



CLIMATE CHANGE IN THE DAURIAN STEPPE

Protecting biodiversity and local communities under an extreme and changing climate



Photo: Vadim Kiriliuk
Fall in Uldz River Valley

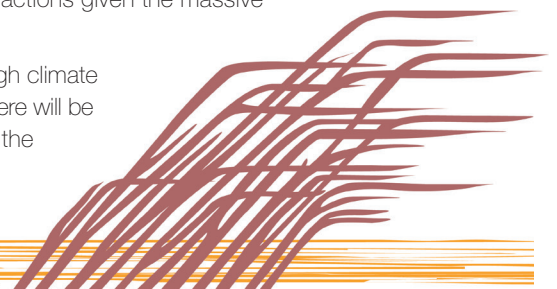
The Dauria Region

East Asia's Dauria region is a highly dynamic and diverse ecosystem with extreme climatic conditions. A complex system of wet and dry periods operates in the region over a 30-year cycle, bringing periodic times of water-abundance and drought. This has a massive influence on the ecoregion, altering the species composition and boundaries of plant communities, influencing the breeding site locations of millions of birds, controlling the migration patterns of hoofed animals, and causing the constant drying and filling of lakes and the advance and retreat of forest.

The wet-dry cycle in the Dauria is made more complex by the fact that the region's various river systems are fed by a range of different mountain catchments, so in any given year one area will be water-abundant while another will be water-deficient. This diversity allows waterbirds and steppe wildlife to move between habitat areas to seek the most favourable conditions. These climatic and hydrological cycles and the resultant diverse ecosystems are of key importance in sustaining the biodiversity and productivity of the Dauria ecosystems.

As climate change threatens the world's ecosystems, its impact on the fragile nature of the Dauria region has become of critical importance to understand. With the climate of the Dauria region already one of extremes in temperature and water availability, an understanding of the likely impacts of climate change on this system is central to undertaking conservation actions given the massive influence of the natural wet-dry cycle on the Dauria ecoregion.

Results of initial climate modeling are not optimistic. Various models predict that although climate change will increase the amount of precipitation in the region, in combination with this there will be much greater fluctuations in precipitation. In addition, the mean annual temperature of the region has already increased by two degrees centigrade and consequently there has been increased evaporation.



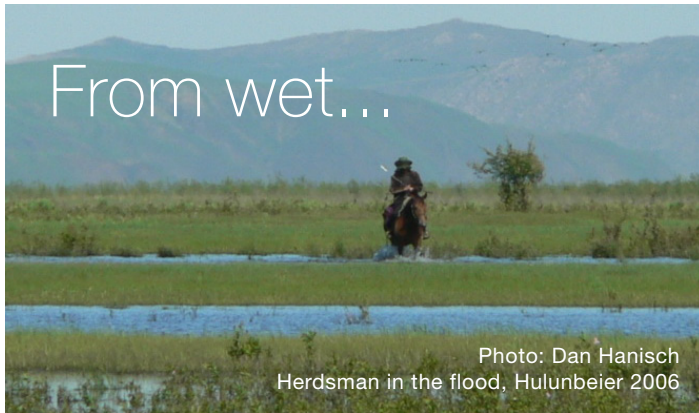


Photo: Dan Hanisch
Herdsman in the flood, Hulunbeier 2006

Photos courtesy of “Argun–Dauria Wetlands” project supported by CLPP

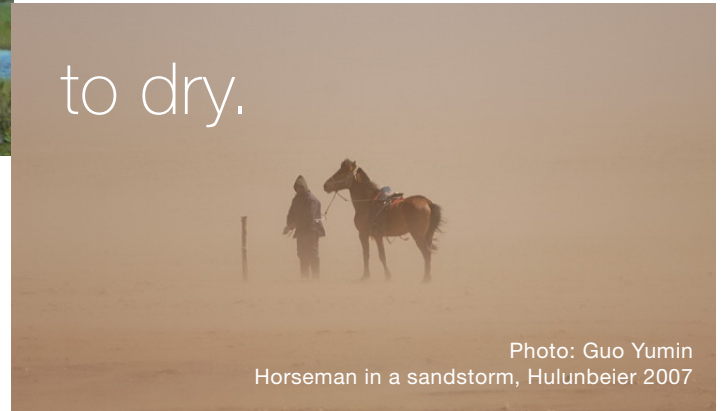


Photo: Guo Yumin
Horseman in a sandstorm, Hulunbeier 2007

The Challenge and Opportunity to Make a Difference

In the future it is expected that there will be a greater occurrence of prolonged and severe droughts, resulting in low grass biomass productivity and causing a scarcity of food for livestock as well as wild herbivorous animals. Already the impacts have been devastating. In 2007, for example, human induced factors coupled with drought meant that 90% of White-naped Cranes of the Dauria steppe did not breed, while the number of breeding Swan Geese decreased every year between 2004 and 2007. Severe impacts such as these will only be exacerbated through climate change.

The impacts of climate change and resulting water shortages are being intensified by the unprecedented and accelerating economic development currently taking place in the Dauria region. For millennia, Mongolian nomadic tribes have been adapted to the naturally occurring temporal and spatial changes in the availability of water. With increasing numbers of stationary settlements and their associated infrastructure, however, the traditional way of life is rapidly changing, and scarce water resources are diverted to thirsty power plants, mining developments and irrigated croplands. Threats are further exacerbated by water demand arising from areas lying further south in the Gobi Desert, and recently, by several proposed inter-basin water transfer projects in the Argun and Onon River basins in China and Mongolia.

Nomadic lifestyles and biodiversity are threatened by economic development and competition for water. Long-established ancestral nomadic ranges are now crossed by boundary fences, and lands are claimed by mining leases. The amount of space available for remaining nomads and for steppe wildlife is shrinking rapidly, and there is severe competition for water and other resources in times of drought. Through rapid loss of nomadic heritage, local communities are less resilient to naturally

fluctuating resources and to droughts and floods made more extreme through climate change. In addition, other impacts from climate change and development, including desertification, ecosystem fragmentation and widespread wild fires, are placing further pressure on biodiversity and nomadic communities.

A key mechanism for conservation within the Dauria has been the transboundary Dauria International Protected Area (DIPA) system, established in 1994, which occurs across Mongolia, China and Russia. This area has been critical in protecting the diverse range of ecosystems of the Dauria and the breadth of land necessary to allow species to migrate between the steppe’s scattered wetlands under the different stages of the wet-dry climate cycle. The DIPA has been of great conservation value and is a model for protected area development. However, under a changing climate and with increasing threats from modernization, the area of land contained within the DIPA lacks the extent and integrity necessary to protect local populations of key indicator species as well as other biodiversity. Thus, many areas critical for the survival of globally threatened birds (Red-crowned Crane, White-naped Crane, Swan Goose, Great Bustard, etc.) are presently not included in the DIPA and lack adequate protection measures. These negative trends are especially evident in such global biodiversity hotspots as the Argun River Midflow on the China-Russia border in the Daurian region. The main calving areas of the Mongolian Gazelle are also situated outside of DIPA and some of them are threatened by accelerating development. In 2006, the trilateral Joint Committee of DIPA approved a plan to expand and upgrade the nature reserves of the DIPA, but implementation of this plan needs strong international backing and additional resources.



The Dauria International Protected Area (DIPA)

Scope of the Project

This project aims to implement a region-wide transboundary (Russia, China and Mongolia) program to enable biodiversity conservation and resource management activities in the Dauria to be adapted to a changing climate. The project will develop ecosystem-wide approaches to buffer fragile grassland systems against adverse climate change impacts. It will also re-establish traditional and more sustainable land use patterns to support grassland biodiversity.

Project Actions

A number of project elements will be undertaken including:

- 1. Climate change adaptation strategy:** A Dauria Climate Change Adaptation Strategy will be developed for the region to identify and understand key issues under changing climate regimes and to provide guidelines for adaptation mechanisms. The project will draw together key stakeholders including scientists, international experts, local communities, decision makers and protected area managers. Given the millennia of experience that nomadic societies in the Dauria already have in coping with cyclical climate changes, a Climate Change Adaptation Strategy can build on this experience to guide adaptation to exacerbated climatic fluctuations. The Strategy will also draw from cutting-edge models of land/water use management from other regions. As a basis for the Strategy, case-studies will be developed for Mongolia, China and Russia identifying solutions to common threats including biodiversity decline, fluctuating availability of water and forage, recurrent wildfires, and placement of infrastructure and new mines. Relevant agencies in the three countries will be involved in the preparation of specific components of the adaptation strategy regarding water use, spatial and land use planning, and agriculture and livestock management.
- 2. Educational program:** An awareness raising program targeting regional policy makers and local communities will provide guidance on adaptation to the cyclical availability of resources while conserving the resilience of the natural steppe and wetlands. A mix of media will be utilized including film, interactive games, and information texts.
- 3. Expansion of the Dauria International Protected Area (DIPA) and adaptation of the protected area network to climate change:** A strategy will be developed and advocated for government action to upgrade and expand the DIPA. Expansion of the DIPA coverage will give protection to a network of regional transboundary reserves, providing resilience to climate fluctuations and development pressures in the Daurian region. The network of reserves will allow the migration and breeding of species in all phases of the region-wide drought cycle, and will sustain and preserve key hydrological features of important refugia.

Continued on page 4

Project Actions – continued

A number of steps will be undertaken to facilitate expansion of the DIPA:

- 3.1 Trilateral coordination and interaction between DIPA managers and other conservation institutions in the region will be enhanced to encourage transboundary cooperation towards adapting the Dauria protected areas system to climate change. A high level trilateral meeting will be held with the aim of increasing key decision makers' understanding of the climatic issues in the Dauria region, to endorse the 'Dauria Climate Change Adaptation Strategy', and to upgrade the trilateral 1994 interagency agreement into an intergovernmental treaty. The intergovernmental treaty is the first essential step in bringing about the expansion of the DIPA system.
- 3.2 Recommendations will be formulated for expansion of the DIPA to ensure that ecosystem processes and the habitat of migratory flagship species (cranes, geese, bustard, gazelle, etc.) are formally protected, providing much needed resilience to changing conditions.
- 3.3 A Transboundary Management Plan will be developed and implemented to cooperatively manage the DIPA system.
- 3.4 A monitoring program will be implemented to analyse ecosystem health and changes during different phases of the climate cycle. This will be critical in informing the adaptive management of the DIPA.
- 3.5 With the 'Dauria Climate Change Adaptation Strategy' providing guidance on priority activities and strategic direction for the region, proposals will be developed to further expand the protected area network, and management planning will be completed for priority areas such as the Argun River Wetlands, Gazelle Calving Grounds, Buir Lake, etc.
- 3.6 In recognition of the international significance of the Dauria area, the DIPA will be assessed in terms of several relevant globally renowned conservation designations such as UNESCO–MAB biosphere reserve, World Heritage Property, or Ramsar Wetland.
- 3.7 A capacity building program consisting of a series of workshops and field training will be undertaken to support DIPA managers and key partners to analyze and predict transboundary conservation issues in the context of climate cycles and climate change. The program will focus on the use of advanced remote sensing techniques combined with fieldwork to implement adaptation measures.
- 4. **Migratory bird conservation:** A network of international bird conservation and observation stations will be set up in Mongolia, China and Russia to monitor and analyze the influence of climate variation on migrating birds and to improve bird conservation measures. An awareness raising program will be implemented to educate local hunters, herders and fishermen about migratory bird conservation.
- 5. **Sustainable land use by local communities:** A series of showcase solutions focusing on sustainable livestock management and wildlife conservation in the buffer zones of the DIPA will be developed and launched. This will ensure that local community livelihoods are protected under various climate change regimes. The initiative will also ensure that the fragile environment is protected through the wise use of its resources. Taking advantage of the traditional nomadic knowledge of use of resources within the heterogeneous nature of the Dauria, innovative solutions will be developed that address the issues of frequent droughts and forage decline. This will be undertaken in cooperation with herder communities that utilise the buffer areas.

Funding Requirements and Timetable

Indicative funding requirements: \$1,115,000US over five years. The project will be implemented over a five-year period. This period is considered the minimum required to fully address the objectives of the project and ensure its effectiveness.

ACTIVITIES/OUTPUT	YEARS					TOTAL (US\$)
	2010	2011	2012	2013	2014	
1. Climate change adaptation strategy	25,000	37,500	25,000	12,500	0	100,000
2. Educational program	18,750	35,000	18,750	6,250	18,750	97,420
3.1 Enhanced International cooperation	6,250	7,500	31,250	0	0	45,000
3.2–3.5, 3.7 Expansion of the Dauria International Protected Area (DIPA) and adaptation of the protected area network to climate change	25,000	37,500	31,250	25,000	50,000	168,750
3.6 Analysis of Transboundary nomination for DIPA: Ramsar, WHS, MAB	32,500	10,000	0	18,750	0	61,250
4. Migratory bird conservation	25,000	87,500	52,500	31,250	12,500	208,750
5. Sustainable land use by local communities	0	15,000	25,000	37,500	25,000	105,500
Project Management and IUCN staff time						331,250
TOTAL BUDGET (US\$)	132,500	230,000	183,750	131,250	106,250	1,115,000

Implementing Agencies and Partners

The project will be a partnership between the Temperate Grasslands Conservation Initiative (TGCI) and the Dauria International Protected Area (DIPA). A working group of the DIPA will implement the project activities and the Daurian Biosphere Reserve in Russia will act as the lead agency.

National and Regional Agencies

The project will be implemented in cooperation with relevant national and regional agencies such as:

- Hulunbeir Environmental Protection Bureau (China)
- Zabaikalsky Kray Ministry of Natural resources (Russia)
- Dornod Administration of Protected Areas (Mongolia)
- Amur Basin Water Agency (Russia)

Monitoring and Research Institutions

The project will require the participation of leading monitoring and research institutions of the region such as:

- Institute of Zoology, Chinese Academy of Sciences
- Chinese Research Academy of Environmental Sciences
- Joint Mongolian–Russian Expedition of Academy of Science
- Zabaikalsky Hydrometeorology Centre, Russia
- Institute of Natural Resources and Cryology, Russia

Local NGOs

The project will also need the close support of local NGOs such as:

- Dauria Ecological Centre (Russia)
- Friends of Hulubeier Wetlands (China)
- Union of Mongolian Lakes and Rivers
- Green Longjiang NGO (China)
- Baikal Fund (Russia)



Photo: Vadim Kiriliuk
Pallas Cat, Daurian steppe

International Organizations

The undertaking will need support from international organizations to provide technical guidance and training, including those already active in the area:

- IUCN Commissions – particularly the World Commission on Protected Areas (WCPA), the Commission on Education and Communication (CEC) and the Commission on Environmental, Economic and Social Policy (CEESP)
- IUCN Secretariat through the Asia Programme
- Wetlands International
- WWF – Amur Branch
- Rivers Without Boundaries
- Ford Foundation
- The Nature Conservancy (TNC)
- Wildlife Conservation Society (WCS)
- International Crane Foundation (ICF)
- Birdlife, Asia



Temperate Grasslands Conservation Initiative

http://www.iucn.org/about/union/commissions/wcpa/wcpa_what/wcpa_conserving/wcpa_grasslandstf/

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