced a presentation by Mr. Amarsanaa, CEO of the Onggi River Movement, about the history and work of their newly formed NGO to save the Onggi River from the disastrous effects of mining; Dr. Peter Marriott, a UNDP Consultant, also gave a presentation and led a discussion on “Mongolia’s Environmental Vulnerability.” Forty-seven people attended.

**Participatory Threats Assessment:** To create the spatially explicit prioritization of our conservation activities (i.e., the Conservation Landscape of the Landscape Species Approach), we first need to identify the important human activities and then, to the best of our ability, map where these activities are occurring. As one of the initial steps in the WCS’ Landscape Species Approach to conservation, WCS staff in Mongolia with the assistance of New York-based staff held a series of Threats Assessment workshops in each of the three eastern Aimags to identify important human activities and map them. Through stakeholder participation in these workshops, we identified direct and indirect threats to the environment of the Eastern Steppe region as defined by those people directly affected by and responsible for alleviating these threats. Secondly, we also identified the actors who are involved in these threats, where and why some threats are greater in certain areas rather than in other areas, and how these threats affect the environment. We also ranked the threats in terms of importance across the steppe landscape, and finally, identified actors who may collaborate to have a positive impact on these threats.

Four Threats Assessment workshops were held:

Dornod Aimag: Choibalsan on Wednesday, May 15, 2004

Sukhbataar Aimag: Baruun-Urt on Saturday, May 22, 2004 (for Government Environmental Inspectors)

Sukhbataar Aimag: Baruun-Urt on Monday, May 24, 2004 (for all other relevant stakeholders)

Khenti Aimag: Ondorhaan on Wednesday, May 26, 2004

All stakeholders were invited to these workshops. Attendees included the staff of the Protected Areas Administration, the Environmental Protection Agency, the Land Management Agency, the Aimag Governors and/or staff, the State Specialized Inspection Agency, the Hydrometeorology Agency, local NGOs, and community members including teachers.

The formal threats assessment workshops were followed by a series of ‘ger assessments,’ which were less formal but explicit interviews with local herders across the Eastern Steppe region. Interviews were designed to determine local community perspective on threats to the environment and livelihoods of the steppe system.

The information collected during threat workshops in Aimags and ger interviews is now being synthesized. Although we do not have complete results yet, we can say that the information collected during these threats assessment is invaluable and will substantially improve our understanding of which threat are most important, the spatial distribution of the threats, and what indirect factors (such as lack of law enforcement) are responsible for the threats. Nearly all threats workshops identified two threats and being most important to the steppe: overhunting and overgrazing. Interestingly, the next highest ranked threats varied in different Aimags. Information collected during Threats Assessments will be critical for future planning efforts, both by this project and by the government of Mongolia. Specifically, we will use the results to revise our conceptual model of the steppe (see Activity 1.1) and to build Threats Landscapes (see Activity 1.3.2) specific to each of our Landscape Species. These Threats Landscapes will directly inform our future conservation interventions by identifying the type, severity, and cause of threats at specific locations across the Eastern Steppe.

### **Activity 1.3. Develop of 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 are identified based on criteria such as their area requirements, use of different habitats, vulnerability to multiple threats, socio-economic significance, and ecological functionality. This suite of species will be used in upcoming years to help define essential conservation lands and management priorities and assist the program in determining future conservation interventions.

We were initially scheduled to select Landscape Species at the end summer 2004. However, for three reasons we chose to delay the formal, participatory segment of the Landscape Species Selection until the late fall of 2004. First, the delay was necessary to address immediate government-led threats to the Eastern Steppe and its wildlife (see Activity 2.1). Second, the delay allowed us to take advantage of the short window of warm weather (4-5 months) in Mongolia to conduct field work and assessments. Third, the software package and criteria used for Landscape Species Selection is actively being revised by Living Landscapes Program staff in New York, and should be available in November, 2004. Although we will not complete the selection process until the revised software is available and we have included the input of local species experts, we have begun summarizing important input data specific to the biology of candidate species. Articles, books, symposia and conference reports, unpublished manuscripts, and other materials have been identified and many of them collected. As well, connections have been made with numerous local research institutes (National University of Mongolia, National Academy of Sciences, etc.) and over 20 international organizations (ICF, JICA, WI, etc.). We will solicit species experts within these groups to provide data for the selection (primarily from research and experience). In addition to being used for the Landscape Species Approach, and the data from these experts will also help to determine future research and methodologies needed for effective conservation of the Eastern Steppe. A full-scale Landscape Species Selection, including expert provided data, will be implemented in November and December of 2004. In combination with data on the spatial distribution and severity of threats collected during threats assessment workshops and interviews (see Activity 1.2: Threat Assessment), data from

the Landscape Species Selection will enable us to define the extent of the landscape and locations in which conservation efforts should focus, as well as to identify priority actions in areas of critical conservation importance and conflict.

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

To promote sustainable natural resource management and conserve wildlife across the vast landscape, we need to focus threat reduction activities where human land uses and wildlife habitat needs conflict with one another. WCS has begun to incorporate available information within the framework provided by the Landscape Species Approach to design map-based biological and human landscapes. At this stage, in collaboration with Living Landscapes staff in New York, we have completed an assessment of the currently available spatial data which relates to habitat quality and the level of human activity within the landscape. In collaboration with Living Landscapes Program staff from New York, we have produced a metadata spreadsheet describing all of the spatial data included in the Eastern Steppe Biodiversity Project dataset, which includes over 700 individual data files, such as GIS files describing human land uses, natural vegetation cover, infrastructure, and species-specific distribution information. We have contacted several individuals to clarify methods used in the development of these data, dates of collection, sources, and other metadata for the existing data files. Living Landscapes Program staff from New York have incorporated several new datasets into the existing GIS database, such as topographic data for the entire steppe, documented information about new datasets in the metadata spreadsheet, and explored the availability and usefulness of different remote sensing data sources for the Eastern Steppe. We have also produced maps, run spatial analyses, and collected information on candidate Landscape Species. Several agencies and NGO's expressed interest in our GIS data bases for use in their planning and research, including some of the new data that WCS has been able to add (including topographic data for Mongolia and satellite imagery). Therefore, we distributed the data and metadata on CD to interested government agencies (the National Remote Sensing Center and Mongolian Academy of Science) and NGOs (including the World Wildlife Fund and ESBP).

In late April and early May, Karl Didier, Landscape Ecologist from WCS' Living Landscapes Program based in New York, visited the project to assess the GIS and remote sensing capacity in the Mongolian natural resource sector. The assessment covered a total of 11 government agencies, NGOs, and private companies. During this visit, WCS held an Eastern Steppe Vegetation Workshop to assess the quality of existing vegetation classification/land cover data sets for the steppe, and utility of these data for modeling habitat quality. The workshop was attended by scientists familiar with steppe ecology and vegetation. The assessment identified several previously unknown sources of GIS information for the steppe and new partners for conservation (for example, the Information and Computer Center at the National Remote Sensing Center, which collects up to date information on land-cover change and fire risk). In general, our assessment concluded that while GIS and remote sensing capacity are relatively high in Mongolia compared to many developing countries, the capacity is very widely distributed across many different organizations and government departments. There is little knowledge of others' activities and even less collaboration and data sharing that might lead to sound management.

As a follow-up to this assessment, Mongolia and New York Program staff will interview and hire a GIS and Remote Sensing specialist. In addition to providing general GIS and Remote Sensing support for project conservation activities and the Landscape Species Approach, one component of this position will be to create a centralized data base of GIS information for the Eastern Steppe, and help encourage increased collaboration among GIS producers and users in Mongolia (e.g., create a Mongolia GIS web page and list serve, organize a GIS conference, develop periodic meetings of a GIS user group). To this point, we have solicited and received several applications, all from native Mongolians, and are planning to select a candidate by November.

### **Activity 1.3.3. Direct conservation activities toward the Eastern Steppe Landscape Species**

**The Mongolian Gazelle:** Although Landscape Species have not been officially selected, the clearest candidate for selection is the Mongolian gazelle, which ranges widely and interacts strongly with people in the landscape. WCS is

striving to ensure the survival of this key species, as well as maintaining a functional steppe ecosystem and a sustained source of revenue for local people. We have focused our conservation efforts on gazelle in three ways: continued research on the ecology and life history of the gazelle which is central to developing a sound management plan, developing consensus among scientists and conservationists and providing clear management recommendations to government, and directly trying to influence government policy and action to ensure that wise decisions are made.

WCS' research activities are focused on answering questions central to the proper management and conservation of gazelle. One of the challenges to properly managing gazelle in the Eastern Steppe is that it is difficult to physically track their movements and habitat use over such a large area. Therefore, we adopted a habitat modeling approach which will help us predict what habitat is good for gazelles during different times of the year and better predict where the animals may be. In collaboration with the Smithsonian Institute's Remote Sensing Laboratory and Living Landscape's staff from New York, we have developed a model that successfully predicts the habitat that gazelles are likely to select during the spring and summer seasons. The model is based on vegetation information collected during our driving surveys and information collected by satellite on the overall vegetation quality of the steppe. Our model confirms that gazelle are selecting grazing sites based how the sites is affected by local weather conditions (e.g., local rainfall). It also shows that gazelle are selecting habitat based on broader-scale environmental patterns (e.g., grass green-up) that are not necessarily consistent in location from year to year. These annual shifts in areas that gazelles use highlight the need to ensure that the Eastern Steppe remains as unfragmented as possible, so that gazelles can continue to migrate freely in search of the habitat they need to survive. We have submitted a paper for publication that describes our model.

Protection of calving areas is critical to conservation of gazelle populations. However, until now it has been unclear whether calving areas are consistently located in the same place from year to year. To assess whether critical calving areas were consistently located in the same place on an annual basis, we flew aerial transects over the steppe during the 2003 calving season. We spent over 40 hours of flying along 4,300 kilometers of transects searching for concentrations of animals at the birth season. However, due to engine troubles, the survey was cut short before covering the entire steppe. Results have not yet been quantitatively analyzed, but we were able to confirm that calving sites that have been previously considered traditional were not used in 2003, and regions where gazelles were not believed to be during that time were used in high concentrations. This again that suggests that gazelles require access to unpredictably large portions of the steppe in order to obtain the quality of habitat that they require. In addition, these habitat conditions, including habitat necessary for the critically sensitive calving period, may change on a yearly basis. This also suggests that existing protected areas will not be adequate for the long term survival of Mongolian gazelle.

Since 2003, we have also been tracking individual gazelle using satellite transmitters, with the goal of further understanding their daily and seasonal habitat choices over multiple years, making accurate estimates of home range size, and understanding their migration routes. In 2003, after developing a safe and successful method for capturing adult gazelle, we captured and fit 11 gazelles with satellite transmitters and have been continually monitoring these animals since this time. While data collection and interpretation are in the early stages, to date this has provided one significant insight: individual gazelle movements have included over half the entire Eastern Steppe region in just five months.

Another obstacle to long-term conservation of gazelle has been the lack of accurate base-line population estimates which, in combination with continued monitoring, can inform decision-makers about important declines in the population and the impacts of development decisions. In addition to surveying calving areas, we were able to use information from our aerial transects to make the first systematic, albeit rough population estimate for gazelle. Our current estimate is 675,000 gazelle for the Eastern Steppe, marking this as the largest population of gazelles in all of Asia, and one of the largest populations of migratory ungulates left in the world. We are planning a statistically based sample using aerial surveys, which will provide a rigorous estimate including a margin of error (see Activity 2.3).

For many ungulates, survival during the first year of life is a critical factor for determining population-wide increases and declines. It has been hypothesized that one of the reasons for the long-term decline in gazelle populations is low calf survival and, therefore, effective management should be focused on calves rather than adults. In order to test this hypothesis, for greater than 3 years we have been monitoring the status and survival of gazelle calves during their first year of life. From these long-term monitoring efforts, we developed accurate estimates of yearly survival for calves,

determined sensitive periods for young gazelles, and assessed some of the causes of mortality. To this point, we have discovered that calf survival is quite high, at 71%, compared to other ungulates living in northern latitudes, although calf mortality was highest in the first 10 days after birth. It appears that weather conditions at the time of calving can play a role in calf survival, but more data are needed to draw firm conclusions. Winter weather did not have as large of an influence on calf survival relative to predation by wolves, although winter weather did have an impact on how heavy calves were at birth. Warmer winters resulted in heavier calves, which could help in their survival. The high survival rates of calves are a good indicator that the gazelle population is capable of recovering quickly from any natural or human caused population decreases. However, our data also suggest calf mortality is not the best explanation for the perceived long-term decline in the gazelle population, and that, alternatively, adult mortality is unnaturally high. High adult mortality is likely due to the intensive poaching that takes places unchecked throughout most of the steppe, and therefore, effective conservation of gazelle is best directed toward reducing impacts of poaching.

Another obstacle to the effective conservation of gazelle has been the lack of concerted management recommendations for policy-makers, especially in regard to the control of poaching and the wisdom of proposed commercial hunting. In order to develop scientific consensus on these issues and make progress on developing a sustainable gazelle management program, WCS hosted a two-day international seminar/workshop on gazelle harvesting and management in October of 2003 (see Activity 2.1). The seminar was attended by over 100 stakeholders including government staff, managers, scientists, private businesses, local community members, and international experts from five countries. International best-practice policy guidelines were introduced for a more humane and sustainable commercial harvest that would maximize profit and give greater value to gazelle, thus creating a greater incentive to protect them as a valuable resource. Presentations were held, and working groups discussed issues related to enforcement, monitoring, and disease. It was recognized that illegal hunting may be causing a long-term decline in the population, and the final conclusion was that no commercial hunting can or should be promoted until steps are taken to ensure adequate enforcement and control of poaching. Currently, the high level of hunting remains a concern, but the increased interest and overall agreement among stakeholders for the need to develop a sustainable program is encouraging.

Not only do project activities address key issues involved in developing management plans in Mongolia, but the project team is also reaching beyond the national borders to areas where the gazelles migrate seasonally; i.e., Russia and China. In previous years, the project has provided (through WCS monies) telemetry equipment to Russian scientists studying the movements of gazelles from Mongolia into Russia (also, see transboundary outcomes expected from the upcoming October 2004 International Mongolian Gazelle Research Symposium / Management Workshop). Working as part of the USAID GCPII Program and in tandem with the UNDP-GEF Eastern Steppe Biodiversity Project, as well as with bordering nations, the information gathered in the program has a greater chance of being incorporated into a long-lasting conservation program for the gazelles and the region as a whole.

WCS is also working to directly influence government policies that could have immediate and long-term effects on gazelle. During 2004, WCS attempted to influence a development project proposed by the Chinese government which threatens to disrupt the historical migration of this species. First announced in 2002 by the Asian Development Bank (ADB), the Millennium Road has been proposed as a means of allowing Chinese and other foreign mining companies to acquire access to the steppe's vast mineral resource base, but it has been widely criticized as being poorly planned and potentially corrupt (See Economist article in Appendix 1d). Unfortunately, the planned road would stretch straight across the steppe from Ondorkhan in the west to the Chinese border, require the degazetting of 3.1 million hectares of Nomrog Strictly Protected Area, and may splice the remaining Mongolian gazelle habitat south of the Kherlen River into 2 fragments (See Appendix 1a). In addition, the planned road would neglect the human residents of the region and bypasses Choibalsan, the largest town in the eastern steppe, by no less than 80 kilometers.

In an attempt to demonstrate the potentially negative impacts of the proposed route and possibly encourage the Mongolian government to consider alternatives, program staff in Mongolia in collaboration with WCS staff in New York developed an alternative route for the road and conducted a GIS analysis to compare our alternative with the proposed route (see Appendix 1a for analysis details). WCS' alternative route would follow existing roads along the Kherlen river (therefore minimizing new ecological damage), would not bisect gazelle habitat south of the river, would be shorter and hence cheaper to build, and would directly serve 26 to 50 times more people than the proposed route.

WCS has used the information developed through this process to attempt to influence national and local actors. Interventions were made to both provincial and national governments with the aim of trying to reopen the discussion of road planning for access to the Eastern Steppe. Disappointingly, these entreaties had little impact with the government. While the plans to degazette part of the Nomrog SPA have, for the moment, been tabled, the design of the road remains unchanged. The reasons for this are unclear, but may revolve around invested interests in the current planned route and, perhaps, the election cycle in Mongolia.

WCS has also tried to raise issues of the proposed route of the Millennium Road with the Asian Development Bank which is responsible for the majority of funding for the project. WCS has made formal presentations to the ADB in Ulaan Baatar and submitted comments to ADB headquarters in Manila. A press release issued by WCS on the issue was widely picked up, perhaps most prominently in the *Economist* (See Appendix 1b and d). While the route of the highway remains unchanged, the issue has not been resolved. We plan to continue to pursue a modification of the route that we believe will benefit not only the wildlife of the Eastern Steppe, but the people as well (the current planned route manages to bypass key population centers). WCS was recently selected by the ADB to develop a desk study on the Eastern Steppe for a broader ADB priority-setting exercise. Initial results will be presented at an ADB sponsored symposium to be held at the IUCN World Conservation Congress in November 2004. Our proposal (See Appendix 1c) aims to enunciate the way in which many large scale development and infrastructure projects in Mongolia have ignored, or given inadequate attention, to environmental impact, local communities, or poverty alleviation. In this proposal, we explicitly note the Millennium Road as symptomatic of this problem.

**Other Potential Landscape Species:** As part of the process of determining the importance of gazelle-human-ecosystem interactions (including interaction with other species such as wolves), we developed a protocol and agreement with the International Takhi Group (ITG) to collaborate on a steppe wolf study project. Little is known about wolf populations in the steppe, although their populations have certainly been decimated (by poaching) relative to historic times, or about their impact on other species. Therefore, we will begin preliminary work on wolves next spring (2005), when we will capture wolves using dart immobilization from a jeep and satellite-collared and observe their movements and predation on gazelles and livestock.

The Eastern Steppe has several wetland and aquatic communities that are important for numerous migratory bird species, and in particular several species of rare cranes (see IBA surveys under Activity 2.1). Many of these areas are severely threatened by livestock use and surrounding land use (e.g., fire, woodcutting). By engaging local communities we believe that these threats may be dramatically reduced. In May, WCS collaborated with the Ornithological Society of Mongolia to write and submit a proposal to the Mongolia UNDP-GEF Small Grants Program for a 2-year project entitled “Community Management of Important Bird Areas for the Conservation of White-Naped Cranes (*Grus vipio*) and Other Species in Northeast Khenti Aimag Using Community Participation Guided by Strategic Scientific Research.”

In addition to gazelle, a suite of threatened ungulates (moose, red deer, and roe deer) use the steppe or are present in forested areas on the edge of the eastern 3 Aimags where WCS focuses its efforts. One of these forested areas, Numrog Strictly Protected Area, seems to be particularly important for all three species and is a virtual island between the Mongolian Steppe and the Chinese border (and the only representative example of the Manchurian ecosystem in Mongolia). We have recently begun initial surveys in Numrog to assess the population status of and threats to ungulates in the park. We are also in the early stages of developing a project on wolf-gazelle-livestock interactions.

The Program continues to investigate possible collaborative work with expert scientists and institutions on species considered under threat from poaching and other activities, including great bustards, marmots, and cranes (Dr. Patrick Osbourne, Dr. Daniel Blumstein, and the International Crane Foundation).

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

### **Activity 2.1. Establish necessary management mechanisms.**

**Gazelle Harvest and Management Workshop:** Gazelles face a number of threats on the Eastern Steppe, including poorly designed development schemes, changing land-use practices, and uncontrolled hunting for meat or skins. Though many herdsman hunt gazelles illegally, it is commercial poachers from towns that constitute the most severe threat, as they illegally slaughter as many as 100,000 gazelles each year. Gazelles cannot be managed as a renewable resource unless poaching is curtailed and an accepted sustainable harvesting program established. Mongolian gazelles should be an important sustainable economic resource for the government and local people if properly managed, and will be a key target of management solutions developed by the project. WCS has already conducted a pilot hunt by an Australian veterinarian and expert in handling wildlife meat to demonstrate proper techniques for harvesting and butchering gazelles.

In order to focus attention and develop specific solutions to problems related to Mongolian gazelle harvesting, a stakeholder workshop on Mongolian gazelle management was held in Ulaanbaatar on October 16-17, 2003. Over 100 people attended the two day event, including staff from three ministries and numerous government agencies and NGOs, as well as media. The workshop focused on the ecological, economic, and legislative issues of gazelle harvesting and management. Topics included hunting quotas, establishing mechanisms for monitoring, enforcement, and improving health standards for handling and processing meat as well as health issues involving gazelle-livestock interactions. A major focus of the workshop was the presentation of the extremely successful and sustainable Australian kangaroo harvest system as a potential model for future gazelle commercial harvest. New management strategies were presented that incorporated the reality that some poaching is inevitable and that specifically link between conservation and sustainable use (See Workshop Report in Appendix 1). The workshop also dealt with wildlife/livestock/human disease issues, meat handling protocols, and safety regulations for a harvesting program based on international best practices and current scientific knowledge of gazelle biology and population dynamics. On the second day, working groups were formed to discuss and develop strategies to improve legislation and implementation of actions related to quotas and monitoring, enforcement, production, and disease.

The major output from this workshop was the agreement that no commercial hunt can be recommended at this time, primarily because currently high levels of poaching appear to be having a negative impact on gazelle numbers. We believe this recommendation has had some impact on preventing the government, at least for the time-being, from reinstating a commercial hunt. Other outputs from the workshop included numerous recommendations for improving enforcement, monitoring, handling and sale of meat, and health issues. A Workshop Report (see Appendix 2) was prepared, printed in Mongolian and English, and presented to all attendees and stakeholders. Information on the workshop has been published in local newspapers and the journal *Frontiers in Ecology and the Environment*, and one paper was published in the *Mongolian Journal of Biological Sciences*.

**International Mongolian Gazelle Research Symposium/Management Workshop:** While the previous gazelle workshop focused on issues related to commercial hunting, few recommendations or strategies have been produced regarding the need for ecological research on gazelles, reducing conflicts between humans, their livestock and gazelle, and protected area management and creation. As a necessary next step in the process of developing broad-scale and sustainable management initiatives, the Program completed a workshop agenda and sent formal invitations (see Appendix 3) to participants for a three-day International Mongolian Gazelle Research Symposium/Management Workshop (October 25-27). Attendees will include all research biologists currently involved in gazelle studies in Mongolia, Russia, and China, as well as relevant government and agency officials from each country responsible for management of wildlife in regions inhabited by gazelles. The main goal of the 2004 three-day gazelle management workshop will be to create recommendations that will ensure long-term sustainable gazelle management. A one-day symposium involving international gazelle research biologists will include recent and on-going Mongolian gazelle research findings that are critical to inform management decisions including population size, trends, breeding biology, migration, and behavior; a priority-setting exercise to determine future research and conservation needs (lead by Living Landscapes Program staff from New York); and the creation of an international Mongolian Gazelle Working Group. This will be followed by a two-day workshop focusing on development issues, land use issues, protected areas, and transboundary issues with China and Russia, including discussion of potential agreements between the three

countries on gazelle management and conservation, as well as the potential for creating one or more transboundary gazelle peace parks. Outputs will be a set of recommendations covering the diverse topics described above, which together will form the framework for a Mongolian Gazelle Management Plan and Action Plan. We are currently drafting the Management Plan in cooperation with the Mongolian Academy of Sciences, which is the official research arm of the Mongolian government. With input from diverse and respected workshop attendees and the seal of approval from the Academy, we hope the management plan will have significant influence on decision-makers.

**Hunting Regulation Recommendations:** A government-led workshop was held in Ulaanbaatar in late October, 2003, on amending all existing environmental laws. The results of this workshop were then presented to the Parliament's Standing Committee on the Environment. WCS performed a complete review of hunting laws and wrote recommendations for changes to the existing regulations on hunting. These recommendations were presented to the workshop through the UNDP-GEF Eastern Steppe Biodiversity Project.

**Brandt's Vole Management Recommendations:** The Brandt's vole (*Lasiopodomys* [=*Microtus*] *brandti*) inhabits much of the Mongolian steppe and adjacent grasslands in China and Russia. This small rodent has a high reproductive capacity, and local populations may increase in numbers and reach periodic peaks, or infestations, that may occur in cycles of between 3-14 years. At extreme peaks, voles can negatively affect grasslands through their grazing. However, recent scientific studies have shown that Brandt's voles are short-grass specialists and that it is overgrazing by livestock, which encourages vole outbreaks. The Mongolian Government has been spending between about US \$300,000-\$800,000 each year on poisoning campaigns against Brandt's voles. Unfortunately, this poisoning campaign has had little effect on the target species, but it has had a serious negative effect on mammalian predators, raptors, cranes, various passerines, livestock, and even human health. According to a report from the Ministry for Food and Agriculture in 2002, at least one person has died from this poison (Bromadiolone), others have been hospitalized because of it, and many livestock have died as have significant numbers of birds and wildlife, including those that are the natural predators on voles. At the same time, poor safety methods involving processing and distribution have threatened the health of workers and community members involved in the poisoning campaign.

WCS collaborated with WWF, ESBP, and NUM to participate in a working group to present recommendations to the Parliament's Standing Committee on the Environment on new approaches to Brandt's vole management. WCS participated in a two-day working group with university experts, toxicologists, and policy experts, and WCS wrote the first draft of a set of recommendations for safer and more effective management of these rodents (see Appendix 4). The recommendations have been translated and submitted to the Standing Committee for review. From this work, a plan was created to hold a full-scale international workshop on Brandt's vole management the fall of 2004.

**Brandt's Vole Workshop:** In order to develop specific solutions to the problems described above, WCS co-hosted a formal international workshop on 27-28 September, 2004 (immediately prior to this report) on the issue of Brandt's vole management (see Appendix 5). Co-funding for the workshop was procured from WWF-Mongolia, the UNDP-GEF Eastern Steppe Biodiversity Project, and the UNDP-GEF Sustainable Grassland Management Program. The workshop was an important opportunity to learn from international experience and, in collaboration with relevant government staff and other stakeholders, to develop a set of very specific recommendations that the Mongolian. Members of Parliament, the Ministry of Nature and Environment, the Ministry of Food and Agriculture, the Ministry of Health, the Academy of Sciences, the National University of Mongolia, and a range of NGOs and concerned citizens were involved in the workshop. International participants included experts from the United States, Great Britain, and Australia. The workshop was also covered by two television channels and numerous newspapers.

Topics included alternative, integrated, and ecologically-based means of vole management, experimental methods and monitoring, training and education, environmental impact assessment, and rangeland management issues. The outputs of the workshop were a set of recommendations on the use of Bromadiolone (the pesticide used to poison voles), alternative and integrated control methods, and international best-practice rangeland management that will be presented to the Mongolian government (appropriate ministries and Parliament) for consideration and adoption. Parliament and ministry personnel at the workshop were extremely positive in their opinions that the recommendations would be seriously considered and adopted in the next or following government sessions.

A report from this workshop will also be translated and made available to all stakeholders, ranging from workshop participants to other government agencies (including local agencies directly involved in control efforts), NGOs, and

local stakeholders. An abbreviated version of the report will also be published in the Mongolian Journal of Biological Sciences. The workshop has already resulted in the introduction of an International Working Group that will include participants from Mongolia in an international forum to investigate issues and disseminate information on the extremely important conservation issue of small mammal management.

**IBA Surveys:** Mongolia contains the most extensive temperate steppe remaining in the world. This grassland ecosystem contains numerous scattered wetlands that play a significant role in the Asia Pacific Migratory Flyway. These wetlands are critical stopover sites for hundreds of thousands of migratory birds, ranging from numerous arctic breeders to six species of crane. They also serve as critical breeding grounds for an array of globally threatened species, including globally important breeding populations of Pallas' fishing eagle, swan goose, white-naped crane, relict gull, and Asiatic dowitcher. A number of outstanding bird sites have been identified, including Mongolia's first Ramsar site, Mongol Daguur. Unfortunately this area is only partially and poorly protected, and most other important sites are completely unprotected. The few existing protected areas are understaffed and underfunded, and all sites are threatened by human and livestock disturbance, overgrazing, grass harvesting, fire, poaching, and mining and other development schemes. Baseline information is a prerequisite to plan and monitor management actions for waterbirds and their habitats. Comprehensive information on breeding ranges, migration routes, important staging areas, quality of habitat, carrying capacity, seasonal/annual usage of habitat, and population changes are simply not available for most waterbirds in Mongolia. After a comprehensive literature search it became clear that this data deficiency is due to a lack of surveys and uncoordinated efforts rather than a lack of important sites or vulnerable species.

Through funding provided by WCS, we collaborated with the Royal Society for the Protection of Birds, the National University of Mongolia, the Protected Areas Administration, and the Daurskii Nature Preserve in Russia to perform a set of three month-long IBA surveys:

- A spring survey (May 1-30) investigated globally important sites for migratory birds.
- A summer survey (July 15-August 15) investigated globally important sites for breeding birds, with a special focus on the globally threatened swan goose and white-naped crane.
- A fall survey (August 25-September 25) investigated globally important sites for migratory birds.

This is the first avian survey in Mongolia to use highly rigorous and replicable data collection methods, in this case based on RSPB IBA standards. During the survey Mongolian (and Russian) biologists, resource managers, and university students were trained in this methodology to improve in-country capacity for sound research and analysis. Data from these surveys will be published in a forthcoming book on Mongolian IBAs. Once these reports are completed, we will formally propose to the Government of Mongolia that those sites identified by the surveys as globally important be designated as official Protected Areas.

## **Activity 2.2. Enhance local capacity to implement the strategy.**

### **Activity 2.2.1. Enhance Local Institutional Capacity.**

**Protected Areas Needs Assessment:** On paper, Mongolia has an excellent country-wide system of Protected Areas, including a suite of 10 Protected Areas in the Eastern Steppe region. These include Mongol Daguur, Nomrog, and Dornod Mongol Strictly Protected Areas; Tosonkhulstai, Yakhi Nuur, Khar Yamaat, Ugtam, and Lachinvandaad Nature Reserves; Onon-Balj National Conservation Park; and Ganga Nuur Natural Heritage Monument. These Protected Areas are critical to the maintenance of biodiversity and ecosystem processes on the Eastern Steppe. However, as is true throughout the world with protected areas, these 10 sites face numerous threats. Threats include illegal hunting, fishing, grazing, hay-cutting, and other activities that conflict with protected area objectives. Another looming threat is that the current national government has solicited recommendations to degazette parts of these reserves to allow road building, mining exploration and other development, and is planning a bridge into and across the Nomrog Strictly Protected Area. Also, the Eastern Mongolia Protected Areas Administration, charged with managing these areas, has inadequate personnel, training and resources to do so effectively. To properly identify and abate these threats, it is important that there be an understanding of the needs of the Protected Areas administration, staff, and

other relevant personnel. Therefore, WCS undertook a formal Protected Areas Needs Assessment of the 10 Protected Areas on the Eastern Steppe.

The needs assessment is in accordance with the Convention on Biological Diversity (CDB)'s "Programme of Work" on Protected Areas (February 2004), and as such positions Mongolia in compliance with this Programme. The assessment used international standards established by WCPA/IUCN and WWF/World Bank to review the status and needs of protected area design, planning (including objectives and indicators), resources, efficiency, and outcome/impacts. More specifically, subjects assessed included:

- infrastructure,
- finances and self-sustainability,
- personnel and training needs,
- land tenure and protected area status,
- zoning and buffer zone management,
- status of management plans,
- ongoing activities,
- threats and threat abatement efforts,
- community awareness and involvement,
- tourism development and opportunities,
- globally important wildlife status,
- research and monitoring needs,
- general effectiveness of PA network.

The assessment was performed in August 2004 and was led by David E. Heffernan, an environmental specialist with 36 years of experience in protected areas management with the United States Fish and Wildlife Service. Mr. Heffernan has spent the last year working with the Ministry of Nature and Environment's Protected Areas Management Division in Ulaanbaatar. The results of this assessment will be provided as a report to the Ministry of Nature and Environment to assist them in determining potential actions to support the Protected Areas Administration in fulfilling its management objectives. The report will also assist WCS in determining how best to address protected area needs within the auspices of the Eastern Steppe Living Landscape Program.

#### **Activity 2.2.2. Enhance Local Community Capacity.**

WCS staff has used this first year to begin designing a program that in Year Two will use socio-economic surveys, Participatory Rural Appraisal (PRA), stakeholder meetings and workshops, and pilot projects in all three Aimags to develop management concepts that are appropriate to local challenges and opportunities, and to facilitate natural resource co-management agreements. We expect to work in collaboration with IPECON (The Initiative for People-Centered Conservation). The work will include providing recommendations and assistance on the creation of sustainable grazing practices and low-impact development schemes that can help alleviate poverty without damaging the ecosystem. Through this initiative, and by explicitly defining the connection between a local community's natural resource base and its cultural survival, we anticipate that communities will become effective and proud stewards of their ecological landscape and the biodiversity found therein. The communities themselves will greatly enhance their abilities to maintain their cultural heritage through sustainable management of their resource base. Currently, funding restrictions are preventing us from implementing our plans to support local community capacity, as staffing and travel costs for PRAs in addition to costs for hosting workshops in remote areas of the steppe are high (start-up costs of approximately \$40,000). In collaboration with WCS staff in New York, we are currently researching additional sources of co-funding to carry out this Activity.

#### **Activity 2.2.3. Enhance Local Disease Management.**

A range of diseases are endemic in livestock on the steppe. Outbreaks of diseases such as foot and mouth threaten local livelihoods, the national economy, and even international trade. Danger also exists that such diseases could be transmitted to gazelles with catastrophic results to the population, as the recent (February 2004) outbreaks in southern Mongolia have proven. Already, gazelle have been blamed for spreading foot and mouth, and some officials have even

called for the elimination of the large herds. However, it is unclear whether gazelles can be ‘carriers,’ as in most cases (such as with buffalo in Africa) carriers are not killed by the disease. Sound science needs to be brought to bear to elucidate potential disease relationships between livestock and gazelles. There is a critical need for science-based livestock and wildlife health policies and programs to minimize outbreaks, to put in place plans to reduce disease impacts on all sectors, and to pinpoint underlying factors contributing to health problems. It is also essential that a health monitoring program be initiated. Timely measures can prevent widespread animal death, and only good epidemiological monitoring of sentinel species like gazelles can help unravel the factors contributing to disease outbreaks or other ecological disturbances – including those with potential ramifications for people. A few of the many other diseases involved in the human-livestock-wildlife disease interface include brucellosis (spread by badgers) and plague (spread by marmots and ground squirrels).

The WCS Mongolia office, in collaboration with the WCS Field Veterinary Program, produced three fact sheets for distribution in English and Mongolian: *Fact Sheet on Bromadiolone and Brandt’s Vole; Food and Mouth Disease in Mongolia;* and *Foot and Mouth Disease Fact Sheet* (see Appendices 6 and 7). These were translated into Mongolian and distributed to the relevant agencies. In future interactions with local herders and communities (e.g., ger interviews associated with Threats Assessment), we plan to further distribute fact sheets to these constituencies.

WCS also prepared and submitted proposals to three donor agencies (USAID, USDA, and Wellcome) to create a field veterinary project on the Eastern Steppe of Mongolia. These proposals have four main objectives:

- Work with relevant ministries, veterinary organizations and NGOs (e.g., V.E.T.NET) to identify priority information gaps related to domestic animal, human, and wildlife health in the Eastern Steppe (collect and evaluate all available literature, evaluate animal and human health data currently available, develop protocols to document diseases/potential zoonotic risk concerns, and establish sampling protocols);
- Delineate which diseases are most significant (in terms of personal health, subsistence livelihoods, and in terms of impacts on commercial trade) for domestic animals, people, and wildlife;
- initiate technical support for relevant disease research, monitoring, and management activities in collaboration with identified governmental and NGO partners;
- Provide on-the-job training to a selected group of counterpart Mongolian veterinarians in field research and management as well as in the policy process, while identifying remaining capacity gaps in practical knowledge and skills that merit additional attention (including short courses, study tours, and longer-term studies).

Key Government Agencies identified include: Ministry of Food and Agriculture (Epidemiology Agency), Veterinary Research Institute (Parasitic Disease Sector, Bacteriologic Disease Sector, Virologic Disease Sector, Pathologic Sector, Metabolic Sector), National Academy of Sciences, State Diagnostic Laboratory, Ministry of Nature and Environment, State Inspection Agency, Veterinary School, Biotechnology School, National University of Mongolia, Atomic Energy Commission, Public Health Institute, Food Research Institute, State Archive Office, State Library; and various Chinese and Russian agencies/scientists given cross-border issues. The proposal to USAID was not accepted in the first round of selection, but WCS plans on re-submitting a revised proposal for the next round of consideration. We have heard no definitive response on our two other proposals to USDA and Wellcome.

#### **Activity 2.2.4. Enhance Local Scientific Capacity.**

Long-term management of biodiversity on the steppe will depend as well on the emergence of a skilled and dedicated cadre of Mongolian scientists who can apply themselves to the problems of biodiversity conservation. WCS has recently signed a Memorandum of Understanding with the National University of Mongolia to work with staff to identify Mongolian professional scientists, graduates, and students and to assist them in developing research and conservation projects that meet the needs of conservation planning and monitoring, while providing field-based training for the next (or first) generation of conservationists in Mongolia.

As a part of the gazelle project, we have been making great progress in our educational and capacity building efforts. To date, six NUM students have been hired and trained on the project. Last year, four undergraduate students from the National University of Mongolia spent the summer helping collect data. These students participated in the flying survey, were involved in capturing and radio monitoring of calves, and worked with a local group of herders to build a

grazing enclosure around an important water source to encourage re-growth of riparian vegetation. One long-term field assistant, NUM Masters student Odonkhuu Daria, traveled to the United States in December 2003 for a five-month WCS-sponsored academic study tour. He spent a month in New Mexico with an ESL teacher for English language training and then took graduate courses during the spring 2004 semester at the University of Massachusetts (Amherst). Upon returning to Mongolia, Odonkhuu Daria completed his Masters thesis on Mongolian gazelle calf movement patterns at the National University of Mongolia and applied for a doctoral program scholarship at the University of Massachusetts-Amherst. By developing the interests and abilities of young national researchers, this project provides valuable experience and training for future Mongolian conservationists.

We 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. Team members also gave lectures and media interviews, and published reports locally to make people aware of the steppe's uniqueness and importance. Two videos about the project's current work were broadcast on Mongolian National Television. Additionally, because herders rely on gazelle for subsistence hunting, we have been interviewing families in their homes to obtain their insights, learn of their concerns, make them aware of the work and solicit their support to work with us on conservation issues.

As part of an effort both to collect relevant data and develop capacity within Mongolia, the program has developed collaborative proposals and tentative agreements for work in 2005 with a number of international experts, including Dr. Patrick Osbourne, a great bustard expert in the UK, as well as potential collaborative ventures with bustard experts in Russia and Spain; Dr. Daniel Blumstein, a marmot behavioral expert at UCLA; and the International Crane Foundation. Each of these projects would involve professors and students from the National University and other research institutions in Mongolia to help build international skills in project planning and methodology, data collection and analysis.

WCS has also worked with Mongolian professors, biologists, and government agency staff to develop scientific writing skills and publish peer-reviewed articles on issues relevant to conservation on the Eastern Steppe. During the past year, three peer-reviewed publications have been co-authored and accepted for publication (another is in submission):

Zahler, P., Olson, K., Ganzorig, K., Boldbaatar, B., Schaller, G.B., Grigg, G., Pople, T., Payne, N., Draisma, M., Hopwood, P. and Odonkhuu, D. 2004. Management of Mongolian gazelles as a sustainable resource. *Mongolian Journal of Biological Sciences*, 1(3): 48-55

Olson, K., Odonkhuu, D. and Zahler, P. 2004. Connectivity, corridors, and stepping stones: Conservation implications of roe deer distribution on the Eastern Steppe. *Mongolian Journal of Biological Sciences*.

Olson, K., Schaller, G.B., Myagmasuren, L., Odonkhuu, D., and Zahler, P. 2004. Status of ungulates in Nomrog Strictly Protected Area. *Mongolian Journal of Biological Sciences*.

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

One of the most meaningful indicators of success is expected to be the population size of Mongolian gazelles. In addition to population research cited in Activity 1.3.3, we have also arranged the use of an aircraft owned and operated by the husband of the US Ambassador to Mongolia to perform a systematic and statistically-based aerial population survey that would serve as an accurate baseline for setting initial offtake rates, monitoring changes in gazelle numbers, and mapping seasonal distribution. Initiation of the survey is expected in the spring of 2005.

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

WCS has begun to identify scientists in Mongolia, Russia and China who can collaborate in a future research symposium publication on steppe ecology and conservation. Collaborative ventures have already occurred or have been planned with a number of Russian biologists and managers. The upcoming workshop on Mongolian gazelles will

further this process, as a host of scientists from both Russia and China will attend, and it is expected that a set of agreements for collaborative activities will be an output of this meeting.

In 2004, we had planned to develop a community conservation education program designed to encourage two-way communication between steppe inhabitants and local government and to ensure that issues faced by steppe inhabitants are identified, collected and passed to relevant authorities and decision-makers. While we have not had an opportunity to begin direct interactions with local inhabitants (e.g., powerpoint presentations for local people regarding wildlife) due to restrictions in staff and time, we have begun to collect education materials for the educational program. We met with the Wildlife Films Archive and the American Museum of Natural History and identified films for use in education efforts. We also met with the Environmental Education Media Project (EEMP) and arranged to receive nature films for educational programs. We have also secured financing and a method for translation of scripts into Mongolian.

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

#### **Activities 3.1. and 3.2. Evaluate tools and best practices for site-based conservation and synthesize lessons for dissemination to a wider conservation community; Review and assess emergent issues in global conservation.**

The Eastern Steppe is one of a suite of WCS Living Landscape Program grassland sites that includes Madidi (Bolivia), Rungwa/Ruaha (Tanzania), Patagonia (Argentina), and Yellowstone (USA). As part of the process of establishing a network for communicating with these projects, a meeting was held in January of 2004 with representatives attending from all 12 Living Landscape sites around the world. At this week-long meeting, we identified more specific topics that we, as a team of collaborative sites, will pursue in order to both share information and learn common lessons as the projects are implemented. In addition, the development of a project conceptual model and roll-out of a participatory threats assessment in the eastern steppe contributed substantially to the testing and refining of these techniques, and the lessons learned are reflected in the respective technical manuals that have been produced this year by the Living Landscapes Program staff in NY (see Appendices 8 and 9).

In the interest of sharing lessons-learned among grassland sites that are currently implementing the Landscape Species Approach, we are coordinating with WCS sites in Tanzania, Argentine Patagonia, and the Madison Valley in Montana to submit a proposal to the National Science Foundation's program for Research Coordination Networks. Funding will allow us to hold an international workshop to share effective conservation, research, and management practices and undertake a systematic review of the status of grassland ecosystems and wildlife worldwide.

### **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) of the program is designed to develop and test wildlife-based, 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 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 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.

The New York CU team consists of a program director, two landscape ecologists, an outreach/communications coordinator, socio-economic monitoring specialist, biological monitoring specialist, two geographic information systems (GIS) analysts, program coordinator, and administrative assistant. Four of these positions are new WCS investments to the program this year, indicating increased WCS commitment to the development and use of landscape

tools for site-based conservation. These new positions also indicate a shift in responsibilities, increasing our ability to extend the tools we are developing to a larger array of conservationists.

During FY 2004, the Coordination Unit in New York achieved most of its objectives for the year. Although the majority of the CU work is embedded in objectives 1-3 of this and other site-specific reports, the following section highlights some of those achievements that are not fully captured in these sections.

#### **Activity 4.1 Provide technical assistance to site-based conservation**

Coordination Unit support to field site operation has been reported in detail in previous sections of this report.

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

##### *Activity 4.2.1 Living Landscapes Program Technical Manuals*

The Living Landscapes Program promotes the implementation of effective conservation projects by encouraging practitioners to: (1) be explicit about what we want to conserve, (2) identify the most important threats and where they occur within the landscape, (3) strategically plan our interventions such that we are confident that they will help abate the most critical threats, and (4) put in place a process for measuring the effectiveness of our conservation actions, and using this information to guide our decisions. Towards this end, LLP has launched a series of manuals that provides guidelines and step-by-step instructions for field practitioners. These will cover topics that include how to: select landscape conservation targets (landscape species), identify and map key threats, prepare a conservation strategy (conceptual model), and develop a monitoring framework. The manuals will be available in English, Spanish, and French.

To date, we've designed and piloted two manuals: one concerning participatory spatial assessments of human activities, and another focusing on how to build conceptual models for a project Belize (see Appendices 8 and 9 for latest versions<sup>2</sup> <sup>3</sup>). We've distributed these within our GCP sites, and more broadly within WCS. In the next few months, after final revision, the manuals will be distributed more widely to our GCP partners and the wider conservation and development community. The threats assessment and mapping manual has already attracted external attention and is the basis for LLP providing technical assistance to the Coastal Zone Management Authority and Institute of Belize, the Belize Audubon Society, and World Wildlife Fund to conduct threats assessments of, respectively, the Turneffe Atoll, Lighthouse Reef and the barrier reef system in. Manuals on building monitoring frameworks, selecting conservation targets, and on intervention priority-setting are currently in draft form and will be field tested and finalized within the next six months.

##### *Activity 4.2.2 Landscape species approach (LSA) progress*

Based on the experience of the several WCS sites that have selected Landscape Species as strategic conservation targets, the landscape ecologist and the biological monitoring specialist are coordinating the revision of the logic for selecting species and the accompanying selection software. We expect to complete a major revision of the software (version 2.0) in November 2004 and distribute it to all sites planning to select landscape species.

The program has made significant progress in implementing the Landscape Species Approach, and a number of sites have generated biological and human landscapes, and developed a strategic monitoring program. There is still work to be done most importantly to develop a defensible process for setting population targets and combining this with estimated area requirements and habitat preferences to characterize the size and configuration of landscapes sufficient to conserve each landscape species – and thus the other species that they represent.

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These are also available by email from [llp@wcs.org](mailto:llp@wcs.org) or on our website [www.wcslivinglandscapes.org](http://www.wcslivinglandscapes.org).

Finally, the assumptions underlying the LSA have yet to be tested from a theoretical standpoint. Towards this end, the Landscape Ecologist and other program staff tackled the question as part of the Annual meeting (See Activity 4.3.1). The results from the exercise that selected landscape species from a 30-year enforcement data set collected in Ghana were presented to the group. As mentioned in the last annual report, the preliminary results suggest that landscape species are among the most vulnerable to human threats, and that successful conservation of landscape species will protect other, less sensitive and less area-demanding species. The meeting participants proposed a number of additional tests and they will be further fleshed out and will form part of the ongoing LSA design process.

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

#### *Activity 4.3.1 The third Living Landscapes Program Annual Meeting*

The Third Annual Meeting of the Wildlife Conservation Society Living Landscapes Program took place at Chico Hot Springs, MT from January 10-18 2004, bringing together expanded LLP staff from the field and New York. The number of core sites for the Living Landscapes Program has expanded from three sites to the current twelve (which includes the six USAID/GCP-funded sites): Yasuni in Ecuador; Ndoki-Likouala in Congo; Madidi in Bolivia; Maya Biosphere Reserve in Guatemala; the Eastern Steppe of Mongolia; Glover's Atoll in Belize; Greater Yellowstone in USA; Northern Plains of Cambodia; the Adirondacks in USA; San Guillermo in Argentina; and Coastal Patagonia. Each site (with exception of Ecuador and Patagonia) was represented by one or two staff members.

The program has done significant design and implementation work on selected conservation planning tools (conceptual models for projects, threats analyses, landscape species analyses, monitoring frameworks), and the meeting provided a venue for all the projects to share experiences and weigh in on the development of the remaining conservation tools (setting priorities within our "conservation landscapes" and/or determining target levels for "healthy, functioning populations"; sorting out priorities for interventions; determining how to operationalize monitoring programs). Proceedings of the meeting were compiled and distributed to participants. A copy is available upon request.

#### *Activity 4.3.2 CMP: leadership, design, writing and audits*

WCS continues to play a leadership role in the direction and activities of the Conservation Measures Partnership. WCS is working with CMP on: (1) piloting conservation audits, (2) evaluating the challenges to and benefits from accounting systems that allocate spending to conservation actions and not simply goods and services purchased, (3) developing a user-friendly system for identifying appropriate indicators for measuring conservation impacts, and (4) pilot testing tools that help project's implement the CMP open standards for the practice of conservation. Craig Groves (part-time CU staffer) participated in the design and implementation of two multi-partner pilot conservation audits (led by WWF International) and David Wilkie (the socio-economic monitoring specialist) is organizing a pilot multi-partner, peer-review audit of the GCP Glover's Reef project in FY05.

#### *Activity 4.3.3 Cross-organizational Learning Initiative*

David Wilkie chaired the GCP Cross-organizational Learning panel during the first year of its implementation. Funded through a separate Associate Award under the current Cooperative Agreement, the initiative gives GCP partners the opportunity to plan and implement joint activities that promote learning.

#### *Activity 4.3.4 Synthesis of Lessons from site-based conservation*

##### **4.3.4.1. Analysis of the ecological risks and the economic and administrative feasibility of legalizing the commercial trade in bushmeat**

In response to the Government of Gabon's stated interest in legalizing the commercial trade in wildlife as a way to regulate the trade and generate tax revenues, LLP staff in collaboration with WCS Gabon and the Ministry of Wildlife and Hunting undertook an analysis of the ecological risks and the economic and administrative feasibility of such a proposal. Results, based on a comprehensive national survey of bushmeat trade and consumption, showed that even a 25% tax on the sale of bushmeat would be insufficient to cover tax collection costs, let alone the additional costs of

enforcing the new tax laws. A paper describing the analysis is in press in the *Journal of International Wildlife Law and Policy*.

#### 4.3.4.2. Local engagement in conservation survey

The design for surveying a suite of WCS projects in the hope of teasing out guiding principles for engaging local people to promote effective conservation of wildlife and wildplaces is largely complete. A survey instrument has been drafted, and a review of the literature to determine what guidance is offered to conservation practitioners to engage local people in wildlife conservation is in progress. The survey work should be complete within the next six months. Analysis of the survey results and literature will produce a set of principles that other WCS project staff can use as a decision support tool to guide how they might engage local people in conservation at their site.

### **Activity 4.4 Application of Living Landscapes Program tools beyond core sites**

As we highlighted in the last Annual Report, the initial work supported by USAID/GCP continues to provide the foundation for a growing number of sites using WCS/Living Landscapes Program tools around the world, and the multiplier effect of USAID/GCP support has been significant.

#### *4.4.1 Training workshops in the use of LLP tools*

Over the past few months, we have conducted a number of workshops at various field sites around the world that have centered on the use of conservation tools developed by the program. Adrian Treves (the outreach coordinator), and Kart Didier (the Landscape Ecologist) ran threats assessment workshops in Madagascar and Patagonia, Argentina. Adrian Treves also ran a joint landscape species selection workshop for field practitioners in Democratic Republic of Congo, Uganda, and Rwanda. Each of the above workshops included participants from national governments and NGOs of each of the countries cited. In each case, we have been gratified by the interest and commitment shown to the use of these tools by conservationists from other institutions, and look forward to conservation results that will stem from their use.

David Wilkie ran a workshop that entailed a spatially explicit threats assessment of Glover's Reef, Belize with local fishers, city council representatives, tour operators, fisheries cooperative members, biologists, government staff and NGO staff. Based on the results of this successful workshop, the Belize Audubon Society, WWF, and Belize Coastal Zone Management Authority and Institute have requested that we lead similar workshops for two other atolls in the Belize Reef system - Turneffe and Lighthouse Reefs, and the Barrier Reef as a whole. Outside funding has now been secured for these workshops and they will be run jointly by WCS, Belize Audubon Society, WWF, and CZMAI during September and October, 2004.

Similarly, Amy Vedder (program director) and David Wilkie led a workshop in Tefe, Brazil during April, with a series of eight Amazonian-Andes projects focusing on design of conceptual models and monitoring frameworks for their projects (six projects in addition to 2 GCP sites, two of which are managed by Brazilian NGOs). The approach was highlighted in an article published in the *Economist* (June 17 2004) (see Appendix 10 for a copy of the article).

#### *4.4.2 Gap Analysis in Bolivia*

The Bolivian Government has embarked on a national level GAP analysis exercise to determine the effectiveness of the country's protected area system and to see if other vital areas should be set aside to ensure comprehensive conservation. In addition to an analysis of representation of different vegetation types in the protected area system, as well as an identification of biodiversity and endemism areas to be carried out by a consortium led by FAN, a leading Bolivian NGO, collaboration with the WCS Bolivia program will strengthen the focus on Landscape Species which are not valued by models based on diversity.

The exercise will involve the use of WCS's Landscape Species Approach for two different, but related purposes. First, existing protected areas will be evaluated to determine if they require further connectivity to ensure that wildlife needs are met. Second, an overall analysis will be done to identify national-scale Landscape Species and the scale of conservation activities necessary for their conservation (combinations of new protected areas, enlarged protected areas, functional corridors, regulation outside these reserves that promote conservation of the identified species, and

international cooperation as determined necessary). The involvement of the WCS Bolivia Program in this important exercise and the application of the Landscape Species Approach by the government represents a significant endorsement of the utility of the Landscape Species Approach that WCS-Bolivia and the Living Landscapes Program have developed. Already there is interest expressed by conservationists in Argentina and Canada in using these national-scale techniques.

#### 4.4.3. *Sharing of conservation tools among conservation NGOs*

We are pleased to see that many elements of conservation planning tools being used or proposed by other conservation organizations are similar to those developed by the Landscape Species Approach. A number of our bulletins have been cited in a recent publication of the World Wildlife Fund: *From the Vision to the Ground: A guide to implementing ecoregion conservation in priority areas*<sup>4</sup> that outlines steps for conservation planning at priority sites within ecoregions. Our LSA concept of spatially mapping biological landscapes and human (social) landscapes, and then integrating the two to create a conservation landscapes is very much in line with those proposed by WWF as a means to identify conflicts and priorities for conservation action. Similarly, Conservation International in their proposed strategy for designing biodiversity conservation strategies - *Conserving the Earth's Living Heritage* - note the importance of "Landscape Species" as important tools for conservation planning and targets for conservation action, and advocate for the use of "conceptual models" to explicitly demonstrate how conservation actions are designed to abate key threats and thus conserve the targets of our conservation actions. These examples are further indication of the value of developing strategic wildlife-based tools for planning and implementing large scale, site-based programs, and sharing these tools both within WCS and more broadly across the conservation community.

### **Activity 4.5 Ensure coordination and communication services for the program**

During this reporting period, all USAID reporting deadlines were met in a timely fashion. Annual Performance Monitoring Plans were prepared by field staff, and submitted by the program coordinator. Yemi Tessema (program coordinator), Amy Vedder, and David Wilkie collaborated in the preparation and attendance of annual GCP meeting in March.

Hard copies of the bulletins, resource CDs, and other information on sites and the program were distributed upon request as well as at workshops led and attended by program staff. Electronic copies of the materials were also made available on our website.

#### **Appendices:**

- Appendix 1 a-c: Analysis of the proposed Millennium Road
- Appendix 1d: Economist article: Bridge to nowhere
- Appendix 2: Report of Mongolian gazelle workshop
- Appendix 3: Report of international research symposium on Mongolian gazelles
- Appendix 4: Fact sheet on Bromadiolone and Brandt's vole
- Appendix 5: Report of Brandt's vole workshop
- Appendix 6: Fact sheet on foot and mouth disease in Mongolia 1
- Appendix 7: Fact sheet on foot and mouth disease in Mongolia 2
- Appendix 8: LLP Technical Manual 1: Participatory spatial assessment of human activities
- Appendix 9: LLP Technical Manual 2: Creating Conceptual Models
- Appendix 10: Economist article – Peering at the future

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<sup>4</sup> [http://www.worldwildlife.org/science/pubs/vision\\_to\\_ground.pdf](http://www.worldwildlife.org/science/pubs/vision_to_ground.pdf)