During early 1985, the Ministry of Forestry in Beijing informed the Director of the Qinghai Wildlife Management and Protection Bureau that 3 American hunters were interested in hunting in Qinghai. At that time no hunting area existed in the Province. During the same year in August representatives of the Ministry of Forestry and Qinghai Wildlife Management and Protection Bureau, together with Mr. Lit Ng, President of Montemar Management Inc., California, conducted inventories in Balong Township, Dulan County. An international hunting area was officially designated in Balong, and in November 1985, the Qinghai Wildlife Management and Protection Bureau brought 3 hunters to Balong and each shot a blue sheep (*Pseudois nayaur*). The hunters were very satisfied with their first hunting experiences on the world's highest plateau (Dulan Agricultural and Animal Husbandry Bureau 1987). Since 1985, 78 foreign hunters have visited the Dulan International Hunting Area (DIHA) from the United States (>90%), Germany, Australia and France.

The degree to which local people are involved in the International Hunting Program (IHP) and the amount of benefit they can obtain from it determines their willingness to cooperate in various present and future wildlife management activities. It is important to understand whether or not the IHP has benefitted local people and if it has furthered conservation of wildlife in the area. Thus, this study was designed to:

1) Evaluate the impact (mainly economic) of the IHP on the local community.
2) Obtain a clear understanding of local people's attitudes towards the IHP.
3) Examine the effectiveness of the IHP in promoting wildlife conservation activities.

**STUDY AREA**

The core study area was located in the DIHA, Dulan County, Haixi Mongolian-Tibetan Autonomous Prefecture, Qinghai Province, China, at roughly 95°29'–99°00'E and 35°15'–37°27'N (Figure 1). The DIHA consists of 3 production townships: Balong, Gouli and Xiangjia. A township is an administrative division of a county that was previously called a commune, consisting of a unit of local government with administrative control of local production, taxes, schools and roads. Hunts took place mostly in Balong and Gouli (Dulan International Hunting Office 1992). Topography within the DIHA is mostly rugged grassland and bare rocky slopes. Altitudes range from 3000 m to 5000 m. The total designated area is estimated at 75 km² (Dulan Agricultural and Animal Husbandry Bureau 1987).

The most abundant wild ungulates in Balong are blue sheep, white-lipped deer (*Cervus albirostris*) and elk (*C. elaphus*). Goitered gazelle (*Procavia subgutturosa*) were common and musk deer (*Moschus sifanicus*) were rare (Gong 1987, Zhen and Zhu 1990). The most abundant wild ungulates in Gouli were blue sheep, white-lipped deer, elk and Tibetan gazelle (*P. picticaudata*). During a field trip in 1992 we saw 45 argali (*Ovis ammon*) in one group and 16 in another. Tibetan antelopes (*Pantholops hodgsoni*) were seen during winter and musk deer are also rare here (Gong 1987, Zhen and Zhu 1990, Cai et al. 1992).

**METHODS**

The nature of this study and the circumstances in the core study area made highly formal survey methods inapplicable. Because the goal of this study was to conduct a general investigation concerning attitudes among different social sectors that were involved in the IHP, rapid, low-cost data collection methods, such as informal surveys, key-informant interviews, and direct observations were used. These methods, discussed in detail by Backstrom and Hursh-César (1981), Casley and Lury (1987), Kumar (1987) and Babbie (1989) are applicable in situations where primary information concerning a phenomenon or process is needed. They are the best choice when probability sampling procedures are not applicable. Such methods are quick, inexpensive and do not require rigid probability sampling procedures. Problems
involves uncertainty concerning the quality of the information gathered and personal biases and prejudices can affect reliability and validity (Kumar 1987). Names and occupations of respondents and key informants remain anonymous.

RESULTS

Direct Observations

Local involvement included: 1) renting horses, 2) serving as hunting guides, 3) working as game guards, and 4) miscellaneous jobs. Renting horses was the primary way that local people could be involved in the IHP, and local nomads generated most of their income from the IHP through this approach. Usually, ¥15 could be generated for 1 horse-day. Only those who had pastures within the DIHA had the privilege of renting their horses to the IHP. Working as a hunting guide was the second lucrative way of local involvement in the IHP. But not as many local people could be involved through this approach as through renting horses. Local residents hired as hunting guides had rich hunting experience and knowledge of behavior patterns of local large mammal populations. The more hunters visiting the DIHA at a particular time, the more local nomads could be hired as hunting guides. Employment as game guards was the third form of local involvement in the IHP. In Balong 2-3 local nomads have been hired as guards since 1988 to counteract poaching in the township. There were no game guards hired permanently in Gouli because of low poaching pressure within the township. Miscellaneous employment refers to temporary work at the 2 hunting camps, such as cleaning, construction, food service and hotels. At each camp site, 2-4 local residents were involved through this approach.

Informal Surveys

Thirty-seven local nomads were interviewed at 3 villages in Balong and Gouli. In Xiatu Village of 10 families with pastures within the DIHA, 5 were interviewed. In Yikegao village the number of families having pastures within the DIHA was unknown and 4 families were interviewed. In Delong Village 75 families had pastures within the DIHA and 28 were interviewed.

All 37 families answered the question concerning family size. The average family size in Balong and Gouli was 6.2 (SE=0.36). I tried to obtain information concerning livestock statistics to obtain a valid comparison of how much economic impact the IHP had on local communities. The average number of sheep possessed by a family was 287 head (SE=27.0). The average for yak, goat, and cattle was 55 (SE=5.1), 48.2 (SE=9.8), and 0.8 (SE=0.6), respectively. A typical family needed to submit an annual assignment of 24.8 sheep (SE=1.9) to the government, with a minimum of 9 head and a maximum 55 head, and received approximately ¥1860 from the government for fulfillment of the annual assignment in meat.

In 1978 the market was opened to private trade and commune properties were allocated to individual families. Peasants and nomadic herders now have more free choice concerning what to do with their crops and livestock. Each year a typical family sold 15-20 sheep at ¥130-150 each, 3-6 yaks at ¥700-1,000 each, or an equivalent combination of sheep and yak. Also, approximately ¥2,000-4,000 were earned through selling wool. Thus, the average family income from free-market trading was ¥3661 (SE= 417).

All 37 respondents interviewed had at least heard of the IHP and all indicated that the IHP was good because they gained monetary personal or community-shared benefits. Among the 37 families, 21 (60%) had rented horses to the IHP, 8 (23.5%) had worked as hunting guides, 2 (5.9%) were hired as game guards, and only 3 (8.8%) were involved in miscellaneous jobs. Fourteen families were not involved in the IHP and thus gained no direct monetary benefit from it. Of the families involved, total yearly family income from the IHP was ¥181.6 (SE=19.7, range ¥80-¥350). Annual family income from the IHP comprised only 3% percent of a typical family's total annual income. Although this percentage seems low, considering the limited job opportunities for local herders, this still can be considered significant in practice.

Information concerning non-monetary benefits was also gathered. Roads to Gouli and Balong were very rocky and often cut off by floods. People living in these 2 townships were eager to have road conditions improved, but because of financial problems peoples' expectations were not fulfilled until the opening of the IHP. Dulan International Hunting Office spent some income generated from the IHP to
improve road conditions to the 2 townships each year after opening of the DIHA. This benefitted local herders. In Balong some herders own their own tractors to transport hay for their livestock and in Gouli herders rent tractors from the township to transport hay. Improved road conditions made their work easier. Among the families interviewed, 57.1% of the families perceived that the road condition had been improved, 28.6% answered no and 14.3% had no opinion.

Medical facilities in remote areas like Gouli and Balong were poor. A small clinic in each township provided only simple, and often delayed, medical services. The IHP was staffed with 1 well-trained doctor or nurse throughout each hunting season to insure the safety of foreign hunters and working personnel. This temporary medical facility was available to local herders. During hunting seasons those who were adjacent to the hunting camps had access to medical services if needed. Among the families interviewed 14.3% of the families (35) perceived that they could get instant medical care during hunting seasons, 48.6% did not and 37.1% had no opinion. Though the percent value is low (14.3%), I view this as significant because only those who were sick would try to use the medical facilities provided and then could perceive the medical access.

Being able to interact with a foreigner was highly valued by some herders. This curiosity could be considered as a special form of cultural incentive to promote wildlife conservation measures. Among the families interviewed 37.1% reported that they were happy and excited to see foreign visitors in the DIHA, 20.0% answered no and 42.9% had no opinion. The majority of the respondents (80%) thought there was no significant increase in local wild ungulate populations. Only 20% of the respondents thought wild ungulate populations had increased since the opening of DIHA.

No respondent perceived any negative impact of the IHP on local communities; 37.1% held no opinion and 62.9% said no. General comments on the IHP by local herders may be categorized as:

1) We like the IHP because individuals, the community and higher level organizations can generate income from it.
2) So far, we are satisfied with what we have received from the IHP, but we hope more money can be spent on hiring local people to work for the IHP.
3) The IHP, in the long run, would do wildlife good if it could be sustained (at least during hunting seasons poaching around the DIHA has declined).

General suggestions concerning the IHP included:

1) Game guards should be permanently hired and salary for them should be insured with income generated from the IHP.
2) Income allocation at village and township levels should be increased to enhance the interest of local leaders and herders (currently, approximately 5-8% of total income is allocated to village and township levels).
3) Payment should be more prompt to insure the credibility of Dulan International Hunting Office and future cooperation.

Key Informant Interviews

Eleven key informants were interviewed. Among them 6 were local game guards, township or village leaders, and 5 were officials in wildlife management organizations at various administrative levels. All the key informants interviewed believed that the IHP had a positive impact in promoting wildlife protection and conservation in the DIHA and in the whole Province. The IHP also had significant impact on local nomadic communities, economically and socially. It not only generated funds for conservation, but also opened a channel for cultural interaction between local nomadic herders and people from the outside world. Wildlife conservation in Dulan, like many other regions in the Province, had been given hardly any emphasis before. Opening of DIHA drew conservation emphasis to the region from management agencies. The conservation awareness of local residents also was stimulated through economic incentives and cultural interactions with people from the outside world.

Division of Income Among Agencies

The Ministry of Forestry and the provincial wildlife agencies achieved a general agreement for division of the income generated from the IHP. The Dulan International Hunting Office, a branch of the Dulan Agriculture and Animal Husbandry Bureau, benefits the most, receiving 45% of the gross hunting income (Figure 2). The Bureau has put income from the IHP to broad use, basically on activities that are
wildlife related. The Bureau has submitted a portion of the income to the county's revenue. The Bureau also donates a small amount of its income to 2 local elementary schools. This is of great political and social importance for future wildlife management programs.

**Gross Income from the IHP**

Hunted species in DIHA include blue sheep, Tibetan gazelle, whitelipped deer (stopped in 1990) and snowcocks. Argali were relatively abundant in the DIHA according to Zhen and Zhu (1990), but hunting of argali was prohibited by the Ministry of Forestry because of uncertainty concerning taxonomy of the argali in Qinghai. The most abundant species in the DIHA is blue sheep, which comprised 82% of the animals taken. Since the opening of DIHA, 75 blue sheep have been shot by hunters.

Fees paid by hunters for their trophies are relatively large. A service fee (transportation, lodging, food, etc.) of approximately US$2,800 was charged for each hunter. The license fee usually cost a hunter US$300. Trophy fees for different species vary and were adjustable according to the number of hunters during the previous year. A trophy fee of US$2,400 was paid for a blue sheep. Trophy fees in China range from $10 for ducks to $18,000 for argali. Profits from the income were high, most key informants interviewed indicated that great profits were made from the IHP.

**DISCUSSION**

Pastoral economies developed in open arid regions unsuitable for agriculture. Traditional pastoralism, often associated with hunting and gathering, has long been a stable and sustainable means of subsistence. However, along with market reform and human population growth, nomadic pastoral systems are being threatened by overstocking and consequent desertification. The consequence is detrimental to wildlife.

Although local people in wildlife-abundant areas often are among the poorest of the poor they bear the cost of conservation in those areas (McNeely 1988). When developing and implementing conservation programs in such areas economic incentives should be seriously considered to provide compensation for local people who bear the cost of conservation. Only by doing so can their interests in being involved in management programs be stimulated. To implement prudent management of biological resources, assigning some management responsibility to local institutions and local communities is critical. By providing incentives, local people and institutions may respond positively to management systems. Sustainable use of wildlife offers one of the best opportunities for addressing the socio-economic and environmental plight of much of the drier parts of Africa. Recreational hunting is now the most positive and widespread economic incentive for the conservation of large mammals in Zimbabwe (Child 1984). The IHP has also opened a channel for management officials to contact local people and share and exchange ideas for promoting wildlife conservation and management in the DIHA.

The status of argali on the Tibetan Plateau has been argued for almost a decade, but so far no detailed study has been conducted to address this argument. If the argali in the DIHA could be hunted legally, the income from the IHP could be increased considerably. The investigation by Zhen and Zhu (1990) in 1986 indicates that the argali population in the DIHA is relatively high. There were concerns that the Chinese wildlife management agencies would lose needed funds with the lack of American hunters because of the prohibition of argali hunts by American hunters due to a U.S. Fish and Wildlife Service Rule in 1992 (U.S. Fish and Wildlife Service 1992).

Nonlocal human activities such as gold mining and marmot hunting have provided nonlocal poachers opportunities to poach musk deer, red deer, whitelipped deer and brown bear. The cash income often outweighs the disincentive of fines for the poacher. Since the opening of the DIHA local nomads in the DIHA have served as game guards and patrolled regularly between hunting seasons. Wildlife protection is better in DIHA than anywhere else in Qinghai Province (Dulan International Hunting Office 1992, Gong 1987). Most of the managers in the wildlife agencies pointed out that this is the direct consequence of economic incentives provided to the local people.

The results generated by my study have implications in China. In any natural resource conservation program the provision of economic incentives to local residents can secure, or at least can
cultivate, their interest in positive participation. Equally important, provision of non-monetary incentives
can play a role in strengthening conservation programs.

Suggestions for Further Research

In other provinces with international hunting programs duplicate studies need to be conducted to
confirm the findings of this study. Although biological studies are urgently needed to evaluate wildlife
population status in DIHA, more sociological studies are needed to further investigate the potential and
alternatives for better management and conservation of wildlife resources. The rapid low-cost data
collection methods used in my study enabled a general understanding of the IHP and the involvement of
local people. Highly formal survey methods should be applied in the future, whenever circumstances allow
further exploration of potential and alternatives concerning local involvement in wildlife conservation
activities.

ACKNOWLEDGMENTS

I am indebted to the Robert M. Lee Foundation for the principal support of this project. Without
Mr. Lee's generous contribution none of this work would have been possible. Additional support was
provided by the Worldwide Fund for Nature, Montana Cooperative Wildlife Research Unit, and Northwest
Plateau Institute of Biology. Burt W. O'Gara, Daniel H. Pletscher, and Stephen F. McCool provided
valuable advice and comments. Guiquan Cai provided unfailing logistic support. I very much benefitted
from comments of Richard B. Harris. Thanks to Shengping Zhang, Yuzhu He, Xiaochen Chen, Weiping
Li, and Rubang Sun for their assistance in the field. Cooperation of China Wildlife Conservation Society,
Qinghai Wildlife Management and Conservation Office, Dulan International Hunting Office, Gouli
Township Government and Balong Township Government helped this project

LITERATURE CITED
California. 501 pp.
Qinghai Province Results of SinoAmerican zoological survey in Qinghai Plateau Part III. Acta Biologica
National parks, conservation and development: the role of protected areas in sustaining society.
Dulan International Hunting Office. 1992. An introduction to wildlife resources and international hunting
in Dulan County. Dulan International Hunting Office. 6 pp. (In Chinese)
Gong, G. 1987. A brief proposal for opening of Dulan International Hunting Area. Dulan Agricultural and
conserve biological resources. IUCN, Gland, Switzerland. 236 pp.
Northwest Plateau Institute of Biology (CAS), editor. 1989. Fauna of economically valuated animals in
Qinghai Province.  Qinghai People's Press, Qinghai, China. 735 pp. (In Chinese)
Qinghai Agricultural and Animal Husbandry Planning Committee. 1982. Designation of natural resources