



Mongolia National Parks Trip Report – May 10-27, 2014

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Additional participants on trip: *BioRegions International* – Cliff Montagne, Director; Rebecca Watters, Wildlife Biologist; Badmaa Dovchin, translator and Doctoral student at Montana State University; Badam Jargalsaikhan, translator for medical professionals; Tsend Nyamiin, translator for natural resources. *Craighead Institute* – Lance Craighead, Director and land use planning specialist. *Medical Professional* – Tersh McCracken, OB/GYN, Billings, MT; Ian McCracken – premed student, Westminster College, UT.

There were two primary goals of the exchange: 1) get connected with the national park units, their staff and surrounding communities to share ideas on managing and protecting parks and, 2) assess medical training needs of rangers and learn about local hospitals (conducted by medical professional). The trip itinerary is included in Appendix 1 and maps of the parks and the GPS'd route we traveled is Appendix 2.

Overview

At the invitation of Mongolian park managers, National Park Service representatives Kristin Legg and David Thoma partnered with BioRegions International to help initiate planning and monitoring programs for new Strictly Protected Areas in northern Mongolia. Two days of participatory training led by Cliff Montagne identified important park resources, issues, and needs as well as ideas that could be the focus of future cooperative efforts. We provided overviews of Yellowstone National Park's history, the Inventory and Monitoring Program, and the importance of science to park management. Lance Craighead provided a history of bear management in Yellowstone and the importance of land use planning to preserve corridors, and Rebecca Watters discussed her recent survey for wolverines in the Darhad area. Staff from the three parks (see map attachment), the Tengis Shishged National Park, Horidol Saridag Special Protected Area, and the Ulaan Taiga Special Protected Area, participated in the two day workshop. There were 41 people in attendance from 4 different provinces including park rangers, provincial environmental officers, land managers, a data manager, and other park support staff.

The two day work shop focused on an approach that identifies values, resources, and future goals that can be achieved through careful planning, monitoring and management. In the process of discussing the holistic approach to park management we gained insight to the range and depth of resources that are available to manage these parks (see Appendix 3 for workshop summary).

In addition to the workshop we had two follow-up meetings with the Parks Director, Tumursukh. These focused on outcomes of the workshop and potential partnerships with the U.S. National Park Service (NPS). The training and follow-up meetings helped us organize Mongolian Protected Area needs into topics that could be addressed immediately while in Mongolia, near term – within a year of the site visit, and long-term future opportunities.

Although parks in northern Mongolia are new, the staff is passionate and resourceful and already has a qualitative sense of species abundance and distribution, trends in animal numbers, and resource issues and impacts associated with poaching, mining, climate change, and livestock grazing. However, they agree that

much needs to be done and are excited by the prospect of working with U.S. park staff to develop new programs tailored to the needs and available resources of Mongolia and to learn from successful U.S. programs and strategies.

Analysis of Capacity and Needs:

Mongolian park employees are enthusiastic and capable but they have very limited financial, field equipment, and computing resources to carry out their mission. Their greatest resource is human capital which they intend to leverage by educating community members and herders to build an appreciation for and understanding that these parks as special places that should be treated with care. In this way they hope all local community members can be ambassadors of these parks and their missions. Pervasive issues include over grazing by herders (legal in some parks), severe erosion, litter (a problem most apparent near communities), artisanal or ninja mining, and illegal logging. Almost all individuals we talked to recognized climate change as a problem.

Material resources include a wood fire heated small office building with a few computers, a few out buildings and a few motorcycles that are shared between rangers. They make their own camping gear including tents and collapsible wood stoves (see photos below). There are a few ranger cabins located in or near the parks.

The minimum education of most employees is through high school, while many younger employees have college degrees in fields such as botany and environmental science. All employees as far as we could tell are from the local area, meaning northern Mongolia in and near the new parks. Many of the park rangers are former sheep or reindeer herders or “ninja” miners.

The parks have no formal data collection or database that we are aware of, but most have a copy of ArcGIS, but do not use it due to insufficient training and lack of data. They are interested in generating data themselves, harvesting available data from other sources, and are eager for opportunities for learning how to map and analyze data in ArcGIS. The field employees are proficient with map reading and some carry maps but if they have any GPS units they are very few in number, so most rangers do not use them. Skills in search and rescue and field emergency medical response (i.e. wilderness first aid) are very limited.

Immediate tasks (completed)

Given our background in resource management and monitoring we focused on developing a data recording and archive system for plants and animals (attached at the end of this document). Rangers are collecting data once monthly on selected wildlife species as part of a national program, but they felt that as their only monitoring effort they were missing opportunities to record observations of interest as evidenced by the many digital photos on their cameras they shared that were not formally archived. To address that concern we developed paper wildlife and plant data recording forms that were translated to the Mongolian language for field rangers and a created a database structure to store observations and record photo documentation. Similar products have been extremely beneficial for the U.S. NPS to inventory and monitor change in animal and plant species over time. We developed this form and a flat file database structure that Mongolian park staff will pilot over the next few months (Appendix 4). The forms and “database” are simple Excel applications that will enable us to continue to work with park staff to refine these tools to meet their needs over time.

Bioregions staff Rebecca Watters will go with rangers in the field to provide “hands-on” training in data collection in July/August 2014. Due to the lack to GPS units for field rangers they typically describe locations of interest verbally, or point to a location on a park map to convey location data. For archiving location data a Mongolian park employee will need to be trained in obtaining geographic coordinates from paper maps. After data are entered the flat file will be imported to GIS for mapping observations. This will demonstrate the full cycle of data collection, archive, and analysis that Mongolian staff will be able to implement.

Near term tasks (will be completed in 12 months)

- Interest in NPS signage guidance in order to develop a similar plan for uniform signage in these three parks. We will provide digital copies of Director’s Order #52C: Park Signs.
- Interest in developing a junior ranger program and expanding on environmental outreach to children. We will contact NPS staff about guidance to develop a junior ranger program and also what other educational outreach strategies might be appropriate and provide this information to the Park Director Tumursukh. He will be able to use these resources to supplement his current ecology outreach programs.
- Provide comments and review a draft park management plan for the new strictly protected areas which is due at the end of the year.
- Provide information on protecting night skies and soundscapes.
- Assist with making digital maps once the database is populated with wildlife and plant sightings. The Mongolian data manager will work with rangers to obtain geographic coordinates for field observations of interest from paper maps.

Long-term (future collaboration potential with other NPS staff):

- Develop a Sister Inventory and Monitoring relationship by helping develop hypothesis driven questions that can be answered through monitoring, and inquiry based analysis that demonstrates the value of monitoring for management. These are foundations of sound science-based monitoring programs that have value for management.
 - Share existing NPS protocols or guidance that could help establish monitoring programs in Mongolian parks (could also fall under near-term).
 - Provide guidance on data management and database development
- Explore potential for Sister Park partnership
- Develop GIS training opportunities for environmental officers
- Ranger Skill Development – with limited ranger staff they need skills to cover range of responsibilities.
 - Developing customer service oriented ranger training so that rangers are viewed by visitors and herders as friends or resources rather than adversaries.
 - Developing science observation skills for rangers so they can collect quality resource data.
 - Develop Search and Rescue training opportunities
 - Develop Wilderness first aid or similar training opportunities
- Assist with designing a visitor contact station/center that is distinct but fits into the surrounding community of Ulaan Uul so that park visitors will recognize it as a place to stop. This is important because stores and homes in the community often look similar and keep their doors shut. Foreign visitors would not likely know where to stop for park information today.
- Assist with designing museum curation and display as this effort is led by BioRegions.

Other pertinent activities:

Climate and Water

In Bayanzurkh we met with a meteorologist who told us about the weather data collection system that employs 5 people including a hydrologist. The meteorologists collect temperature and precipitation manually on a 3 hour interval since 2000 and the hydrologist measures flow on the Beltes River each morning at 8:00 am when ice free. Flow measurements have been made since the 1970's. They also collect vegetation plot data at sites throughout the Soum once per year in August. Data are compiled monthly then taken to Murun on a thumb drive.

In Ulaanbattar we met with Dr. Erdenbat Eldev-Ochir, senior officer in charge of International Cooperation for the National Agency for Meteorology and Environmental Monitoring. He agreed to help us obtain available climate data for the area if needed for further work. His cooperation is essential because it is quite difficult to obtain climate data for Mongolia as evidenced by the preliminary work prior to this trip.

David obtained climate data for 10 stations in Mongolia before the trip to evaluate conditions and trends. He summarized trends over time at Murun for temperature and precipitation along with changes in evapotranspiration and drought, important metrics for assessing climate impacts to vegetation. His findings are summarized later in this document.

Museums

We visited two museums and talked with museum directors about collections and curation. The museum in Ulan Uhl was in fairly good condition and the other in Byanzurkh is a small room with minimal curation. They recognize this and are building a new facility in partnership with BioRegions and the Mongolian National Historic Center. There may be opportunities to collaborate during this process.

Blue Valley Cultural Festival

We attended the Blue Valley Festival which is a cultural event designed to promote the arts and culture of the Darhad Valley. There is interest in encouraging more participation and to promote this festival to a wider audience including tourists. We provided thoughts on doing so in an environmentally sustainable way that would result in minimum impact if it were to be hosted in a natural setting out doors.

Government and other outreach

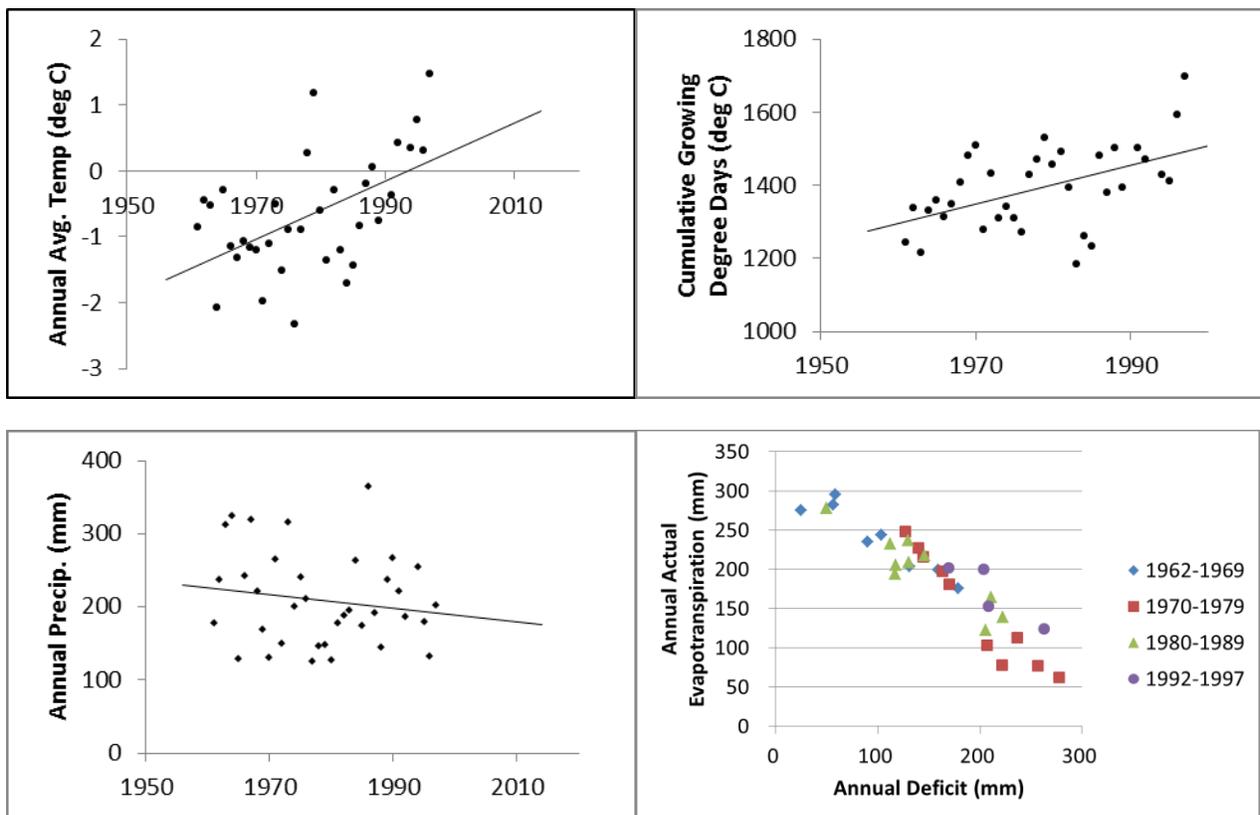
We met with the Governors from Ulaan Uul and Byanzurk and the Provincial Governor for the Hovsgol Aimag on separate occasions to discuss the purpose of our trip, and their interest in community and tourism development. These meetings were informative as they indicated recognition of value of National Parks and a desire to improve visitor services including trash disposal and recycling. The governors also shared an interest in raising awareness of over grazing that is leading to erosion and in developing ways to educate community and visitors about wildlife conservation of the Taiman fishery and climate change impacts. We provided half day training to participants Bayanzurk that could not attend the full 2-day workshop in Ulaan Uul and participated on a fieldtrip to the countryside to discuss the severity of erosion, grazing practices, and the challenges with trash disposal. In

addition we met with Jan Jorgensen, Founder of Nomadic Journeys, to discuss similar topics and possible opportunities to collaborate with BioRegions in the future.

Future Outreach Efforts Related to this Trip

We will be submitting an abstract to the Greater Yellowstone Biennial Science Conference about the trip and future collaboration opportunities. Also we will give a presentation at the USGS Northern Rockies Science Center and will look for additional opportunities to present information about this experience at other workshops/conferences (i.e. George Wright Society conference) that will hopefully result in meaningful partnerships.

Climate summary for Moron, Mongolia 1962-1997



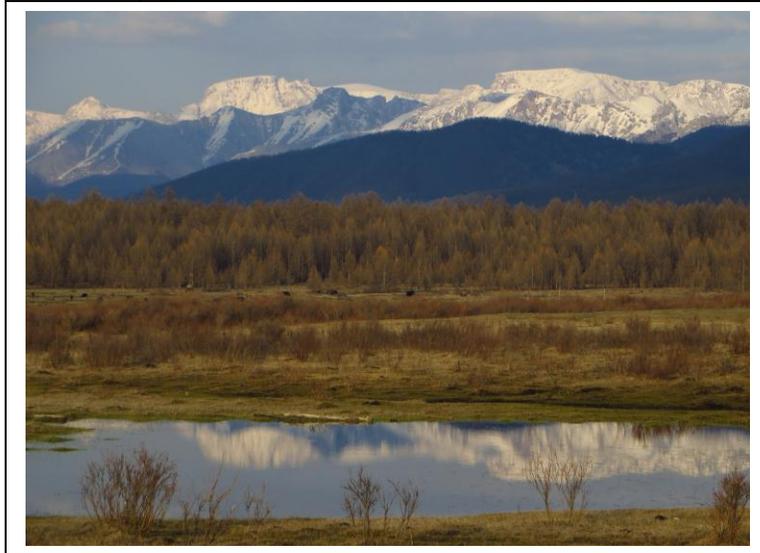
Using available data for Moron, Mongolia obtained from the U.S. National Climate Data Center before our trip, we were able to summarize some patterns and short-term trends in climate. For the period between 1962 and 1997 temperature and growing degree days increased while precipitation decreased. The climatic water balance indicates a cold wet decade in the 1960's while more recent decades have generally been warmer and drier. Complete and up-to-date climate data for the region are difficult to obtain without an in-country contact. However, this analysis can be repeated if we can obtain more recent and complete weather data from Mongolian meteorologists.

Photos

Entrance sign into the Darhad Valley and home of the three protected areas: Tengis Shishged National Park, Horidol Saridag Special Protected Area, and the Ulaan Taiga Special Protected Area.



View of the Horidol Saridag Special Protected Area.



David and Kristin presenting at the workshop and park staff discussing and presenting their resources, issues, and goals for their parks.



Post Workshop photo of participants and the Park Director giving each ranger a heavy duty rain slicker. The park staff fabricated their own tents and collapsible wood stoves that fit on the back of a motorcycle.



Photos from the Blue Valley Festival and the museum in Byanzurk with the Cultural Director.

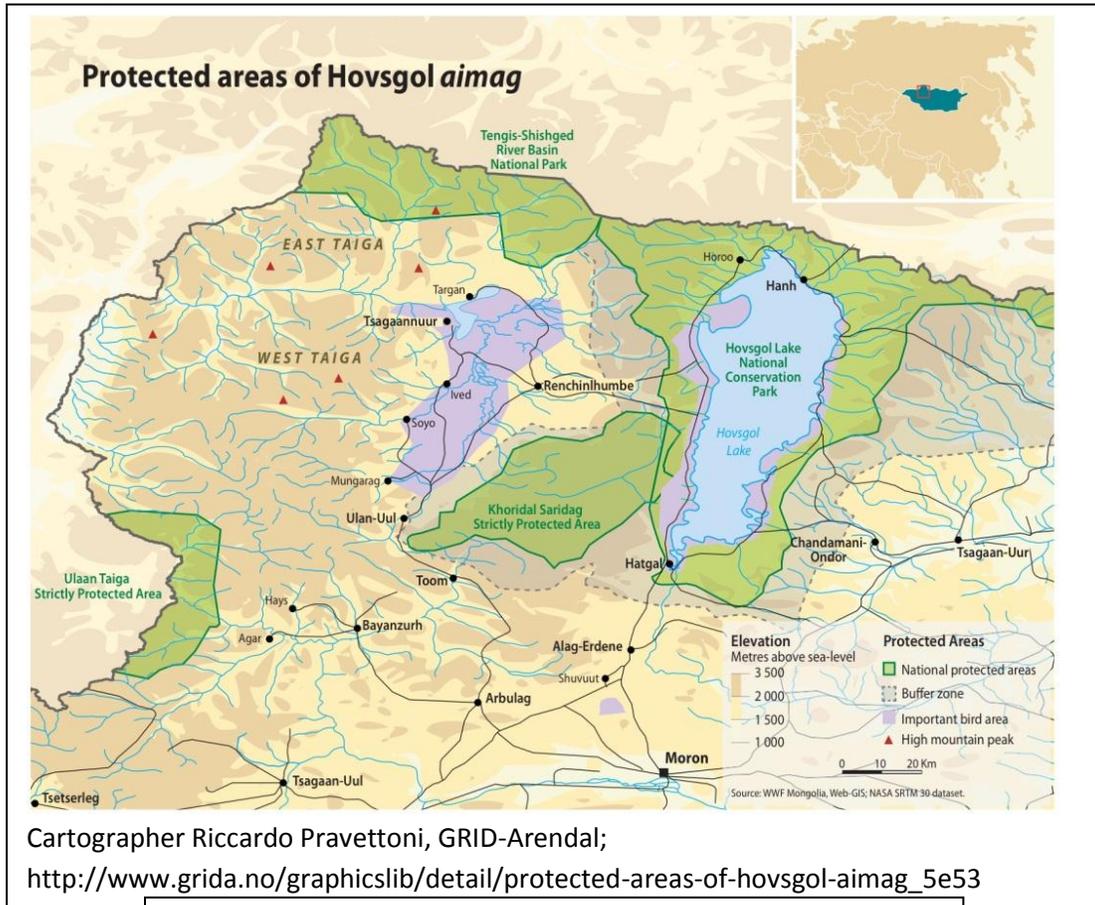


Photos from field trips to discuss potential location and environmental concerns for future Blue Valley Festival and example of erosion from over grazing. The last photo is an example of trash and recycling bins. These are the only ones we saw, and they were at the park headquarters.

Appendix 1. Itinerary

BioRegions International Trip Itinerary – May 2014	
DATE	Activity
May 10 Saturday	Depart US
11 Sunday	Arrive Ulanbaatar, Mongolia
12 Monday	Rest, visa extensions for Rebecca and Cliff, meet with Mrs. Oyungerel, Ministry of Tourism and Infrastructure (from Hatgal, Stanford graduate) about the Blue Valley festival, hospital/medical school and other visits, final preparation of materials
13 Tuesday	Health contacts for Tersh and Ian Visit Agricultural University 3pm Ministry of Culture
14 Wednesday	Flight delayed one day to Murun. Meet with Harry Reynolds and Doug Chadwick who are studying Gobi Bears. Visit Gorkhi-Terelj National Park outside of Ulanbaatar.
15 Thur	Fly to Murun. Drive To Ulaan Uul.
16 Fri	Tour Ulaan Uul cultural museum Environmental Training Workshop Training: 41 people [rangers, environmental officers, Aimag staff]
17 Sat	Training continued
18 Sun	Blue Valley Festival
19 Mon	Meet with Ulaan Uul Governor Hike in the local area to view park areas from afar
20 Tue	Travel to Bayanzurkh Meet with Bayanzurkh Governor Visit Museum facility and meet with head of the Meteorological Office
21 Wed	Training/community work: environmental training overview for staff and visits to hospital and discussion with local government on waste cycling/cleanup, grazing/watershed stability-contact ahead to locals Field visit to local herder, see severe erosion issues, over grazing, and discussions about flooding in stream drainage thought to be tied to climate change and increased storm intensities
22 Thur	Field trip to view proposed area for future Blue Valley Festival and discuss environmental and social thoughts with locations.
23 Fri	Travel to Hatgal Visit Tumursukh to recap thoughts on training and provide him an overview of the wildlife and plant sighting form/database. Visit Regional Governor to discuss purpose of trip and future potential collaborations
24 Sat	Return to Murun and catch late flight to Ulaanbatar
25 Sun	Site visits
26 Mon	Try and meet with staff from Nature Conservancy (unfortunately out); meet up with owners of Nomadic Journeys who are very interested in quality tourism development throughout the region; Meet with the head of the Mongolian Meteorological Division. Visit National Cultural Museum
27 Tue	Return to Bozeman, MT

Appendix 2. Maps



Parks and protected areas in northern Mongolia (top – see citation under map) and our travels (bottom) to visit with park staff, environmental officers, cultural center directors, meteorologists and governors in Moron, Ulan-Uul, Bayanzurhk, and Hatgal (GPS locations collected by Lance Craighead, Craighead Institute). 9

Appendix 3. Mongolia Park Ranger Training Workshop Notes

Notes recorded by Dr. Lance Craighead, Craighead Institute during the two day planning process at Ulaan Uul and follow-up discussions related to workshop and park management.

Holistic Resource Management Mandala Planning Process

Quadrant 1 (The Whole) Results

Ulaan Taiga SPA (Upper Delger region)

Current situation/problem

1. Poaching
2. Illegal persons in park – no visa or permit
3. Climate change
4. Forest fires
5. Artesanal mining – ninja miners
6. Low salary and wage for park personnel

Resources

Listed Natural Resources

1. Over 300 Lakes
2. 5 major river headwaters
3. Wildlife
4. Forest
5. Native plants and soils
6. Minerals

Listed Social Resources

1. 8 reindeer rangers
2. 4 specialist rangers
3. User groups – herders
4. Border patrol officers
5. Environmental protection office in each of 3 soums

Listed Financial Resources

1. Salaries from government
2. Park Service office
3. Ticket sales to tourists
4. Taxes
5. Donations from individuals and NGOs
6. Vehicles

Chingis –Shiskit SPA (in north)

Current situation/problem

1. This is the best, most pristine area in Mongolia
2. Illegal mining of green jade
3. Difficult working conditions – tough logistics, few rifles, extreme climate and weather conditions
4. Poor communications
5. Large area to cover – 100,000 ha

6. Corrupt officials break rules, poach animals – especially high government officials

Resources

Listed Natural Resources

1. Wild animals
2. Minerals
3. Native vegetation
4. Fish
5. Historical/cultural areas
6. Topographic features – sights

Listed Social Resources

1. Help from other government agencies
2. Cooperation from reindeer herders in area
3. Transportation support from reindeer herders

Listed Financial Resources

1. Salaries from government
2. Low wages
3. Park rangers are proud to never go on strike

Horidal Sardag SPA

Current situation/problem

1. Poaching
2. Illegal logging
3. Forest fires – these are about 99% human caused (60% by humans being careless, and 40% due to extreme dry and windy conditions.) Some fires cross the border from Russia. Fire fighting is seldom successful.
4. Overgrazing/ desertification
5. Illegal harvest of plants
6. Migration route of herders goes through PA – increases overgrazing problems.

Resources

Listed Natural Resources

1. 8 rare animals – Argali, Marco Polo Sheep, Ibex, Moose, Elk, Brown Bear, Snow Cock
2. Rare plants – Mountain Rue
3. Minerals – coal, uranium
4. 5 major river headwaters
5. 3 tree species

Listed Social Resources

1. 6 Rangers
2. 9 user groups
3. Environmental Protection Office
4. Volunteers
5. Teachers in schools

Listed Financial Resources

1. Tourist income
2. Salaries from government
3. Support from government

For this portion of the workshop Cliff presented the Holistic framework and the Mandala concept. The BioRegions team discussed the history of Yellowstone Park. Kristen noted that park employees in the US. have the same problems: poaching, forest fires, etc. and even low salaries. Lance discussed the history of bear management in Yellowstone. David discussed monitoring protocols and offered to provide data sheets. Lance suggested that hair samples could be collected and stored in envelopes; kept cool and dry. At some future time there may be funding available to analyze them. Any samples that might be from rare or interesting species could be collected and saved.

Quadrant 2 (Actions and Tools) Results, Holistic Vision (Values),

Ulaan Taiga SPA (Upper Delger region)

Quality of Life - Values

1. Water quality
2. Forest
3. Biodiversity

Activities and Economy

1. Prevention (fires, illegal activities?)
2. Cooperation with other agencies, border patrol, police
3. Stop poaching, trading of animal parts
4. Start an information center
5. Produce maps of the area for visitors/researchers
6. Develop a tourism infrastructure
7. Promote cultural resources through education and tourism

This is a brand new protected area. Research is important to learn about what is there. They need new tools and need to build a database. They need to change the attitude of the public and educate them about the importance of conservation so that they have many more people acting as protectors of the resources. This can involve the use of social networks and media. They also want to improve the quality of tourism facilities and develop trainings for the future economy; local guides and helpers

Vision (In 5 years)

1. Inventory of wildlife resources
2. Reduce poaching by 80%
3. Educational campaign will be completed so that people will know their national park
4. Increase visitation from 30 visitors (2013) to 500.
5. Increase number of local guides from a few to 30
6. Have 60% more of locals involved in protection

7. Have 60% more of locals involved in advertising
8. Have 60% more of locals involved in services
9. Improve knowledge of rangers and specialists by 50%

Vision (next year)

1. Perhaps BioRegions team can take workshops to each new protected area.

Horidal – Sardag SPA

Quality of Life - Values

1. Biological diversity
2. Rare Wildlife – Marco Polo Sheep, Ibex, Moose, Brown Bear, Elk, Musk Deer

Activities and Economy

1. Research is very important
2. Involvement of local people
3. Protection of critical areas for wildlife

Vision (In 5 years)

1. Argali will increase from 50 to 70
2. Brown bear will increase from 6 to 8
3. Moose will increase from 20 to 28
4. Ibex will increase from 40 to 60
5. Snow leopard will at least remain stable at 3
6. Elk will increase from 65 to 80
7. Herders will all have the ‘heart of a ranger’ and understand they need to protect wildlife (instead of just 30 rangers, everyone will be a ranger in spirit)
8. Wildlife will be visible and unharassed
9. More habitat will be available to support larger wildlife populations
10. No increase in infrastructure
11. No increase in fragmentation

Chingis – Shiskit SPA (in north)

Quality of Life – Values

1. Maintain pristine qualities and biodiversity
2. Keep as special destination for tourism
3. This is the best area in Mongolia

Activities and Economy

1. Service for tourism
2. Protect areas while allowing tourists to enjoy area
3. Increase visitor activities – fishing, climbing
4. Enforce laws –stop poaching
5. Develop training for ecotourism

Vision (In 5 years)

1. Domestic reindeer will increase from 1600 to 5000

2. Increased Taiman population – more sportfishing
3. Less poaching
4. More wildlife

In this portion of the workshop we had other presentations by the BioRegion Team. David talked about climate change, Kristen talked about monitoring and inventory, and Lance talked about bear research tools and approaches. Lance demonstrated how GeoPDF maps can be used in the field to record and share location and observational data. A copy of the geoPDF map of Hovsgol and the TerraGo tools were given to one of the rangers, and a copy of the map was given to Tumursukh.

Quadrant Four (Management)

General Notes from discussions, and workshops and from meetings with Tumursuk in Ulaan Uul;

From the introductions we learned that the participants are generally interested in protecting animals and plants, planning, GIS, and local economies.

Cliff expressed the idea that rangers can be a very valuable resource and share their knowledge of the Darhad Ecosystems.

The holistic goal of each special protected area can be expressed as a scientific document with personal underpinnings (ie. there are now 6 brown bears, and in the future we hope to see 8).

The rangers are currently using a UNDP protocol for recording data that limits the recorded observations to just a single species at a known site once per month on the same day. They are glad to have additional options for inventory and monitoring.

Land officers have been provided with GIS. Many do not know how to use it.

Tumursuk wants to

1. get standardized signage for the parks
2. start a junior ranger program
3. form a sister national park connection in the U.S.
4. join any National Park Associations that may exist
5. build a visitor center at a site in Ulaan Uul

Tumursuk explained that the BioRegions Holistic Management approach is similar to the national Mongolia Program. The results from the workshop will help him to develop a management plan (the MIRAD plan) that is due within the next 6 months. The plan will need to be adaptable and flexible.

Tumursuk asked if BioRegions can help with coaching or advice for the MIRAD plan.

Cliff discussed the possibility of developing a joint proposal to bring a BioRegions team next year that could spend time in each of the 3 parks. We also discussed possibilities of a proposal(s) to help with the planning process later this year.

One observation of the workshop results is that only one of the ranger groups considered overgrazing to be a problem. From our observations it may be the biggest problem throughout the region. When asked, people have responded that conditions have 'always been like this'; they don't remember a time when there was streamside vegetation or non-eroded hillsides.

Cliff envisions a goal of reducing grazing by 30% as a start to allow systems to begin to recover. To achieve this would involve incentives such as alternate income or employment.

Tourism of the type that can significantly improve employment opportunities will require some improvements in infrastructure and probably emergency services. At least a small plane and some local airstrips would be required to provide emergency health care for older tourists and those with other health risks.

General Notes from discussions and from meeting with Tumursuk in Hatgol;

Tumursuk met with Hovsgol leaders in Muren to affirm the mining ban above the 50th parallel. The group decided to extend the mining ban indefinitely. The Amag governor will inform the national government. This does not mean it cannot be overturned in the future.

The park rangers and environmental officers have started on the MIRAD plan; they will use the results from the BioRegions workshops to get started. Tsend had suggestions to improve the empowerment of women, improve energy efficiency of housing, and improve grazing practices in mountainous areas. Empowerment of women would include reducing the alcohol problems among men.

Emergency first aid training would be important to provide for rangers. The Mongolian Red Cross training in the suoms that BioRegions supported in the past should be renewed. This could be an opportunity for medical students and residents to do community service.

The planning process was discussed; Planners need to ask what information is needed. Rebecca (and originally Tsend) could provide some assistance in July. It is uncertain whether Tsend will be active at this level however. The planning process needs to be parallel in the suom governments and in the parks so that they will be similar and seamless.

Tumursuk helped set up a management committee with 5 representatives from each suom, one rep from each watershed, and also reps from user groups and NGOs. There are about 30 reps in total. This committee could explore possible actions to secure the future that they want for the Darhad Valley. Tsend expressed the need for an MOU between BioRegions and the Ministry of Environment so that all parties could know what to expect. However, Tumursuk said that things can get very complicated if the Ministry is involved; lots of bureaucratic layers are added to the process. Permits may be required for teaching and workshops for example. If the Ministry can provide support it may be useful for some things; for other activities it may be best to just work independently. At the Amag level it is usually good to cooperate; they will try to help. At the Suom level it becomes more difficult; to provide a

balance between preservation of resources in the National Park and improving life for the herders and other people in and around the National Park. However there are two things that work: 1) small projects to help the community, and 2) a planning process involving various entities. [My take on this is that some top-down regulations at the Amag level may be more effective than local efforts at the Suom level where officials are more answerable and influenced by local people wanting less preservation]

Tumursuk said that it would be useful if next year BioRegions could bring a newsletter/report about what has been done over the past years so that locals could learn and participate. Rebecca can help Tumursuk with translation and editing of English language materials for the park web site. David and Kristin provided Tumursuk with field data forms that are consistent with U.S. National Park inventory and monitoring protocols; one for animals and one for plants. David spent a whole afternoon writing the English versions: Tsend stayed up very late on our last night at Bayanzurkh translating the forms into Mongolian.

Appendix 4. Data Collection Forms and Instructions in Mongolian

Дархад, Амьтан ажиглах маягт		Дархад, Ургамал ажиглах маягт	
Огноо: Өдөр Сар Он Бүртгэлийн дугаар		Огноо: Өдөр Сар Он Бүртгэлийн дугаар	
Байршил: Өргөрөг (°,'") Уртраг (°,'")		Байршил: Өргөрөг (°,'") Уртраг (°,'")	
Байршил Байршлын тодорхойлолт:		Байршил Байршлын тодорхойлолт:	
Ажиллалт хийсэн хувиус:		Ажиллалт хийсэн хувиус:	
Зүйлийн нэр:		Зүйлийн нэр:	
Тус бүрийн тоо: Эргэчин Эмэгчин Нэлх Залуу Мэдэгдэлгүй		Зүйлийн нэр: Элбэгшил, эсвэл тоо	
Эсвэл: мөр дуу хөвгөн бусад?		Талбай (ам метр - м2)	
Шөнө тэмдгийн тоо:		Цэцэглэж байгаа?	
Үйл хөдлөл:		Өс, бутлаг мал идсэн, зулгаасан байдал:	
Зураг, дугаар:		Тодорхойлолт:	
Зураг, дугаар:		Зураг, дугаар:	

<p>Амьтан ажиглах маягтыг бөглөх заавар</p> <p>Маягтын нүд бүрт мадсалаа оруулах бөгөөд хэрэв байгууль бол "Х" -ээр тэмдэглэнэ</p> <p>Өдөр: 2 оронтой, Сар: 2, Он: 4 оронтой "05" "06" "2014"</p> <p>Бүртгэлийн дугаар: Тоо бүртгэлийн амьтан бүртгэлд авсан өдрөөр бөглөнө</p> <p>Өргөрөг: Боломтой бол хэарийн нөөцөлд GPS -эс авсан газар зүйн координатаар оруулна. Компьютерт ариатын градус шилжүүлж оруулна "52.456"</p> <p>Уртраг: Боломтой бол хэарийн нөөцөлд GPS -эс авсан газар зүйн координатаар оруулна. Компьютерт ариатын градус шилжүүлж оруулна "110.456"</p> <p>Хэрэв GPS -ийн өргөрөг, уртраг байгууль бол тэдгэрийг ажил дээрээ ирээд бөглөнө.</p> <p>Байршлын тодорхойлолт: "Төмөрсүний даван дээр" гэх зэргээр үгээр тодорхойлж бичнэ</p> <p>Ажиллалт хийсэн хувиус: Ажиллалт хийсэн хувиусийн нэрийг бүтнээр нь бичнэ</p> <p>Зүйлүүд: Ажилласан амьтны зүйлийг хэрэглэй бол тухайн амьтны мөр, бусад үлдсэн тэмдгүүдийг бичнэ</p> <p>Тус бүрийн тоо: Ажилласан амьтны тоог бичнэ</p> <p>Хэрэв амьтан ажиглагдаууль бол тухайн нүдийг "Х" -ээр тэмдэглэнэ.</p> <p>Шөнө тэмдгийн тоо: Тухайн амьтны хөвгөн, дуу чимээ, мөр, зурсан, самардсан тоог бичнэ.</p> <p>Үйл хөдлөл: Ажилласан тухайн үед тэр амьтан ямар үйл хөдлөлийн хийж байсан тухай цөөн үгээр тодорхойлж бичнэ.</p> <p>Үнд "унгаж байсан", "ажж байсан", "идэжж байсан" гэх мэт</p> <p>Зургийн аппаратаар авсан зургуудыг дугаарлаж тэмдэглэнэ</p>	<p>Ургамал ажиглах маягтыг бөглөх заавар</p> <p>Маягтын нүд бүрт мадсалаа оруулах бөгөөд хэрэв байгууль бол "Х" -ээр тэмдэглэнэ</p> <p>Өдөр: 2 оронтой, Сар: 2, Он: 4 оронтой "05" "06" "2014"</p> <p>Бүртгэлийн дугаар: Тоо бүртгэлийн амьтан бүртгэлд авсан өдрөөр бөглөнө</p> <p>Өргөрөг: Боломтой бол хэарийн нөөцөлд GPS -эс авсан газар зүйн координатаар оруулна. Компьютерт ариатын градус шилжүүлж оруулна "52.456"</p> <p>Уртраг: Боломтой бол хэарийн нөөцөлд GPS -эс авсан газар зүйн координатаар оруулна. Компьютерт ариатын градус шилжүүлж оруулна "110.456"</p> <p>Хэрэв GPS -ийн өргөрөг, уртраг байгууль бол тэдгэрийг ажил дээрээ ирээд бөглөнө.</p> <p>Байршлын тодорхойлолт: "Төмөрсүний даван дээр" гэх зэргээр үгээр тодорхойлж бичнэ</p> <p>Ажиллалт хийсэн хувиус: Ажиллалт хийсэн хувиусийн нэрийг бүтнээр нь бичнэ</p> <p>Нийлэг нэр: ажиглагдсан зүйлүүд Шөнөдөх цааны нэр: ажиглагдсан зүйлүүд</p> <p>Элбэгшил, эсвэл тоо: "сүл", "дүнд", "и", эсвэл 100 -ээс бага байвал тоолно</p> <p>Тоолоход хэцүү, хэарийн олон байгаа бол зүйлүүдийн эзэлж буй талбайгаар нь багцална.</p> <p>Цэцэглэж байгаа: Тухайн зүйлүүд цэцэглэж / дэлгэрч байгаа эсэхийг "нийл" эсвэл "гүй" гэж бичнэ</p> <p>Өс, бутлаг мал идсэн, зулгаасан байдал: "гүй", "бага", "дүнд эргэн", "их" гэж тэмдэглэнэ</p> <p>Тодорхойлолт: Ургамлын талаар "боргоцой ургам байгаа", "үхсэн" гэх мэт амаарал гатах зүйсийг тодорхойлж бичнэ</p> <p>Зургийн аппаратаар авсан зургуудыг дугаарлаж тэмдэглэнэ</p>
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