Community Based Wildlife Management Planning in Protected Areas: the Case of Altai argali in Mongolia

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Abstract—*The number of protected areas in Mongolia has increased four-fold since the country's transition to a market-based economy over a decade ago; however, many of these protected areas have yet to realize their intended role as protectorates of biodiversity. Given the prevalence of (semi-) nomadic pastoralists in rural areas, effective conservation initiatives in Mongolia will likely need to concurrently address issues of rangeland management and livelihood security. The case of argali management in western Mongolia is illustrative of a number of challenges facing protected areas management and wildlife conservation planning across the country. In this study, results from interviews with pastoralists in a protected area in western Mongolia indicate that local herders have a strong conservation ethic concerning the importance of protecting argali and are generally aware of and support government protections, but may not be inclined to reduce herd sizes or discontinue grazing certain pastures for the benefit of wildlife without compensation. Because past protectionist approaches to argali conservation in western Mongolia have not achieved effective habitat conservation or anti-poaching enforcement, alternative management strategies may be necessary. Results from this study suggest local receptiveness to integrated management programs incorporating processes of consensus building and collaboration to achieve pasture management and biodiversity conservation and providing direct local benefits.*

Keywords: *Community, argali, wildlife, management, conservation, Mongolia, Altai-Sayan*

Introduction

Following the 1992 transition from a command to market economy, Mongolia plunged into an economic depression from which it has still not recovered. Over a third of Mongolians live in poverty and per capita income and GPD remain below 1990 levels (Finch 2002). During the last decade, foreign donor aid contributed on average 24 percent of GDP per year (Finch 2002), and Mongolia became one of the highest recipients of foreign aid dollars on a per capita basis (Anon. 2002). A significant portion of this donor aid has been directed toward biodiversity conservation and, with this support, the Mongolian government has developed an extensive network of protected areas.

The number of protected areas has increased from 11 areas covering 3.6 percent of the country prior to 1992, to 48 areas covering 13.1 percent of the land area in 2000 (Myagmarsuren 2000). Moreover, protected area numbers are expected to continue to increase as the Mongolian government moves toward its goal of placing 30 percent of its total landmass under some form of protection (Myagmarsuren 2000). A four-tier system of protected areas was adopted by the Mongolian Parliament in 1994, including the following designations: Strictly Protected Areas, National Parks, Nature Reserves, and Natural and Historic Monuments (Wingard and Odgerel 2001). The Mongolian government, however, has yet to initiate management or conservation activities in many of its protected areas (Reading and others 1999a).

Nearly a third of Mongolians practice some form of pastoralism and the country's 27 million livestock out number the population ten-fold (Anon. 2002). With Mongolia's high livestock numbers and its citizens' predominately pastoral livelihoods, grazing issues affect nearly every aspect of the economy across the country. Although grazing rights of pastoralists are

Bedunah, Donald J., McArthur, E. Durant, and Fernandez-Gimenez, Maria, comps. 2006. Rangelands of Central Asia: Proceedings of the Conference on Transformations, Issues, and Future Challenges. 2004 January 27; Salt Lake City, UT. Proceeding RMRS-P-39. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

recognized within protected area regulations, certain zones within protected areas are managed primarily for biodiversity conservation. Special Zones within National Parks, for example, can be accessed for grazing only by special permit during instances of pasture shortage (Wingard and Odgerel 2001). Once Mongolia transitions from the current system of paper parks to a regulated and enforced network of protected areas, conflict between residents and protected area administrators will likely increase (Bedunah and Schmidt 2000, 2004).

Some protected areas, such as the Great Gobi Strictly Protected Area, occupy marginal grazing land and their associated resource use limitations do not represent a significant loss to herders. Many protected areas, on the other hand, such as National Parks, harbor not only unique and often fragile ecosystems but thousands of herders and their domestic livestock (Wingard and Odgerel 2001). As a result, range management is one of the most pressing issues facing biodiversity conservation in Mongolia's protected areas.

Rangeland management is not new to Mongolia and grazing lands have been extensively managed here since feudal times in the thirteenth century through the collective period which ended in the early 1990s (Fernandez-Gimenez 1997; Sneath 1999). With collectivization, Mongolian pastoralists lost control of much of their personal livestock, with only 25 percent of herds remaining in private hands, but benefited in numerous ways from becoming members of the *negdel* (local collective) (Potkanski 1993). Collectivization provided regulatory institutions to control regional pasture usage, and combined with increased Soviet-subsidies, allowed for a new level of social welfare previously unavailable to most Mongolians, including: free health care services and education, emergency fodder during harsh winters, access to veterinary programs, mechanized transportation for seasonal movements, retirement pensions, and stable markets in which to sell livestock products (Potkanski 1993; Bruun 1996). Following Mongolia's economic transition in 1992, however, Soviet-style collectives broke down and no regulatory institution has yet filled the void (Mearns 1993; Schmidt 1995; Bruun 1996). Consequently, the last decade has seen minimal or no range management in most of Mongolia and increased pasture degradation is noted for many areas (Fernandez-Gimenez 1997; Bedunah and Schmidt 2000).

Background

Status of Altai argali

The Altai subspecies of argali is the largest wild sheep in the world and occurs in the Altai mountains of Mongolia and adjacent regions of Russia, China and Kazakhstan (Geist 1991; Shackleton 1997; Amgalanbaatar and Reading 2000). Although the Altai argali is one of the most sought after species of wild sheep by trophy hunters and commands high fees, its current population status remain poorly understood (Shackleton 1997; Reading and others 1999b, 2001; Amgalanbaatar and Reading 2000; Schuerholz 2001). Argali populations were once more common throughout large tracts of the Altai (fig. 1). However, habitat disturbance and deterioration resulting from competition with domestic livestock and poaching appear to have contributed to population declines, habitat reduction and fragmentation and, in some cases, localized extirpation of Altai argali in Mongolia, China, Russia and Kazakhstan (Shackleton 1997; Amgalanbaatar and Reading 2000; Paltsyn and Spitsyn 2002).

The Altai argali is now at high risk across its entire range in Mongolia due to dramatic declines or localized extirpations, highly fragmented habitat, and high and increasing densities of humans and domestic livestock (Shackleton 1997; Amgalanbaatar and Reading 2000). The total population of Altai argali in Mongolia is well below 3000 animals (Reading and others 1999c). Similar conditions are documented for Altai argali in adjacent countries, with population declines or extirpations noted in the Ukok plateau, southern Altai, Mogun-Taiga, western Tannu-Ola, Sangilen highland, and the Sailugem and Chikhacheva ranges (Smirnov 1990; Shackleton 1997; Fedosenko 1999; Paltsyn and Spitsyn 2002).

National governments and international regulatory bodies have sought varying degrees of protection for *O. a. ammon* based on these and other findings. The Altai argali is designated as Vulnerable by the IUCN (Hilton-Taylor 2000); carries Appendix II status by the Convention on International Trade of Endangered Species (CITES) and is listed as Threatened on the U.S. Endangered Species List (Johnson 2002). The Peoples' Republic of China list *O. a. ammon* as a Class II species (Shackleton 1997), roughly analogous to the Threatened status accorded by the Mongolian government (Shiirevdamba 1997), while Russia has assigned it Endangered status (Shackleton 1997).

A number of protected areas have been established in western Mongolia and adjacent countries specifically for argali and snow leopard conservation (fig. 2); and proposals exist for the creation of transboundary biosphere reserves in the region (Badenkov 2002). Yet, large portions of known argali distribution remain outside of the current network of protected areas (Shackleton 1997; Reading and others 1999a), and a number of biologists have questioned if even existing protected areas can safeguard argali because the areas lack sufficient funding, resources, training and personnel to carry out basic management activities (Shackleton 1997; Reading and others 1999a; Amgalanbaatar and Reading 2000; Paltsyn and Spitsyn 2002).

Management of argali

Management and conservation activities for argali (wild sheep) *Ovis ammon* in Mongolia historically have been linked to trophy hunting. Although government sanctioned trophy hunting has occurred since the 1960s (Luschekina and Fedosenko 1994), the Mongolian Ministry for Nature and Environment (MNE) has yet to adopt a national management plan for argali (Amgalanbaatar and others 2002). In the absence of formal plans, national conservation and management strategies have focused on increased law enforcement and continued

Figure 1—Current range and historic sightings of argali (*O. ammon*) in Mongolia and the Altai-Sayan ecoregion. The southeastern boundary of Altai argali range is unclear due to uncertainty concerning the designation and differentiation of argali subspecies in Mongolia. Past encounters with argali are summarized by Kolosov (1938), Tsalkin (1951), Smirnov (1990), Luschekina and Fedosenko (1994). (modified from Maroney and Paltsyn 2003).

development of protected area administrations (see Mallon and others 1997; Amgalanbaatar and Reading 2000; Working Group 2000). These efforts, however, largely have overlooked the direct involvement of or impacts on pastoralists within argali habitat.

In recognition of these shortcomings, recent discussions to reform Mongolia's trophy hunting practices have led to proposals for Community Based Wildlife Management (CBWM) programs for trophy hunting (Schuerholz 2001; Amgalanbaatar et. al. 2002). Although the market-based approach to management and conservation that underlies trophy hunting proposals allows for local involvement in a select number of viable trophy hunting locales, it does not address significant argali populations in protected areas where trophy hunting is not permitted.

This study addresses Altai argali *Ovis ammon ammon* in non-trophy hunted areas of western Mongolia and adjacent countries. The Altai-Sayan ecoregion, as defined by Olson and Dinerstein (1998), encompasses much of recognized *O. a. ammon* distribution (fig. 1), and serves as a useful bioregion to address conditions and conservation challenges unique to Altai argali including transboundary-zones, larger human and domestic livestock populations, and high ethnic and cultural diversity (Maroney and Paltsyn 2003).

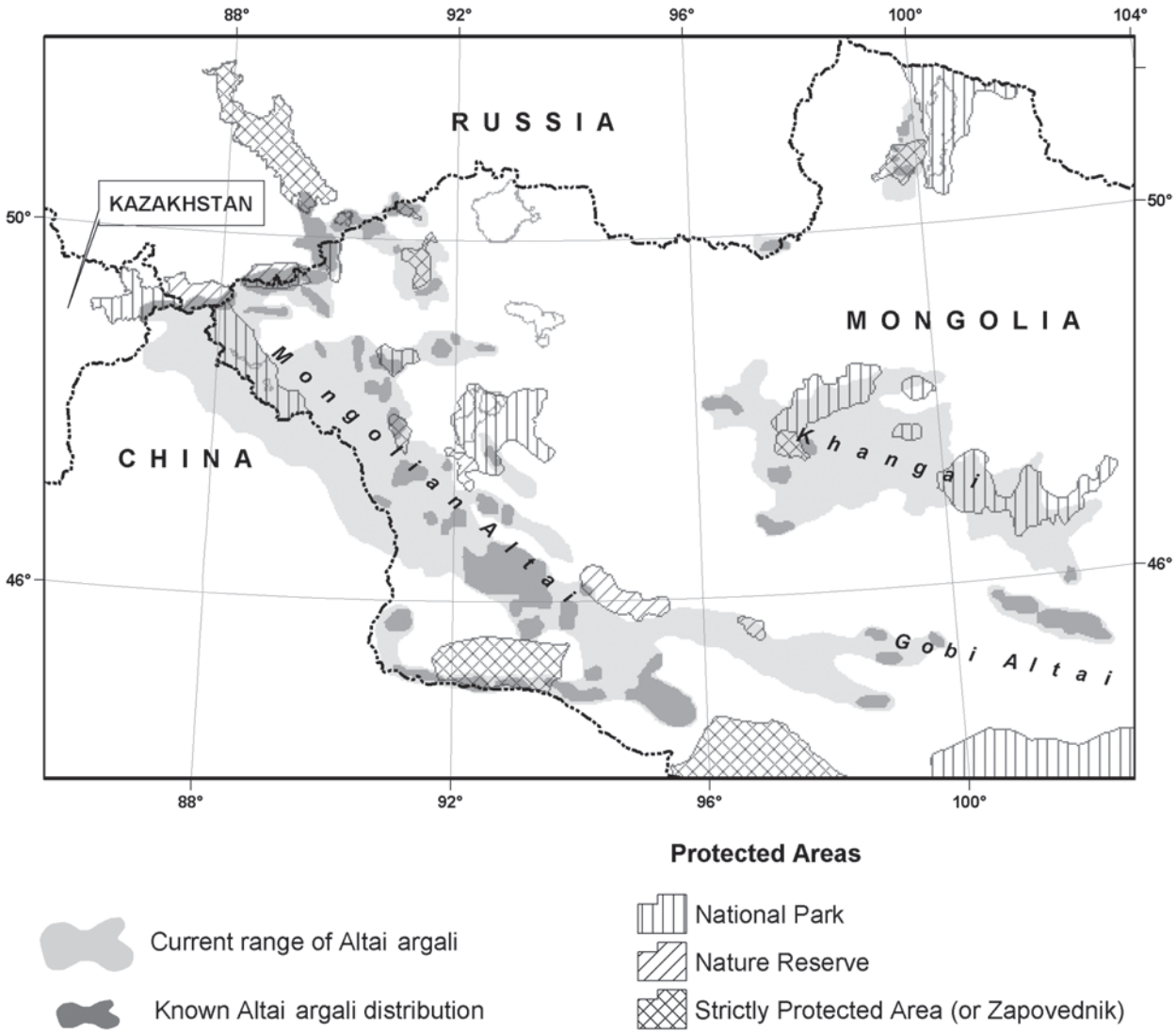

Figure 2—Protected area network and known range and distribution of Altai argali *O. a. ammon* in western Mongolia and the Altai-Sayan ecoregion as described by Fedosenko (2000), the Mongolian Institute of Biology (upub. Data, 2001), Maroney and Davarkhbayar (upubl. Data, 2002), and Paltsyn and Spitsyn (2002). Argali distribution in the Chinese Altai remain approximate due to incomplete field surveys. (modified from Maroney and Paltsyn 2003).

Until more direct investments in biodiversity conservation are possible in areas that lack argali trophy hunting opportunities, management and conservation initiatives may have to rely on a system of incentives and benefits other than the financial compensation provided by CBWM trophy hunting programs. Integrated approaches to management and conservation that recognize local livelihood security needs and incorporate the ecological knowledge of resident people can lead to more informed and effective management and conservation programs (Reading and others 1999a; Fernandez-Gimenez 2000; Siebert and Belsky 2002; Schmidt and others 2002). In this study, results from interviews with pastoralists in a protected area in western Mongolia provide insight into local resource use patterns and community concerns, and attitudes toward wildlife.

Study area − Siilkhemiin Nuruu National Park

Siilkhemiin Nuruu (Sailugem Range) National Park (SNNP) is located in Mongolia's westernmost province of Bayan-Olgii (fig. 3). SNNP was created in 2000 primarily for the protection of argali and is divided into two sections, which cover a combined area of 140,080 ha (Myagmarsuren 2000). Spanning portions of Ulaankhus and Nogoon Nuur provincial counties, SNNP is one of four protected areas under the management of the Mongol Altai Nuruu Special Protected Areas Administration (MANSPAA) in Bayan-Olgii province. As with many protected areas in the region, MANSPAA and its three rangers in SNNP have had little involvement in the area due to limited resources.

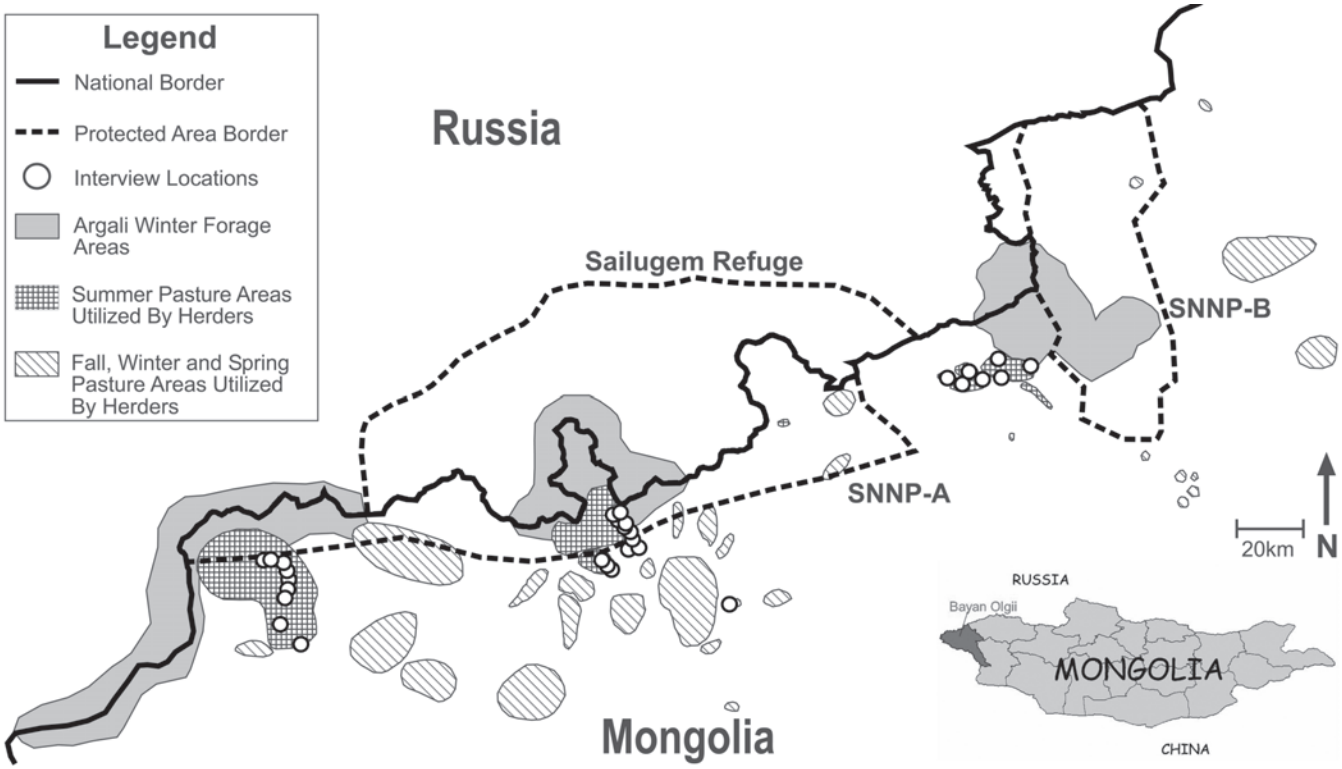

Figure 3—Siilkhemiin Nuruu National Park (SNNP) is divided into A and B zones. SNNP A-Zone is adjacent to Russia's Sailugem Refuge. Interview locations and predominate seasonal pasture usage of herders interviewed are illustrated. Argali winter forage areas identified by Maroney and Davarkhbayar (2004) are also depicted. Seasonal movement patterns of pastoralists prevent direct observation of argali for many in SNNP.

The Sailugem mountains form part of the Mongolian-Russian border and intersect the Chikhacheva range at the borders of the Altai and Tuvan republics. This alpine and mountain steppe environment is characterized by high plateaus, broad valleys, and undulating hills ranging in elevation from 2473 m at the Bor Borgusen river to 4029 m at Ikh Turgen peak (fig. 4). Weather in this region is characterized by a strong continental climate with severe winters, a short growing season, and approximately 300-400 mm of annual precipitation (Hilbig 1995).

Pastoralists have grazed livestock in the region that makes up SNNP for over 3000 years, and extensive petroglyph sites throughout the eastern portion of the park document the rich history of former inhabitants' interaction with wild ungulates and other wildlife dating back to the late Pleistocene (Jacobson and others 2001). In the mid 1800's, Kazakh nomadic pastoralists from Xinjiang began entering the area that is now far-western Mongolia, and have seasonally grazed livestock there for several generations (Finke 1999). Kazakhs now comprise the largest ethnic minority group in Mongolia and in Bayan-Olgii province they constitute over 90 percent of the population (figs. 5 & 6) (Finke 1999). In addition to transhumant pastoralists, several Mongolian National Border Posts are located along the length of SNNP and many are inhabited year round by soldiers, their families, and livestock herds.

A dramatic increase in the number of privately owned livestock occurred in many areas of Mongolia over the last decade (Bedunah and Schmidt 2000). These trends are present in the counties where SNNP is now located and the total number of livestock in this area has more than doubled since 1992 (Bayan-Olgii Office of Statistics 2002). Consequently, overgrazing is an increasing concern for many pastoralists in and around the park.

Resource use regulations in national parks in Mongolia are designated into Special, Travel and Limited Use Zones (Wingard and Odgerel 2001). The MNE, however, has not yet finalized the boundaries of these zones in SNNP. In addition to park zones, military regulations prohibit all activity within 5 km of the Mongolian-Russian border (Colonel Yo. Ganhuu pers. comm. 2002). During the consecutive *zuud* years of 2000 and 2001, local herders petitioned and received grazing access to border areas in SNNP and continued to graze these areas in 2002 and 2003. With park zonation unclear and access to border regions approved, uncontrolled livestock grazing is widespread in all regions of the park.

Argali in SNNP make seasonal, transboundary migrations and are known to winter in Mongolia predominately on relatively sheltered southern slopes (Davarkhbayar and others 2000). As is true for much of western Mongolia, habitat disturbance and

Figure 4—Siilkhemiin Nuruu National Park is a landscape of alpine and mountain steppe characterized by high plateaus, broad valleys, and open grasslands. A petroglyph of an argali sheep is present in the foreground (photo R. Maroney).

Figure 5—Kazakh pastoralists in western Mongolia (photo R. Maroney).

Figure 6—Autumn camp for pastoralists in Siilkhemiin Nuruu National Park B-Zone (photo R. Maroney).

overgrazing have displaced many argali to marginal pastures in SNNP (Davarkhbayar and others 2000). In addition, poaching of argali for meat and sport is a noted problem in SNNP (Maroney and Davarkhbayar 2004), although the full extent of the problem is unknown.

Adjacent to SNNP, the Sailugem or Khosh Agach Refuge (241,300 ha) is located on the Russian side of the Sailugem range and was created in 1973 for protection of argali (fig. 3) (Paltsyn and Spitsyn 2002). Poaching by both local residents and visiting Russian hunters is commonly reported for this area (Maroney and Paltsyn 2003); however, lower stocking rates create significantly less grazing competition between argali and domestic livestock than found in SNNP (Paltsyn and Spitsyn 2002). Cooperation between the governments of Mongolia and Russia for management of these protected areas currently does not occur.

Methods

Interviews lasting approximately 25 minutes were conducted with 98 individuals from distinct family units in SNNP between August 6-10, 2002 (fig. 3). A 36 item questionnaire regarding local perceptions and general ecological knowledge concerning Altai argali was developed and utilized to provide respondents with an opportunity to share their knowledge, opinions and experiences pertaining to a variety of wildlife and range management issues. Individuals were selected for interview based on their summer quarters' proximity (≤2 km) to a predetermined course through known inhabited areas of SNNP. The first adult encountered from each family unit, frequently the male, head of household, was solicited for interview. Many Kazakh herders in SNNP find speaking Mongolian either difficult or uncomfortable, therefore, interviews were conducted in Kazakh by two assistants trained in interview methodology. The author observed all interviews and participated in discussions when appropriate. Male (n=77) and female (n=21) respondents ranged in age from 18 to 82 years (median = 41 years). During previous fieldwork in SNNP, some pastoralists were hesitant to discuss open-ended questions concerning wildlife poaching or grazing conflicts. By utilizing a questionnaire format and incorporating questions in which respondents are asked to rank general categories of threats to wildlife, herders could address controversial issues without self implication. Additionally, all respondents were informed that their responses would be confidential.

Results and Discussion

A large majority (91 percent) of pastoralists in SNNP believed it is important to protect argali and 93 percent expressed interest in receiving further information on protected areas and their environmental regulations (table 1). Following interviews, several individuals even indicated a willingness to participate in argali conservation efforts. When respondents were asked why they thought conservation of argali was important, most remarked that argali are "rare and magnificent animals" deserving of protection. A minority (6 percent), considered protection of argali unnecessary and viewed them as a nuisance that could limit access to certain pasturelands. Typical comments from this latter group included:

> These argali are not our responsibility and do not need our protection. They only come into Mongolian border territory and really belong to the Russians.

Results indicate pastoralists in SNNP are generally aware of and support environmental laws concerning argali. Most (94 percent) respondents knew they were in a protected area and 77 percent were aware that argali are a protected species (table 1). Interviews with Mongolian pastoralists conducted in 1998, by Bedunah and Schmidt (2004) in Gobi Gurvan Saikhan National Park, also documented a majority (83 percent, n=77) of pastoralists were aware of the local protected area. However, only 37 percent of their respondents had any knowledge of land use regulations associated with the park's Special Zone (Bedunah and Schmidt, 2004). Once Special Use Zones are defined and managed for argali in SNNP and herder's access becomes restricted, it is likely that the 6 percent of pastoralists currently opposed to argali conservation will find increased support for their views.

Only 18 percent of respondents thought that argali range had decreased and most believed that argali numbers were either increasing (40 percent) or stable (26 percent) in SNNP (table 2). These findings support the general perception documented by McCarthy (2000), who found a majority of herders (n=57) in Mongolia's three western provinces believed that argali populations were increasing (37 percent) or stable (37 percent), while only 26 percent thought argali number were declining. It is significant to note that a majority of pastoralists surveyed in western Mongolia believe that argali numbers are either stable or increasing, contrary to reports by Mongolian and foreign biologists.

This discrepancy can be partially explained by considering argali displacement by herders and livestock, herder seasonal movement patterns and general ecological knowledge. Argali are highly mobile and easily displaced by the seasonal movements of herders and livestock (Harris and Bedunah 2001; Schuerholz 2001). Therefore, it is unlikely that many pastoralists are able to observe argali unless they make an effort to do so. Outside of formal interviews, a number of herders reported that they cannot regularly view argali, because "*argali move away from people and do not return until we move to different seasonal pastures*." Known spatio-temporal land use patterns of pastoralists in SNNP support this claim, revealing that many herders do not come into direct proximity of argali because they only inhabit argali winter forage areas during the summer and early fall (fig. 3). As many herders' seasonal movements preclude regular observation of argali, it is probable that these pastoralists do not have sufficient experience to speak accurately about population trends. Gender issues also factor into general awareness levels and ecological knowledge of pastoralists in SNNP. A high proportion of the respondents who were uncertain of argali population and range trends were women.

Table 1—Pastoralists' responses to selected questions concerning argali conservation and grazingland use in SNNP (n=98).

Question	Yes	Uncertain	No
Is it currently possible for argali and livestock to co-exist in the same area?	28%	12%	60%
Do argali in SNNP stay in Mongolia all year?	2	16	82
Do herder and livestock movements affect argali movement patterns?	51	18	31
Is it important to protect argali here?	91	3	6
Do you know that you live in a protected area or its buffer zone?	94	0	6
Do you know that argali are a protected animal both in Mongolia and Internationally?	79	0	21
Would you like more information about the protected area network and environmental laws here?	93	0	7
Does any form of land use management currently exist to avoid grazing conflicts?	34	3	63
At present, do local herder communities or local county governments work together in any way?	7	3	90

Note: some rows' percentages do not add to 100 due to rounding.

Table 2—Pastoralists' responses to selected questions concerning argali conservation and grazingland use in SNNP (n=98).

Question	Increase	Unchanged	Decrease	Uncertain
Do you desire more, less, or the same number of livestock for your family?	55%	38%	3%	4%
Do you think the number of argali in your area is currently increasing, decreasing, or stable?	40	26	21	13
Is argali range currently increasing, decreasing, or unchanged?	7	58	18	16
Has the condition of rangeland improved (increased), decreased, or remained unchanged in the last five years?	21	18	56	4
If the number of herders and livestock continue to increase in this area, will the population and range of argali increase, decrease, or stay the same?	12	45	29	14

Note: some rows' percentages do not add to 100 due to rounding.

Of the 21 women interviewed, half (52 percent) indicated they were not informed enough to comment on argali because they seldom discuss issues involving wildlife with the men of their families and do not often venture far from their homes.

Pastoralists that use remote areas when argali can be regularly observed, however, likely have more informed views on trends in argali population and range. In speaking with a herder who has observed argali and other wildlife from one such winter home during the course of his lifetime, he described with regret the current status of argali:

> Argali have become frightened of humans and livestock and don't mingle with our flocks anymore. Large rams are becoming less common and there are many mountains that no longer have argali.

Even without regular observation of argali, most (82 percent) pastoralists are aware of general argali movement patterns (table 1), and, as mentioned previously, realize that humans and domestic livestock can displace argali. A majority of respondents (60 percent) believed that argali and livestock could not co-exist in the same area (table 1), and half (51 percent) of the pastoralists acknowledged that herder and livestock movements affect argali movement patterns (table 1). When respondents were asked how an increase in herder and livestock numbers would affect argali in the area, however, the largest number (45 percent) believed argali population and range would remain unchanged (table 2).

Only a small number (14 percent) of those interviewed reported to have hunted or knew specifically about a case of someone hunting argali in the area; while, in a separate question regarding the types of hunters, over half (52 percent) of the respondents claimed no knowledge of argali hunting. While some pastoralists have limited experience with argali and likely do not know about hunting issues, several respondents in informal discussions following interviews conceded that their concern over speaking of hunting a protected species prevented them from openly discussing issues of poaching. It is likely that some respondents chose not to answer questions concerning poaching because they feared reprisal even though all respondents were notified prior to interviews that the information obtained through the questionnaire would remain confidential. These findings differ from reports by Reading and others (1998, 2001) and Amgalanbaatar and others (2002), who found discussions with herders in other areas of Mongolia concerning poaching of argali open-natured, and the findings illustrate the variety of perceptions within Mongolia towards government authority.

Respondents willing to rank categories of poachers perceived Russian border soldiers (52 percent) to be the most common group hunting argali, followed by 41 percent who considered non-resident Mongolian and Russian visitors the second largest group (table 3). Respondents recognized fellow pastoralists as poachers with 25 percent ranking herders as the most common poachers, while 22 percent believed herders were the second largest group (table 3). When asked to rank threats to conservation of argali in the area, the largest number (38 percent) of respondents indicated that natural predators are the leading threat. Responses were mixed, however, and many considered both poaching and overgrazing serious threats (table 4).

A majority (63 percent) of respondents indicated that no form of land use management is in place to avoid grazing conflicts, and 90 percent reported no cooperation between local county governments or resident pastoralists (table 1). Accordingly, community involvement in conservation activities will likely be difficult to pursue, as many pastoralists make decisions on movement patterns and resource use independently or only with small family groups.

Table 3—Ranking of the most common groups to poach argali in SNNP as perceived by local pastoralists. Each row value represents the percent of people ranking that column category as the number 1 (2) group to poach (n=98).

Rank of Group	Herders	Visitors M	Visitors R	Visitors B	Visitors ∑	Foreign Trophy Hunters	Border Soldiers M	Border Soldiers R	Border Soldiers B	Border Soldiers ∑	n
1	**25%**	4%	0%	4%	8%	2%	6%	**52%**	4%	63%	48
2	**22**	13	13	16	**41**	13	0	19	6	25	32

M = Mongolian, ***R*** = Russian, ***B*****=** both
Note: some rows' percentages do not add to 100 due to rounding.

Table 4—Ranking of threats to conservation of argali as perceived by pastoralists in SNNP. Each row value represents the percent of people ranking that column category as the number 1 (2 or 3) threat (n=98).

Rank of Threat	Overgrazing	Poaching	Predators	Natural Disasters (Zuud)	Uncertain (no response)
1	25%	29%	**38%**	0%	9%
2	31	**36**	18	2	13
3	**32**	18	32	1	17

Note: some rows' percentages do not add to 100 due to rounding.

Management implications for SNNP

Forage competition with livestock, disturbance associated with people and livestock, and habitat loss resulting from range deterioration are significant threats to the future of Altai argali populations in SNNP. These threats are not specific to SNNP, but are occurring throughout the Altai-Sayan ecoregion. Management of rangeland for the benefit of wildlife is often difficult as it generally involves restrictions or changes on the resource use patterns of resident pastoralists (Amgalanbaatar and others 2002). As protected areas begin to be managed for wildlife, increased conflict between herders and protected area authorities can be expected (Harris and Bedunah 2001; Bedunah and Schmidt 2004).

When livestock numbers were lower, habitat partitioning between argali and domestic herds occurred and provided some degree of separation between livestock and wildlife in the region (Schuerholz 2001). However, seasonal movements of herders and livestock now increasingly encroach on argali habitat that was previously lightly grazed or ungrazed by livestock. This change in livestock use largely displaces argali into marginal areas inaccessible or otherwise unsuitable to livestock (Luschekina and Fedosenko 1994; Schuerholz 2001). Schuerholz (2001) believed that high mortality rates would characterize argali populations displaced into areas without sufficient winter forage, or if existing argali winter forage areas are not managed appropriately. Consequently, identification, protection and, in some cases, reclamation of historic argali winter forage areas should be a key component of conservation and management programs for argali (Luschekina and Fedosenko 1994; Harris and Bedunah 2001; Schuerholz 2001).

To successfully develop and implement a multiple use management strategy to protect wildlife habitat within SNNP, real benefits must be provided to local stakeholders willing to work toward shared conservation goals. As demonstrated in this case study, many pastoralists revere argali, are aware of national environmental laws and recognize that some level of range partitioning is necessary to provide argali with sufficient pasture resources. These herders have a strong conservation ethic concerning the importance of protecting argali, but more than half (55 percent) desire additional livestock and less than a third (29 percent) believe an increase in livestock numbers will negatively impact argali population and range (table 1). As a result, many pastoralists may not be inclined to limit or discontinue grazing certain pastures for the benefit of argali. Moreover, even if pastoralists were so inclined, community institutions are not in place to coordinate such range management. Development of effective programs and community incentives to reconcile pastoralists' cultural value for argali with their material needs and desires for increased domestic herds is likely the greatest challenge facing argali conservation in SNNP.

A public education campaign that acknowledges the cultural respect of pastoralists for argali and draws attention to recent declines for argali in the greater region could encourage local

stewardship and reduce incidents of poaching (Amgalanbaatar and Reading 2000), but would not address the underlying economic factors influencing pastoralists' decisions concerning resource use patterns and herd sizes. Indeed, much of the biodiversity loss which occurs in Mongolia and elsewhere is perpetrated by individuals who value nature, but act in what they believe is their own economic self-interest to support themselves and their families (Ferraro and Kiss 2002). Programs that provide direct compensation to create economic incentives are often more successful in achieving their conservation goals (Bruner and others 2001; Ferraro and Kiss 2002), and argali trophy hunting has the potential to provide considerable funding (Harris and Pletscher, 2002; Hofer 2002).

If CBWM trophy hunting programs are successfully established and managed, they could subsidize argali conservation programs outside of hunting reserves. Alternatively, protected areas that can support sustainable argali trophy hunting operations could petition the MNE for revision of environmental law to sanction CBWM trophy hunting programs in protected areas or their buffer zones, as suggested by Bedunah and Schmidt (2004). In either case, development of sustainable trophy hunting programs will take considerable time. In the interim, management activities in protected areas are needed and incentives could be developed to encourage community groups to form and work with protected area administrations and other government bodies toward conservation of argali and argali habitat.

Many herders in Mongolia are familiar with and value the benefits that previous Soviet-era community institutions provided before their breakdown in the early 1990s. During socialist times, the *negdel* coordinated joint management of livestock production and provided for both economic and social needs of community members (Bruun 1996). The development of community institutions in SNNP could provide benefits to local pastoralists and facilitate the development and implementation of collaborative management strategies and should be initiated by MANSPAA. Additionally, identifying and working with key informants from these communities could increase success rates of collaboration and provide MANSPAA with detailed information concerning SNNP's wildlife.

Elsewhere in Mongolia, herders living in protected areas in the Gobi and other regions of western Mongolia have recently formed community groups to improve their livelihoods and better interact with protected area administrations (Schmidt and others 2002; Bedunah and Schmidt 2004). The conservation and development projects described by Schmidt and others (2002) and Allen and McCarthy (1999), have employed a diverse set of strategies and incentives that have met with positive results in these communities. Some of the benefits these projects have provided to community groups committed to conservation, and applicable to SNNP, include: the development of performance based small business opportunities, the creation of locally owned and operated information and resource centers and the support of community requested training for livelihood improvement (Allen and McCarthy, 1999; Schmidt and others 2002).

Regional management implications

Of the noted threats to conservation of Altai argali, habitat loss and deterioration caused by grazing competition is likely the most significant (Schuerholz, 2001), and range management of these communal lands is essentially a community oriented process requiring collaborative approaches (Schmidt and others, 2002). Management plans for argali in the Altai-Sayan could be developed collaboratively with resident communities and participation encouraged with direct benefits. Moreover, protected area administrations and local government organizations should act to facilitate this process to ensure that management and conservation goals are adequately addressed.

Conclusion

Within SNNP as well as the greater Altai-Sayan ecoregion, transboundary zones, high cultural and ethnic diversity, relatively large human and domestic livestock populations, and fragmented wildlife habitat create difficult obstacles to the formation of regional protected area management plans. Developing and implementing effective community based management and conservation strategies to resolve grazing conflict between pastoralists, protect important wildlife habitat, bridge transboundary zones, and ensure the livelihoods of resident pastoralists will be extremely difficult, but the alternative of employing solely protectionist approaches has not proven successful in many areas of Mongolia and will inevitably result in increased conflict between resident pastoralists and government authorities. Anti-poaching measures and protection of core wildlife zones are necessary, but should not be the only interaction protected area administrators or government officials have with herders. A policy shift from a primary focus on law enforcement activities toward more integrated management incorporating participatory approaches and providing direct local benefits offer the potential to improve conservation effectiveness while developing links between communities and governments.

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