Using saiga antelope conservation to improve rural livelihoods

Final Report
June 2006


IMPERIAL COLLEGE LONDON
INSTITUTE OF ECOLOGY AND EVOLUTION, RUSSIA
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Pictures: Family in Kalmykia being interviewed by our team, one of the winners of the children's art competition, Kalmykia.

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Darwin Initiative for the Survival of Species
Final Report

1. DARWIN PROJECT INFORMATION

Project Ref. Number	12/028
Project Title	Using saiga antelope conservation to improve rural livelihoods
Country(ies)	Russia and Kazakhstan
UK Contractor	Imperial College London
Partner Organisation(s)	Institute of Ecology and Evolution, Russia Institute of Zoology, Kazakhstan
Darwin Grant Value	£118,790
Start/End dates	April 2003 - March 2006
Project website	www.iccs.org.uk, www.saigak.biodiversity.ru/eng/
Author, date	E.J. Milner-Gulland, 30th June 2006

2. PROJECT BACKGROUND/RATIONALE

The project was located in two saiga range states, Kazakhstan and Kalmykia (an autonomous Republic of Russia). The project was conceived as a response to the rapid reduction in saiga populations, due to illegal hunting for meat and horns. It built on a decade of scientific collaboration between the project partners, and extended our work into practical conservation action. The project aimed to address the fact that little is known about the socio-economic drivers of poaching activity, the extent of poaching and the livelihoods of local people in saiga range areas. Without this fundamental information, conservation interventions are difficult to target effectively. We also aimed to address the fact that long-term monitoring of saiga populations has weakened recently due to a lack of funding, and that there is a critical need for more quantitative and less invasive monitoring procedures. There is a requirement for an agreed set of ecological monitoring procedures to form a basis for future assessment of saiga population status. We also addressed the issue that saiga management is not necessarily currently set up in the most effective way to ensure that local communities buy into it; this is addressed by helping to restructure conservation actions, by analysing the current level of awareness that local people have of the saiga management problem, and working to raise the profile of saiga conservation in the host countries and internationally. Finally we addressed the issue that there is a lack of trained young researchers in the region able to carry saiga conservation research into the future. The need for the project was identified by all the project partners in the course of previous collaborations, by the Governments of Russia and Kazakhstan (through their prioritisation of saiga conservation in Biodiversity Action Plans), and by the Action Plan for saigas drawn up under the Convention on Migratory Species in 2002. Local demand for and commitment to the project is demonstrated by the involvement of local partners throughout the process of project design and implementation, and the continuation of our collaboration post-project.

3. PROJECT SUMMARY

Purpose: To save the critically endangered saiga antelope from extinction and support impoverished rural communities by building a framework integrating saiga conservation and sustainable use of natural resources with communities' needs and aspirations.

Objectives:

● To assist the governments of Kalmykia (Russia) and Kazakhstan in their activities to conserve the saiga antelope.

● To involve rural communities in saiga conservation and ensure local support for and participation in saiga conservation.

● To conduct assessments of alternative livelihood opportunities for local people, as a step towards relieving rural poverty and dependence on unsustainable resource use.

● To act as a flagship for community-based conservation of natural resources in the region.
● To assist range states in developing an international strategy for saiga conservation, that leads to the recovery of the species.
● To put in place a saiga monitoring scheme, and use its results in high quality scientific research on the linkages between human activity and reproductive success.
● To share expertise between scientists in saiga range states and train young scientists in conservation, ecology and social research techniques.

Our objectives slightly shifted after Year 1 to reflect the change in emphasis towards conservation and away from sustainable use, and towards a broader geographical scope. This change was approved by the Darwin Secretariat at the Year 1 report. See Appendix 2 for outputs and Appendix 5 for reporting against the logical framework.

The project addresses the following Articles of the CBD:
7. Identification and Monitoring - by putting in place a robust monitoring system for saigas.
8. In-situ conservation - by supporting protected areas and engaging local people.
9. Ex-situ conservation - by supporting the Saiga Breeding Centre in Kalmykia.
12. Research and training - by building capacity in the range states.
13. Public education and awareness - through a range of media and direct interventions.
17. Exchange of information - through networks of collaborators and newsletters.

The success in achieving our objectives is summarised below:

● *To assist the governments of Kalmykia (Russia) and Kazakhstan in their activities to conserve the saiga antelope.* This has been a major success in Kalmykia. In Kazakhstan the project's focus was on monitoring rather than active intervention, but we have provided information to support the intervention of other teams, with whom we have an MOU.
● *To involve rural communities in saiga conservation and ensure local support for and participation in saiga conservation.* Highly successful in Kalmykia, and progress made in Kazakhstan through catalysis of other projects.
● *To conduct assessments of alternative livelihood opportunities for local people, as a step towards relieving rural poverty and dependence on unsustainable resource use.* Carried out in both countries.
● *To act as a flagship for community-based conservation of natural resources in the region.* We have made the saiga into a flagship for conservation, and have implemented community-based conservation based on livelihoods enhancement.
● *To assist range states in developing an international strategy for saiga conservation, that leads to the recovery of the species.* We have been instrumental in international conservation initiatives, and will be convening a technical meeting to develop a conservation strategy for saigas at the first meeting of the signatories to the CMS Saiga MOU in September 2006.
● *To put in place a saiga monitoring scheme, and use its results in high quality scientific research on the linkages between human activity and reproductive success.* This has been done in Kalmykia and has also been attempted in Kazakhstan and Uzbekistan. The worse status of the saiga populations in these latter countries has, however, reduced our ability to conduct monitoring.
● *To share expertise between scientists in saiga range states and train young scientists in conservation, ecology and social research techniques.* This has been done.

Additional achievements include developing a substantial media profile, both locally and internationally, which has helped to raise awareness and catalyse funding. We have also brought Uzbekistan into the saiga conservation community and developed an online newsletter and umbrella group for communication between saiga conservationists. The Darwin Initiative project was a major factor in stabilising saiga populations in Kalmykia, the ultimate purpose of the project (Appendix 7).

5. SCIENTIFIC, TRAINING, AND TECHNICAL ASSESSMENT

5.1. Research activities.

The research carried out for the project falls under two categories; monitoring of the reproductive ecology of the saiga antelope, and socio-economic surveys to assess incentives to poach. Methods for both components were developed at a technical workshop convened in April 2003, at the beginning of the project, and were formalised into a data collection protocol for ecological data, and a questionnaire survey and procedure for the socio-economic data. Both are available on request, and were applied in a standardised way in all the data collection locations. The major data collection expeditions are described in Tables 1 and 2.

Table 1. Data collection for the ecological component of the project. CZBR = Chernye Zemli Biosphere Reserve, Kalmykia. IC = Imperial College. SS = Stepnoi Sanctuary, Kalmykia. IOZ = Institute of Zoology, Kazakhstan

Location	Date	Description	Personnel
CZBR, Kalmykia	May 2003-6.	Calving transects	IC: Aline Kühl (2003), Nils Bunnefeld (2004), Peter Kabat (2005), E.J. Milner-Gulland (2006). CZBR: Denis Goryaev (2003-4), Gennady Erdnenov (2005-6)
CZBR, SS, Kalmykia	2004-6	Herd size, structure & distribution	CZBR: Denis Goryaev (2003-4), Gennady Erdnenov (2005-6) SS: Anatoly Khludnev (2005-6) IC: Aline Kühl (2003-4)
Ustiurt, Kazakhstan	May 2004-6	Calving transects	IC: Aline Kühl (2004-5), Marcus Fry (2004), Andrew McConville (2006). IOZ: Yuri Grachev (throughout)
Betpak-dala, Ustiurt, Ural, Kazakhstan	Feb-April 2003-6	Aerial & ground surveys of population size and distribution	IOZ: Yuri Grachev

Table 2. Data collection for the socio-economic component of the project. CEP = Centre for Ecological Projects, Kalmykia. KNAU = Kazakh National Agricultural University, Almaty.

Location	Date	Description	Personnel
Tavan-Gashun, Kalmykia	June-July 2003	Livelihoods and attitude surveys	IC: Aline Kühl Kalmykia: Nataliya Balinova, Marina Frolova
Khulkhutta, Kalmykia	Nov-Dec 2003	Livelihoods and attitude surveys	IC: Aline Kühl Kalmykia: Nataliya Balinova, Natalia Kusnezova
Kalmykia (3 provinces)	June-July 2004	Attitude and knowledge survey	CEP: Ruslan Medzhidov
Ulan-Bel', Betpak-dala, Kazakhstan	June-July2004	Livelihoods and attitude surveys	IC: Aline Kühl Range state trainer: Nataliya Balinova KNAU: Azamat Baysugurov, Almas Dzhmybekov, Bekzhan Makasev
Moiinti, Betpak-dala, Kazakhstan	July 2004	Livelihoods and attitude surveys	KNAU: Victor Ukrainsky, Azamat Baysugurov, Almas Dzhmybekov, Bekzhan Makasev, Victor Fomin
Karakalpakia, Uzbekistan	August 2004	Livelihoods and attitude surveys	Range state trainer: Nataliya Balinova UZ: Elena Bykova, Alexander Esipov (funded by FFI/DGIS)
Bosoi,	June-July	Livelihoods and	IC: Aline Kühl

Ustiurt, Kazakhstan	2005	attitude surveys	Range state trainer: Nataliya Balinova KNAU: Almas Dzhmybekov, Bekzhan Makasev, Victor Fomin, Saberzhan Narmuratov

5.1.1. Biological research findings

Monitoring in Ustiurt

In 2004 there was no concentrated saiga aggregation, and we caught only 13 calves. The calving zone was spread out over an open stretch of Ustiurt plateau, exposed to disturbance by illegal goods traffic between Uzbekistan and Kazakhstan. This may have contributed to the very low density of calving females. In 2005, the situation was improved, and an aggregation was found in which we could sample calves. 293 observations were made, of which 118 were live calves for which full measurements were taken, 14 were dead calves, 43 were placentas and 62 were calves which could not be captured. The calving aggregation was on the shores of a salt pan, and observations over the calving period clearly demonstrated drift of females and calves during the aggregation period (Fig. 1). It is unclear to what extent the presence of observers contributed to this movement. In 2006, our expedition failed to find the calving aggregation, drawing attention to the precarious status of the saigas, and the difficulty of monitoring effectively under these conditions.

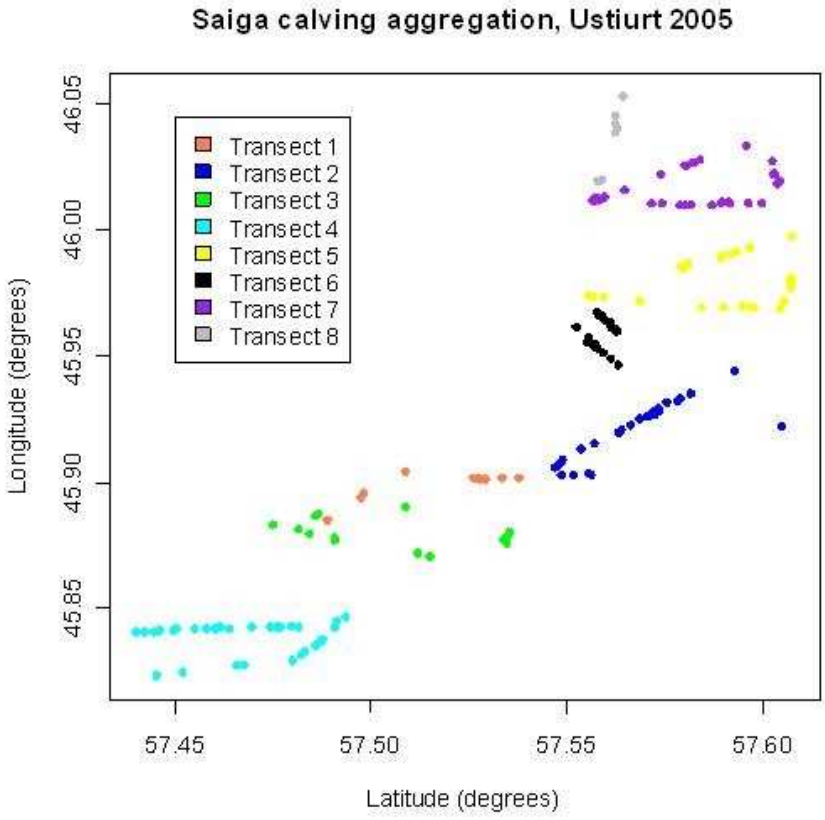

Figure 1. Locations of calves found on transect walks in Ustiurt, 2005.
Each dot is an observation of a calf or calf pair (dead, alive or escaped) or of a placenta.

The proportion of females twinning in 2005 was around 28%, which contrasts sharply to historical twinning levels of around 75%. This is likely to be a reflection of a change in age structure away from the more fecund older females towards first-year females, due to heavy poaching pressure. In November 2005, vehicle surveys were used to estimate the proportion of adult males in the Kazakhstan portion of the Ustiurt population coming into the rutting season. The proportion was estimated at 5%, which is substantially below the historical norms (20-25%), but higher than the proportion known to cause reproductive failure.

An aerial survey was carried out in the Ustiurt area by the Institue of Zoology in April 2005, in collaboration with Okhotzooprom. The survey covered 2108 km^2, in which 3966 saigas were observed, with a density of 0.06-5.32 saigas/km^2. This gave an overall population estimate of 19,621 saigas in Ustiurt, which represents a 30% increase on the population estimate for 2004. This increase is too large to be explained by natural population growth, particularly given that poaching is known to be intense and ongoing. Similar increases have been recorded in the other 2 populations in Kazakhstan. It is likely that observation error is more severe when populations are very low, given the aggregative nature of saigas and the large areas which they inhabit (hence missing a single herd, or saigas aggregating to a greater or lesser degree due to disturbance, can make a substantial difference to the accuracy of aerial surveys). This interpretation is borne out by the fact that nowadays saigas are found in much smaller herds than in the past. In the past, the vast majority of herds observed in aerial surveys at this time of year were in the category of 50-500 individuals or larger, but in 2005 in Ustiurt, 88% of the 147 herds observed were <50 individuals, 9.5% 60-100 individuals, 2% were 110-600 individuals and none were greater than 600. The average herd size in Ustiurt in 2005 was 17 animals. The areas in which saigas were found during the aerial survey in April are larger and further north than the site of the calving aggregation in May (Fig. 2).

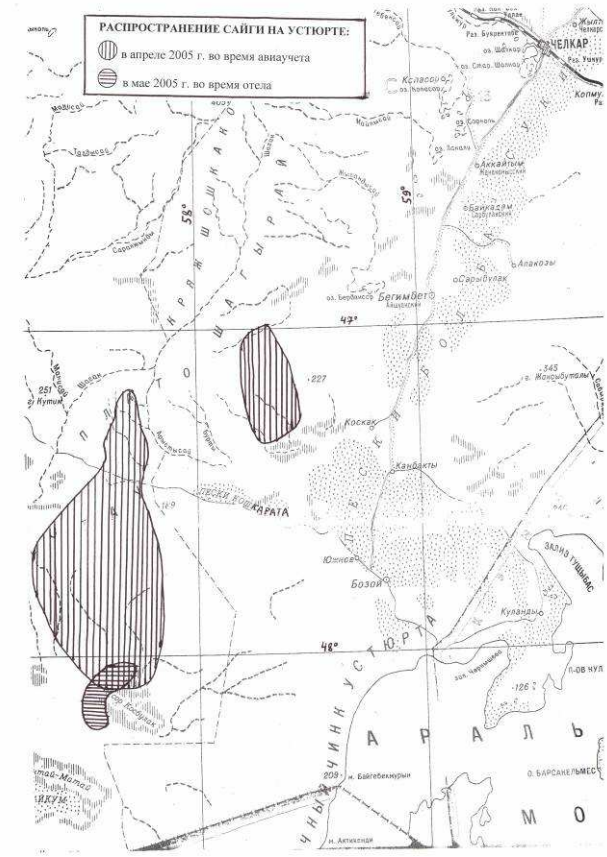

Figure 2. Location of saiga observations in Ustiurt during the aerial surveys in April (vertical lines) and the calving period in May (horizontal lines)

Monitoring in Kalmykia

There have now been three seasons of calf data collected in the Chernye Zemli Biosphere Reserve. In all cases the calving aggregation has been in approximately the same location (Fig 3).

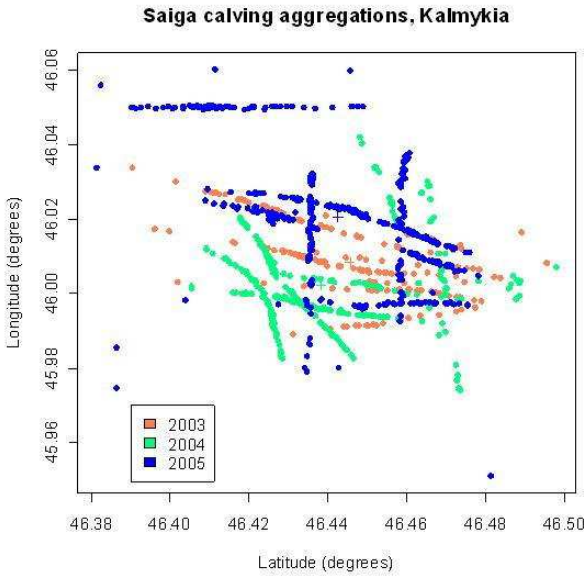

Figure 3. Locations of calves found on transect walks in Kalmykia, 2003-2005.
Each dot is an observation of a calf or calf pair (dead, alive or escaped) or of a placenta.

In 2005, 12 transects were walked, totalling 89km. The birth peak was 11th-17th May. Sampling methodology was consistent for all 3 years, and over this time, the number of live calves for which full data have been collected has stabilised (205 live calves were sampled in 2003, 415 in 2004 and 414 in 2005). We are hopeful that this is an indication of stability in the saiga population and healthy calving rates among females, although calving counts are not a reliable proxy for population size or fecundity, due to the sampling methods involved. In 2005, an additional 40 calves were found dead, 208 placentas were recorded and 71 calves ran away and so could not be weighed. The twinning rate in 2005 was 30%, and the overall observed neonatal mortality rate was around 8%. Monitoring was also carried out in May 2006, but the results are not yet available.

The rangers in the Chernye Zemli reserve and the Stepnoi Sanctuary monitored saiga movements and activity patterns, as well as population structure, throughout the rut period. The proportion of males in the 2005 rut was estimated at 6.1%, substantially higher than the 2004 estimate of 1.7%, and well within the limits for normal conception. The peak rutting period was 13th-22nd December 2005.

In Kalmykia, a robust protocol for counting saiga herds is being implemented in the Chernye Zemli Biosphere Reserve and the Stepnoi Sanctuary. 1027 observations have been entered into a database, covering the period from September 2003 to December 2005. As well as herd size and structure, information is entered on the spatial location of the herd, the weather and disturbance from humans or predators. Preliminary results show that the herd sizes in Kalmykia are larger than those observed in Ustiurt at the same time of year; 55% of the herds observed in the pre-birth period in Kalmykia are <50 individuals, and 7% are >500 individuals. This shows the value of taking a comparative approach between countries, using a standardised methodology, and also may suggest that the saiga population in Kalmykia is in better condition than that in Ustiurt. The distribution of observations between herd size categories varies between seasons (Fig. 4), with herds being smallest in the summer and largest in the autumn. This ties in with previous research into saiga herding behaviour.

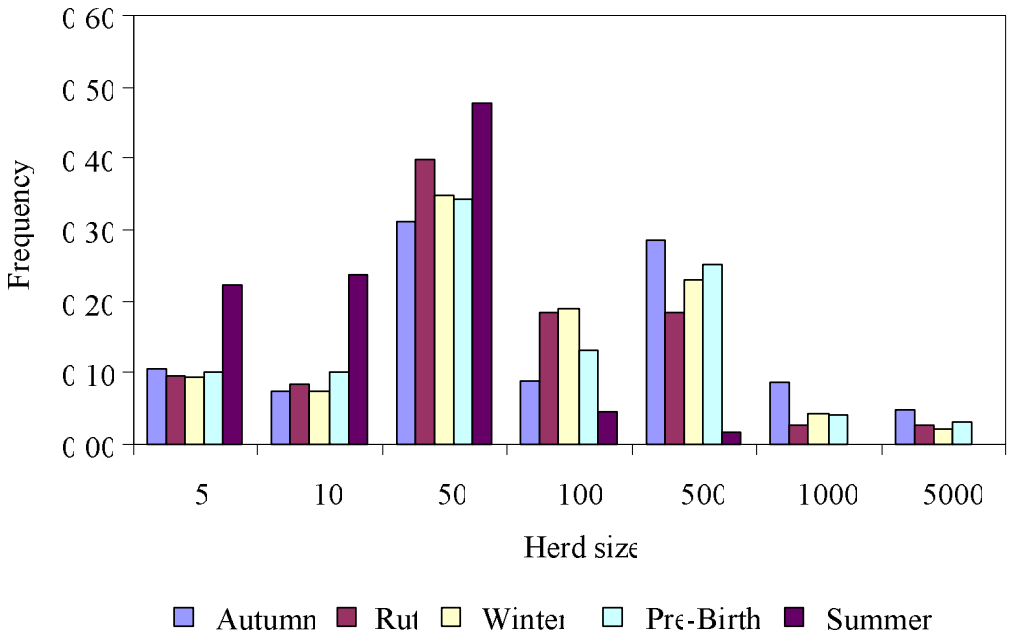

Figure 4. Herd sizes in Kalmykia at different times of the year.
The numbers on the x-axis are the maximum sizes (i.e. 1000 is herds of size 501-1000).

The monitoring programme is also being used to evaluate the role of the two Protected Areas in the conservation of the saiga, by estimating the proportion of the Kalmykian saiga population observed in these areas over the year. It is clear that the Protected Areas play a particularly key role during the vulnerable periods of birth and rutting, but that the saigas leave the protection of the reserves during early spring and summer (Fig. 5). This information will help in the appropriate targeting of anti-poaching effort by season.

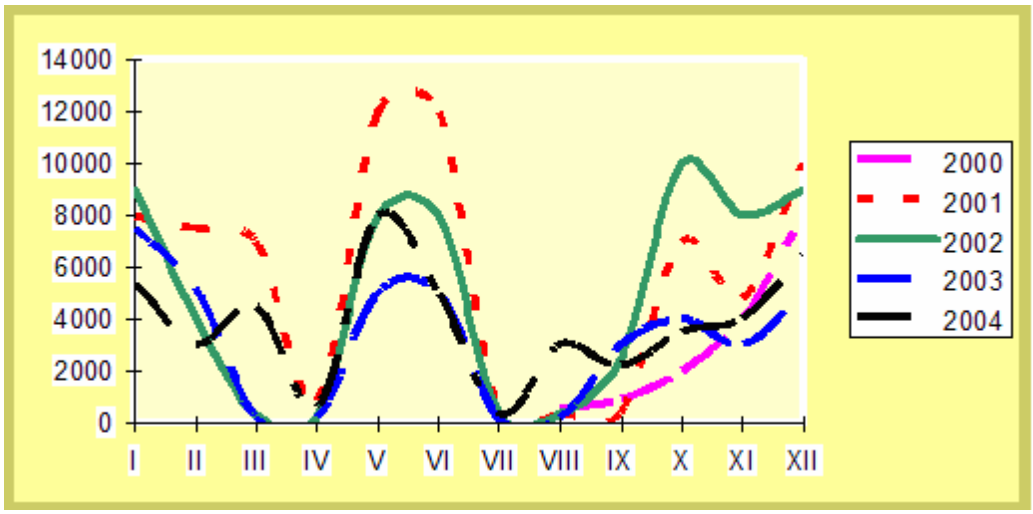

Figure 5. Number of animals observed in the Stepnoi Sanctuary and Chernye Zemli Biosphere Reserve, 2000-2004. Seasonal peaks at the time of birth and leading up to the rut are clearly visible.

It is of concern that the peak number of animals observed is not increasing over time. To what extent this reflects a lack of recovery in the saiga population as a whole is unclear, given the lack of an independent population estimate.

Analysis of reproductive effort

We have completed an analysis of sex-specific maternal investment in calves from litters of different sizes (singletons or twins), based on 3 years of data collected by the project team in the Chernye Zemli Biosphere Reserve, together with data collected in the 1960s by the Institute of Zoology, Kazakhstan.

Calf body mass varied by sex and litter type, with singleton males being heaviest (Fig. 6). The differences between singletons and twins, and between males and females, were highly statistically significant. There was also a significant difference between twin males that had a female sibling and those which had a male sibling, with the former being lighter (Table 3). This effect was not seen in females - the sex of the sibling did not affect the weight of a female twin. Controlling for the other effects, calves born later in the birth season were heavier, and calves were heavier in 2003 and 2004 than in 2005.

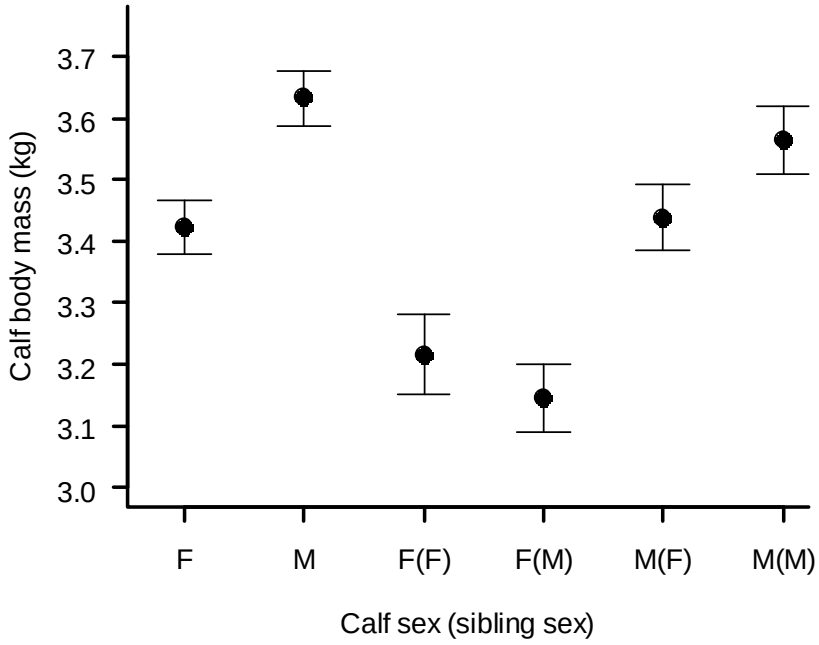

Figure 6. Calf body mass as a function of sex and litter type. F = singleton female, M = singleton male, F(F) = female with a female twin, F(M) = female with a male twin, etc.

Parameters	**Estimate**	**SE**	**T value**	**P value**
Intercept	1.233	0.013	96.748	< 0.001
Singleton vs Twin	0.018	0.003	6.019	< 0.001
Singletons: male vs female	0.029	0.005	5.711	< 0.001
Twins: male vs female	0.048	0.007	7.043	< 0.001
Twin female with male sibling vs twin female with female sibling	-0.011	0.010	-1.039	0.299
Twin male with male sibling vs twin male with female sibling	0.019	0.009	2.031	0.043
Julian date	0.014	0.002	5.730	< 0.001
Age (hours)	0.001	< 0.001	2.211	0.027
Year 2004	-0.018	0.013	-1.436	0.152
Year 2005	-0.045	0.013	-3.458	0.001

Table 3: Linear model of saiga antelope calf body mass (kg) in 2003 - 2005 in the Kalmykian saiga population (n = 641). The baseline year is 2003.

There are a number of interesting conclusions, which can be drawn from this analysis. Firstly, saigas are record-breaking in their pre-birth maternal investment - the weight of calves carried by a female is on average 17% of a female's own body mass, up to 35% in exceptional cases (male-male twins and triplets). This is 57% higher than the average for ungulates, and the highest maternal investment

recorded in an ungulate species. Despite this, and in contrast to previous studies, saigas can still invest differentially in the sexes. These findings cast new light on the life-history strategy of ungulates, and should be followed up with studies of post-natal behaviour, particularly sex-differentiated suckling.

It is likely that females in better condition invest in males and in twins, in accordance with theory and empirical evidence. In our case, we have no data on female condition, and hence we cannot directly confirm this. Among females which produce mixed-sex twins (hence when maternal condition is controlled for), there is differentially higher investment in male than female twins, leading to heavier male than female calves. It seems, however, that females are unable to target investment precisely in mixed-sex litters. Hence males in mixed-sex litters are not as heavy as males in single-sex litters. This study is the first time that such effects have been documented, and so it is an important step forward for maternal allocation theory (the Trivers-Willard and Williams hypotheses). The study has been written up and is now in review at *Proceedings of the Royal Society B* (see attachment).

5.1.2. Socio-economic research

Methodology

Our social research covered the livelihoods available to people living in saiga areas and their attitudes to and knowledge of saigas and their conservation. Our approach was to live in a village for 3-4 weeks, getting to know the local people slowly before starting the questionnaires. This was important because one of our major aims was to understand the drivers of an illegal activity, saiga poaching. In most cases, respondents did not say that they were active poachers; instead they were assigned to the poaching category if 3 independent reports of their status were received from other inhabitants, usually during informal chats with the research team. This was not possible for the isolated farms. In Kalmykia, one of the interviewers, Nataliya Balinova, is Kalmykian, while in Kazakhstan we were much helped by the presence in the team of male students from KNAU, who were all from the rural areas, spoke Kazakh, and were able to interact comfortably with the men of the village. This enabled them to get information about the economics of poaching from active gangs which would have been unavailable to others (Fig. 7).

Figure 7. KNAU student Bekzhan Makasev interviewing in Bosoi village.

As well as informal discussions with residents, we also administered two semi-structured questionnaires. One, at the household level, looked at the livelihood options available to people and at their assets and income. The other, to individuals, elucidated their attitudes to saigas and knowledge of conservation and ecology. Due to our long stay in each village, we were able to achieve a high sampling percentage (Table 4).

Location	**Community**	**Household number**	**Households sampled**	**Sampling %**
Kalmykia	Tavan-Gashun	71	37	52%
Kalmykia	Khulkhutta	120	61	51%
Kalmykia	Isolated farms	27	21	78%

Kazakhstan (Betpak-dala)	Ulanbel	280	86	31%
Kazakhstan (Ustiurt)	Bosoi	467	135	29%

Table 4. Sampling information for the social surveys.

At the beginning and end of our surveys, we gave presentations about our study and about the importance of saiga conservation to local residents. In Kalmykia, we also produced a leaflet summarising the results of the questionnaires, which was distributed to local villagers and more widely, giving feedback to participants. We have also been able to demonstrate positive action based on the recommendations received from villagers, with three out of the four villages now subject to livelihood interventions (the fourth has no active saiga poachers; see below).

Results from Kalmykia

In year 1, we surveyed two villages and isolated farmsteads to the north-west of the Chernye Zemli Biosphere Reserve. The villages were chosen both because of their proximity to the reserve, where saigas are concentrated in the birth and rutting periods, and because they were known to contain poachers. Indeed, in 2005, three incidents of saiga poaching were intercepted by anti-poaching patrols, two of which resulted in convictions of Khulkhutta residents. The economy in the area is primarily livestock-based, especially in Tavan-Gashun village and the surrounding farms. Khulkhutta is more closely located to markets and infrastructure, due to its position on the main Elista-Astrakhan road. Overall, 10-19% of the sampled households were directly engaged in poaching. The number of households that are indirectly involved in saiga exploitation (e.g. selling meat/horns, preparing the meat for sale) is higher, at 20 % in Khulkhutta and 32 % in Tavan-Gashun. The number of households poaching is not necessarily correlated with offtake, however. Our discussions with residents suggest that poaching in Tavan-Gashun is more subsistence-based, whereas in Khulkhutta it is more organised and commercial. This inference is supported by the fact that poaching households in Tavan-Gashun are significantly poorer than those that do not poach (Fig. 8).

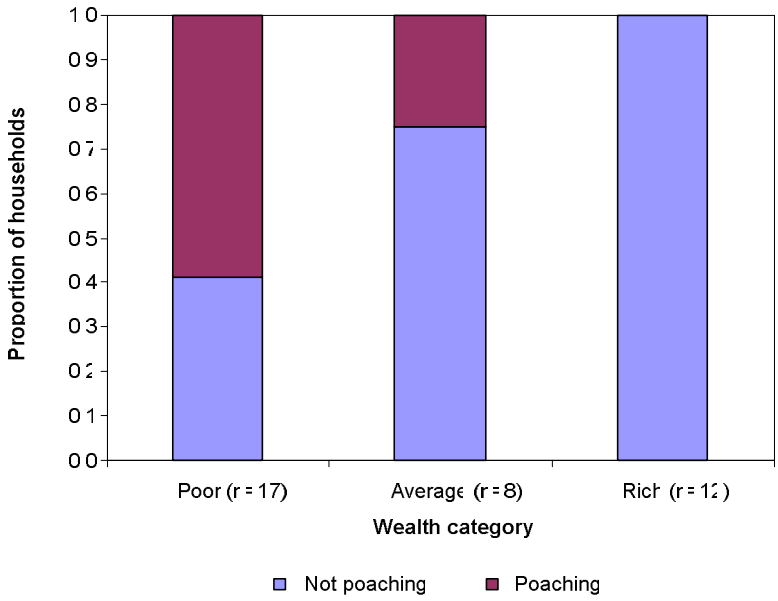

Figure 8. The proportion of each wealth category that is involved in some way in saiga poaching in Tavan-Gashum village.

In Khulkhutta, motorbike ownership is the primary factor correlating with a household's poaching activity. Other factors include low monthly income or low values for wealth indicators such as the number of sheep owned. Moreover, individuals that were born in the village more commonly poach than those that have immigrated from elsewhere. Often people stated that other ethnic groups than

their own were involved in saiga poaching, however the data do not support a role for ethnic group as an explanatory variable independent of place of birth.

Participatory research techniques were used to rank the alternative professions available in the villages according to a range of criteria including prestige, physical difficulty, career prospects and profitability. Poaching was ranked very low, and livestock farming was consistently the preferred livelihood (Fig. 8), which is one reason why the livelihood intervention chosen in Kalmykia was the provision of cows of a well-regarded local breed to the poorest families.

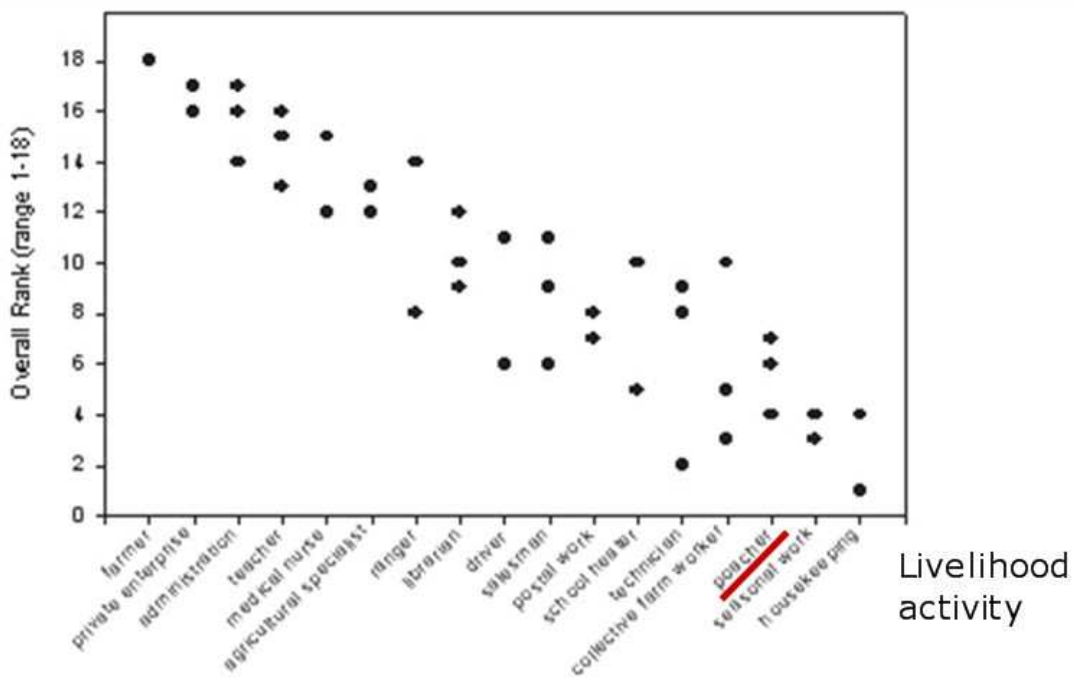

Figure 8. The livelihood alternatives available in Tavan-Gashun village, ranked by perceived desirability.

Results from Kazakhstan, and comparison between locations

In years 2 and 3 we worked in two villages in Kazakhstan, Ulanbel and Bosoi. Ulanbel is in the winter range of the Betpak-dala saiga population, and in the mid-late 1990s was a well-known hotspot of saiga poaching activity. Bosoi is a remote village in the vicinity of the area where saigas tend to aggregate for calving, and was also thought likely to harbour significant poaching activity.

The poaching situation in Kazakhstan is very different to that in Kalmykia. The percentage of households involved in poaching is signficantly lower (Fisher test, $n = 251$, $p < 0.001$). In Bosoi, only 4% of households sampled (6 households) were directly involved in saiga poaching (excluding saiga produce traders). This small sample size greatly reduces statistical power and thus a formal GLM is not feasible. However, it is clear that all individuals involved are male, all bar one are part of the poorest wealth category and they are between 20 and 60 years of age with below average education levels. A group of <10 unemployed men have formed an organised poaching group which goes out for multi-day hunting expeditions. They are relatively well-equipped with several cars, motorbikes and guns. Despite declining saiga numbers and thus increasing hunting costs, they are able to make a profit and sustain their families throughout the year. They would prefer a stable income, but it is extremely difficult to find employment in remote steppe villages such as Bosoi, especially once an individual has been unemployed for several years.

In Ulanbel, there is no poaching taking place. Based on our discussions with local people, this is because there are not sufficient saigas in the vicinity for it to be economically worthwhile mounting an expedition, particularly given the current high price of petrol. A few people stated that they did on occasion mount large-scale commercial expeditions to the distant Ustiurt region to poach for saigas, because the populations there are still large enough to make this investment worthwhile. The Betpak-

dala saiga population has declined more than the other saiga populations, a fact reflected both in the scientific literature and in local perceptions (Table 5).

	Khulkhutta	**Ulanbel**	**Bosoi**
Seen saigas in 1991	100 % (n = 59)	99 % (n = 88)	95 % (n = 139)
Seen saigas this year	48 % (n = 63)	11 % (n = 88)	18 % (n = 138)
Seen calving in 1991	88 % (n = 58)	9 % (n = 87)	64 % (n = 138)
Seen calving this year	32 % (n = 62)	5 % (n = 88)	7 % (n = 138)

Table 10. A comparison of three villages, in three different saiga populations, showing the percentage of individuals questioned who stated that they had seen saigas prior to the year 1991 and in the year leading up to the survey. 1991 was chosen as the base year as it is the year in which the Soviet Union started to break up, and hence a very clear marker in people's lives, while also being before large-scale poaching started. The percentage seeing calving in 1991 is a function of saiga distributions at different times of the year.

Not only are people aware of the overall reduction in saiga abundance, but local people have also noticed a marked decline in herd size (Fig. 9).

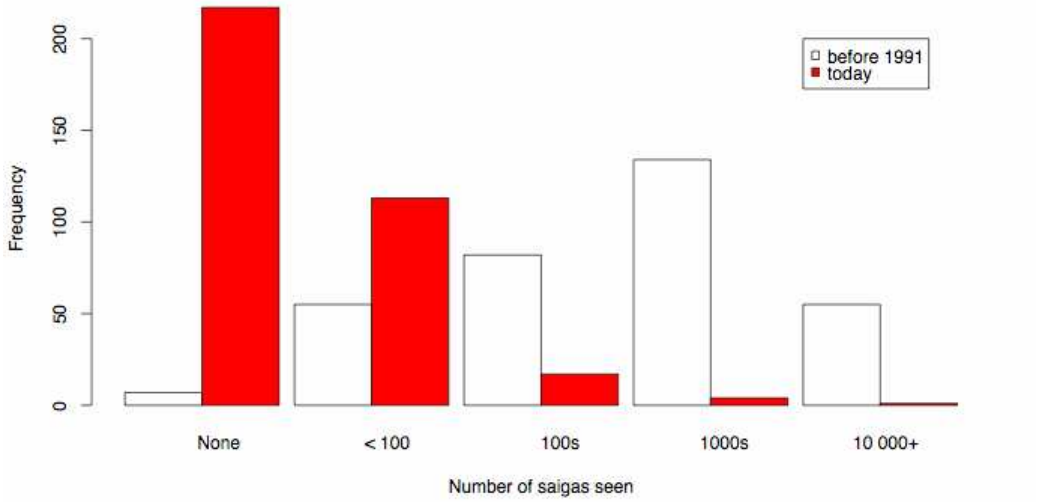

Figure 9. The maximum number of saigas seen by respondents in a given year before 1991 and in the 12 months before the survey. In the current period., the <100 category mostly consists of sightings of single or a handful of animals. Results are similar in all villages and so are lumped.

Our results reflect each village's location within the range of the migratory saiga. Both Khulkhutta and Bosoi are not far from the saiga's traditional calving grounds, where saigas give birth in May (Table 9). In summer, saiga migrate further north, however this is more pronounced in Kazakhstan, where saiga still migrate over large distances. Saigas can now be observed in the CZBR all year round. The level of poaching in Kalmykia also remains almost constant throughout the year. In Kazakhstan however, there is a strong autumn peak. Overall, autumn is the preferred hunting season because saiga are heaviest and fatter during this time, and thus more valuable.

Respondents in all villages were well aware of the illegal status of saiga hunting, with 97% of respondents responding correctly to this question. The majority of respondents also responded that they would mind strongly if saigas went extinct (Fig. 10). 85% of respondents (n = 359) were prepared to take action to save the saiga. The types of help offered varied from setting up village warden schemes to providing forage for saiga to donating money. The replies to how the saiga could be saved were equally wide-ranging and inventive, but two themes were dominant; the need to strengthen law enforcement and the need to improve the socio-economic situation of the rural population.

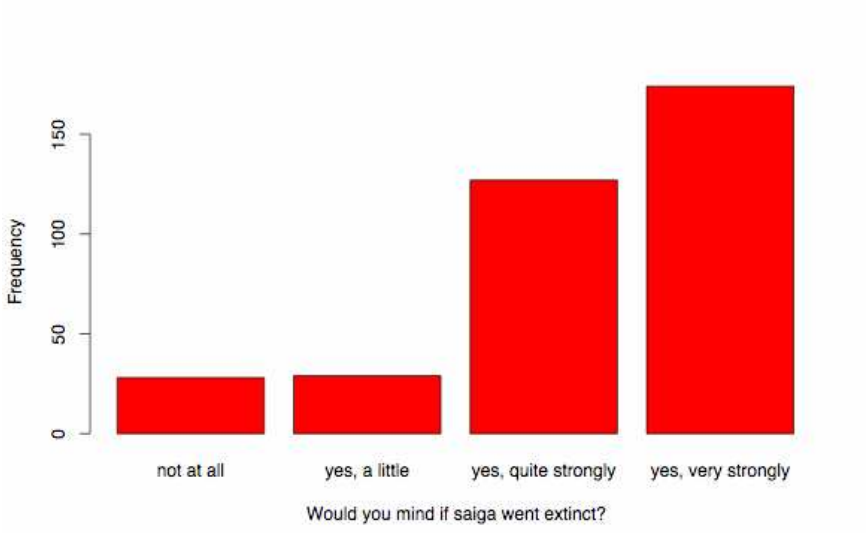

Figure 10. The attitude of respondents to the prospect of saiga extinction.
Respondents from all villages were lumped because the results were similar.

The results of these social surveys have informed our subsequent conservation interventions. They also bring home important messages about the similarities and differences between the situation in different locations. Some things are universal, such as the decline in saiga numbers and the local population's view that saigas should be protected. Others, such as the timing and structure of poaching operations, the profile of those who poach and the intensity of poaching, vary between villages. These similarities and differences are important to bear in mind both when interpreting information about poaching incidence and when planning interventions.

5.2. Training and capacity-building activities.
Our training and capacity-building had a number of phases.

• In April 2003 we held a workshop for all participants in Elista, Kalmykia. At this we discussed methods for both the biological and social monitoring and developed a protocol for biological monitoring and a questionnaire for the social surveys. These were developed by consensus, but the workshop had a substantial training and capacity-building component for all the teams involved.

• In June 2003, Aline Kühl (IC) trained her Kalmykian counterpart, Nataliya Balinova, in social research techniques. Ms Balinova was a student researcher at the Institute for Humanitarian Research in Elista, Kalmykia, and was selected on the basis of academic excellence and commitment to the research. Aline and Nataliya subsequently worked together to carry out two surveys in Kalmykia in 2003 based on the questionnaires developed in the April 2003 workshop. For the first survey they trained Marina Frolova, a scientist at the CZBR, in social research methods. She went on to teach future teachers in the Biology Faculty of the Elista Pedagogical College. For the second survey in Kalmykia, Nataliya Kuznezova, an economics student at the Kalmyk State University, was recruited. In 2004, Aline and Nataliya Balinova moved to Kazakhstan, where they worked together to train 5 students from the Kazakhstan National Agricultural University (KNAU) in social research techniques. They then worked alongside these students in 2004 and 2005, and the students subsequently carried out surveys independently later in 2004. In late 2004, Ms Balinova trained our colleagues in Uzbekistan in the same techniques for a comparable survey. Hence there has been a snowball effect of training in social survey techniques between three range states.

• Capacity-building of a similar kind was undertaken for the biological monitoring. The techniques were trialled in Kalmykia in 2003 and then rolled out to Kazakhstan in 2004. In 2004-2006, representatives from Imperial College participated in the monitoring in both locations. In May 2006, the Kalmykian team carried out the surveys independently, with the project coordinator (EJMG) participating as an observer for the last 2 days of the survey. Hence we have built capacity in the

CZBR for continued monitoring using a rigorous but practical technique. The Russian team leader, A. Lushchekina, and team member Professor Iu. Arylov, have also spent substantial time working with scientists and rangers in the CZBR and SS, developing their monitoring skills and ensuring that they maintain the saiga herd size database and contribute high quality data.

• Finally, we worked extensively with local NGOs and other organisations in Kalmykia. The Centre for Ecological Projects, for example, carried out an attitude survey for us and produced public information materials. We worked to involve local schools, universities and religious organisations in our project. This has raised the capacity of these organisations to carry out conservation projects, and to work within a large international team. The success of this strategy has led to our post-project grant, which has an explicit aim of building the capacity of civil society within Kalmykia through involvement in saiga conservation.

6. PROJECT IMPACTS

6.1. Meeting the project purpose

Our project purpose was twofold; to save the critically endangered saiga antelope from extinction and to support impoverished rural communities by building a framework integrating saiga conservation with communities' needs and aspirations. The evidence that we have contributed to saiga conservation comes from our monitoring, which suggests that the Kalmykian population is reproducing healthily, and the fact that saigas are easily observed in the CZBR and the surrounding areas, and do not flee approaching vehicles. Both of these suggest that poaching pressure is reduced. The Kalmykian authorities recognise the Darwin project's involvement in this achievement, as shown in Appendix 7, a letter from the Prime Minister thanking us for our work for saiga conservation.

The evidence that we have supported rural communities and linked this to saiga conservation is that we have now translated our research findings into action. We have successfully implemented a "rotating cow" project in the area adjacent to the CZBR, funded by DEFRA's Small Environmental Projects Scheme, and feedback from local villagers is very positive - they are aware that the scheme is linked to saiga conservation and keen to get involved (Fig. 7). The two villages chosen were those in which we carried out our social surveys, Tavan-Gashun and Khulkhutta, demonstrating to the villagers that our research did indeed lead to action of the type they requested. Our post-project grant will enable us to extend this scheme and to formally assess its effectiveness in changing attitudes.

Figure 7. The Tsebekov family in Khulkhutta have received a cow, named Krasilka ("Little Beauty"), as part of the rotating cows scheme. Her milk products contribute to the nutrition of the family.

Our partners FFI have implemented a livelihoods enhancement project in Bosoi, Kazakhstan, another village where we carried out social research in the previous year. A major component of this project is capacity-building of local NGOs, Casdin and Kamystybas. Based on the results of the Darwin surveys, villagers were asked what livelihood opportunities they would like help to enhance. Interventions have included helping people set up as mechanics, joiners and welders, a sewing guild, bakeries, a massage

centre, a greenhouse, improving remote pastureland and computer classes. Many of these livelihoods are those that young men can take up, which directly affects the opportunity costs of poaching.

The main unexpected impact has been the mobilisation of schools and religious groups in Kalmykia. There is huge enthusiasm for environmental education in the local schools, and Buddhism is resurgent in Kalmykia, with a strong emphasis on caring for nature. The Russian project team's energy in cultivating these links has led to many opportunities for synergies with these groups and publicity for the saiga. We have run children's art competitions, helped schools with ecological projects and contributed to the erection of a Buddhist shrine in the local administrative centre. This has earned us a lot of goodwill, which we are capitalising on in our post-project activities.

Figure 8. A saiga standing with the White God at the front of the new Buddhist temple in Elista, Kalmykia. The temple will be opened by the Dalai Lama in July 2006.

6.2. Meeting CBD obligations

The project team is heavily involved in international saiga conservation, providing information that underpinned resolutions about saiga conservation at the 2004 World Conservation Congress and CITES meetings. We are also working with the Convention on Migratory Species to facilitate a technical meeting to assess range states' progress against the CMS Action Plan for saigas. Both the Kalmykian and Kazakhstan governments take their commitments to saiga conservation very seriously, and our projects have provided objective information to support their activities and have worked with their CBD implementing committees to put conservation activities in place. The evidence in Kalmykia includes the letter at Appendix 7, and several other letters from the adminstration at the local, regional and republi-wide level (available on request). In Kazakhstan our involvement with CBD has been less direct, but we have contributed to the monitoring activities of the government's official saiga management authority, *Okhotzooprom*.

6.3. Improving local capacity and collaboration

The current activities of key personnel are as follows:
Nataliya Balinova - currently at Moscow State University carrying out a PhD in Kalmykian culture.
Almas Dzhmybekov, Bekzhan Makasev, Victor Fomin, Saberzhan Narmuratov - Have graduated from KNAU. A major international conservation organisation is hoping to employ them in the near future as trainee researchers. Azamat Baysugurov was tragically killed at the end of 2004.
Gennady Erdnenov - scientist at the CZBR. Currently leading the scientific research on saiga antelopes and maintaining a database of saiga distributions, using the techniques developed under our project.
Anatoliy Khludnev - Director of the Stepnoi Sanctuary. Now also carrying out ongoing monitoring for a saiga database, according to the methods developed in the Darwin project.
Olga Obgenova - Director, Centre for Ecological Projects, Kalmykia (local NGO). She is now coordinating the Kalmykian end of our post-project activities.

All other project personnel in both countries are continuing their work with us, and are still engaged in saiga conservation. Our project has made possible a substantial network of 7 organisations in

Kalmykia, who are working together to further saiga conservation, public awareness and engagement, collaborating on our post-project work. This is a major step forward, because the original Darwin project was coordinated principally between London and Moscow - to have built a local network is a key step towards sustainability. The organisations are the Centre for Ecological Projects, the Centre for Wild Animals, the Chernye Zemli Biosphere Reserve, the Stepnoi Sanctuary, the Dharma Centre, Yashkul School and Arshan Children's Home. In Kazakhstan, the FFI project has built capacity in local NGOs and amongst villagers to improve their lives. Project team members in Kazakhstan have also participated in judging art competitions and developing a children's book, together with a local NGO in the Karaganda region, Arlan. We have also catalysed the development of a saiga conservation movement in Uzbekistan, which has mobilised government to take saigas seriously as an issue, and is beginning engagement with civil society at a local level. Our collaborative work in all three range states is ongoing.

Finally, our project and the e-newsletter *Saiga News* has much improved communication about saigas at all levels (see attachment for the most recent issue). We currently have the newsletter available in English, Russian, Uzbek, Kazakh and Chinese, with the Mongolian version imminent. This allows us to distribute it both in villages in the saiga range area and at an international level. It provides news and feature articles about saiga conservation projects around the world, and is an important source of objective information to all. As an umbrella organisation for *Saiga News* and our collaborations more generally, we have created the Saiga Conservation Alliance, an informal group which has already won funding for its activities in Uzbekistan from the Wildlife Conservation Network (http://www.iccs.org.uk/SaigaAlliance.htm).

6.4 Social impact

A direct social impact of the project has been to carry out the baseline research that enabled us to implement livelihood enhancement projects in Kalmykia and Ustiurt (see above). The indicators of this are that the livelihood projects have been awarded funding and are underway. We have also had an impact on school children in Kalmykia, improving their understanding of environmental issues and enthusiasm for conservation of their local biodiversity. Indicators include the fact that a child from our partner school in Yashkul won a Russia-wide competition for the best essay on environmental issues, and that the schoolchildren have have constructed an ecological museum and saiga display boards with the help of our Kalmykian partners. Others who have benefitted socially are the people of Yashkul village who requested that we provide financial support for the erection of a Buddhist shrine in the village square. We have also provided indirect social benefits through presentation of films and articles about saigas in the local press (see output measures), and through the empowerment of local NGOs in both Kalmykia and Kazakhstan. There have been no particularly unexpected impacts, either positive or negative.

7. PROJECT OUTPUTS

The project outputs are quantified in Appendix 2, publications are listed in Appendix 3. Below is a summary of where our original and actual outputs differed - we had some shifts in emphasis based on the results of the first phase of the project, and we also had substantial improvements in outputs over those envisaged, especially with respect to media exposure.

Output	Envisaged	Delivered	Notes
1	0	1	This is a UK PhD student who was funded from other sources
2	0	4	3 UK MSc students, funded from other sources, 1 Russian student
4	20	31	We focussed on higher-level training and more substantial participation for 6 students, in order to maximise capacity-building, as well as having larger-scale training for 25 students.
5	2	0	The intensive training was short-term (output 6) and followed up by practical experience through project participation
6	26	6	We moved away from the village warden idea based on results from our social surveys (see yr 1 report)
7	1	2	1 set of public awareness materials for each country (a range of

			materials are included, including posters, leaflets etc - see attachments to previous reports)
8	72	80	Time spent by UK team members is as envisaged
9	2	1	Our aims shifted away from sustainable hunting after yr 1 so that report was not produced.
10	0	2	A formal protocol for biological data collection, and one for social surveys.
11	2-4	16	We will produce at least 4 articles in international journals (2 so far), the rest are in national journals or conference proceedings.
12	0	1	Databases arising from our monitoring programme
14	7	28	We have attended many more conferences to present our work than envisaged, and these have been more formal and more international than expected. Our local interventions have been intentionally much less formal than originally envisaged.
15	2	24	We have exceeded our expectations in terms of media coverage
16	0	2	The idea for Saiga News was generated by us during the project
17	1	1	Dissemination network as envisaged
18	2	9	The TV coverage of our work has been a bonus, which could not have been envisaged
19	2	4	Ditto radio coverage
20	£5,000	£8,464	We have also invested in equipping the Stepnoi Sanctuary team
23	£136,838	£379,040	We have comfortably exceeded the matching funding and catalysis of new funds that we expected

7.1. Dissemination

There are a range of target audiences, and the medium for dissemination varies accordingly. For the general public in the saiga range states we have developed posters, pocket calendars, a children's book, children's art competitions, and written articles for newspapers and magazines. We circulated a leaflet to people in the saiga range to give them feedback about the results of our questionnaire survey, so that they could see how the population in general viewed saiga conservation, and how we were using the information they had given us. Our continuing dissemination work in Kazakhstan is funded until the end of March 2007, and in Kalmykia the post-project funding will allow us to take it to the next stage, by expanding grassroots involvement.

Saiga News is aimed at people with a more focussed interest in saigas; conservation professionals in government, academia and NGOs, but also at opinion-formers and leaders at all levels within the range states and internationally. That is why we have been keen to translate it into as many relevant languages as possible. *Saiga News* is funded for the next 12 months, and we are looking for sustainable funding into the long-term.

We have major dissemination opportunities coming up this year on the international stage, as we have an article appearing in BBC Wildlife (August 2006) and an interview on BBC4's "Saving Planet Earth" series (to be transmitted in the autumn), as well as the post-project funding for a UK-Kalmykia exchange. We also have the first meeting of the CMS MOU on Saiga Antelope Range states in September, and a slot at the Wildlife Conservation Network's Expo in San Francisco in October.

8. PROJECT EXPENDITURE

	Budget	Expenditure	% Variance

This expenditure is as envisaged in the original budget. The low office costs are due to an attempt by all parties to minimise office expenditure in favour of conservation expenditure. Conference/seminar costs were kept low by the hosts waiving fees for room booking, by not employing formal translators, and by combining trips to workshops with fieldwork or visits funded from other sources wherever possible so as to reduce airfares. Capital items were slightly over budget because the vehicle bought by the CZBR was slightly more expensive than expected, as was some of the computer equipment.

9. PROJECT OPERATION AND PARTNERSHIPS

9.1. Local partners

The local partners involved in the project are as follows:

Kazakhstan

Institute of Zoology. The main partner in Kazakhstan, who coordinated our work there, and carried out the biological monitoring components of the work. They also work with Government and with the saiga management authority *Okhotzooprom* to deliver scientific advice and to implement government conservation policy.

Kazakhstan National Agricultural University. Collaborated with us on the socio-economic surveys and training, and on public awareness activities. Victor Ukrainsky was previously Director of *Okhotzooprom* and now takes an active interest in saiga conservation. His students were trained by us in social science methods and were active members of the survey team in Kazakhstan.

In Kazakhstan, our local partners also collaborated with a network of other organisations, including *Okhotzooprom*, the State Committee on Biodiversity, local NGOs such as Arlan and ACBK (Birdlife Partner), and international NGOs WWF, Frankfurt Zoological Society, NABU and WCS. Through our international partners FFI, we have links with local and national NGOs now also working on saiga conservation.

Kalmykia - original teams

Institute of Ecology and Evolution. Based in Moscow, the IEE was the overall coordinator of the range state teams' work, and particularly of the project's work in Kalmykia. Anna Lushchekina was the most active individual in the project as a whole, and was involved in all aspects of project design and implementation. She also had many of the most innovative ideas for public engagement and for promoting saiga conservation in Kalmykia, including the children's art competitions and book, the links with the Buddhist religion and the involvement of new partners in the project.

Centre for Wild Animals of Kalmykia. The Centre for Wild Animals was our focal point within Kalmykia. Yuri Arylov was very active both in the science and in training, public awareness, education and dissemination activities. He has also been very involved in developing and implementing follow-up activities for the project.

Chernye Zemli State Biosphere Reserve. The Reserve has been the focus of our saiga protection activities, and we have worked alongside them to improve anti-poaching effectiveness. We also based our scientific monitoring work there, with their scientific officer leading this activity.

Department of Hunting Management. Based on the decision to move away from a sustainable use focus, given public opinion and the status of population, we ceased to interact with this team after the first year.
Department of Environment Protection and Nature Conservation. We had strong links with this Government Department, focussed on consultation about our plans and activities, and financial and moral support from them to our local partners.

Kalmykia - additional partners
Centre for Ecological Projects. This recently-formed Kalmykian NGO is concerned with environmental protection, with a particular emphasis on public engagement. We commissioned them to carry out a broad-scale attitude and knowledge survey in Kalmykia to complement the detailed surveys which we were engaged in. Their excellent work and enthusiasm to collaborate meant that they started to take an active role in our project, and they are the coordinators of our post-project activities. We feel that this is a good step towards capacity-building of civil society in Kalmykia.
Yashkul School, Arshan Children's Home. Through the CWA, we have developed good relationships with local educators, and we are now working closely with these partners to implement the next phase of our work in Kalmykia.
Dharma Centre. Through Anna Lushchekina, we have formed close relationships with religious groups in Kalmykia, who are promoting the importance of nature conservation to their congregations. They will be increasingly active in our post-project work.
Stepnoi Sanctuary. This reserve adjoins the Chernye Zemli Biosphere Reserve, but is under another administration (Astrakhan Province, rather than Kalmykia). During our project we built collaboration with this team, and they are now full partners with us, and carry out both ecological monitoring and anti-poaching activities alongside the Chernye Zemli Biosphere Reserve.

The local partners were fully involved in project planning and implementation. We developed our monitoring strategy and data collection protocols at a joint workshop at the beginning of the project, and carried out our research and conservation interventions collaboratively. Local consultation changed our approach in Kalmykia, from focussing on sustainable hunting towards public engagement and education.

9.2. Collaboration and participation
In Kazakhstan, we signed a Memorandum of Understanding between Imperial College, WWF-Russia, Frankfurt Zoological Society, the State Committee on Biodiversity, Okhotzooprom and the Institute of Zoology, to work together for saiga conservation. This included an understanding that the Darwin project would carry out monitoring and socio-economic survey work, while FZS/WWF would carry out conservation implementation activities.

We also collaborated in Kazakhstan with FFI's project on alternative livelihoods, which arose out of the Darwin project, and in Uzbekistan with the Institute of Zoology which carried out a parallel study to ours, funded by DGIS through FFI. In Kalmykia, the work of our local partners (particularly CWA and CZBR) was co-funded by other sponsors, and we ensured that this co-funding was used synergistically to enhance our Darwin Initiative activities. There was active consultation in all countries with the relevant government departments.

Out international partners were Fauna and Flora International and IUCN - the World Conservation Union. Our original IUCN partners were the Sustainable Use Specialist Group, but with the shift in focus away from sustainable use we worked in the latter phase of the project with the Antelope Specialist Group. We have also strengthened our relationship with the Convention on Migratory Species in the past year, and two Darwin project participants (EJMG and D. Mallon) are co-organising the CMS's Technical Workshop on saigas in September.

The Darwin project has catalysed a strong network of partnerships at the local level, and also at the international level, with improved links between saiga scientists and conservationists in the range states. These partnerships are active and ongoing, and are influential in the local biodiversity strategy

process. There is a need for more community partnership, which is what our post-project activities are focussing on.

The private sector already plays a role through sponsorship, for example TNT-Express is an active partner of the Centre for Wild Animals in Kalmykia. This kind of relationship is something we are hoping to encourage in other places. For example, we are working to engage gas companies in Uzbekistan with saiga conservation.

10. MONITORING AND EVALUATION, LESSONS LEARNT

10.1. Monitoring strategy

The main mechanism for monitoring and review of the project's day-to-day activities was through the local project leaders; Dr A. Lushchekina in Russia and Prof. A. Bekenov in Kazakhstan, who met regularly with team members to monitor progress. Dr Lushchekina also coordinated communications and activities between the two range states. Dr Lushchekina visited Kalmykia about once every 2 months, to monitor and evaluate progress and ensure financial accountability. She communicated with E.J. Milner-Gulland on a daily basis by e-mail, ensuring a free flow of information. On her visits to Kalmykia, Dr Lushchekina examined and validated the field data collected by the rangers. Field data were passed on to Imperial College for analysis by participants in both countries, giving a further safeguard. Imperial College took an active part in the field research programme, ensuring that they were fully engaged in project monitoring and evaluation and that they interacted with team members on an ongoing basis. After every field expedition a report was submitted to the project leaders for evaluation and to ensure lessons were learnt as appropriate. We also had regular formal meetings, rotating between the two host countries to maximise local participation.

The value of the project is not demonstrated so much by the process of monitoring and evaluation, as by the results achieved. The main result in Kazakhstan was that we have made objective information about the status of the saiga antelope and the attitudes and behavioural drivers of local people available to all interested parties. We have ensured that this information is used to inform conservation intervention strategies, and the value of this is demonstrated by the fact that we are currently working with FZS and WWF to develop a saiga conservation strategy for the next few years, in collaboration with our local partners. In Kalmykia, our main achievement at the Purpose level has been to contribute to the stability of the saiga population. Our outputs also demonstrate that we have been successful in massively increasing the level of public awareness and interest in saigas.

10.2. Key problems and lessons

Key problems in undertaking this project were:

- *The increasing international and local interest in saigas brings with it an increasingly political and competitive conservation environment at all levels*

We addressed this by trying hard to engage constructively with all players in the field, and to be supportive of other people's efforts, through sharing our experience and expertise. This has included the CWA sharing its expertise in the field of captive breeding with other organisations in Russia, Kazakhstan, China and Mongolia. We have also passed our fieldwork protocols on to teams working in Uzbekistan and Mongolia, to help ensure standardised monitoring throughout the saiga range. AAL and EJMG attended a workshop on the conservation of the Mongolian saiga in 2004, to share our experiences with Mongolian colleagues. We also started *Saiga News* as a response to the blossoming of saiga conservation initiatives, as a formal means of sommunication between all players. This has worked well, and people with whom we have had no prior contact are now submitting articles about their projects to the bulletin, demonstrating that they value it as a means of communication. Our work with CMS is also aimed at bringing people together to ensure a coordinated approach to saiga conservation.

- *We needed to reevaluate our approach in both countries on the basis of the results of our first year's work.*

Our regular formal meetings and informal e-mail contact allowed us to exchange research results quickly, and thus to act upon them immediately, rather than waiting until the end of the project to

assess progress and make changes. This allowed us to be flexible in our approach, seize opportunities when they arose, and maximise our impact.

Our formal meetings acted as internal evaluations of the work. We also held a workshop at the end of Year 1, to which external participants were invited under the auspices of IUCN-ESUSG. Their role was to share lessons from elsewhere and also to help us to evaluate our progress and suggest changes.

The key lesson we learnt was to maintain the flexibility that allowed us to seize conservation opportunities as they arose and to respond to difficulties. We were able to recruit new teams, extend the reach of the project and still meet our original goals, based on this strategy. This flexibility came from regular communication between participants and from maintaining a clear vision of the overall purpose of the project, rather than being trammelled by focussing only on the fulfilment of near-term output targets.

11. ACTIONS TAKEN IN RESPONSE TO ANNUAL REPORT REVIEWS
Both reviews were forwarded to the project team for discussion. The issues raised were:

Year 1
Two key points were raised: the scope for economic alternatives to saiga hunting and clarifying the monitoring and evaluation procedures. We have invested substantial effort into investigating economic alternatives in years 2-3 of the project, and now have pilot schemes up and running in both Kazakhstan and Kalmykia. FFI has also written a report on livelihood alternatives (Appendix 8) which will be circulated to interested parties. Based on the reviewer's comments, we have clarified our monitoring procedures, which was helpful.

Year 2
The reviewer queries the discrepancy between aerial survey results and our ground counts in the calving areas of Kazakhstan.
We agree that this is an issue of concern. The same personnel does take part in both studies - specifically Yuri Grachev is the chief scientist for both. The component of the population being monitored is different however, as is the scale of the monitoring (local calving studies vs broadscale aerial surveys). We have an MSc project currently underway, with an Imperial College student working in the Institute of Zoology in Kazakhstan to look at the likely effects of current saiga herd structure on the bias and error of aerial survey counts - hopefully this will shed some light on the matter.

The reviewer makes useful suggestions about regional-level cooperation and methods for approaching donors.
We have taken the reviewer's advice about developing a portfolio of projects for presentation to donors, which has been a useful tool. GEF projects are still being discussed both by in-country UNDP offices and UNEP, and we are participating in these discussions. The CMS meeting is also a good opportunity for promoting regional cooperation, and we are currently preparing a prioritised list of conservation actions for this meeting, as convenors of the technical workshop. The consensus list will be presented to the main range states meeting. WCS-China is carrying out a study of the horn trade, and we helped them to develop the proposal for this.

12. DARWIN IDENTITY
The Darwin logo has been used at all possible opportunities, including illustrating articles in the local press. We have made it clear to all stakeholders that the work is being funded by the Darwin Initiative, and we have received letters of thanks and support for the Darwin funding from our colleagues and partners, including government officals at the district, province and Republic levels. The project is recognised as having a distinct and clear identity, although we have used the high profile of the saiga to get across more general messages about nature conservation.

13. LEVERAGE

We have leveraged substantial additional funding for saiga conservation, as detailed in Appendix 2. This has come both as investment by partners and collaborators, and as funding from international donors. We have worked hard to strengthen capacity of our range state partners, through joint grant-writing, help with proposal development and exchange of information about possible funding sources. We feel that this investment of time has paid off well. We have achieved post-project funding as well as additional grants from other donors for our Kalmykian partners. In Kazakhstan, FFI is continuing their project with additional funds, and Imperial College is working with FZS to attract new funding for saiga conservation. Our newly-formed umbrella group, the Saiga Conservation Alliance, was invited to submit an application to the US-based NGO, the Wildlife Conservation Network, for Partner status. We have been shortlisted, and Elena Bykova has been invited to their Expo in October 2006 to present her ideas for a possible project in Uzbekistan. If we obtain WCN partner status, this will provide ongoing support for our activities, including *Saiga News*.

14. SUSTAINABILITY AND LEGACY

Project partners are continuing their active collaborations, and our vision for the future is of a snowball effect, so that saiga conservation becomes a part of everyday life for people living in the range area. The Darwin project was a key catalyst for all subsequent saiga conservation activities, because it was the first major international project to tackle the issues underlying the saiga's status. It has been hugely influential in leading the way for future interventions. Project staff are continuing to work together, and the physical resources provided by the Darwin grant are still being used for saiga conservation activities.

15. VALUE FOR MONEY

My personal view is that the Darwin project was extremely good value for money. The project was modestly funded and included a large number of partners in three countries, so the funding was thinly spread. However it has achieved a substantial amount, due to careful oversight and judicious targetting of resources. A major part of the credit for this must go to our in-country coordinator, Anna Lushchekina, who worked very hard to ensure that funding was spent effectively. We have also worked hard to leverage additional funding for our work, and to take advantage of opportunities that have arisen to promote our work without financial cost, particularly in the media. It is also important to note that none of the UK participants received any funding for their participation beyond reimbursement of expenses, and the range state partners also did not receive salaries for their work on the Darwin project, other than token payments for their time. Thus the organisations to which all project participants belonged, and in many cases the participants personally, were donating substantial amounts of their time to support our work on this project. This was done willingly, because of the commitment that all concerned felt to the aims of the project. However, it should be borne in mind when computing the true costs of this project.

APPENDIX I: PROJECT CONTRIBUTION TO ARTICLES UNDER THE CONVENTION ON BIOLOGICAL DIVERSITY

Project Contribution to Articles under the Convention on Biological Diversity		
Article No./Title	**Project %**	**Article Description**
6. General Measures for Conservation & Sustainable Use		Develop national strategies that integrate conservation and sustainable use.
7. Identification and Monitoring	25	Identify and monitor components of biological diversity, particularly those requiring urgent conservation; identify processes and activities that have adverse effects; maintain and organise relevant data.

8. In-situ Conservation	15	Establish systems of protected areas with guidelines for selection and management; regulate biological resources, promote protection of habitats; manage areas adjacent to protected areas; restore degraded ecosystems and recovery of threatened species; control risks associated with organisms modified by biotechnology; control spread of alien species; ensure compatibility between sustainable use of resources and their conservation; protect traditional lifestyles and knowledge on biological resources.
9. Ex-situ Conservation	5	Adopt ex-situ measures to conserve and research components of biological diversity, preferably in country of origin; facilitate recovery of threatened species; regulate and manage collection of biological resources.
10. Sustainable Use of Components of Biological Diversity		Integrate conservation and sustainable use in national decisions; protect sustainable customary uses; support local populations to implement remedial actions; encourage co-operation between governments and the private sector.
11. Incentive Measures		Establish economically and socially sound incentives to conserve and promote sustainable use of biological diversity.
12. Research and Training	20	Establish programmes for scientific and technical education in identification, conservation and sustainable use of biodiversity components; promote research contributing to the conservation and sustainable use of biological diversity, particularly in developing countries (in accordance with SBSTTA recommendations).
13. Public Education and Awareness	30	Promote understanding of the importance of measures to conserve biological diversity and propagate these measures through the media; cooperate with other states and organisations in developing awareness programmes.
14. Impact Assessment and Minimizing Adverse Impacts		Introduce EIAs of appropriate projects and allow public participation; take into account environmental consequences of policies; exchange information on impacts beyond State boundaries and work to reduce hazards; promote emergency responses to hazards; examine mechanisms for re-dress of international damage.
15. Access to Genetic Resources		Whilst governments control access to their genetic resources they should also facilitate access of environmentally sound uses on mutually agreed terms; scientific research based on a country's genetic resources should ensure sharing in a fair and equitable way of results and benefits.
16. Access to and Transfer of Technology		Countries shall ensure access to technologies relevant to conservation and sustainable use of biodiversity under fair and most favourable terms to the source countries (subject to patents and intellectual property rights) and ensure the private sector facilitates such assess and joint development of technologies.
17. Exchange of Information	5	Countries shall facilitate information exchange and repatriation including technical scientific and socio-economic research, information on training and surveying programmes

		and local knowledge
19. Bio-safety Protocol		Countries shall take legislative, administrative or policy measures to provide for the effective participation in biotechnological research activities and to ensure all practicable measures to promote and advance priority access on a fair and equitable basis, especially where they provide the genetic resources for such research.
Total %	**100%**	**Check % = total 100**

APPENDIX II. OUTPUTS

Code	Total to date	Detail
Training Outputs		
1a	Number of people to submit PhD thesis	1 - Aline Kühl
1b	Number of PhD qualifications obtained	0 - Due in 2007
2	Number of Masters qualifications obtained	4 - Aline Kühl (2003), Marcus Fry (2004), Nadezhda Arylova (2005), Andrew McConville (2006)
3	Number of other qualifications obtained	0
4a	Number of undergraduate students receiving training	31 – Nataliya Kusnezova (Kalmyk State University), Azamat Baysugurov, Almas Dzhmybekov, Bekzhan Makasev, Victor Fomin, Saberzhan Narmuratov (Kazakh National Agricultural University, Almaty) worked on the social surveys. 25 students from Kalmykian State University were trained in animal behaviour and husbandry at the Centre for Wild Animals
4b	Number of training weeks provided to undergraduate students	2 - Formal training (on-the-job training also provided)
4c	Number of postgraduate students receiving training (not 1-3 above)	1 - N. Balinova, Institute for Humanitarian Research, Kalmykia
4d	Number of training weeks for postgraduate students	2 - Formal training (on-the-job training also provided)
5	Number of people receiving other forms of **long-term** (>1yr) training not leading to formal qualification	0
6a	Number of people receiving other forms of **short-term** education/training	6 - M. Frolova (Kalmykia), A. Esipov, E. Bykova (Uzbekistan) trained in socio-economic survey techniques. D. Goryaev, G. Erdnenov, A. Grachev trained in biological transect methods.
6b	Number of training weeks not leading to formal qualification	1
7	Number of types of training materials produced for use by host country(s)	2 - a wide range of educational materials was produced in each country (see enclosures to previous reports for examples).
Research Outputs		
8	Number of weeks spent by UK project staff on project work in host country(s)	80 - A. Kühl (53), N. Bunnefeld (6), M. Fry (6), P. Kabat (6), D. Mallon , T. Gricks, A. Entwistle, R. Sharp (1 each), E.J. Milner-Gulland (5).

Code	Total to date	Detail
9	Number of species/habitat management plans (or action plans) produced	1 - Report on the role of alternative livelihoods for saiga conservation (attached at Appendix 9)
10	Number of formal documents produced to assist work related to species identification, classification and recording.	2 - Protocol for field data collection methods for biological surveys; Protocol for social survey methodology
11a	Number of papers published or accepted for publication in peer reviewed journals	1 - in international peer-reviewed journal. 1 - submitted and under review.
11b	Number of papers published or accepted for publication elsewhere	14 - in national journals and conference proceedings.
12a	Number of computer-based databases established (containing species/generic information) and handed over to host country	1 - A set of databases of saiga biological information (herd size and locations and calving data over 3 years in 2 countries, compilation of historical data on saiga ecology)
12b	Number of computer-based databases enhanced (containing species/genetic information) and handed over to host country	0
13a	Number of species reference collections established and handed over to host country(s)	0
13b	Number of species reference collections enhanced and handed over to host country(s)	0
Dissemination Outputs		
14a	Number of conferences/seminars/ workshops organised to present/disseminate findings from Darwin project work	8 - Project workshops: May 2006, Aug 2005, April 2004, April 2003. Feedback presentations to villages where social research carried out: Tavan-Gashun, June 2003; Khulkhutta, December 2003; Ulanbel, July 2004; Bosoi, July 2005
14b	Number of conferences/seminars/ workshops **attended** at which findings from Darwin project work will be presented/ disseminated.	20 - See Appendix 6
15a	Number of national press releases or publicity articles in host country(s)	2 - Newspaper articles based on project's work in Kazakhstan
15b	Number of local press releases or publicity	9 - Newspaper articles based on project's work in Kalmykia (this is a minimum estimate)

Code	Total to date	Detail
	articles in host country(s)	
15c	Number of national press releases or publicity articles in UK	2 press releases - Imperial College press office, IUCN ESUSG. 11 internationally read articles about our work - BBC Wildlife (Aug 2006), German magazines Eurasisches Magazin (30.8.05), Hoerzu (May 2004) and Der Spiegel Online (12.12.05), "Tengri" - onboard magazine for Air Astana (2006), French magazines "Terre sauvage" (Dec 2004 – Jan 2005) and National Geographic French edition (January 2004), "Nature Australia" magazine (summer 2003-2004), National Wildlife Magazine and Ranger Rick (USA, April/May 2004, Feb 2005), Life World Magazine (China, Oct 2004)
15d	Number of local press releases or publicity articles in UK	0
16a	Number of issues of newsletters produced in the host country(s)	2 - *Saiga News*. This is distributed in hard copy in the appropriate language in the range states as well as electronically on 3 websites (including http://www.iccs.org.uk/saiganews.htm)
16b	Estimated circulation of each newsletter in the host country(s)	Several hundred hard copies, also online.
16c	Estimated circulation of each newsletter in the UK	Internationally this is available online in 5 languages, and we have received a lot of positive feedback suggesting a wide distribution.
17a	Number of dissemination networks established	1 - Saiga Conservation Alliance. http://www.iccs.org.uk/SaigaAlliance.htm
17b	Number of dissemination networks enhanced or extended	0
18a	Number of national TV programmes/features in host country(s)	3 -. Documentary - Gala Productions (Kazakhstan), October 2005. "Vesti" news programme, Russian Channel 2, May 2006. A, Bekenov appeared on Kazakhstan's channel KTK on 20th February 2005, broadcast "How can we save the saiga in Kazakhstan?".
18b	Number of national TV programme/features in the UK	2 - BBC 4 "Saving Planet Earth", interview with E.J. Milner-Gulland. To be transmitted in autumn 2006. "Aline and the Saiga" - film by Marathon Productions, transmitted worldwide (via Canal Plus International), 2004-2006.
18c	Number of local TV programme/features in host country	6 - Film; Saiga - Karma Stepei (Russia), shown on Kalmykian TV, 2005. Kalmykia - Professor Yu. Arylov appeared twice (December 25, 2004 and March 17, 2005) on the local TV news programme "Vesti" interviewed about the status of the saiga and CSCWAK's role in implementing international conservation projects. E.J. Milner-Gulland and Aline Kühl were interviewed by Kalmyk State TV about saiga fieldwork and conservation in Kalmykia (April 2003, June 2003, May 2006).
18d	Number of local TV programme features in the UK	0
19a	Number of national radio interviews/features in host country(s)	0
19b	Number of national radio interviews/features in the UK	1 - BBC Radio 4, *Material World*. January 2006 (E.J. Milner-Gulland)

Code	Total to date	Detail
19c	Number of local radio interviews/features in host country (s)	3 - Professor Yu. Arylov and Dr. B. Ubushaev have been interviewed and answered questions from local people about saiga conservation in a live broadcast by a Kalmykian radio station (October 10, 2004). Dr. A. Lushchekina appeared twice (January 23, 2004 and December 6, 2004) and was interviewed and answered questions from the public about saiga conservation on the program "Your nobleness, Madam Nature" regularly broadcasted by "Telling Moscow" radio station.
19d	Number of local radio interviews/features in the UK	0
Physical Outputs		
20	Estimated value (£s) of physical assets handed over to host country(s)	£8464 - 2 computers**,** uniforms, binoculars, photo-cameras, power unit, night vision devices, vehicle.
21	Number of permanent educational/training/research facilities or organisation established	0
22	Number of permanent field plots established	0
23	Value of additional resources raised for project	Minimum £379,040: Okhotzooprom (Kazakhstan) - £4000 per year for aerial surveys. WWF-Russia (Kazakhstan) - £43,123 matching funds for conservation activities in Kazakhstan. INTAS - £161,000 from April 2004 for 3 years for research on the reproductive ecology of the saiga antelope. People's Trust for Endangered Species - £6000 for public awareness activities in Kalmykia in 2004. IFAW - substantial ongoing contributions in kind, particularly in helping us to transfer money to Russia without incurring substantial charges. ESRC/NERC - £3000 per year tuition fees, A. Kühl. WCS $20,000 to A. Kühl for fieldwork expenses in the period Oct 2003-July 2005. DGIS (via FFI) - £4694 for extension of project work to Uzbekistan, July-Dec 2004, and £35,000 for livelihoods project in Ustiurt arising out of Darwin project (2005-6). Chicago Zoological Society – $1,500 for saiga telemetry in Kalmykia, June 2004-June 2005. DEFRA SEPS - £26,790 for "Rotating Cows" project in Kalmykia. Darwin Initiative - £64,600 post-project grant, Kalmykia, May 2006-Dec 2007. Large Herbivore Foundation & Chicago Zoological Society - support for printing costs, £3000, 2005-6. USFWS - support of CZBR maintenance costs, US$4,560, 2005. Wildlife Conservation Network - support of Saiga Conservation Alliance work in Uzbekistan, Oct 2006, $10,000.

APPENDIX III: PUBLICATIONS

Type * (e.g. journals, manual, CDs)	Detail (title, author, year)	Publishers (name, city)	Available from (e.g. contact address, website)
National Journal	"The status of the saiga population in Kazakhstan in 2004." Iu.A. Grachev, A.B. Bekenov, 2005	Steppe Bulletin 17, 15-16. [in Russian]	http://ecoclub.nsu.ru/books/Stepbull.htm
National Journal	"Conservation of the saiga for future generations." A. Bekenov, 2005	Biologiya 2, March-April) [in Kazakh]	A. Bekenov, terio@nursat.kz
National Journal	"International meetings on conservation of the Mongolian gazelle and Saiga antelope".	Steppe Bulletin 17, 17-19. [in Russian]	http://ecoclub.nsu.ru/books/Stepbull.htm

	Kiriluk V., Lushchekina A., 2005		
Conference Proceedings	"The saiga antelope in the drylands of Russia and how to ensure its sustainable future." Iu. Arylov, A. Lushchekina, V. Neronov	Proceedings of International Workshop, Elista, Russia, 23rd-27th June 2004. UNESCO-MAB Drylands Series 4, p. 163-166	A. Lushchekina, mab.ru@relcom.ru
Book	"In a cradle of feathergrass" D. Kuzul'tinov, G. Kukareka, 2005	Dzhangar, Elista, Russia [in Russian]	A. Lushchekina, [copy enclosed with last year's annual report]
International Journal	"The saiga antelope - teetering on the brink but still cause for hope." Y. Arylov, V. Badmaev, A. Bekenov, J. Chimeg, A. Entwistle, Y.A. Grachev, B. Lhagvasuren, A. Lushchekina, D. Mallon, E.J. Milner-Gulland, V. Ukrainsky	Oryx 38, 250-251	[Copy sent previously]
Magazine	"Establishing links between saiga conservation and local livelihoods in Uzbekistan". T. Aylett	Fauna & Flora Magazine Oct 2004	Paul Hotham,
National Journal	Problems of the conservation of saigas in the Republic of Kazakhstan. Bekenov, A.B., Grachev, Iu.A. 2005	Scientific Journal of the Pavlodar' State University, Chemico-Biological Series 1, 119-126.	A. Bekenov, terio@nursat.kz
National Journal	Territorial organization of nature protection and perspectives of saiga survival within its habitat on the right bank of the Volga River. Lushchekina A.A., Neronov V.M., Badmaev V.S., Khludnev A.V. (2005)	Volga region ecological journal 1, 80-85	A. Lushchekina, mab.ru@relcom.ru
National Journal	Experience of breeding and keeping saigas (Saiga tatarica L.) in captivity. Kholodova, M.V., Arylov, Iu.N., Arylova, N.Iu., Lushchekina, A.A. 2005	Transations of the State Biosphere Nature Reserve "Chernye Zemli" 2005, 90-96.	A. Lushchekina, mab.ru@relcom.ru
National Journal	The local population's views on the reduction of the saiga population, and possibilities for saiga conservation in Kalmykia. Medzhidov R.A., Kaminov Yu.B., Obghenova O.B.2005.	Steppe Bulletin 18, 25-28.	http://ecoclub.nsu.ru/books/Stepbull.htm
Conference proceedings	Sharing experience between Russia and Mongolia in saving the endangered saiga antelope (Saiga tatarica tatarica and S. t. mongolica). Ecosystems of Mongolia and frontier areas of adjacent countries: natural resources, biodiversity and ecological prospects. Arylov Yu., Lushchekina A. (2005)	Proceedings of international conference, Ulaanbaatar, September 5-9, 2005, 242-245	A. Lushchekina,
Conference proceedings	Ecosystem approach for conservation and restoration of saiga population in the Lower Volga region. Biological recourses and biodiversity of the ecosystem of Volaga region: past, present and future. Neronov V. M., Lushchekina A. A., Arylov Yu. N. (2005)	Proceedings of International Workshop. Saratov, 2005, 164-166	A. Lushchekina,
E-bulletin	Saiga News. 2 issues published in 2005, 1	Saiga Conservation	http://www.iccs.org.uk/

	in June 2006.	Alliance	saiganews.htm
Magazine	Desperately Seeking Saiga. E.J. Milner-Gulland & Aline Kühl (2006)	BBC Wildlife, August 2006	* [draft attached]
National Journal	Status of the population and perspectives for the conservation of the saiga in Kazakhstan. Iu.A. Grachev, A. Bekenov. (2006 - in press)	Stepnoi Bulletin	
National Journal	Saiga antelopes on the international stage - developments over the last 3 years and future prospects. D.P. Mallon (2006 - in press)	Stepnoi Bulletin	
National Journal	Using saiga antelope conservation to improve rural livelihoods. E.J. Milner-Gulland, A.A.. Lushchekina, A.B. Bekenov, Iu.A. Arylov (2006 - in press)	Stepnoi Bulletin	
National Journal	International projects on the study and conservation of saigas in Kalmykia. Iu.N. Arylov, V.V. Voznesenskaya, A.A. Lushchekina, R.A. Medzhidov, E.J. Milner-Gulland , B.S. Ubushaev. (2006 - in press)	Stepnoi Bulletin	
National Journal	The saiga in Uzbekistan - current status and reasons for population decline. Bykova, E.A., Esipov, E.V., Efimov, A.Iu., Golovtsov, D. (2006 - in press)	Stepnoi Bulletin	
International journal	The “Big spenders” of the steppe: sex-specific maternal allocation and twinning in the saiga antelope. Aline Kühl, Atle Mysterud, Gennadiy I. Erdnenov, Anna A. Lushchekina, Iuri A. Grachev, Amankul B. Bekenov and E.J. Milner-Gulland (in review)	Proceedings of the Royal Society of London B (in review)	* [draft attached]

APPENDIX IV: DARWIN CONTACTS

Project Title	Using saiga antelope conservation to improve rural livelihoods
Ref. No.	12/028
UK Leader Details	
Name	E.J. Milner-Gulland
Role within Darwin Project	Project leader
Address	Division of Biology, Imperial College London, Silwood Park, Buckhurst Road, Ascot, Berkshire, UK. SL5 7PY
Phone	020 759 42509
Fax	
Email	
Partner 1	
Name	Anna Lushchekina
Organisation	Institute of Ecology and Evolution, Russian Academy of Sciences
Role within Darwin Project	Project leader in the host countries
Address	13 Fersman Street, Moscow 117312, Russia
Fax	
Email	
Partner 2	
Name	Amankul Bekenov
Organisation	Institute of Zoology, Ministry of Education and Science, Kazakhstan
Role within Darwin Project	Project leader in Kazakhstan
Address	Institute of Zoology, Akademgorodok, Almaty 480032, Kazakhstan
Fax	
Email	

APPENDIX V. REPORT OF PROGRESS AND ACHIEVEMENTS AGAINST LOGICAL FRAMEWORK.

Project summary	***Measurable Indicators***	***Progress and Achievements***
Purpose To save the critically endangered saiga antelope from extinction and support impoverished rural communities by building a framework integrating saiga conservation and sustainable use of natural resources with communities' needs and aspirations.	**1)** Foundations of a lasting conservation programme in place. **2)** Saiga populations show evidence of stabilisation or improvement. **3)** Building blocks for transboundary saiga conservation action in position. **4)** Assessment of sustainable rural livelihoods completed and acted upon. **5**) Rural communities actively participating in conservation of saiga antelopes. **6)** Scientific monitoring providing reliable data.	**1)** We have contributed substantially to raising international awareness about the status and needs of the saiga antelope. We have secured funding for continuation of the conservation work in both countries. **2)** The Kalmykian population continues to appear stable, according both to Government counts and our monitoring. Reproductive output is healthy in our study area, although the proportion of males is still low. In Kazakhstan, offical counts suggest slight population increases, but our detailed monitoring paints a worrying picture. **3)** We have extended our work to Uzbekistan, built a network of saiga professionals, and contributed to CMS activities. **4)** We have implemented a pilot project based on the results of this assessment in Kalmykia, and our partners FFI have implemented one in Kazakhstan. **5)** We have had a high local media profile and have engaged significantly with local people. **6)** We now have a tested monitoring protocol, which has been rolled out to other areas.
Outputs		
1) Foundations of a conservation programme able to continue saiga protection.	**1)** Saiga rangers employed, equipment purchased, legal powers established.	We have supported rangers by providing training, salaries, a vehicle and field equipment. We have extended this support to the adjacent Stepnoi Sanctuary.
2) Trained rangers, wardens and young scientists to continue monitoring.	**2)** 2 young scientists, 6 rangers and 20 wardens trained in conservation and monitoring.	We have trained 8 young scientists, 3 rangers (in saiga monitoring, CZBR) and 6 senior scientists. We have also trained large numbers of undergraduates and school children less formally, through site visits and lectures.
3) An understanding in the region of the philosophy and methods of community-based conservation.	**3)** Workshops held on lessons from elsewhere (yr 1) and from saiga project (yr 3). Educational materials for local people.	We have continued to use community-based conservation methods and to strengthen grass-roots support for our work. We have produced and distributed educational materials for local people in both Kazakhstan and Kalmykia. We held large formal workshops in Years 1 & 2, and informal discussions with local partners in year 3.
4) Sustainable livelihoods for rural people.	**4)** Framework for a sustainable use scheme for saigas set up, eventually providing revenue and resource ownership to local communities. Assessment of alternatives done.	Based on the results of our livelihoods surveys and assessments of alternatives in Kalmykia, we have implemented a "Rotating cows" project, which is ongoing in the area adjacent to the CZBR. Our partners FFI have set up a livelihoods support project in the main poaching village in the Ustiurt saiga population, Kazakhstan, again based on our survey results, and following an assessment of alternatives.
5) Scientific research focussed on linkages between human activities and saiga ecology	**5)** Papers in scientific journals.	We have submitted the first paper based on our biological monitoring results to a top scientific journal. We are now continuing analysis of the data, and expect to submit another 3 or more papers in the near future.

APPENDIX VI. CONFERENCES/SEMINARS/WORKSHOPS ATTENDED (OUTPUT 14B)

1. International Meeting “Bioresources and biodiversity of the Volga ecosystem”, 24-28 April 2005, Saratov, Russia;

2. Northern Buddhist Conference on Ecology and Development. Ulaanbaatar, Mongolia June 20th-23rd 2005;

3. “Ecosystems of Mongolia and frontier areas of adjacent countries: natural resources, biodiversity and ecological prospects”. Ulaanbaatar, September 5-9, 2005.

4. Presentations at the UK National level include talks at the Universities of East Anglia, Oxford and Kent and the NERC Centre for Population Biology in the UK.

5. Annual Meeting of the Society for Conservation Biology New York, 2004.

6. Annual Meeting of the Society for Conservation Biology San Jose, 2006 (2 talks).

7. UNESCO International workshop on “Traditional Knowledge and Modern Technology for the Sustainable Management of Dryland Ecosystems” (Elista, Russia, June 23-27, 2004)

8. Bilateral US-Russia meeting on environmental protection (Moscow, December 1-3, 2004).

9. International conference on “Current problems in Ecology” (Karaganda, Kazakhstan, December 2-3 2004)

10. International conference on the conservation of the Mongolian gazelle and Saiga antelope (Ulaanbaatar, October 2004).

11. Student Conference on Conservation Science (Cambridge, March 2005).

12. Graduate Student Workshop, UK PopNet (Centre for Population Biology, Imperial College, Jan 2005)

13. Workshop on birds of prey convened by the Center of Ecological Projects of Kalmykia (Elista, December, 2004).

14. Presentation at the Institute of Zoology, Kazakhstan, at a Frankfurt Zoological Society, WWF International, RSPB/Birdlife meeting on saiga conservation (Almaty, June 2005)

15. Departmental presentation at the University of Oslo, Centre for Ecological and Evolutionary Synthesis (March 2006)

16. Presentation at the “Arbeitskreis Wildbiologie der Justus-Liebig-Universität Gießen e.V.” (Working group on wildlife biology, Justus-Liebig University, Giessen, Germany, 2006)

APPENDIX VII. LETTER FROM THE PRIME MINISTER OF KALMYKIA

ХАЛЬМГ
ТАҢҺЧИН
ПРАВИТЕЛЬСТВ

ПРАВИТЕЛЬСТВО
РЕСПУБЛИКИ
КАЛМЫКИЯ

358000, Республика Калмыкия, г. Элиста, Дом Правительства

Исх. АК-04-4166 пр "02" 12 2005 г.

В ФОНД «ДАРВИНСКАЯ ИНИЦИАТИВА»

Учитывая критическое состояние сайгака, включенного в Красную книгу МСОП, в мае 2002 г. по инициативе Правительства Республики Калмыкия в Элисте было проведено международное совещание по охране сайгака, в котором приняло участие более 100 специалистов из всех стран ареала этого вида и ряда международных организаций. После этого совещания руководство республики обращает особое внимание на выполнение его рекомендаций всеми природоохранными структурами республики. В этом плане особо необходимо отметить большой вклад международного проекта «Взаимосвязь между благосостоянием сельского населения и охраной сайгака в Калмыкии и Казахстане», поддержанного Фондом «Дарвинская инициатива» (2003-2006 гг.).

В рамках этого проекта было организовано обследование местного населения и существенно улучшены научные исследования, проводимые в Биосферном заповеднике «Черные земли», Центре диких животных Республики Калмыкия и Центре экологических проектов Республики Калмыкия. Такое сотрудничество способствовало повышению информированности местного населения о мероприятиях, проводимых участниками проекта для изучения биологии сайгака, и, несомненно, благоприятно сказалось на стабилизации численности этого вида на территории Калмыкии.

Пользуясь этой возможностью, Правительство Республики Калмыкия выражает искреннюю благодарность Фонду «Дарвинская инициатива» за поддержку усилий по сохранению европейской популяции сайгака. Мы очень надеемся, что Фонд «Дарвинская инициатива» сочтет возможным продолжить этот проект в 2006-2007 г.г.

Председатель
Правительства Республики Калмыкия А. Козачко

(Translation by E.J. Milner-Gulland)

GOVERNMENT OF THE
REPUBLIC OF KALMYKIA

358000, Republic of Kalmykia, Elista, Government House

2nd December 2005

TO THE DARWIN INITIATIVE

Bearing in mind the critical condition of the saiga, which is included in the IUCN Red List, in May 2002 an international meeting was held in Elista on the conservation of the saiga, at the initiative of theGovernment of the Republic of Kalmykia, in which participated more than 100 experts from all the range states of this species and a variety of international organisations. After this meeting the government of the republic paid special attention to fulfilling its recommendations in all the nature conservation structures of the republic. In this plan it is especially necessary to note the major contribution made by the international project "Interactions between the livelihoods of local people and conservation of saigas in Kalmykia and Kazakhstan", supported by the Darwin Initiative (2003-2006).

As a component of this project social research on the local people was carried out, as well as vital improvements in the scientific research being carried out in the "Chernye Zemli" Biosphere Reserve, Centre for Wild Animals of the Republic of Kalmykia, and the Centre for Ecological Projects of the Republic of Kalmykia. Such collaboration contributes to the improvement of information to local people about the measures being undertaken by the project team to study the biology of the saiga, and undoubtedly, to the favourable reports of the stabilisation of the numbers of this species in the territory of Kalmykia.

Taking this opportunity, the Government of the Republic of Kalmykia would like to express our sincere thanks to the Darwin Initiative for your support of our efforts to preserve the European population of the saiga. We very much hope that the Darwin Initiative will consider the possibility of continuing this project in 2006-7.

Prime Minister [signed]
Government of the Republic of Kalmykia A. Kozachko

APPENDIX VIII. REPORT ON ALTERNATIVE LIVELIHOODS

Achieving Saiga Conservation through Livelihood Improvement

Eurasia Programme, Fauna & Flora International
Tiffany Aylett 2005

INTRODUCTION

Since the mid 1990's, FFI's Eurasia Programme has been actively working in Central Asia. Our conservation programmes have varied from sustainable resource use and protected area development in the spectacular mountainous country of the Kyrgyz Republic, to the development of national level policy documents in Turkmenistan. Throughout this region, a significant number of our programmes have included interventions that seek to develop sustainable livelihoods for local communities. The need for livelihood focused projects has been directly driven by the extreme poverty of rural communities in the region, the high impact of these communities on the biological resources, and the low capacity of civil society to address either of these issues. Indeed throughout the world, improving the livelihoods of local people in a targeted way is an essential tool being used to achieve biodiversity conservation goals by many of FFI's projects.

Nevertheless, there is heated debate internationally regarding the value and impact of livelihood initiatives as a means to achieving biodiversity conservation outcomes. In this context FFI has been actively examining its livelihood focused interventions, and is using this learning to improve and monitor the success of our current and future projects. In the Eurasia programme Central Asia has been a focus for this work, and in 2003 the programme began applying its understanding and experience of livelihood issues in Central Asia to tackle the problem of the saiga antelope (*Saiga tatarica tatarica*), a Critically Endangered antelope that ranges through the arid lands of Central Asia.

The opportunity to write this report has come from the Darwin Initiative project implemented by Imperial College London. Through it we hope to communicate the reasons behind FFI's livelihood improvement strategy regarding the saiga antelope, and to describe some of the challenges we are facing in developing this pilot programme.

The saiga antelope

At first sight, the saiga is a rather small and strange looking antelope. At closer inspection however it stands out clearly as one of the world's truly remarkable species. Its unusual physical attributes (such as its enlarged nose) enable it to survive the extremes of the arid steppe landscapes; one of the harshest environments in the world. Saiga undertake seasonal migrations travelling thousands of kilometres to rutting, calving and wintering grounds. Until as recently as the 1980s these were spectacular events, involving herds of up to 100,000 animals.

The character of this resilient, nomadic antelope justifies its position as an emblem for both the natural and human communities of the Central Asian steppe. The saiga is esteemed in local culture and frequently represented in traditional folklore, commonly appearing in song and poem. Sadly, and perhaps indicative of its close relationship to humans, the dramatic decline in saiga populations mirror the recent decline into poverty and the social isolation of the people of the steppe.

The decimation of the saiga

In the late 1980's the global saiga population was estimated to be over one million animals. Since then numbers have decreased by more than 94%, and continues to fall at this rate today. Populations are now isolated in 4 distinct areas. The saiga is listed as Critically Endangered (the highest IUCN Red List threat category), and is on Appendix II of CITES.

Various factors are believed to have contributed to the decline of the saiga. Large areas pf the fragile steppe landscape that makes up its habitat have been destroyed and degraded through a range of poorly planned activities (such as the `improvement' of the steppe for large scale agriculture). The development of roads, railways and pipelines has also fragmented the steppe and restricting the free migration of saiga herds, thereby reducing the saiga's ability to move and adapt to natural patterns of change. Saiga numbers are also known to be affected by climatic variation and disease (Bekenov *et al.,* 1998), however, there is no indication that these factors are responsible for the recent decline. Ultimately it is widely believed by scientists and conservationists that extreme and relentless hunting / poaching is the prime reason for the saiga's decline (Milner-Gulland *et al.,* 2001).

Text box 1 - FFI's draft position statement on human needs:

"FFI will endeavour to ensure that its conservation activities do not disadvantage or undermine poor, vulnerable or marginalised people that are dependent upon or live adjacent to natural resources, and wherever possible will seek to conserve biodiversity in ways that enhance local wellbeing and reduce disadvantage."

Poverty is considered to be the prime driver behind poaching; saiga are hunted as a vital source of meat and income. The meat is consumed locally and the horn is sold on through middle men to the traditional Chinese medicine market.

IMPROVING LIVELIHOODS, REDUCING THREATS TO BIODIVERSITY

Conservation organisations such as FFI have for many years recognised the importance of addressing local livelihoods when undertaking long term biodiversity conservation initiatives. This is founded in the experience that conservation projects are unlikely to be successful if they go against the fundamental interests of local people. It is also now widely acknowledged that biodiversity plays a central role in the lives and livelihoods of the world's poorest and most disadvantaged people. Moreover, given the opportunity local people can be excellent stewards of natural resources and can be the best partners to ensure long term conservation success. Hence, where-ever appropriate, FFI works to improve local livelihoods, to reduce poverty and to encourage local responsibility for conservation (see text box 1).

The approach is not without its critics and there is an ongoing debate about the impact and appropriateness of conservation organisations undertaking development work to achieve conservation aims. Many conservation organisations have attempted to implement interventions with positive outcomes for local poverty and biodiversity conservation, often with limited success. And it is argued that the global record of conservation in relation to poverty alleviation and human rights has been tarnished as a result.

FFI does not claim to have all the answers, or to be able to alleviate poverty purely through conservation interventions or vice versa. The problems of poverty and resource use are often extremely complex, and it may not always be possible to find appropriately balanced solutions. FFI maintains a constructively critical position on this, learning lessons from its own practical work experience and that of others.

Conservation activities can generally be divided into direct programme interventions, in areas of conservation concern, or indirect interventions focused, for example, on supporting

and building the capacity of local partners to undertake direct conservation action. In both cases conservation interventions can influence livelihoods and human needs.

Livelihoods focused interventions fall broadly into three categories: - Entry-point, Trade-offs and linked livelihoods. The distinctions between these are often blurred and projects may employ more than one approach simultaneously or at different times.

Entry-point

Addressing livelihood needs that are a priority to a local community can build credibility and trust, even if it does not directly address biodiversity threats. Other positive outcomes include mobilising the civil society sector and increasing community capacity for decision making. An example of this from FFI's portfolio is the CBF Small Grants Programme (SGP) in Kyrgyzstan. The objectives of the SGP are to support the development of a network of community-based NGOs who in turn, implement activities that to seek to bring tangible benefits to communities by developing community led support systems and alternative income sources. Although the direct conservation outcomes of the SGP-supported projects are limited, the network of community-based NGOs and the social licence to operate, generated through the SGP has enabled FFI to more effectively pursue its conservation mission in Kyrgyzstan. Moreover, several of the NGOs supported by the SGP have begun to raise concerns about biodiversity issues and are actively looking to work with FFI to address these issues.

The benefits of an entry-point approach are its immediacy in addressing human needs and building local credibility and trust, as part of a longer-term conservation strategy. There are some challenges, however:

- Focusing on human needs without an overt linkage to conservation goals risks sending the wrong message to communities about what FFI stands for. Attempting to build in conservation agendas at a later date may be seen as "shifting the goal posts" and attaching conditionality to hitherto unconditional support.
- FFI on its own may not be the most appropriate organisation to deliver direct livelihoods support.
- Some projects may inadvertently have a negative conservation impact unless environmental safeguards are built in.
- There is always the danger that short term livelihoods input will not be translated into longer term conservation gain.

These issues need to be carefully considered in planning this kind of approach.

Trade-offs

An intervention is undertaken in return for (or as compensation for) a conservation action implemented by (or affecting) community members. This includes offsetting the costs of conservation in terms of lost or reduced access to and use of land or resources, and developing 'alternative livelihoods' that are less dependent on, or damaging to, natural resources of conservation concern.

One benefit of these approaches is their transactional nature, where it is clear that a deal is being done, with both sides benefiting. In addition, when people are made aware of the conservation significance of their local environment or species, this can engender local pride. As people begin to value their local biological resources more in this way, it can supplement or supersede the material benefits of the trade-off in people's decision-making.

The challenges can also be significant, however:

- Community members may decide not to take up the offer of alternative livelihood support, especially where tangible benefits are unlikely in the short term. It is often more immediately profitable to continue with environmentally damaging practices, even if these are unsustainable in the long run.

• Alternative livelihoods may not be viable, and even if they are, benefits may take a long time to materialise and may not be sufficient to meet expectations or to offset conservation costs.
• Linkages between livelihoods support and conservation obligations are not always recognised or respected, and even if those targeted with livelihoods support alter their behaviour, others with the power to influence or exploit natural resources may not.

It is therefore very important that a comprehensive feasibility study for alternative livelihoods is undertaken in advance, that the most appropriate target stakeholders are identified, and means are developed to ensure that beneficiaries understand and uphold their conservation obligations in return for the livelihood support provided.

Developing linked livelihoods
Building on the trade-off approach, new or improved livelihoods opportunities are developed that rely on, and are therefore closely linked to and more likely to support, conservation. This might include employment of local community members as forest guards, the development of ecotourism providing jobs and income to community members, or the development of novel sustainable use projects.

Linked livelihoods are clearly the most integrated form of conservation-poverty linkage, and therefore very valuable to explore. However they do suffer some of the same challenges as the trade-off strategies described above. In particular:
• Ecotourism is a notoriously unpredictable market, and bears considerable risk of failure or small-scale returns. It can also be environmentally damaging.
• Sustainable use may be less than sustainable, resulting in overexploitation if not carefully managed, and sustainable off-takes may yield fewer benefits than anticipated.
• Supporting community guards and ranger forces is a financial drain and some creative thinking is required to find dependable, long-term sources of funding.

Broadly speaking, whichever combination of the above types of intervention that are used, the most appropriate impacts tend to be those that:
• Are affordable and cost effective
• Are strategic – contributing to the conservation objectives
• Are likely to have a demonstrably positive livelihoods outcome
• Are not going to disadvantage any vulnerable groups
• Are focused on the poorest or those most likely to influence change
• Are defined by and with target groups or individuals

The table in Annex 1 gives some examples of FFI activities that are carried out for biodiversity conservation goals that include components of local livelihood improvement.

LIVELIHOOD IMPROVEMENT AND SAIGA CONSERVATION

Why will improving livelihoods achieve saiga conservation?

It is widely accepted that the unsustainable and relentless hunting has been the primary cause of the decline in saiga numbers in the last 15 years. Recently, a partnership of UK and range state scientists have demonstrated that poaching is clearly linked to rural poverty. FFI is therefore seeking a way to address the underlying poverty that is driving the need for local communities living close to the Ustiurt plateau to poach,.

Since the collapse of the Soviet Union, the social and economic situation has changed significantly throughout the saiga's range. Political and economic transition has had a catastrophic impact on rural communities and natural resources. In the saiga rangeland, collectivised farming systems (and the livestock markets sustaining them) have broken down, and rural populations no longer have the means to maintain their agricultural systems and no options to find alternative employment. As a result, poaching for saiga horn has provided a

vital source of income. This 'social' need, is further driven by an increase in demand for horn for the traditional medicines market, and coincides with an overall and very significant reduction in capacity and funding to enforce hunting bans. Hence, local people can hunt without fear of prosecution.

Saiga poaching is carried out by men of the poorest families in the communities bordering the saiga's migration routes. These families tend to be at the bottom of the social spectrum, including those with the fewest employment opportunities and lowest education levels. Poaching is not considered to be 'easy money'; it is a dangerous, illegal, and physically demanding activity and other community based jobs are preferred, but are not available.

It is therefore anticipated that a conservation intervention that includes an improvement in the livelihoods (specifically increasing the income) of poor families will reduce levels of saiga poaching. In addition, a well focused intervention could also increase the support for saiga conservation from within the local communities; thought to be essential for long term saiga conservation given the difficulty of patrolling the vast areas of the saiga migration routes.

FFI's pilot programme in Kazakhstan

FFI's Eurasia programme is using funds provided by the Dutch Government[1] to initiate a pilot programme in Kazakhstan. The programme aims to develop, implement and evaluate a model for improving livelihoods within the Ustiurt Plateau region, with the specific aim of reducing levels of saiga poaching. The pilot programme has three basic aims:

To develop the capacity of a local organisation through which to implement the programme

To develop an intervention that provides alternative, sustainable livelihoods to saiga hunters

To build support for and ownership of saiga conservation within rural communities

The programme

The programme is seeking to achieve these aims by supporting the development of a local NGO who in-turn supports local people to come together to develop and implement community-level projects in villages on the eastern fringe of the Ustiurt Plateau. The community projects focus on the development of small businesses and initiatives that provide employment opportunities for poachers and wherever possible wider environmental/community benefit. This approach in many ways mirrors the SGP model successfully used by FFI in the Kyrgyz Republic.

The main goal of the programme is to identify the best possible mechanism for supporting community groups to develop and implement projects aimed at supporting livelihoods and reducing saiga poaching.

In the first instance the initiative is being piloted in one community and the lessons learned from this experience will be rolled into a larger scale programme across the region (subject to administrative and funding dependencies).

FFI is working in collaboration with Kazakh NGOs (one local, one national), with whom a locally appropriate implementation structure, and project methodology is being designed. The local NGO will work at the community level to implement the project, supported by the FFI team and the national NGO. FFI and the national NGO will mentor and train the local NGO as it proceeds.

[1] Funding from the Dutch Ministry of Foreign Affairs supports the FFI project "Resources for Improved Livelihood', of which the Kazakh saiga pilot programme is a component.

The local level process commences with the delivery of a series of workshops that are used to engage village members, and to begin raising their awareness of the issues surrounding the saiga. During the workshops the basic idea for supporting small projects is explained, and people interested in starting up a project are invited to complete a simple application form. The FFI team then supports the applicants throughout the application procedure, through generating and improving ideas, to helping with the completion of the application form. In this way, the applications are more likely to be relevant to saiga conservation and have greater community and environmental benefit.

The applications are then critically assessed and successful applicants are supported to implement their ideas. Once a project is approved, a local programme officer is regularly on hand to support the project leaders to implement their projects. This officer can assist with most issues, and can flag up any problems and channel external support promptly. Training is also provided to project teams and the wider community on subjects relevant to the local situation such as business planning and making grant applications.

FFI believes that project ideas that have been locally generated and supported in this way, have a much greater chance of long term success. In our experience the local project teams have a strong sense of ownership, and work hard to make the project successful. Furthermore locally developed initiatives are more often better suited to the local social and economic situation and stand a greater chance of success.

Entry point intervention

The long tem aim of this work is to gain support and action for saiga conservation within local communities, and this particular programme clearly falls under the entry point type of intervention. In the first couple of years the key tasks have been to build trust and credibility within the community, to develop an effective implementation structure, and to determine the best method of supporting local projects. Communities such as those on the Ustiurt plateau often have little or no knowledge of NGOs, or conservation programmes, thus it takes time to begin implementing any programme. Furthermore in these communities, the concepts of community cooperation, sustainable resource use and self help can be alien. This pilot programme is an ideal way to begin to start helping the communities to understanding why and how they can support saiga conservation, how they can be helped to find alternative employment from saiga, and how they can become ultimately responsible for saiga conservation.

As described earlier, there are several challenges facing entry point interventions. Given that livelihood improvement activities are related but not directly linked to saiga conservation, a critical challenge for this programme will be to ensure firstly, that it remains focused on reducing saiga poaching, and secondly, that this focus and the relationships between the projects and the saiga are clearly communicated to the community. It is essential that the community understand that addressing their livelihoods is one approach within a wider saiga conservation strategy. Improving livelihoods without this clear message could lead to confusion and misunderstandings in the future. The goals of the programme should be reinforced at every opportunity and projects chosen for support should have a clear benefit to saiga poaching. Furthermore a parallel awareness raising programme should be conducted in the village to support the overall goals of the programme.

A further challenge lies in ensuring that short term livelihood inputs translate into long term conservation goals. For this to happen, alternative livelihoods must be more attractive than the quick wins of poaching, and must bring in sufficient income to reduce or halt the need for poaching by a family. This will be partly dependent on the success of the community projects, but also on the dynamics of the saiga horn trade in the future.

It is important to note that the livelihoods approach is a medium to long-term strategy that will not usually deliver rapid biodiversity impacts. The pilot programme will be closely monitored and evaluated to determine its success in this regard. Nevertheless, it would be

unrealistic to expect this pilot programme to deliver a measurable positive impact on saiga numbers in the near future.

Trade Off components

By supporting the development of alternative livelihoods that are less damaging to the natural resources of the local area, the programme can also be seen as having elements of a 'trade off' intervention. This demonstrates the importance of implementing locally developed projects, projects that offer an improved livelihood as a trade off for the loss of saiga income. This approach will become more relevant in the future, as enforcement of hunting laws begins to prevent communities taking advantage of desperately needed income from saiga.

Beyond the pilot programme

In the future, the lessons learnt from this programme can be used to expand the concept to other areas of this and other saiga range areas. This document has been written prior to a full evaluation of the pilot programme and therefore, should be considered as work in progress. However, it is clear that we do not yet have all of the solutions to the challenges faced by this type of intervention. Hopefully as the programme grows over the following year, further obstacles will be surmounted, and a method to reduce saiga poaching through livelihood improvement can be fully developed.

FFI recognises that improving livelihoods of the local communities is only one of the conservation interventions that need to be implemented to save the saiga. However, by working to improving livelihoods in this region we are recognising the two basic principles mentioned earlier that will be essential to the long term future of saiga. Namely any conservation interventions are unlikely to be successful unless they are supported by local people. This is particularly relevant for saiga, in a vast region with extreme poverty, as long as the need (and trade demand) remain, people will continue to hunt for saiga. Secondly, in the long term, local people can become excellent stewards of this natural resource. Historically vast areas of saiga were protected and sustainably managed, and with the support of the local communities we hope that this can be achieved once again.

Appendix one –

Examples of direct livelihood activities implemented by FFI around the world, to achieve biodiversity conservation goals

Components of Livelihoods	*Activities of FFI programmes*
Impact on human capital	• Training forest guards, wildlife monitors, and conflict enumerators. • Training for employment in tourism. • Training in product development and marketing (bee-keeping, handicrafts, etc.). • Education (specifically environmental or otherwise) • Healthcare provision. • Establishment of Natural Resource Management committees
Impact on financial capital	• Provision or facilitation of employment opportunities, e.g. as forest guards or tourist guides. • Small-scale business development. • Provision or facilitation of collective income (tourism revenue-sharing, trophy-hunting quotas, incentives).

	• Improved access to external funding sources (credit, donor support).
Impact on natural capital	• Development of participatory management plans. • Forest and watershed protection. • Increasing the viability of wildlife populations. • Protecting water sources, reducing fire. • Protecting crops and livestock. • Assisting the development and promotion of sustainable agricultural, forestry and fishing practices.
Impact on physical capital	• Equipment provision. • Improved roads and transport. • Construction of schools, clinics, community campsites, etc. • Protection of infrastructure from wildlife damage.
Impact on social capital	• Strengthening NRM institutions. • Enhancing community cooperation through exchange visits, etc. • Promoting cultural heritage.
Impact on livelihood strategies	• Protect and strengthen existing livelihood strategies. • Enable livelihood diversification (tourism, other forms of natural resource use, service and support businesses, etc.)
Impact on structures and processes	• Influencing, development and implementation of relevant government policy and strategy (biodiversity, legal, land tenure, rural development, etc.). • Development and strengthening of community institutions. • Improving partnerships and co-ordination between government, community and other stakeholders. • Raising awareness nationally and locally of poverty and conservation issues.

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