



GIS mapping of habitats and further field research to identify the priority leopard (*Panthera pardus*) areas in Dagestan, Russian North Caucasus

Final report

Yury Yarovenko

Laboratory of Animal Ecology
Dagestan Scientific Centre
Caspian Institute of Biological Resources
Gadjiev Str. 45, Makhachkala 367025
Russia

Tel: (+8722) 67-60-66
Fax: (+8722) 67-58-81
Email: yarovenko2004@mail.ru

7 February 2012
Makhachkala, Dagestan

INTRODUCTION

In the previous Rufford projects, we obtained reliable information confirming the presence of the leopard (*Panthera pardus*) in the Republic of Dagestan, south-east of the Russian Greater Caucasus. In this project, we continued exploring the presence areas where the cat records are most frequent. Fifteen digital camera-traps were purchased and employed and a GIS specialist was hired to assess the status of the leopard and its habitats in the republic. Local villagers were actively involved throughout the project. The project results were widely publicized through the regional mass media and disseminated among the region's conservation and scientific organizations.

In Dagestan, like elsewhere in the Caucasus, the leopard has been a symbol of mountains and local communities. Despite this, its number had plummeted to the critical bottom line. Before 2008, it was never purposefully studied and all gleanings about its distribution and status used to be collected alongside with other research projects. During the 2nd Rufford project "Population ecology of the leopard (*Panthera pardus*) in Dagestan, Russian North Caucasus" (2009-2010), we have proved the existence of leopards in three hinterland areas of south-western Dagestan.

In the third Rufford project, we have combined field research (camera-trapping, sign and public surveys) with the GIS mapping of terrain, landscapes, roads, settlements, prey distribution and other important factors of leopard distribution.

To raise awareness and increase motivation of local people, we hired 3 local villagers and equipped them with 2 binoculars and one digital camera. The wall calendar 2012 with the Rufford logo was printed in Russian, English and vernacular languages and disseminated among the key communities, educational and conservation organizations, and all interested stakeholders in Dagestan. An illustrated overview was produced as pdf files on compact discs and distributed.

Our project activities were approved by local people and supported by a small grant of World Wide Fund for Nature (WWF) office in the North Caucasus. The territory located on the right bank of the Andiyskoe Koisu River where leopards were frequently encountered and a stapled population of the prey, bezoar goat (*Capra aegagrus*), exists has been proposed for the establishment of Khuzakhsky Natural Park. In 2012, all necessary documents and spatial design works will be finished to officially endorse this brand-new protected area.

The establishment of protected areas containing at least 50% of suitable leopard habitats can assure the safer future for this big cat in the Caucasus. Hopefully, our initiatives will be further supported by other international foundations as well. Some donors are already active in this work (**Appendix, Figs. 1, 2**).

Functioning of Khuzakhsky Natural Park will enable to recover the status of leopard prey species (bezoar goat, wild boar, roe deer and others) and eventually to entice leopards for residence. Currently, this area is only sporadically visited by these cats, being a part of much larger home ranges.

Unfortunately, during this project we failed to obtain a permit for working in the study areas indicated in the proposal (Tsuntinsky and Tsumadinsky districts along the Andiyskoe Koisu River, close to the border with Georgia). The reason was that these areas were swept and combed by army troops in search of the terrorist gangs.

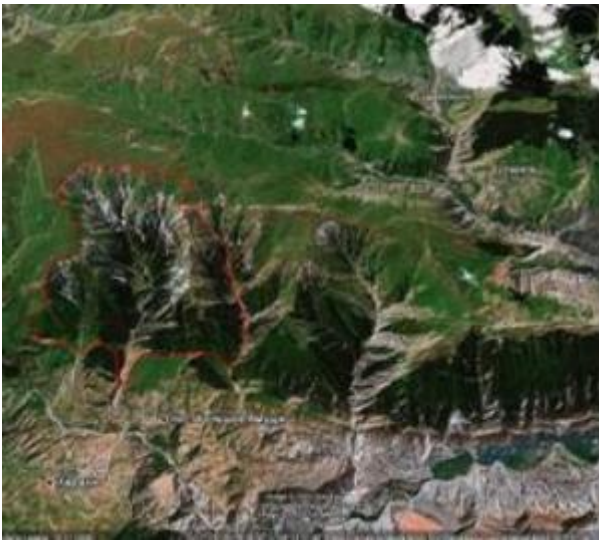


Fig. 1. The space image of Khuzakhsy Natural Park

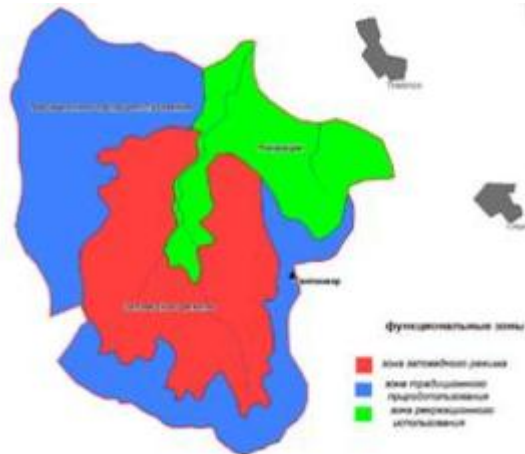


Fig.2. Functional zooming of Khuzakhsy Natural Park. Red – reserve zone; Blue – Economic zone; Green – recreational zone

For the same reason, we could not survey the Kazbekovsky district where local people and hunters glimpsed leopards and even observed a female with a cub.

Most of the project activities were carried out in the Arzhuta Ridge and southern Dagestan where leopard records are also available.

FIELD WORK

We visited twice the Dokuzparinsky and Akhtynsky districts, surveying in total 46 km (24 km in the former and 22 km in the latter district). The first transect stretched along the bottom and slopes of the canyon in the vicinity of the Mt. Shalbuzdag (**Fig. 3**). The second transect was along the course of the right tributary of the Akhtychay River, basin of the Samur River (**Fig. 4**). The first transect was not so suitable for leopard existence, but abundance of the Dagestan tur (*Capra cylindricornis*) and an array of good shelters makes it attractive for regular visits.



Fig.3. Mount Shalbuzdag view from the North-west.



Fig.4. The upper Samur River.

A local hunter from the Akhtynsky district claimed that in 2002-2003 he has come across a leopard in the scree of the Mount Shalbuzdag (**Fig. 5**). The horse fell in panic what has saved the leopard from a scared hunter's shot. No such records are documented in recent times. In the past 10-15 years, this site has been intensively used for Islamic worships. The hotel built at 3000 m above sea

level receives the pilgrims from June to September. In this period, the pilgrims sacrifice sheep, eat mutton and discard the heads, skins and entrails. These byproducts have been readily consumed by wildlife, including large mammals. Generally, the entire territory is quite suitable for leopards, but large open spaces to the west of the Mount Shalbuzdag are far from optimal habitats.



Fig. 5. The scree on the Mount Shalbuzdag.

Nonetheless, the Dagestan tur population (**Fig. 6**) living in this area allures large predators, including leopards.



Fig. 6. The Dagestan tur groups near the Mount Shalbuzdag.

The second transect was located along the bed of the Fiy chay River (right tributary of the Akhtychay River) 20 km to the south-west of the Mount Shalbuzdag, on the Greater Caucasus Ridge. Terrain and vegetation are similar to those of the first transect.

Here, we obtained information about killing a female leopard with swollen nipples behind the Fiy sky Pass (3273.8 m a.s.l.), on the border with Azerbaijan. It was reported to regularly kill one sheep per week and died from human retaliation. This information was hushed up and we got to know the details only due to the personal contact with villagers. Possibly, the lair was situated on the southern slope of the Greater Caucasus Ridge where protective properties of the landscape are better (**Fig. 7**).



Fig. 7. The space image of the site where the female leopard was shot.

To better understand the relationships between leopards and their potential prey, we processed prey data obtained from all mountainous parts of Dagestan and maintained at Ministry of Natural Resources and hunting societies. We updated this database with our own information derived from the previous Rufford projects.

In order to identify and assess the dominant prey, we first separated the mountainous part of Dagestan into Inner Mountainous Dagestan (1000-2700 m) and Highland Dagestan (1500-4000 m) (**Fig. 8a, b**).

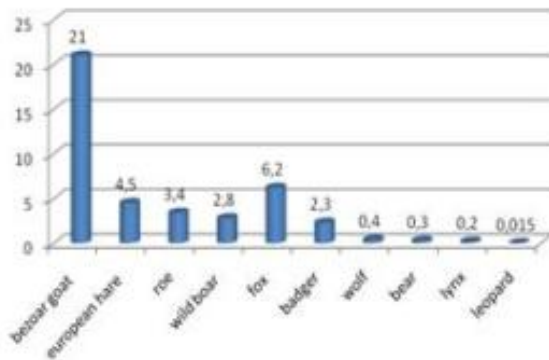


Fig.8a. Prey density (number of individuals Per 1000ha) in Inner Mountainous Dagestan

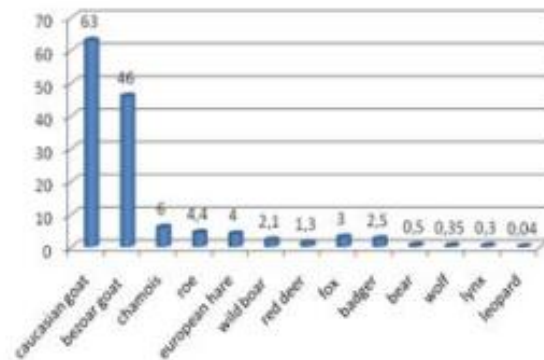


Fig.8b. Prey density (number of individuals per 1000ha) in Highland Dagestan

The GIS maps have shown a significant overlap in distribution of leopards, their main prey species and the main competitors – wolves (**Appendix**). The increase of the wolf population recorded in the past 10 years can affect wild prey species, thus forcing leopards to attack domestic livestock. On the other hand, leopards are supposed to be able to feed on wolf leftovers, but we do not possess any proofs of this.

CAMERA-TRAPPING

Fifteen units of Cuddeback and Bushnell digital camera-traps were purchased online from Cabelas Co. (www.cabelas.com). In April-May 2011, three trips were undertaken to Inner Mountainous Dagestan. We had to stop using the model Stealth Cam, STC-DVSIR5 Prowler DVS because of its inadequate functioning at nights. In May, we set up only Cuddeback® Capture IR 5.0 Megapixel scouting cameras because the arrival of Bushnell Trophy Cam was delayed.

Ten camera-traps set up in May on the steep slope of the Tsolodinskoe Canyon (Arzhuta Canyon, vicinity of the Tsoloda village) were operating for two months. The maximum number of captures was 22, including 12 captures of bezoar goats, 6 of foxes, 7 of badgers and one of the hare, wild boar (1.5 years old) and stone marten each. As before, the bezoar goats and foxes were trapped most frequently (**Fig. 9**).



Fig. 9. The potential leopard prey species camera-trapped in the area where leopards were encountered 6 times in the past 3 years.

The second camera-trapping site was located on the steep and rocky western slopes. The camera-traps were set up along the trail at the mid-elevation of 2000 m a.s.l. This is the best possible place for leopard crossing from one canyon to the neighbouring one (**Fig. 10**). According to photographic captures, this area has been used by male bezoar goats for night rest.



Fig. 10. The animals on a trail most likely used for leopard movements.

Another trail crossing the slope was located nearby on which we detected a poacher and a wolf (**Fig. 12**).

The new Bushnell Trophy Cam camera-traps were good for us since they stayed functioning for a long period of time and were able to capture up to 10000 frames. These characteristics are very convenient in mountains which are not always accessible in different seasons.

In winter 2011, we set up the Cuddeback's which continued functioning for 4 months since November 2010 to 17 March 2011. During this period, they shot 25 frames of which 4 were empty. One of the photographs has captured an anomalous hornless adult male bezoar goat (**Fig. 11**).



Fig. 11. A hornless adult male bezoar goat.



Fig. 12. A poacher and some animals camera-trapped on a slope-crossing trail.

LOCAL PARTICIPATION

Three local persons highly interested and motivated in leopard conservation were involved in our project. We have purchased two binoculars and one digital camera to allow them collect information about leopards in their whereabouts.

The wall calendar 2012 appealing for leopard conservation in Dagestan was printed in 500 copies and distributed among the interested parties – Ministry of Natural Resources and Environment, Agency of Forestry, Society of Hunters and Fishermen, schools and institutes. However, most of these calendars went to the key stakeholders – local communities living in leopard habitats (**Figs. 13-15**).





Fig. 13. Local people involved in the project.

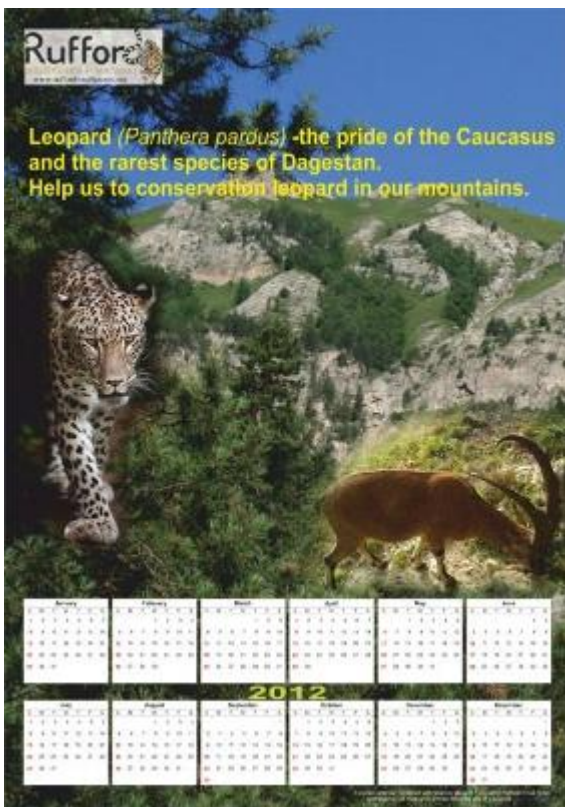


Fig. 14. The wall calendar (English version).



Fig. 15. The calendar hanging in a local conservation office.

Our project has raised the interest in other scientists as well what has led to the expedition of the Caspian Institute of Biological Resources to leopard habitats for collection of field data and local information (**Fig. 16**).



Fig. 16. The expedition of the Caspian Institute of Biological Resources.

INTERNATIONAL COOPERATION

The Rufford project, its progress and preliminary results were presented at the international workshop “Conservation of the leopard in the Caucasus” held on 7-8 March 2011 in Istanbul, Turkey. The first and last pages are presented in **Fig. 17**.



Fig. 17. The first (left) and last (right) pages of the presentation at the Istanbul workshop.



Fig. 18. At the Istanbul workshop.

CONCLUSION

1. GIS mapping has shown a close link between leopard distribution and the occurrence of main prey species
2. In Inner Mountainous Dagestan, leopards concentrate in the areas with high densities of cattle, sheep and goats. Also, leopards are associated with forests in Dagestan's foothills, especially on the northern slopes
3. This Rufford project was widely publicized nationally and internationally and supported by WWF for the establishment of a protected area in Inner Mountainous Dagestan. This collaboration is ongoing now. It also stimulated scientific research at our Caspian Institute of Biological Resources
4. Conservation of the leopard must be based on conservation of its habitats
5. A comparative analysis of prey and competitor distribution in Inner Mountainous Dagestan and Highland Dagestan has shown a higher diversity in Highland Dagestan
6. Large-scale awareness-raising was done among local people through meetings, discussions and the distribution of the wall calendar 2012

FUTURE PLANS

It is essential to carry out the following activities in the nearest future:

1. Awareness-raising, training and lobbying of leopard conservation among border guards, army troops and other military forces dislocated on the state borders between Dagestan, Georgia and Azerbaijan
2. Production and demonstration of a film or video clip about the leopard in Dagestan

Appendix. A grant agreement between WWF-North Caucasus and Dr. Yuri Yarovenko on the establishment of a new protected area in leopard habitats in Dagestan



WWF for a living planet®

Всемирный фонд
природы

125080 Москва
ул. Вавиловская, 19
стр. 3

Тел: +7 495 727 09 39
Факс: +7 495 727 09 38
russia@wwf.ru



ГРАНТОВОЕ ПИСЬМО № 53

От 11 мая 2011 г.

Всемирный фонд природы (далее – «Грантодатель») в лице директора Честина Игоря Евгеньевича, руководствуясь благородными целями развития рационального природопользования и охраны биологического разнообразия России, настоящим направляет Яровенко Юрию Александровичу (далее – «Грантополучатель») грантом, предоставляемым по программному направлению Анализ материалов научных и камеральных исследований и подготовка предложений для эколого-экономического обоснования создания природного парка «Хунзахский» в Республике Дагестан, в сумме и в соответствии с целями назначения, как указано ниже, при условии согласия Грантополучателя с ниже перечисленными условиями и положениями.

НАИМЕНОВАНИЕ ПРОЕКТА: Анализ материалов научных и камеральных исследований и подготовка предложений для эколого-экономического обоснования создания природного парка «Хунзахский» в Республике Дагестан.

НОМЕР ГРАНТА: WWF53/CG003102-2009/GLM. *(Номер Гранта должен быть использован во всех соответствиях между Грантодателем и Грантополучателем)*

ГРАНТОПОЛУЧАТЕЛЬ (Ф.И.О.): Яровенко Юрий Александрович

Дата рождения: 26.09.1959

Адрес: 367013, Дагестан Респ., Махачкала г., А.Акушинского пр-кт, Научный городок дом № 7, кв.49

Паспорт: Паспорт гражданина РФ серия 82 03, номер 865389, выданной 17.11.2004 Отделом внутренних дел Кировского района города Махачкалы Республика Дагестан

Страховое пенсионное свидетельство: 069-584-737 29

ИНН: 056006286140

СУММА ГРАНТА: 350 004,00руб (Триста пятьдесят тысяч четыре рубля 00 копеек).

ПЕРИОД ДЕЙСТВИЯ ГРАНТА: 01 мая – 31 октября 2011 г.

ЦЕЛЕВОЕ НАЗНАЧЕНИЕ ГРАНТА: Грантополучатель должен использовать денежные средства, полученные в виде Гранта, для покрытия специально оговоренных расходов (в соответствии с заявкой), понесенных в связи с проектом.

СРОКИ ПРЕДОСТАВЛЕНИЯ ФИНАНСОВЫХ И СОДЕРЖАТЕЛЬНЫХ ОТЧЕТОВ:

Промежуточные отчеты 01 августа 2011 г.

Итоговые отчеты 31 октября 2011 г.

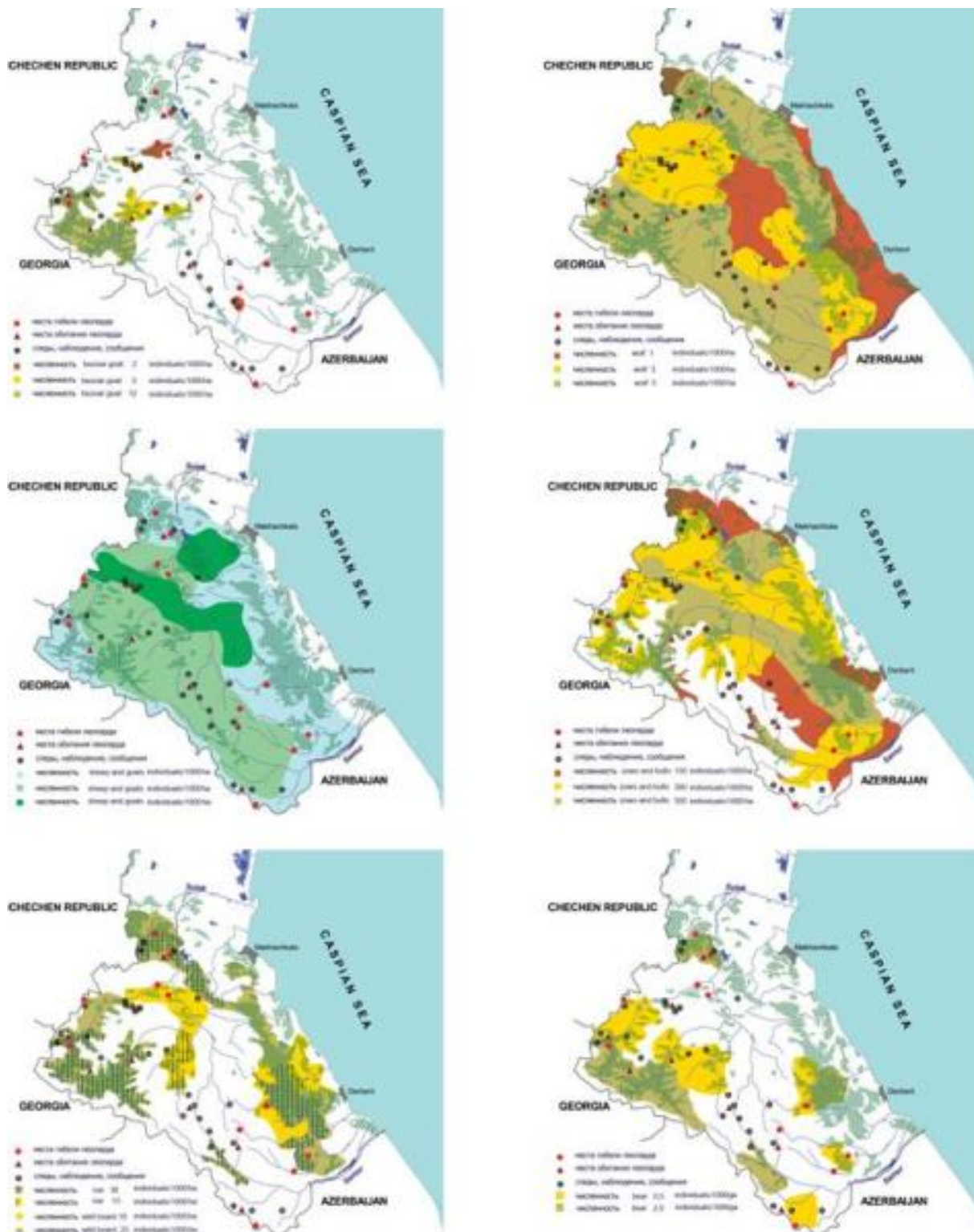
Российский Орнитологический Союз
Орнитологический центр «Мир»
Киевский бульвар,
дом 116-117, стр.100/102
Российская Федерация
125080, Москва
Тел: +7 495 727 09 39
www.roros.ru

К4004404
WWF (World Wildlife Fund) Russia
WWF (World Wildlife Fund) Russia
WWF (World Wildlife Fund) Russia
WWF (World Wildlife Fund) Russia
WWF (World Wildlife Fund) Russia
WWF (World Wildlife Fund) Russia
www.wwf.ru



Project on leopard habitat

Distribution of leopard kill sites (red circle), leopard occurrence sites (red triangle) and leopard record sites (green circle) in relation to the densities of bezoar goats (top left), wolves (top right), sheep and goats (middle left), cattle (middle right), roe deer and wild boars (bottom left) and brown bears (bottom right).



Distribution of leopard kill sites (red circle), leopard occurrence sites (red triangle) and leopard record sites (green circle) in relation to the densities of red deer (top left), chamois (top right) and Dagestan turs (bottom).

