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13th April 2014.

Board of  
UK Wolf Conservation Trust

Dear Tsa:

With gratitude for your support in 2013, here I attach our report.

Enclosed please find:

1. The report on the work in 2013 on our project on wolves and lynx
2. Financial accounting

Sincerely,



Josip Kusak

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13<sup>th</sup> April 2014.

Project report for 2013:

Board of  
UK Wolf Conservation Trust

## **PROTECTION OF WOLVES AND LYNX IN CROATIA**

### **SUMMARY**

Described are all activities related to wolf and lynx research, conservation and management in Croatia during the year 2013.

In Croatia, considerable efforts were invested to capture and collar new wolves, but it failed this year. Supported with other data obtained by different means this lead to the conclusion of a slight decline of wolf population in Croatia in the last two years. The estimate was 177 wolves (compared to high of 230 in 2011). This finding lead to the important management decision not to allow any hunting quota for wolves this year. So, the negative trapping result was also very useful. Much work and many new results arose from the use of trap cameras (obtained with UKWCT funds). On about 8000 (of over 50.000) pictures some animals were seen what gave a new insight in predator and prey populations abundances. Part of genetic work was published in cooperation with Italy and the cooperation with SloWolf project additionally helped to estimate wolf population in Slovenia. The finding that only 35-40 wolves are in Slovenia also led to the decision of no hunting quota in Slovenia this year as well. New findings on the likelihoods of collisions with animals on the highway were obtained by modeling of habitat and other relevant parameters. Published were 7 scientific papers and two reports (one on wolf and lynx each) in Croatian language.

We were again internationally active (USA, Turkey, Slovenia, Italy, Poland, Spain) what is described and illustrated here. In most cases we were invited to speak and teach about our work on large carnivores in Croatia: monitoring system, emergency teams, trapping methods, health survey etc.

### **Progress report**

This yearly report is for the period from 27 November 2012 to 08 November 2013 (346.3 days).

We continued with efforts of capturing and radio-tracking of wolves, collection and examination of dead carnivores, as well as direct application of our study results in management and protection. This year we were involved in training of students, researchers and large carnivore management professionals from Turkey and Bosnia & Herzegovina. Researchers from the project were invited to present project results in Minnesota, Slovenia, Spain and Italy. The radio tracking of remaining ungulates collared during 2006-2007 was also continued.

### **Work overview**

In the period from 27 November 2012 to 08 November 2013 (346.3 days) project researchers spent a total of 168.71 (48.71% of time) work/days doing field work, checking cases of wolf mortality, performing necropsies of dead wolves, participating on workshops and meetings related to research and conservations of wolves and lynx in Croatia and other countries. Field work in other countries lasted all together 66.61 days (activities marked in gray in Table 2), leaving the remaining 102,10 days for the work in Croatia. Work in other countries included 54.24 days (Activity # 537 in Table 2) at KuezyDoga Society (Turkey) and helped with the continuation of large carnivores (wolf, bear and lynx) study in the Kars region, eastern Turkey. The other two activities in other countries included 7.57 days (Activity # 536, Table 2) in Trebinje and Bijela gora area during Biodiversity week and 4.8 days in NP Una (Activity 534, Table 2), also in B&H within the frame of cooperation on large carnivores research with NP Una and University of Bihać. We continued to help in research and monitoring of large carnivores in the area of newly established (in 2011) **National park “Una”**, at the border between Croatia and **Bosnia & Herzegovina**. In May 2013, we captured and collared the first bear in B&H. This animal is being tracked since then.



*Figure 1: Processing of a bear captured on 01.05.2013 in NP Una, near Bihać (B&H). This was the first large carnivore ever collared in B&H and hopefully the beginning of a work which will be extended on wolves and lynx in Bosnia and Herzegovina as well.*

Researchers of the project (Đuro Huber and Josip Kusak) participated at the Biodiversity week in the area of **Trebinje and Bijela gora** as initial step in the start of a large carnivores and biodiversity research and monitoring project in south-eastern Herzegovina and to help establishing the mentioned area as national park.



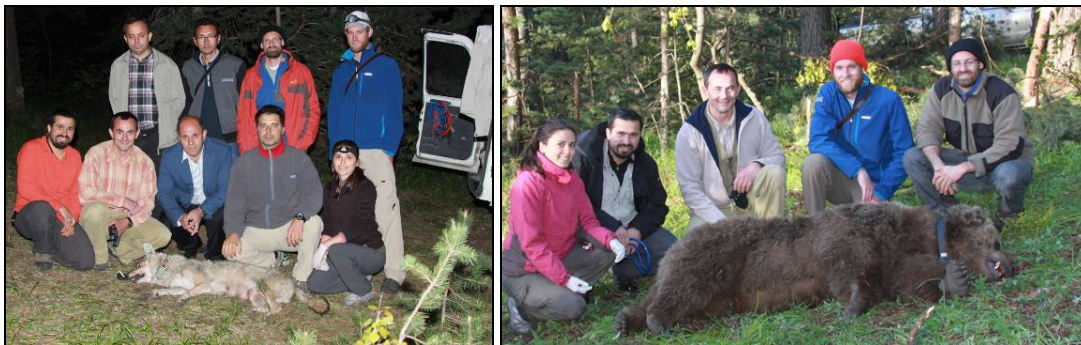
*Figure 2: Participants of the Biodiversity week, which was held in Trebinje, Bijela gora area, B&H in the period from 11.05.2013. to 18.05.2013.*

As a follow-up of Biodiversity week in Trebinje, researchers and NGO activists Dušan Toholj, Igor Trbojević and Tijana Vračar, visited our project in Croatia to learn about the work on wolves.



*Figure 3 and Figure 4: Igor Trbojević, Tijana Vračar, Dušan Toholj and Josip Kusak during the field work in Banija region on 03.09.2013 (Photos by J. Kusak and Tijana Vračar).*

During the 54 days of field work in Kars region, eastern **Turkey**, capture team lead by Josip Kusak, captured and collared six wolves and five bears. During the first three years of the project, a total of eight wolves and 16 bears were collared. This project is giving the first results about spatial ecology of wolves and bears in this part of the world. During the 2013 capture session, attempts to capture lynx were also performed, but were not successful.



*Figure 5 and Figure 6: Field crew at one of six wolves and at one of five bears captured in Kars region, eastern Turkey in the period between 22.05.2013 and 15.07.2013.*

**Sean Anderson**, professor at **California** State Channel Islands University and working in nature conservation (wetlands restoration), visited our project in the period from 28.09.2013 and 03.10.2013. He was particularly interested to learn about Croatian achievements in nature conservation regarding mitigation measures against habitat fragmentation.



*Figure 7 and Figure 8: Sean Anderson, professor at California State Channel Islands University and working in nature conservation (wetlands restoration), visited our project in the period from 28.09.2013 and 03.10.2013. On pictures at Plitvice lakes NP and on Ivačeno brdo green bridge.*

Đuro Huber, Josip Kusak and Slaven Reljić participated at several international meetings about large carnivores (**Utah, Minnesota, Slovenia, Italy**), where results from our project were presented.



*Figure 9: International Conference on Bear Research and Management in Provo (Utah) in September 2013.*



Figure 10 and Figure 11, International Wolf Symposium (about 500 participants) in Duluth (Minnesota) in October 2013. Josip Kusak and Pete Haswell had one common presentation.

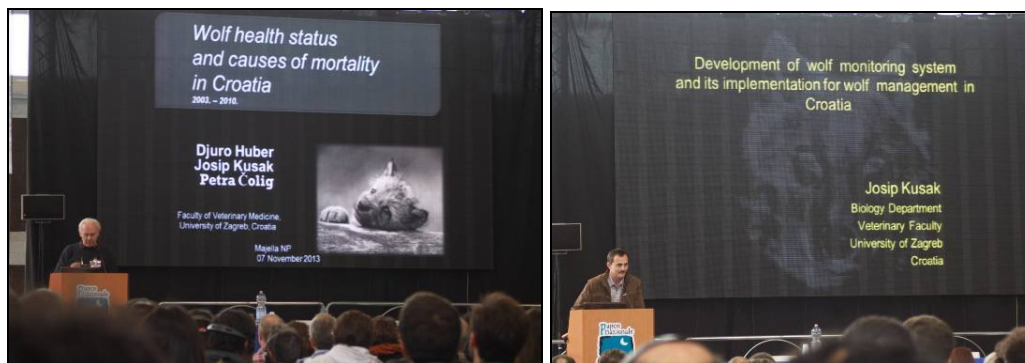


Figure 12 and Figure 13: Đuro Huber and Josip Kusak giving presentations at International Wolf Congress held in Majella, Italy in the period between 06.11.2013 and 08.11.2013.

Đuro Huber was invited speaker and guest at the VIII International Wildlife Symposium in **Leon (Spain)** from 31 October to 02 November 2013. He presented the opening speech on Large carnivores in Europe and provided training on wolf measurements, necropsy and samples taking.



*Figure 14: Đuro Huber providing training on wolf measurements, necropsy and samples taking at the International Wildlife Symposium in Spain in November 2013.*

Đuro Huber assisted with immobilization and a tumor surgery of one bear in Braniewo Zoo (Poland) on 14.08.2013.



*Figure 15 and Figure 16: Đuro Huber, Agnieszka Sergiel and Tomasz Piasecki handling bear in Poland*



Đuro Huber as a chairman and Josip Kusak as a member of the Committee for Large Carnivores, continue to participate in management of these species in Croatia.



*Figure 17: Large Carnivores Committee meeting, Zagreb, Croatia 08.05.2013.*

The Bear Management Committee is meeting regularly (Đuro Huber is the member) and has a special task this year to adapt the management to the new status of bear as a protected species after Croatia joined EU on 01 July 2013.



*Figure 18: Bear Management Committee meeting, Zagreb, Croatia 19.06.2013.*

This year we performed a training workshop on monitoring for rangers and other personal in protected areas (N=15) in Croatia, as well as to the foreign volunteers (N=9) staying in Kuterevo. The workshop had the aim of further education on how to do monitoring of large carnivores in a systematic way. The workshop consisted of two days of theoretical sessions and practical training during the third day.



*Figure 19, and Figure 20: Theoretical and practical part of the Workshop for large carnivores monitoring, Kuterevo and northern Velebit, Croatia 23.10.2013.*



*Figure 21, Figure 22; Theoretical and practical part of the Workshop for large carnivores monitoring, Kuterevo and northern Velebit, Croatia 24.10.2013 and 25.10.2013.*

On 18.07.2013. Đuro Huber and Slaven Reljić conducted the workshop for the Bear Emergency Team in the village Perdasi above Senj. Both, theoretical and practical sessions were focused on training for proper actions in problem cases with bears.



*Figure 23: Theoretical and practical training of Croatian Bear Emergency Team in Perdasi in June 2013.*

## Wind power parks – new threat in large carnivores habitat

During the last few years, a new development started to threaten large carnivores in Croatia. According to the data from Croatian Ministry of Economy (<http://oie-aplikacije.mingo.hr/pregledi/>) at least 90 projects for the development of wind power are planned or are currently being implemented. A total of 83 such projects are situated in large carnivores distribution range (<http://oie-aplikacije.mingo.hr/InteraktivnaKarta/>).

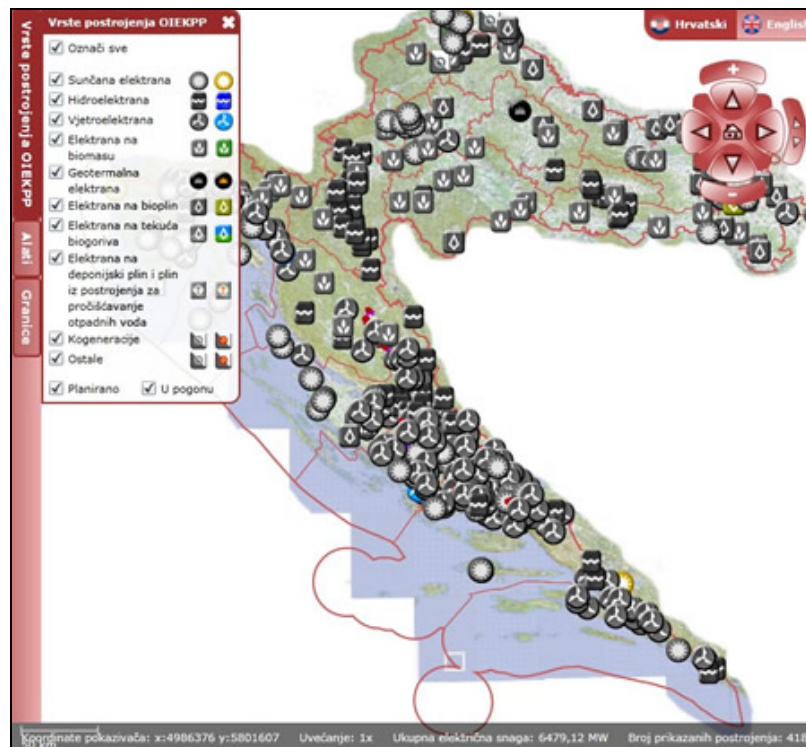


Figure 24: Interactive map, which can be viewed at <http://oie-aplikacije.mingo.hr/InteraktivnaKarta/>, shows all currently registered wind power and other power plant development in Croatia.

This development is “fueled” mostly by the money from foreign companies, but also by some domestic companies that are trying to develop their own wind park infrastructure i.e. are starting to produce wind turbines. All is happening very fast. Researchers from the Croatian Large Carnivores Project raised concern about the potential impact of such development on large carnivores: Consequently, Josip Kusak and Đuro Huber were contracted to write environment impact assessment for four planned wind parks in large carnivores range. Within the frame of this work they visited, explored and evaluated corresponding areas and wrote four extensive studies (between 60 and 80 pages each). Based on all the previous knowledge about the need of large carnivores for space and particularly during the reproductive seasons, we were generally very restrictive regarding wind power plant development. There were no further feed-back information after the formal submission of these studies, but it seems that recommendations from at least one assessment were implemented in the final EIA for that one wind park.



*Figure 25 and Figure 26: Wind Park Velika Popina in Southern Lika was already built without considering the presence of wolves in the area. Josip Kusak and Zlatko Prpić (wind parks engineer) during the field evaluation of planned wind park “Senj” on 20.03.2013.*

It also seems that stronger initiative is needed to convince investors and planners for considering large carnivores presence when planning and developing wind parks. It appears that decision makers can be convinced only by very specific information about the interactions of large carnivores and wind parks. Wind parks in the large carnivores range are a rather new development and there are only few studies currently being conducted (Portugal and Spain) which evaluate the wind parks impact on wolves. Studies which evaluate impact of wind parks on large carnivores will have to become integral part of EIA when wind parks are planned, built and used. The first step in this direction may be writing of guidelines how to evaluate mentioned potential impact and the second step would be to make such assessment obligatory.

### **Field work overview**

Josip Kusak spent a total of 142.94 days doing the work on the project. Slaven Reljić, PhD student and veterinarian, who have been primary, contracted to work on bear part of our projects, spent 29.55 days, helping on the wolf and lynx work, while Đuro Huber spent 5.17 days on the field part of the project.

The amount of time spent for field work was in the range of amount during previous years. The time spent for meetings, presentations, lectures, i.e. activities where the results of field work were presented, disseminated and discussed were the same as during the previous period.

Other people that contributed are listed in Table 3. Majority of other persons participated in management meetings, and some contributed during field work.

Table 1: Summary table of work activities on the project in the period from 27 November 2012 to 06 April 2014, (496 days) when we collected 176.18 field days

Activity description	N	Duration ( days)
Animal mortality found	1	1.56
Animal necropsy	4	0.66
Animal observation recorded	3	0.08
Bear-wolf telemetry	1	4.80
Biodiversity workshop	1	7.57
LC comity meeting	3	0.45
Monitoring meeting	2	0.97
Telemetry	2	3.35
Project meeting	1	0.01

Activity description	N	Duration ( days)
Wildlife crossings check	1	2.54
Wolf autopsy	2	0.47
Wolf telemetry	1	1.50
Wolf trapping	8	92.23
Wolf search	2	3.93
Wolf-bear field work	1	54.24
Wolf-Lynx management meeting	1	1.82
TOTAL	34	176.18

Note: It is not entirely possible to absolutely accurately count all activities because often 2-3 or more things were done at once (Like: trapping and telemetry, collecting dead wolves, checking wildlife crossings places and telemetry during the same trip).

Table 2: Detailed table of work activities related to wolf and lynx work on the project in the period from 27 November 2012 to 06 April 2014, (496 days) when we collected 176.18 field days. Activities marked orange were done with the use of UKWCT funding. Activities shaded in gray are not directly related to the project in Croatia, but were performed in other countries.

#	ACTIVITY N	N PERIODS	ACTIVITY MAIN OBJECTIVE	START	END	N DAYS
1	518	1	Wolf autopsy	27.11.2012 08:15	27.11.2012 15:15	0.29
2	519	1	Monitoring meeting	28.11.2012 08:00	28.11.2012 20:15	0.51
3	520	1	Monitoring meeting	29.11.2012 11:05	29.11.2012 22:00	0.46
4	521	1	Wolf-Lynx management meeting	13.12.2012 05:00	15.12.2012 00:48	1.82
5	522	1	LC comity meeting	19.12.2012 10:30	19.12.2012 15:00	0.19
6	523	1	Animal mortality found	30.12.2012 08:33	31.12.2012 22:03	1.56
7	524	1	Animal necropsy	18.12.2012 08:30	18.12.2012 14:30	0.25
8	525	1	Animal necropsy	11.01.2013 09:00	11.01.2013 10:30	0.06
9	526	1	Animal necropsy	04.02.2013 11:00	04.02.2013 15:15	0.18
10	527	1	Wildlife crossings monitoring	18.03.2013 07:07	20.03.2013 20:07	2.54
11	528	1	Animal necropsy	23.03.2013 09:23	23.03.2013 13:23	0.17
12	529	1	Animal observation recorded	04.04.2013 17:20	04.04.2013 18:20	0.04
13	530	1	Animal observation recorded	11.04.2013 07:35	11.04.2013 08:35	0.04
14	531	1	Telemetry	17.04.2013 12:44	19.04.2013 21:00	2.35
15	532	1	Animal observation recorded	25.04.2013 11:01	25.04.2013 11:01	0.00
16	533	1	Wolf telemetry	26.04.2013 07:00	27.04.2013 19:00	1.50
17	534	1	Bear-wolf telemetry	01.05.2013 01:42	05.05.2013 20:49	4.80
18	535	1	LC comity meeting	08.05.2013 12:00	08.05.2013 16:00	0.17
19	536	1	Biodiversity workshop	11.05.2013 06:05	18.05.2013 19:46	7.57
20	537	1	Wolf-bear field work	22.05.2013 07:00	15.07.2013 12:48	54.24
21	538	1	Wolf trapping	26.07.2013 21:00	18.08.2013 12:04	22.63
22	539	1	Wolf trapping	20.08.2013 08:32	23.08.2013 19:30	3.46
23	540	2	Wolf trapping	26.08.2013 10:23	08.09.2013 18:00	11.74
24	541	3	Wolf trapping	18.09.2013 07:37	03.10.2013 13:30	12.29
25	542	1	Wolf trapping	19.10.2013 05:15	30.10.2013 20:07	11.62
26	3041	1	Wolf trapping	28.09.2013 11:45	18.10.2013 09:41	19.91
27	3042	1	Wolf trapping	31.10.2013 06:33	08.11.2013 14:32	8.33
28	543	1	Wolf autopsy	20.12.2013 09:17	20.12.2013 13:30	0.18
29	544	1	Wolf search	21.12.2013 08:20	23.12.2013 23:20	2.63
30	545	1	Project meeting	20.01.2014 12:00	20.01.2014 12:14	0.01
31	546	1	LC comity meeting	28.01.2014 10:00	28.01.2014 12:30	0.10
32	547	1	Wolf search	06.02.2014 10:30	07.02.2014 20:15	1.41
33	548	1	Trapping	19.03.2014 06:20	20.03.2014 18:55	1.52
34	549	1	Telemetry	05.04.2014 06:30	06.04.2014 21:06	1.61
			TOTAL			176.18

Table 3: List of persons participating on the project in the period from 27 November 2012 to 06 April 2014, (496 days). During this time a total of 76 different persons participated in project activities, resulting in 508.6 person-days.

#	PERSON	N ACTIVITIES	DURATION
1	Alibabić, Vildana	1	4.54
2	Anderson, Sean	2	7.14
3	Andrić, Velimir	1	0.44
4	Bakliža Berislav	1	0.19
5	Bokić, Mihajlo	1	0.39
6	Bosiljevac, Damir	1	0.13
7	Bratić, Nataša	1	5.54
8	Brujić, Jugoslav	1	5.54
9	Coban Emrah	1	54.24
10	Domazetović, Zrinka	2	0.35
11	Fontana Pudić, Karmela	1	0.17
12	Franjković, Filip	1	0.08
13	Gašić, Branislav	1	4.54
14	Gužvica, Goran	1	0.19
15	Habazin, Marina	1	2.15
16	Hadžihajdarević, Haris	2	2.22
17	Hadžihajdarević, Maja	1	4.40
18	Halder, Ulrich	1	6.72
19	Hamidović, Danijela	2	0.35
20	Huber, Đuro	5	5.17
21	Iković, Vuk	1	2.53
22	Ines, NPSV	1	0.14
23	Jakovac, Andreja	1	0.49
24	Jakšić, Zrinko	1	0.19
25	Jasmina, NPSV	1	0.18
26	Jeremić, Jasna	5	2.85
27	Karaahmetoglu, Ayşegül	1	54.24
28	Konstantinović, Nika	1	0.18
29	Koprivica, Jelena	1	4.54
30	Kovačević, Goran	1	1.42
31	Kovačević, Nataša	1	5.54
32	Kusak, Josip	25	142.94
33	Kusak, Josipa	4	25.79
34	Kusak, Pavao	4	14.03
35	Kusak, Tanja	5	31.52
36	Lazarus, Maja	1	2.27
37	Majnarić, Dario	1	0.19
38	Mazija, Mirna	1	0.19
39	Milanović, Đorđe	1	5.54
40	Milošević, Mićo	1	1.42
41	Modrić, Marko	2	0.55
42	Modrušan, Miroslav	1	0.04
43	NPSV, osoblje	1	0.13
44	Octenjok, Daria	1	1.94
45	Omanović, Tijana	1	4.40
46	Petronić, Slađana	1	5.54
47	Popović, Ratko	1	9.64
48	Poučki, Helena	1	1.19
49	Prvanović-Babić, Nikica	1	0.19
50	Radošević, Dejan	1	2.53
51	Raos, Petar	1	0.17

#	PERSON	N ACTIVITIES	DURATION
52	Ratković, Igor	1	2.42
53	Reljić, Slaven	9	29.55
54	Sindičić, Magda	1	0.17
55	Sjeničić, Jovica	1	5.54
56	Slijepčević, Vedran	2	0.48
57	Spajić, Tomislav	1	0.17
58	Šakotić, Slobodan	1	0.44
59	Šercer, Slaven	1	0.02
60	Šilović, Luka	1	0.77
61	Šišić, Sonja	1	0.06
62	Škapur, Vedad	1	0.30
63	Šoštarić, Ivan	1	0.19
64	Štahan, Željko	1	0.19
65	Todorović, Sara	1	2.53
66	Toholj, Dušan	2	11.50
67	Tomljanović, Marko	1	0.17
68	Trbojević, Igor	2	9.48
69	Trošić, Marko	1	0.19
70	Urli, Lucija	2	0.35
71	Vračar, Tijana	2	7.34
72	Vugrinec, Denise	1	0.77
73	Vugrinec, Ines	1	1.93
74	Wolf-Kramarić, Sandra	1	0.19
75	Zingg, Robert	1	6.72
76	Žarko, NPSV	1	0.14
			508.60

## FIELD WORK ON WOLVES IN CROATIA

This year, a field work on wolves was enhanced by the participation of Slaven Reljić, who took part of trapping efforts on Velebit. The work in the Northern Velebit study area was given the priority, while Gorski kotar area was given secondary priority, without capturing attempts, but with the continuation of wolf and ungulates tracking and with the intensive use of automatic cameras. We use automatic camera to check for the presence of wolves in the area and to document all other facts, like reproduction, presence of other wild animals, primary lynx.

### *Status of tracked packs during 2012-2013*

By the end of 2012, we had one wolf with collar in Gorski kotar. This was W28-Tona, which was not a resident wolf, but was floating among territories of three different packs in Croatia and Slovenia.

During the winter 2012/2013 on the territory of Risnjak pack, a footprints of minimum 4 wolves were found and Josip Kusak visually observed four wolves. On the territory of Snježnik pack, footprints of four wolves were found in April 2013. Suho pack was documented to have at least three wolves. This is rather low number, considering that the pack had reproduction during 2012. This indicates rather high mortality of wolves in this pack. Only two wolves were found in Krasno pack in winter 2012/2013. After the low number of wolves in Snježnik pack area, it seems that some wolves have settled on the pack territory. However, a reproduction was not yet confirmed. On a contrary, a reproduction of Suho pack was confirmed during 2013 as well. At exactly the same place as in 2013, six wolf pups were recorded by automatic camera set to take video of 20 sec.

The area of Risnjak pack was not checked intensively enough during summer (the priority was Velebit and new area of Banovina) Suho pack was found to be in positive trend in numbers since reproduction was documented with automatic camera. One of collared wolves (W29-Ayse, from the 2012 litter) was recorded on these videos. Since there is no VHF signal from the collar, this means the collar has stopped functioning. During the summer 2013 Suho pack had at least 3 adults and at least 6 pups.



*Figure 27: A series of pictures taken by automatic camera and showing one adult wolf and six pups from Suho pack passing by on 07.09.2013 06:42.*

### **Searches for signs of wolf and lynx presence**

During 2013, searching for signs of wolf presence was done in Gorski kotar, Velebit area, in Banovina region and inside Plitvice lakes NP but only as howling survey.

The search for the presence of wolves started during the spring and was continued during the summer. The most intensive searching for wolf signs was performed in the northern part of Velebit and in Banovina region, while in Gorski kotar searching was done opportunistically during telemetry tracking. For the first time, wolf survey was conducted inside Plitvice lakes NP, as a howling survey done in the cooperation of NP. The use of automatic cameras to augment searches for the presence of wolves was continued in Gorski kotar and northern Velebit.

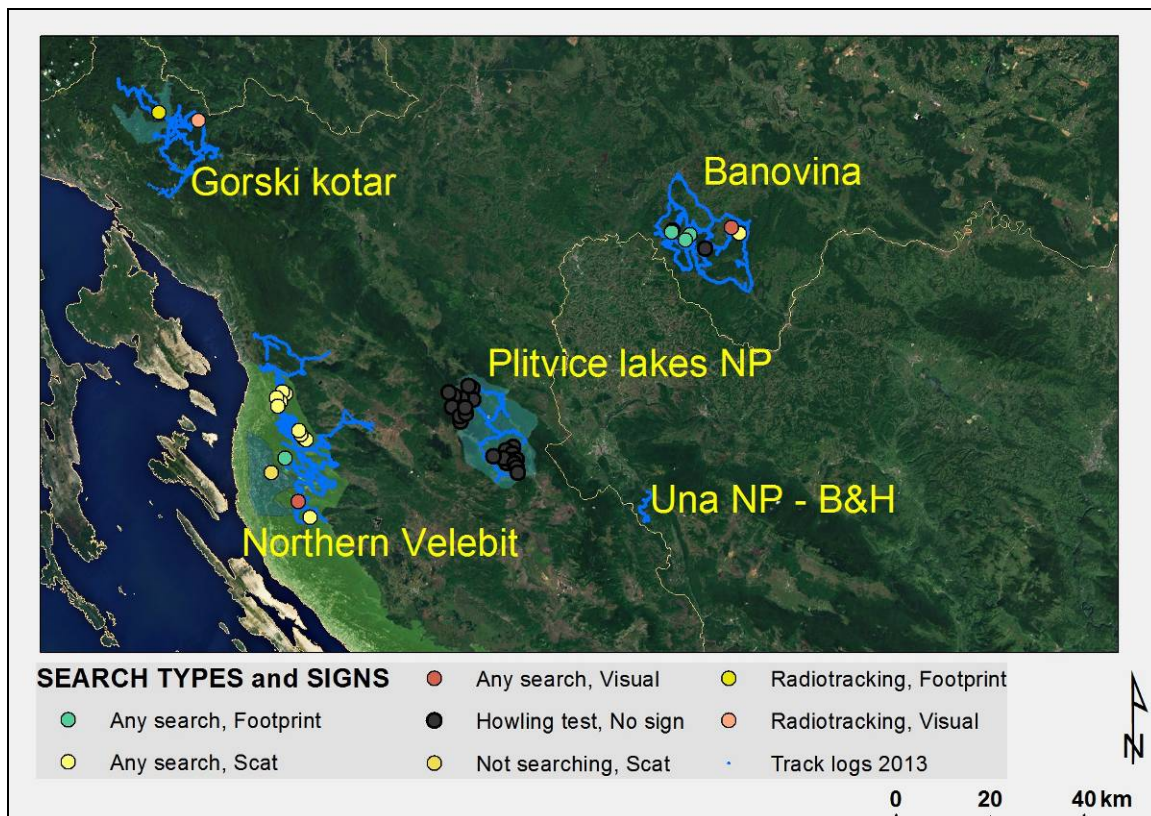


Figure 28: Four study areas (Gorski kotar, northern Velebit, Banovina and Plitvice lakes NP) with shown track-logs, sites of howling attempts and wolf signs found in Croatia during 2013.

Signs of wolf presence (footprints, scats) were found **on 22 sites only** (Table 4). Two of these signs were found in Gorski kotar, nine in Banija region and eleven more in northern Velebit area. Howling test was done at 23 sites inside Plitvice lakes National Park, but without any reply. This is exceptionally low number of wolf sign observations and considering that the search effort was at the same intensity as during previous years This most likely indicates the drop in wolf numbers in studied areas. Beside wolf signs, one lynx and one wild cat was also documented.

Table 4: Signs of wolf, lynx and some other species recorded in the study areas during 2013 surveys.

SPECIES	SIGN	SEARCH TYPE	N
Wolf	Footprint	Any search	7
Wolf	Scat	Any search	13
Wild cat	Visual	Any search	1
Wolf	No sign	Howling test	23
Wolf	Scat	Not searching	1
Lynx	Footprint	Radiotracking	1
Wolf	Visual	Radiotracking	1

We noted the human activity (timber cutting and extraction) during summer 2013 at five different locations. That influenced some of the wolf activities as well and our trapping efforts. However, some human activities had several times started after traps were already in the ground. This resulted in removal of three traps and our displacement from the area in these two occasions. This also negatively influenced our trapping success. Twenty three different sites were used for trapping on northern Velebit



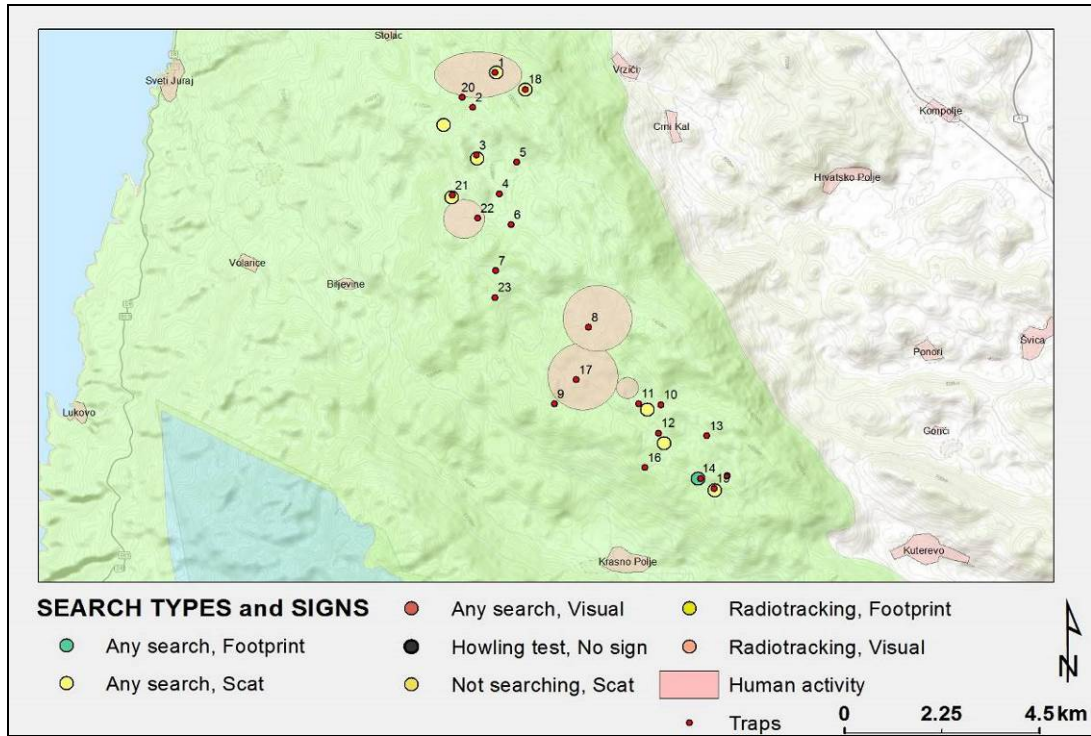


Figure 29: The area of northern Velebit, wolf signs, areas of human activity and wolf traps during 2013.

### Wolf sign searching in Banovina region

Banovina is located east of Gorski kotar and Velebit, on the border with Bosnia & Herzegovina. It has recently been resettled by wolves and it seems the area supports three packs. The area has been abandoned during/after the last war (1991-1995) and was not resettled by humans but by wolves. Remote villages are empty and are being overgrown by thick vegetation. The forests of Banovina are rich in acorns of oak, chestnuts and beech, which then provide good habitat for wild boars. Wild boars seem to be rather numerous in the area. As a potential wolf food, there are roe deer, but no red deer and no bears (good for wolf trapping!) except of some sporadic occurrences. Wild boar and roe deer are two main large herbivores present in Banovina area. They are important as wolf prey and as game animals.



*Figure 30, Figure 31 and Figure 32: Abandoned orchards, chestnuts, beechnuts and oak acorns are an excellent food sources for many animals. These crops were particularly rich in 2013. (Photos J. Kusak).*



*Figure 33 and Figure 34: Wild boar and roe deer are two main large herbivores present in Banovina area. They are important as wolf prey and as game animals.*

During the ten-day search, only nine signs of wolf presence were found and the previous idea of wolf capturing in this area was rejected for this year.

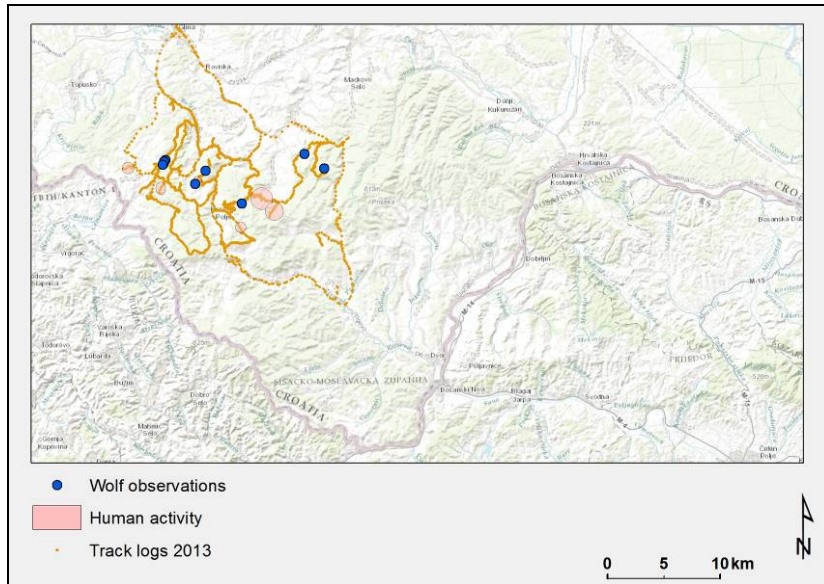


Figure 35: Track logs and wolf signs collected during ten days of intensive searching.

### Wolf sign searching in Plitvice lakes National park

In the cooperation with Plitvice lakes NP (they provided assistance of park rangers), an initial survey of wolf presence was conducted in the area of NP. Beside sign searching, a systematic howling survey was done at 22 different sites inside NP in late August 2013. There was not a single response.

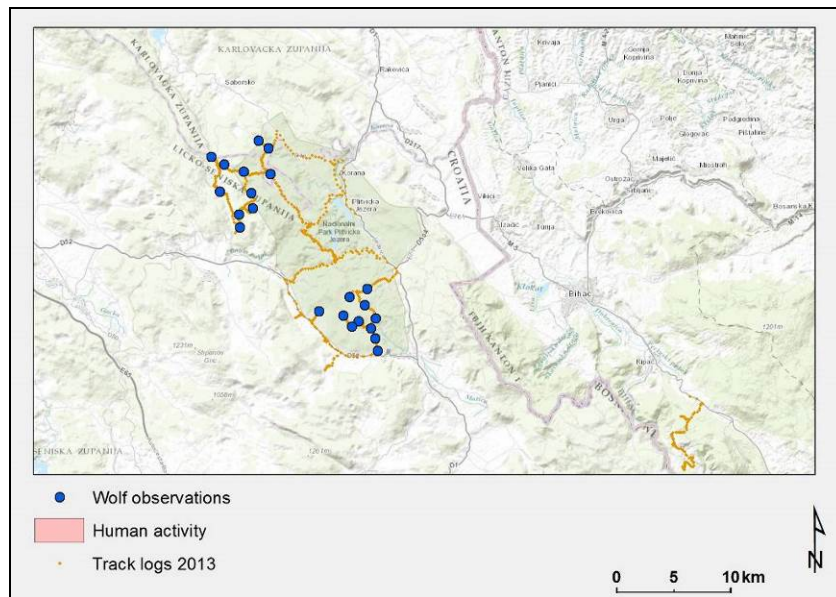


Figure 36. Track logs and places where howling attempts were made in Plitvice lakes NP.

However, the evidence that wolves do exist in the Plitvice lakes NP was collected by a park ranger who photographed a wolf at the edge of Čorkova uvala on 22.08.2013.



Figure 37: A wolf at the edge of Čorkova uvala valley on 22.08.2013 in Plitvice lakes NP.

Wolves were never studied in the central Lika area. The area is also close to B&H and to Una NP on the other side of the border. We already have good cooperation with people from Bihać (NP Una and University of Bihać). Starting a wolf study in Plitvice lakes NP would be good for wolf conservation in Croatia and would help to initiate similar process in the neighboring B&H.

### Wolf trapping in northern Velebit

Activities to radio-collar new wolves in Velebit area started in September, when the first trap was set on 28.09.2013. Traps were set in the part of Krasno pack territory where at least some wolf signs were found. There were no signs indicating the presence of the whole pack and no signs of reproduction, but only signs which indicated the existence of maximum two wolves which occasionally pass by.

In the period from 28.09.2013 to 08.11.2013 (41 day) traps were active during one single period, lasting 40.7 days. A total of 23 traps were used and 726 trap-nights were invested in wolf trapping in Velebit area. Traps were checked 789 times. Various events happened while the traps were active. They are listed in Table 5. The only large mammal which visited traps were bears (N=5), while the visit of wolves was not documented a single time.

During the whole trapping season driving was about 800 km/week for searching wolf signs and checking traps.

Table 5: List of events on traps during 2013 trapping season in Velebit, in the period from 28.09.2013 to 08.11.2013 (41 days).

EVENT	N
bear visit	5
bulldozer passed near	1
foresters on site	3
fox capture	3
fox visit	4
marten visit	2
nothing	720

EVENT	N
rain	18
unknown visit	24
wind	1
TOTAL	781

Unfortunately, no wolves were captured during this year trapping attempt in Croatia. Lynx capture attempts were not done since no new lynx collars were available. The collar from a lynx L08-Tomo was sending data until 24.05.2013 and then it disappeared. We could not find it and retrieve it.

## TELEMETRY TRACKING

### Wolf tracking

Of three captured wolves in 2012, two were collared, one with GPS-UHF and another with VHF collar only. W28-Tona disappeared from our study area soon after the capture. It reappeared again in April 2013 and Josip managed to retrieve all the data which accumulated in the memory of the collar. After the data was processed, it became apparent why Tona could not be found! Most of the time, she has spent in Slovenia, but since late March 2013 she has returned to Croatia and settled down in the area of Risnjak pack. During the data retrieval in April, Josip approached to wolves close enough to see and count them. Tona was in a group of three other wolves. On 17.07.2013 09:30 a collar automatically dropped from the neck of W28-Tona and was found by Josip some days later. During the tracking time, home range of W28-Tona was 1170 km<sup>2</sup>.

The second wolf collared during 2012 (W29-Ayse) got a used VHF collar which unfortunately malfunctioned soon after the deployment. The signal could not be found, but we have learned that W29-Ayse at least survived the winter 2012/2013. It was recorded by one of our automatic cameras 22.04.2012 (night video of too bad quality for frame capture). Together with other video materials from the area of Suho pack, we could conclude that during the 2013 this pack had at least two adult wolf, one surviving pup from the litter of 2012 (Ayse) and six more pups from the litter of 2013.

### *Lynx tracking*

Lynx L08-Tomo, which was collared on 31.07.2012, was tracked until 24.05.2013 (297 days), and a total of 707 locations were collected. During the tracking time L08-Tomo was moving on the southern part of Gorski kotar and covered 400 km<sup>2</sup>.

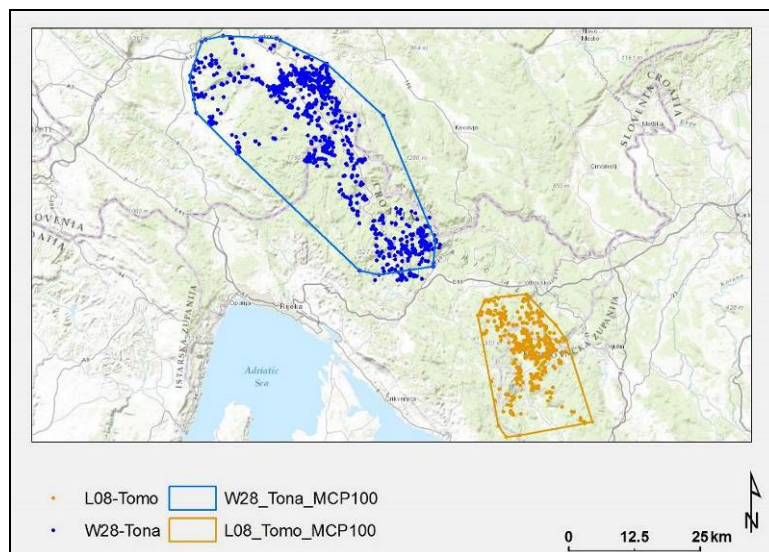


Figure 38: Lynx L08-Tomo tracked covered 400 km<sup>2</sup>, while wolf W28-Tona roamed on 1170 km<sup>2</sup>. During tracking time, calculated as 100% MCP.

### Tracking of red deer and roe deer

Since the end of 2007 and until the end of 2013 a total of 11 cervids were radio tracked in Gorski kotar. All radio-collared cervids had VHF collars and 1009 locations were collected. All radio tracking was done by a game warden Damir Prokopović on a voluntary basis. The main objective for tracking of cervids is to determine survival and the cause of death. D. Prokopović checked for the signal (mortality or not) on a regular basis. Interestingly, after the death of five animals in late winter of 2009, all remaining animals survived until the end of 2010, while one more roe deer died in spring 2011. During 2012, we have lost two other tracked animals. One red deer (RD04-Mina) has disappeared (signal lost), while the collar of roe deer RO04-Ars was found cut-off, so most likely a deer was illegally shot. The last remaining red deer RD01-Fana is still being tracked by the game warden but no significant changes in her movement were documented.

Table 6: Basic data about red deer and roe deer radio-tracked in Gorski kotar during 2007-2013.

Animal	Start	End	N days	N locations	Fate
RD01-Fana	25.12.2007	17.10.2013	2123	186	Active
RD02-Daki	12.02.2008	26.09.2009	592	32	Shot legally
RD03-Tina	19.04.2008	10.03.2009	325	32	Starvation/disease
RD04-Mina	25.04.2008	21.09.2012	1610	65	Signal lost
RO01-Siljo	02.12.2007	09.01.2008	38	12	Disease
RO02-Gabi	18.12.2007	19.02.2009	429	83	Starvation
RO03-Nova	06.01.2008	20.03.2009	439	72	Starvation
RO04-Maki	07.01.2008	31.03.2011	1179	166	Starvation/disease
RO05-Magda	12.01.2008	21.04.2012	1561	169	Collar failed, alive
RO06-Ars	12.02.2008	15.10.2012	1707	157	Shot illegally
RO07-Lena	09.04.2008	03.03.2009	328	35	Lynx predation
TOTAL				1009	

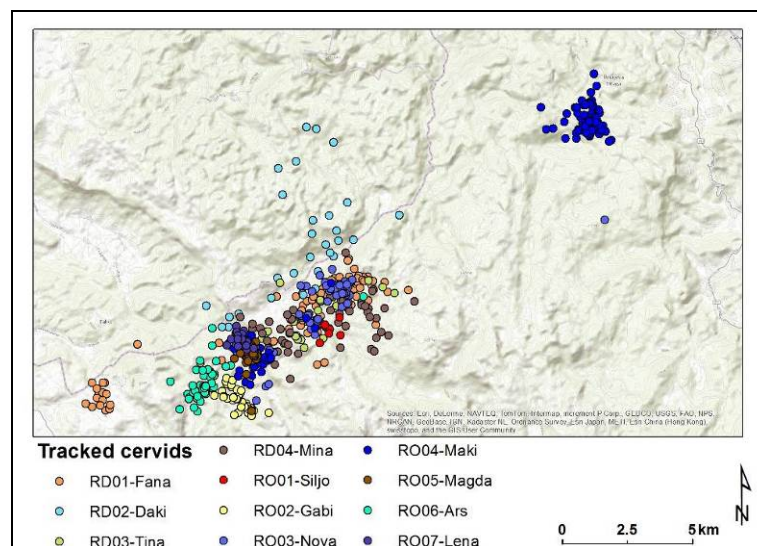


Figure 39: Cumulative data (all locations) of all tracked cervids ( $n=11$ ) in the period between 2007-2013.

## WOLF GENETIC RESEARCH

In November 2013 the research paper on the wolf genetic study done with our Italian partners has been published.

Since the beginning of the LIFE+ SloWolf project all wolf samples collected in Croatia for genetic studies were merged with Slovenian samples. That enabled the true transboundary insight in the wolf population dynamics. The samples collected in the season from 30.06.2012. to 01.07.2013 were processed till the end of 2013.

That project handled about 500 samples (of scats, urine, saliva and tissues) in each of 3 seasons (2011 to 2013) and that allowed, for the first time, the scientifically based calculation of the Slovenian wolf population size. Roughly 10% of those samples were from Gorski kotar (Croatia). The study identified each individual in average 4 times. That made possible correct calculations and revealed that the number of wolves in Slovenia is slightly below 40. That was contrary to the common belief in about 100 wolves and it changed the management reasoning. Consequently, the quota for wolf hunting in Slovenia was set to zero wolves for the winter 2013/2014. More detailed results showed that in October 2011 in Slovenia and Gorski kotar were 47 individuals (44-51; 95% CI), while in Slovenia alone there were 41 wolves (38-45; 95% CI). After subtracting of recorded mortality in the next season of 11 wolves - 10 in Slovenia and 1 in Gorski kotar), the estimate for March 2012 was 35 wolves (28-35; 95% CI). Those results indicated population decline.

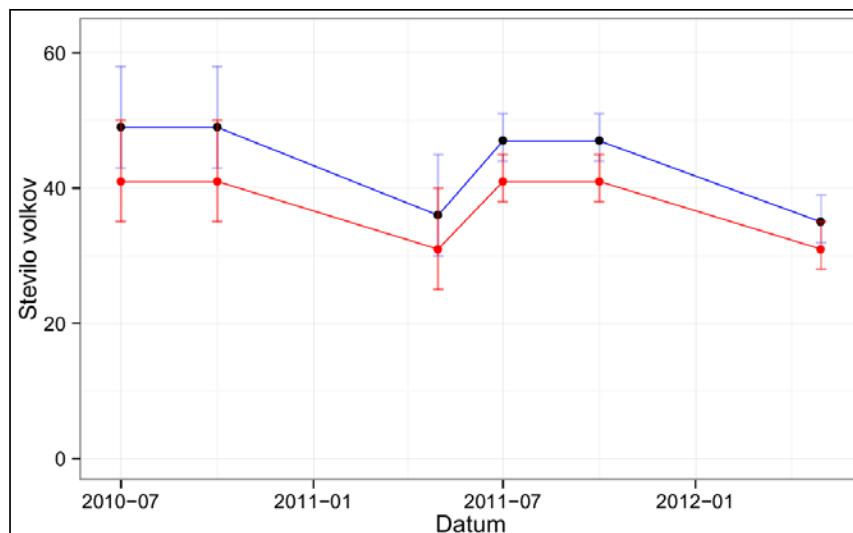


Figure 40: Wolf population size estimates: blue line includes Slovenia and the shared packs with Gorski kotar; red line is Slovenia only. (Source: SloWOLF project, Skrbinšek 2013).

The telemetry data were further enriched by the genetic analyses. That revealed the wolf dispersals and their family relations.

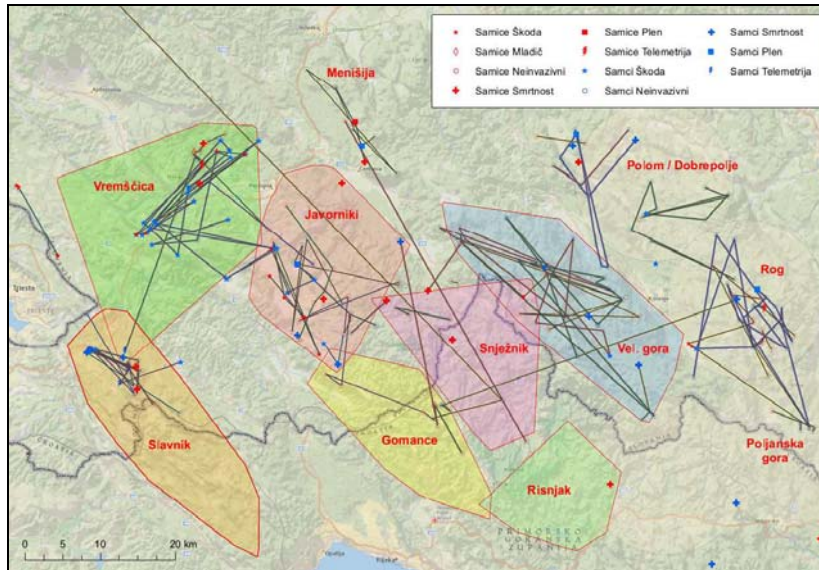


Figure 41: Wolf pack ranges revealed during the SloWolf project. Dots show and the lines connect the samples of the same individuals (blue are males and red are females) (Source: Project LIFE+ SloWolf, Tomaž Skrbinšek).

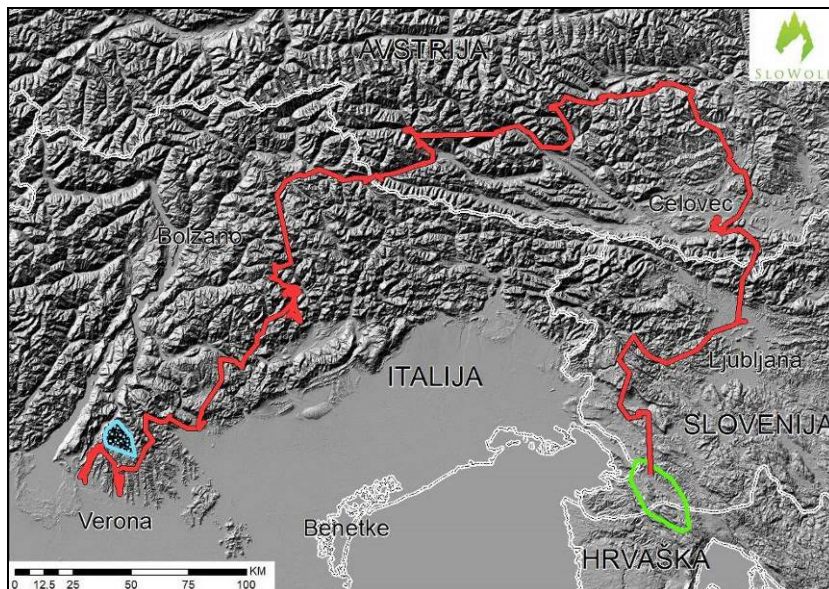


Figure 42: Dispersal route of wolf Slavco from the Učka/Slavnik pack (collared in 2011) over Slovenia and Austria to Italy near Verona. In 2013 there was a confirmed reproduction of Slavco with a female named “Julija” from the Apennine wolf population.

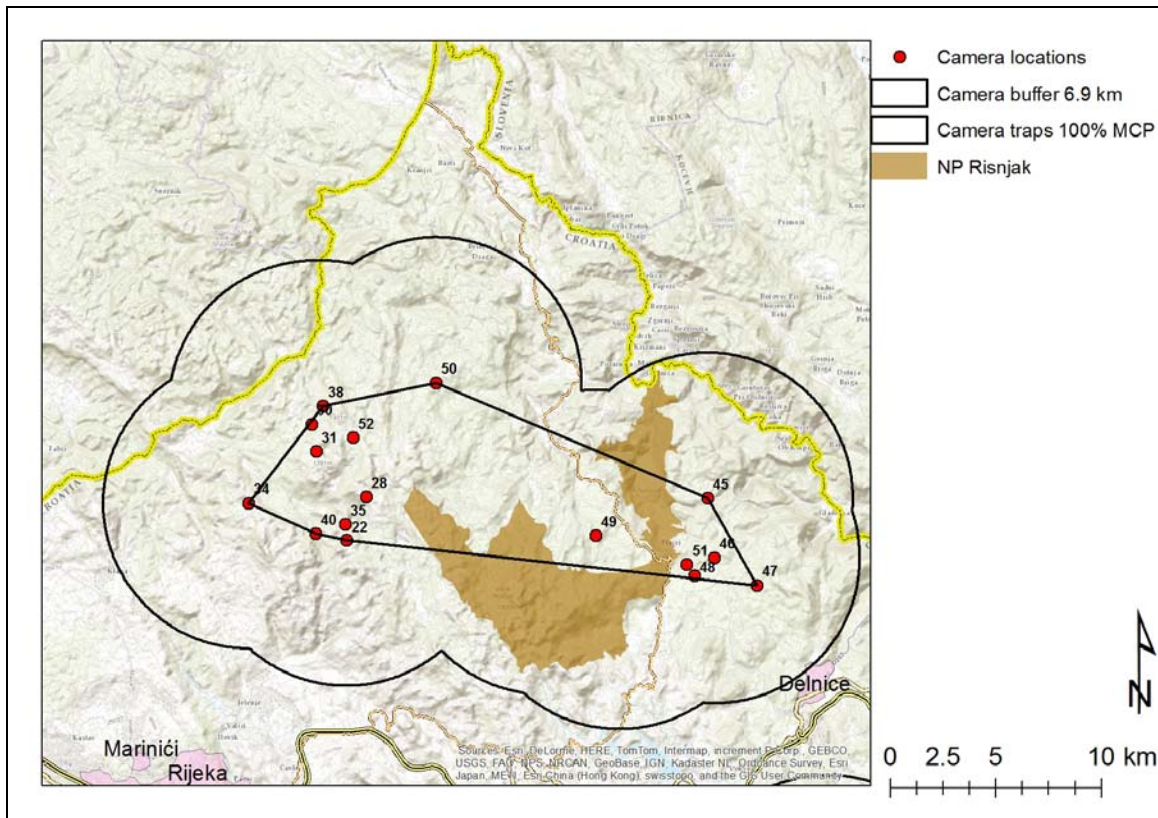


## CAMERA TRAPS

Camera traps give large amount of data (pictures and videos which take a lot of storage space). Processing of the data (looking at thousands of pictures and entering seen information into the database) also take a lot of time. Currently, four different persons (two students who will make their diploma papers on the data, one volunteer and one ranger of protected area) were inputting observations into the database camera data collected during 2013. Here we present basic results of the data collected by the use of camera traps in Gorski kotar area during 2013. The data from northern Velebit area is still being entered into database.

During 2013 we covered larger area (compared to 2012.) with cameras. We used them to monitor lynx presence and numbers, to check for wolf presence in the area and to collect data about spatial-temporal distribution and activity pattern of humans, large herbivores and large carnivores in Gorski kotar and Northern Velebit.

For the analysis of the use of space in time by large mammals and humans, data collected in the northern part of Gorski Kotar were used. The area covered by cameras was 129.3 km<sup>2</sup> (100% MCP), i.e. 608.7 km<sup>2</sup> (buffer 6.9km radius), and was the largest so far. These cameras were grouped into two groups (*Figure 43*).



*Figure 43: Camera traps locations, 100% MCP polygon (129.3 km<sup>2</sup>) and 6.9 km buffer (608.7 km<sup>2</sup>) around camera traps used in Gorski kotar region during 2013.*

Cameras were mainly set along forest roads and logging roads. Already during the 2011 we identified seven types of camera sites: the main forest road, secondary forest road, tertiary forest road, logging road, hiking trails, animal trails and forests without trails. This categorization was retained as it is essential in analyzing the activities and the use of space by animals and humans. When choosing a camera site, we took into account that cameras should be hidden from view, and at the distance of 3-5 m from presumed passage place. Cameras were placed at a height of 50 to 200 cm from the ground, depending on the distance of the recording site. As the distance was greater, the angle which the camera was covering was increasing too.

Some cameras were set to record video clips for 10, 20 or 30 seconds, with a three-second pause in the event of prolonged retention of the subject in the view-field of tze camera. Still, most camera

were set to record images as the previous use of the camera showed that video had not sufficient quality to identify the details, but was good good for recording animal behavior.

### Camera data analysis

In the period from 02.01.2013 till 02.01.2014 (365 days) cameras were placed at 18 different sites. At two sites, cameras were on logging roads, 11 cameras were at secondary forest roads, two places were the main forest road, one place was forest without any trails, and two cameras were at animal trails. For a future periods of monitoring, it would be good to increase the representation of categories that have so far been little or not represented.

*Table 7: Type, the coordinates and the micro-location-relief data for the sites where automatic cameras were placed during 2013.*

Camera	Site type	X coord	Y coord	Elevation(m)	Slope (deg)	Exposure (deg)	To road (m)
22	Logging road	5462552	5035007	1172.7	4.6	2.7	38.4
28	Secondary forest road	5463493	5037055	1314.9	8.0	102.7	3.1
30	Secondary forest road	5460907	5040514	1284.0	7.7	297.5	30.5
31	Secondary forest road	5461122	5039222	1334.7	1.9	289.5	4.6
34	Secondary forest road	5457922	5036769	1167.9	2.7	291.6	29.4
35	Secondary forest road	5462498	5035763	1122.0	6.7	7.6	2.8
38	Secondary forest road	5461426	5041361	1262.2	7.9	211.0	52.3
40	Logging road	5461102	5035322	1146.9	5.0	220.5	81.0
45	Secondary forest road	5479665	5037002	866.6	1.8	137.7	0.4
46	Main forest road	5479990	5034180	770.4	5.2	260.6	25.3
47	Secondary forest road	5482026	5032871	915.5	4.5	141.4	3.0
48	Animal trail	5479066	5033321	709.6	2.8	320.7	12.9
49	Main forest road	5474371	5035230	942.2	5.1	165.8	29.0
50	Secondary forest road	5466805	5042472	1097.3	4.1	95.7	3.7
51	Secondary forest road	5478694	5033853	711.3	4.1	251.5	16.8
52	Secondary forest road	5462858	5039864	1301.0	1.0	1.5	6.8
53	Animal trail	5492864	5017195				
54	Forest	5494369	5016404				

The slope of the terrain on which cameras were, ranged from 0.7 to 11.1 degrees, the average was 5.2 degrees. The cameras were at altitudes from 652 m to 1335m up, 1006 m average. Distance of the cameras to the nearest forest roads ranged from 0.3 m up to 697 m, average 36.9 m.

Cameras have made a total of 41817 recordings (Table 8), which were identified as 25 different types of events (activation of the camera). All these images were examined, it was a huge job which was done by four persons mentioned earlier. Out of the total number of shots, 31071 (74.3 %) recordings were without any homeoterm animal, humans or vehicles. Most of these recordings came in large series and during the hottest part of the day during the summer season, typically between 10:00 and 16:00 hours. Common to many of these recordings (23528, i.e., 56.3 %) is that part of the frame was with sunlit surface, while the second part was in shade. Based on the analysis of such recordings in a previous study, we conclude that these images are formed for the sake of over-sensitivity of thermal sensor, despite the fact that all cameras were set to low sensitivity. On another 5370 (12.8 %) recordings were such circumstances, yet the footage did not show anything, and they were interpreted as events, called "nothing". On 1163 (2.8 %) recordings showed people who have checked the camera (implementers of the project, not pedestrians), while in 1007 (2.4 %) records showed an object which could not be recognized, and three shots (0.01%) were made due to rain. All of these types of events and associated recordings were excluded from further analysis. On remaining 10746 (25.7 %) shots were events that were classified into 20 groups (Table 8).

Table 8: The total number of recordings sorted by type of recorded events. The column "usable" shows the distribution of the footage usable and unusable for further analysis.

#	EVENT TYPE	N RECORDINGS	% RECORDINGS	USABLE
1	Squirrel	0	0.00	YES
2	Rain	3	0.01	NO
3	Dog	3	0.01	YES
4	Chamois	9	0.02	YES
5	Hunters at place	30	0.07	YES
6	Wildcat	60	0.14	YES
7	Badger	66	0.16	YES
8	Wild boar	91	0.22	YES
9	Small mammal	92	0.22	YES
10	Mouse	111	0.27	YES
11	Lynx	114	0.27	YES
12	Wolf	167	0.40	YES
13	Roe deer	173	0.41	YES
14	Hare	182	0.44	YES
15	Marten	196	0.47	YES
16	Bear	458	1.10	YES
17	Foxes	554	1.32	YES
18	Human	678	1.62	YES
19	Unknown visits	1007	2.41	NO
20	Check	1163	2.78	NO
21	Dormouse	1733	4.14	YES
22	Vehicle	2322	5.55	YES
23	Red deer	3707	8.86	YES
24	Nothing	5370	12.84	NO
25	Sun triggered	23528	56.26	NO
	Total	41817	100.00	

Analyzed 41817 recordings contained a number of different events, because one event (visit of the animals, the passage of people and vehicles) typically was taken from at least three shots since the cameras were set to record three shots one after the other, to which was followed by a pause of five seconds. If the object was still in the camera frame, three more shots were made, etc. There have been a total of 2588 events, one event was recorded with an average 4.1 shots.

### Presence, frequency and time-space distribution of space use

Of analyzes 2588 events, the most common was passing vehicle (N = 1049, 40.5%), followed by the second most common, red deer (N = 469, 18.1%). In contrast to red deer, roe deer was observed only 35 times (1.4 %), while the wild boar was recorded 21 times (0.8%). It is very interesting that the occurrence of red deer was 13.4 times higher than the frequency of roe deer! Roe deer are the main prey of lynx in our habitats, and if in an area is dominated by red deer, which are typically too large prey for lynx (except calves), it can be suggested that this ratio would not be favored for lynx. That could be one of natural causes for a small number of lynx. In other words, investigated habitat would be more appropriate for wolves than lynx. However, this should be taken with a grain of salt and requires to collect more data from a wider area and conduct a deeper analysis of the data collected. Since the most common large carnivore was a bear, whose passage was 125 (4.8 %), which is even higher than the frequency of roe deer and wild boar together, and certainly more than the frequency of the lynx, which was recorded 42 times (1.6 %), while the wolf was recorded 61 times (2.4 %). The mere recording rate of certain species does not necessarily reflect their density in the community. Some cameras were in the wolf rendezvous sites, and the wolves were photographed often. It may also be that certain categories of animals (ungulates - prey) avoid places where it is more likely to encounter predators, and that predators avoid places where it is more likely to encounter people. It

seems that the prey, „weigh ", which is better; be closer to the people meant to be safer from predators (unless it's hunting season).

On 135 occasions (5.2%) recorded were the people who walked the woods, and in addition there were 1049 (40.5%) passes of vehicles. All recorded objects were categorized into six categories relevant for analyzing the relationship between large carnivores (predators), ungulates (prey) and people who can influence the activity and use of space by the first two categories. The passage of people on foot and vehicle was merged into one category, and perhaps in some future analyzes (with much larger data set) and two categories of people in the woods could be analyzed separately.

Ungulates avoided primary forest road, compared to secondary forest road ( $\chi^2$  (1DF) = 57.23,  $p = 0.0000$ ), as well as differences in the use of secondary forest roads in relation to logging roads ( $\chi^2$  (1DF) = 34.02,  $p = 0.000$ ). There was no difference in the use of secondary forest roads and animal trails ( $\chi^2$  (1DF) = 0.08,  $p = 0.776$ ). Preferences of artiodactyls to use the logging roads showed out to be in comparison with the animal trail ( $\chi^2$  (1DF) = 10.79,  $p = 0.001$ ).

*Table 9: Total number of events per type of event and the type of place during the 2013. Events excluded were: checking cameras and camera activation of sun, rain, and images with unrecognizable features.*

Event	Forest paths (roads)			Forest with no paths		Total N	%
	Primary	Secondary	Logging	Animal Trail	Forest		
Human	10	121	1	2		134	5.2
Hunters at site	1	1				2	0.1
Small mammal				9		9	0.3
Dog			1			1	0.0
Wildcat	2	12	17			31	1.2
Wild boar	3	8	9	1		21	0.8
Badger	1	16	3			20	0.8
Red deer	69	260	111	29		469	18.1
Marten	1	43	10	10		64	2.5
Foxe	28	103	60	18	2	209	8.1
Bear	53	53	17	2	1	125	4.8
Mouse	29	3				32	1.2
Dormouse	95	43	12	86		236	9.1
Lynx	10	28	4			42	1.6
Roe deer	1	17	7	10	5	35	1.4
Squirrels			6			6	0.2
Wolf	13	41	7			61	2.4
Hare		34	6			40	1.5
Vehicles	570	479				1049	40.5
Chamois		2				2	0.1
TOTAL	886	1264	271	167	8	2588	100.0

Large carnivores have used equally primary forest roads in relation to secondary forest roads ( $\chi^2$  (1DF) = 0.60,  $p = 0.439$ ), and there were no differences in the comparisons of primary forest road with logging roads ( $\chi^2$  (1DF) = 0.94,  $p = 0.333$ ). This is different compared to the 2012 season, and it may be due to the small sample size. The difference in the use of forest extraction roads and animal trails by large carnivores was significant ( $\chi^2$  (1DF) = 12.6,  $p = 0.0004$ ). It was also different compared to data from 2012 and may also be due to the small sample size.

The frequency of men was higher on the primary forest roads in relation to secondary forest roads ( $\chi^2$  (1DF) = 19:53,  $p = 0.000$ ). It is also different from the results of the 2012th year, and may also be a consequence of rather small sample size. The incidence of people on a logging roads compared with the frequency of people on animal trails was not significantly different ( $\chi^2$  (1DF) = 03.01,  $p = 0.3109$ ).

*Table 10: The total number and proportion of events per type of event for each monitored location. Excluded were; checking of cameras and camera activation by the sun, rain, and images with unrecognizable features.*

Event	Forest paths (roads)			Forest with no paths		Total	
	Primary	Secondary	Logging	Animal Trail	Primary	Secondary	Logging
Humans	581	601	1	2		1185	45.6
Other	124	80	24	95		323	12.4
Small carnivore	1	43	10	10		64	2.5
Ungulates	73	287	127	40	5	532	20.5
Medium carnivore	31	131	80	18	2	262	10.1
Large carnivore	76	122	29	2	1	230	8.9
TOTAL	886	1264	271	167	8	2596	100.0
RATIO (%)	34.1	48.7	10.4	6.4	0.3	100.0	

It can be concluded that large carnivores and people often use forest roads, while ungulates are significantly more likely to use logging roads and animal trails, where people and large carnivores are at low presence. It is understandable that they are thereby avoiding the aforementioned categories of space user.

We have found a lower proportion of small and medium-sized animals in relation to the proportion of large animals. It is expected that the frequency of small animals would be much higher on recordings, because their density is typically higher. A possible reason for this is that the smaller animals tend to be unnoticeable for the camera which may not be activated. One can consider that these automatic cameras are applicable only to large mammals.

Information about the passage of large carnivores, artiodactyls and people were divided by hours and presented separately for each of the five different types of places for which there was sufficient information. Shown are absolute ("raw") numbers.

On primary forest road, it was noted that during the day is dominated by the activity of people, and that during the night hours by large carnivores while the activity of artiodactyls was also at night, but generally at low intensity. It can be said that ungulates do not have much opportunity to use the primary roads because they are intensively used by people during the day, and by large carnivores at night.

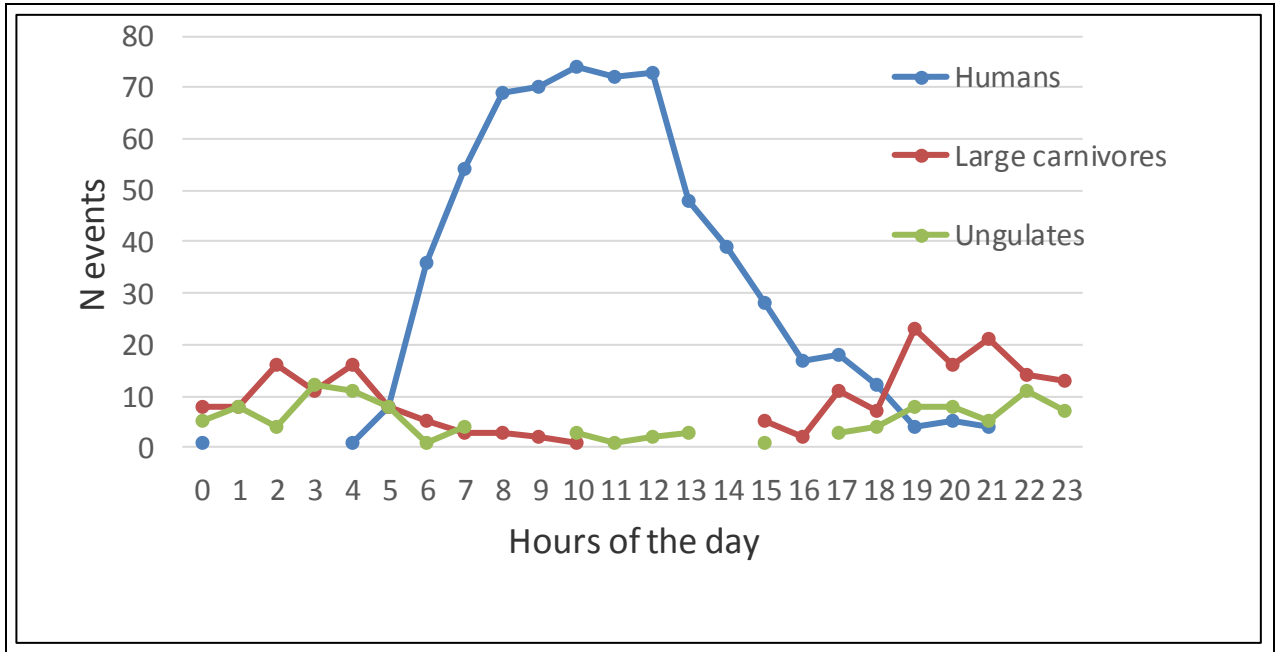


Figure 44: Number of events with people, large carnivores and ungulates per hour during the day on the primary forest road.



Figure 45: On primary forest road during the day are the most common people, the large carnivores at night, while ungulates were poorly represented.

Humans were most often recorded at the secondary forest road during the day, but notice the increased activity of artiodactyls during the night, while the large carnivores were almost equally active (increased activity in the evening), but less than in ungulates.

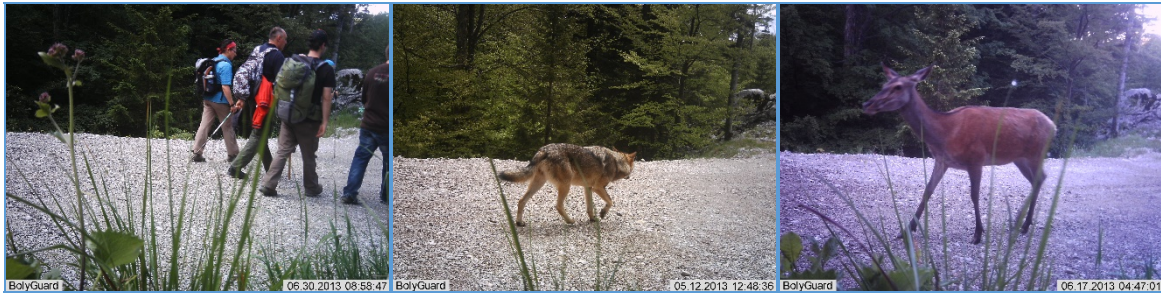


Figure 46: Humans were the most common at the secondary forest roads during the day, while large carnivores and ungulates were passed during the day, but more often in the morning and at dusk.

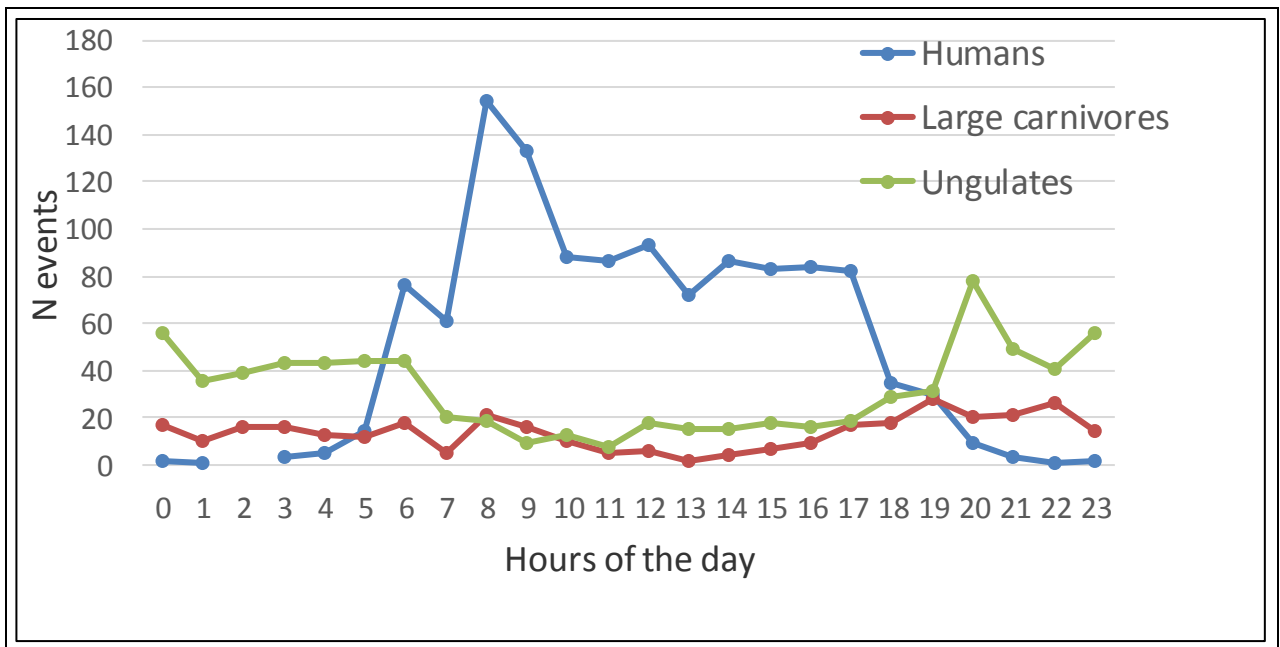


Figure 47: Number of events with people, large carnivores and ungulates per hour during the day on a secondary forest road.

During the 2013, not a single camera was set at tertiary forest roads, and no information is available about the daily frequency for the three selected categories of space user.

On forest logging roads, a low presence of humans was recorded throughout the day. Large carnivores were active during the morning and the evening, but the most obvious such activity rhythm was recorded for ungulates, more than on any other type of places.

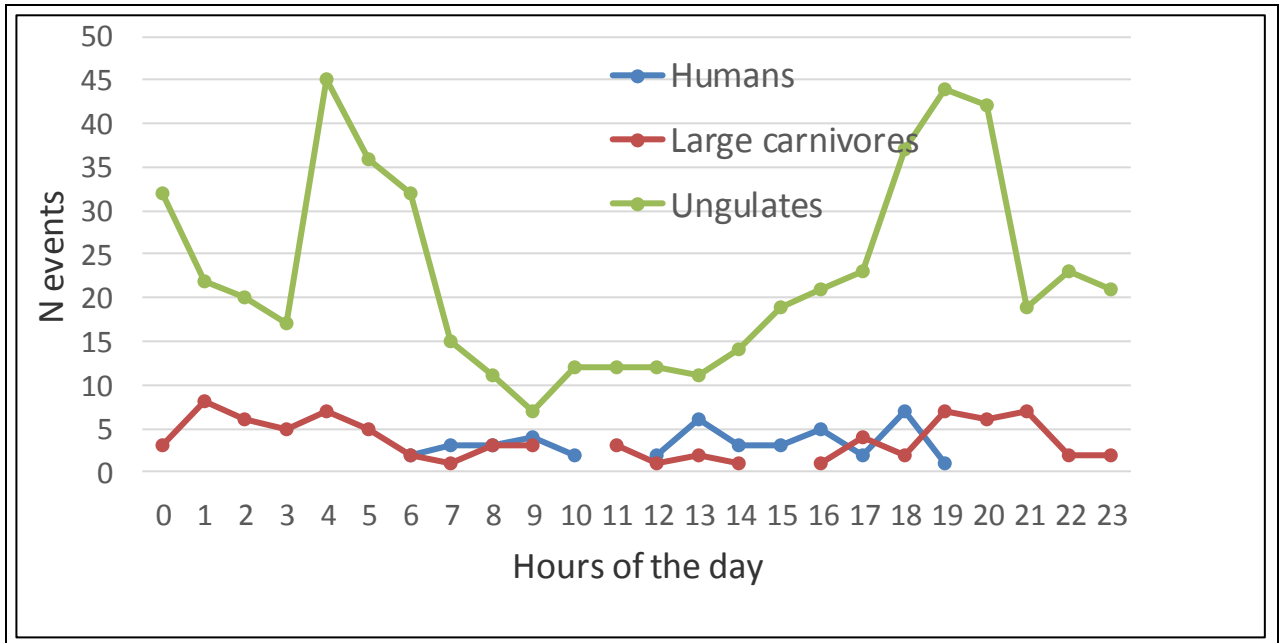


Figure 48: Number of events with people, large carnivores and ungulates per hour during the day on a logging roads.

Quite a different pattern of activities of three main categories of "user" was recorded on animal trails. Already during the first years of the study it was noted that the activity of humans and large carnivores on animal trails was very small, and that ungulates were active throughout the day, and not only at dusk and dawn. Ungulates were less active at these places during the night than during the day. Taking into consideration the patterns of activity of the same category of animals to other, previously described types of places, it can be said that ungulates adapt their pace of activities to people and to large carnivores, depending on their intensity and time schedule. Large carnivores are using the same paths as humans and avoid people so that they are active at the time when there are no people. Therefore ungulates in primary and secondary forest roads have relatively rare occurrence, while on the tertiary forest roads and logging roads they can be active mainly at dusk and dawn, and the least disturbed areas may be active throughout the day.



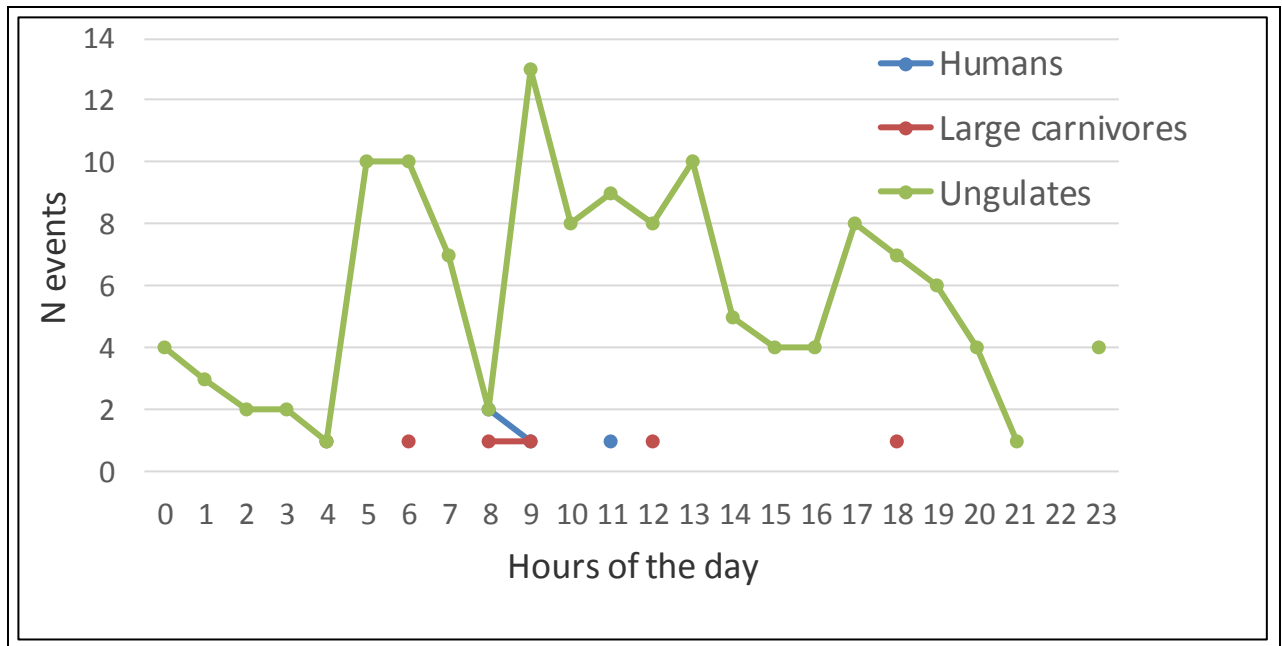


Figure 49: Number of events with people, large carnivores and ungulates per hour during the day on a animal trails.

For the 4810 event, activity of recorded object is interpreted by observing recorded photos or videos. Great majority ( $n = 3464$ ) has just walked. It has been reported 16 other types of activities, all of which are shown in the table, classified by type of activity and the species observed.

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Table 11: The total number of recorded activity types by species recorded and by type of activity.

SPECIES/ ACTIVITY	BROWSING	VOCALIZING	WACHING CAMERA	SCRACHING GROUND	WALKING	EATI NG	SNIFFING	GRAZING	CHECKING BAIT	DIGGING	STANDING	RUNNING	URINATING	KILLING PREY	TOTAL
man			17		356				4		2	1			383
wildcat			3		88		1				7	1			101
wild boar				2	164		25	1		3		6			202
badger			4		44		1		1	1	2	3			56
Red deer	4	4	32		1369	68	49	498	7		117	62			2213
Chamois					3										3
Marten			6		102		1				8	42	1		160
fox	1		10		365		13		11		24	17	8	2	452
bear	1		15		384	1	30	1			16	7			457
mouse					46						19	2			67
unknown			2		6						1	2			11
Dog					38		1		1						40
dormouse			14		141		11				6				172
lynx			1		71		3		3		2	2			82
Grey hamster			1												1
roe deer	1				100		2	5			4	1			113
Squirrel					5										5
Wolf			3		132		12		1		7	26	1		182
Hare	1				50	1	1	1			33	23			110
TOTAL	8	4	108	2	3464	70	150	506	28	4	248	195	10	2	4810

## WOLF MORTALITY

A mortality of 19 wolves was documented between 12.10.2012 and 04.09.2013. Prevailing causes of death were legal shooting (n=9) and road mortality (n=5). Illegal killing of wolves is still present; it was documented for three wolves. We are aware that this data is biased.

*Table 12: Basic data about dead wolves in Croatia between 12.10.2012 and 04.09.2013.*

ANIMAL ID	ANIMAL NAME	TIME	CAUSE
WCRO229	Branjin Vrh - Beli Manstir	12.10.2012 06:00	Illegal hunting
WCRO230	Mojanka lubanja	27.10.2012 22:22	Undetermined
WCRO231	Žrtva tornjaka	28.11.2012 06:00	Rabies
WCRO232	Kvota PG 2012-02	06.12.2012 19:50	Legal hunting
WCRO233	Kvota SD 2012-02	09.12.2012 22:22	Legal hunting
WCRO234	Kvota PG 2012-03	27.12.2012 11:00	Legal hunting
WCRO235	Kvota PG 2012-04	27.12.2012 11:10	Legal hunting
WCRO236	Kvota SD 2012-03	30.12.2012 10:00	Legal hunting
WCRO237	Kvota SD 2012-04	04.01.2013 21:00	Legal hunting
WCRO238	Kvota ŠK 2012-02	06.01.2013 09:30	Legal hunting
WCRO239	Promet Drniš	25.01.2013 22:22	Road kill
WCRO240	Kvota ŠK 2012-03	27.01.2013 22:22	Legal hunting
WCRO241	Promet Pađene	14.02.2013 06:00	Road kill
WCRO242	Vuk-Čagalj	22.08.2010	Legal hunting
WCRO243	Studenci	07.03.2013 22:22	Illegal hunting
WCRO244	Promet Dugopolje	17.03.2012 05:00	Road kill
WCRO245	Trilj-benzinska	06.06.2013 03:00	Road kill
WCRO246	Promet Klapavice	04.09.2013 22:22	Road kill
WCRO247	NP Krka, podnožj Promine	15.12.2012	Illegal hunting

*Table 13: Summary data about dead wolves in Croatia between 12.10.2012 and 04.09.2013.*

WOLF MORTALITY CAUSE	N
Legal hunting	9
Illegal hunting	3
Road kill	5
Rabies	1
Undetermined	1
TOTAL	19

All dead wolves are being pathologically processed at the Veterinary faculty of the University of Zagreb and some of them were fresh enough to be thoroughly examined.

By looking back, since the protection of wolves in Croatia, a mortality of 250 wolves was documented. The data are certainly biased since non-human caused deaths are difficult to find and even some human caused mortalities (illegal killing) are inherently hidden. Anyway, it is evident that illegal killing of wolves represented 16% of all known mortality.

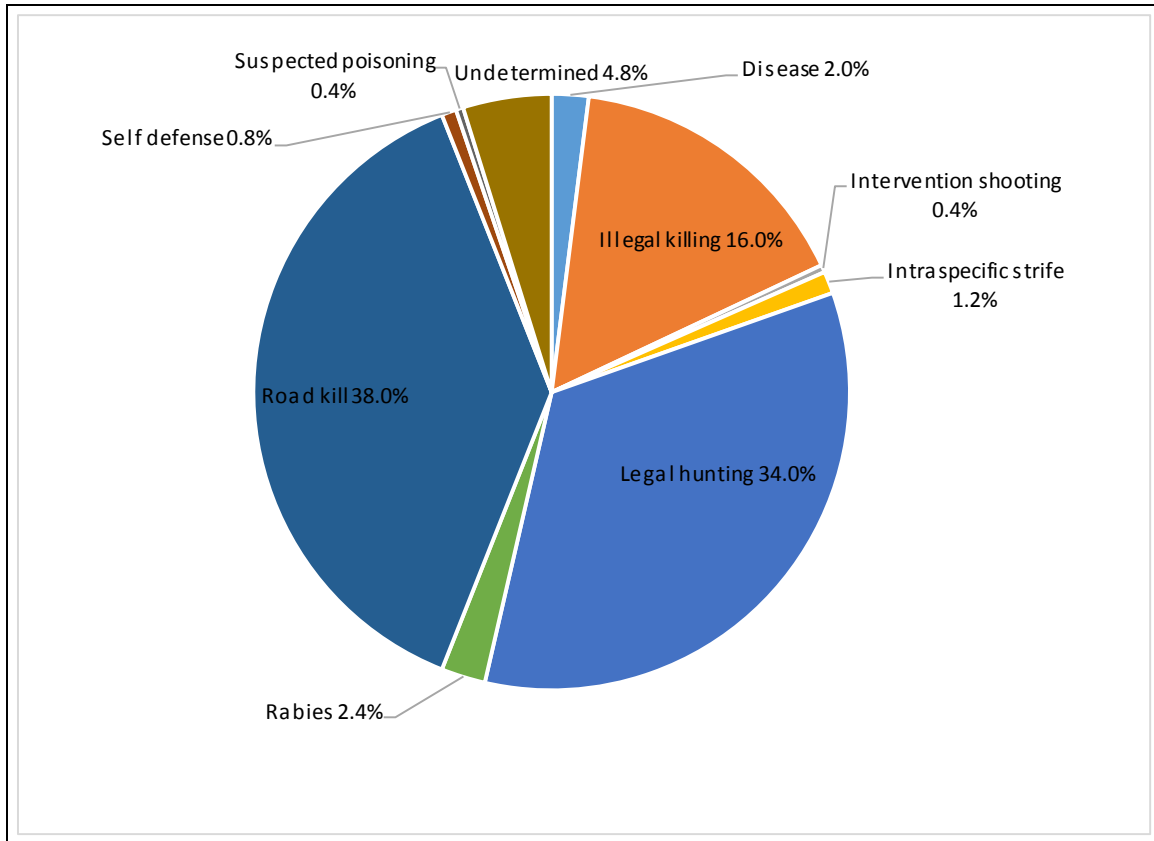


Figure 50: Causal distribution of mortality of 250 wolves in Croatia for the period between 1996 and 2013.

The main reason for the introduction of legal quota for wolves was to reduce damages in the areas of high frequency of wolf attacks on livestock. The other reason was to minimize illegal killing of wolves, i.e. replacing illegal killing with legal and controlled one. Was the goal of minimizing of illegal wolf killing achieved?

During the first ten years of wolf protection, no wolves were allowed to be legally killed. However, illegal killing of wolves was documented for every year during these ten years of no legal quota allowance. The highest number of illegally killed wolves was documented in 1996. After this year, the number of known illegally killed wolves was ranging between one and three. Legal quota was introduced with the management plan in 2005 and was getting higher and higher every year. Unfortunately, illegal wolf killing did not disappear, but instead, it was in the same level (1-3 wolves per year) as before the introduction of wolf quota. In the same time, approved quota was never fulfilled. This indicates that the concept of legal wolf shooting does not work as expected and it will have to be re-evaluated during the process of the next revision of wolf management plan. Illegal wolf killing can seriously slow the recovery of wolf population (proven for Sweden) and similar evaluation would be good to do for Croatia as well.

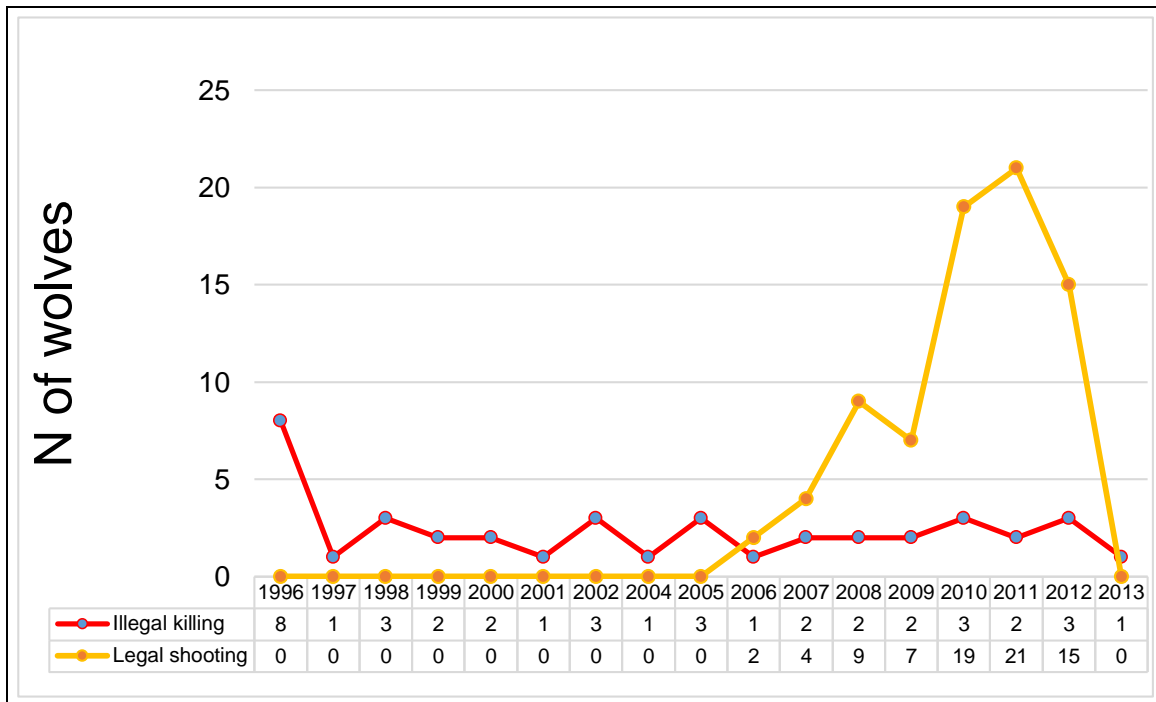


Figure 51: The trend in illegal and legal wolf killing since the beginning of wolf protection in 1995, to the introduction of legal quota in 2005 and until 2013, when for the first time the yearly quota (not yet approved by the minister) was set to zero.

The Committee for large carnivores of Croatia has recommended to the ministry that for the next season the quota should be zero. Responsible ministry has accepted this recommendation and did not allow any legal wolf shooting during the winter 2013/2014.

### LYNX MORTALITY

There was no confirmed dead lynx in Croatia during 2013, as well as in 2012. However, the illegal killing of the only GPS tracked lynx was documented in 2013 (see chapter about lynx tracking).

## IMPLEMENTATION OF THE WOLF AND LYNX MANAGEMENT PLANS

### WOLF MANAGEMENT

Đuro Huber and Josip Kusak continue to participate in large carnivores management through the work in the “Committee for large carnivores in Croatia” and the “Comity for bear management in Croatia” and through various other activities (organizing and implementing monitoring, giving courses for damage inspectors and Intervention team for large carnivores, media appearances and statements). Both researchers are co-authors of the yearly report about wolf population status in Croatia. The main conclusion of the report for 2013 was that we observed a drop to about 177 wolves in 49 packs, and that there are no arguments for any legal shooting of wolves. This conclusion was brought after the collecting and analyzing monitoring results. The main outcome of this work was a map showing the distribution, numbers and trend of wolves in each of 49 wolf packs determined during monitoring. Beside lower number of wolves, the number of packs has also decreased.

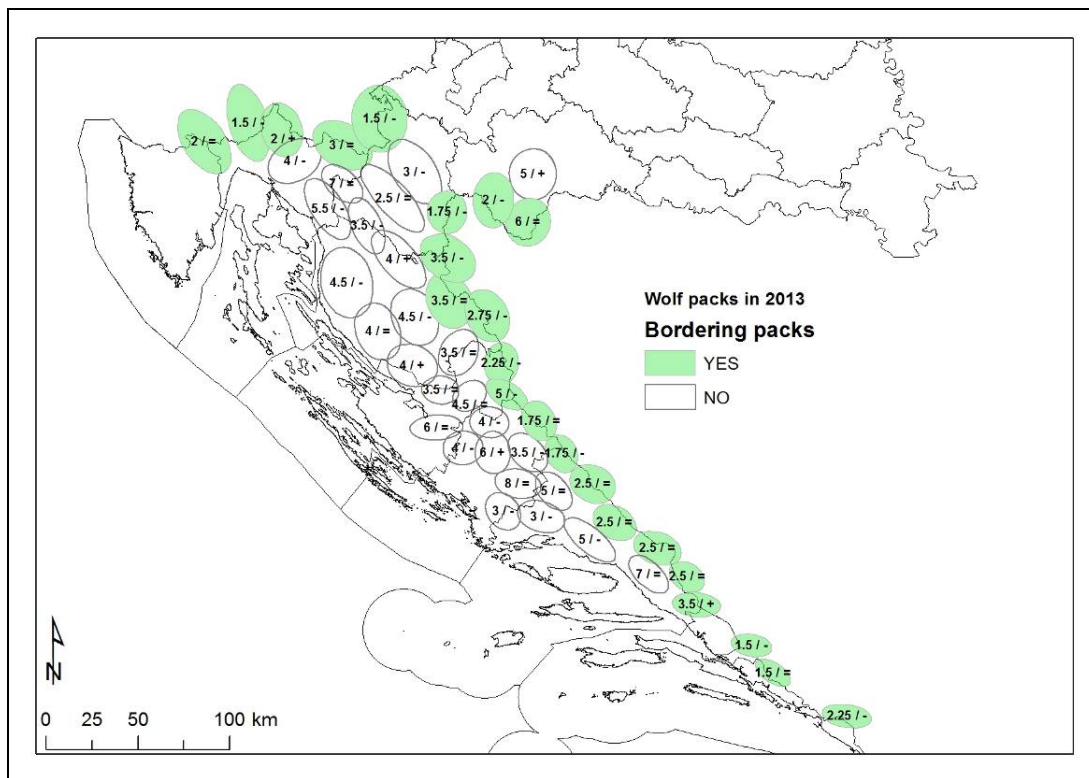
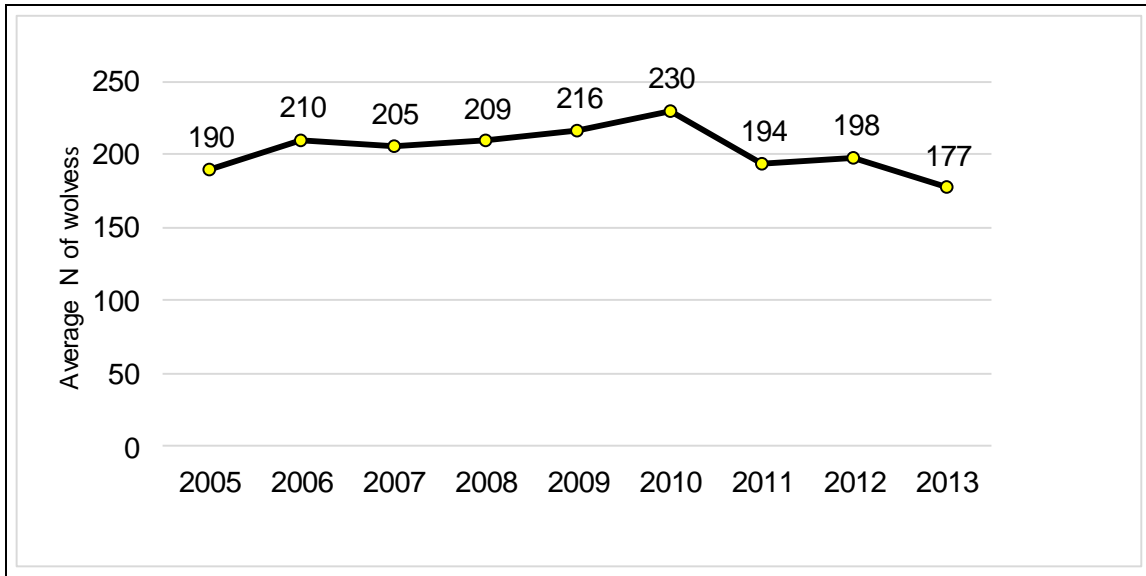


Figure 52: The spatial distribution, average number and trend in packs observed in Croatia during 2013 (from the “Yearly report about the status of wolf population in Croatia in 2013”).

The trend in wolf numbers since the beginning of the implementation of wolf management plan from 2005 was for the first five years positive and then it turned down during the last three years. The most serious drop happened in the year 2013.

The negative trend in wolf number and the fact that illegal wolf killing is still present form two main arguments against any legal quota on wolves this year.



*Figure 53: The trend in wolf numbers in the period from 2005 to 2013, i.e. since the beginning of the implementation of wolf management plan and until recent times.*

The regular public meeting on discussing the yearly quota of accepted mortality was not held this year! The ministry in charge of wolf conservation and management decided that it is enough to have the “Yearly wolf status report” and discuss it at the National Large Carnivore Committee meeting. That committee met on 28.10.2013. and decided that this year the wolf quota will be 0 (zero). This will certainly raise additional negative reaction from the hunting lobby, but seems that there was no alternative.

## LYNX MANAGEMENT

Considering **lynx management** this year a group of authors (including Đuro Huber and Josip Kusak as the first two authors) prepared a 28 page document on the “Lynx population status in Croatia”. The main of 13 conclusions tell that the population size is roughly around 50 individuals, but they are heavily inbred and there is an urgent need for repopulation to increase genetic variability.



*Figure 54: Lynx pictured in a photo trap*

The Directorate for nature protection of the Ministry for environment and nature protection agreed that the species is critically endangered (CR) and that repopulation is necessary. The Directorate for hunting of the Ministry for agriculture submitted the complaint on that fearing that the eventual rise of lynx population will put roe deer population in threat. In any case the researchers of Croatia and Slovenia plan to submit a LIFE+ project proposal aimed to add new animals to the Dinaric lynx population.



## HIGHWAY MITIGATION MEASURES

The authors of this study continue to monitor the use by animals of the Green bridge Dedin near Delnice. Other bridges are monitored by G. Gužvica (OIKON) since 2008. The photo and video recordings allow counting of animals by numbers within each species. The records of wolves on 8 bridges (Ivančevo brdo, Rasnica, Medina gora, Varošina, Osmakovac, Rošca, Konšćica i Vrankovića ograda) show the trend over the years. On 6 of 7 bridges where wolves were ever recorded this study revealed the decrease of wolves on pictures over the last 5 years (2008 to 2013). This was yet another proof of recent decline in wolf numbers.

The study which we did for the Rijeka – Zagreb Highway was the “Evaluation of the risk of entering of animals to the highway” (43 pages). The approach was based on the habitat types in various sections of highway while considering the animal species living around, their abundance, availability of crossing structures, quality of fence, and the attractions at the road itself in the form of previously killed animals and garbage. The data on the sites of all known traffic collisions since the highway construction (1999) were used.

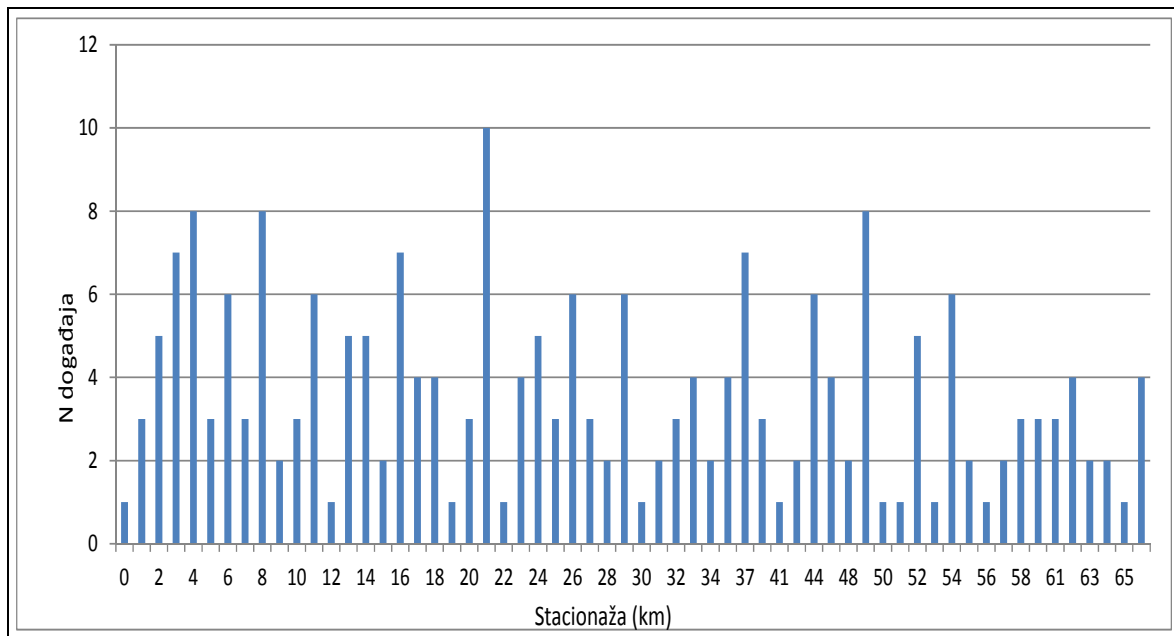


Figure 55: Animal mortalities on the highway A6 by kilometers in the direction from Zagreb.

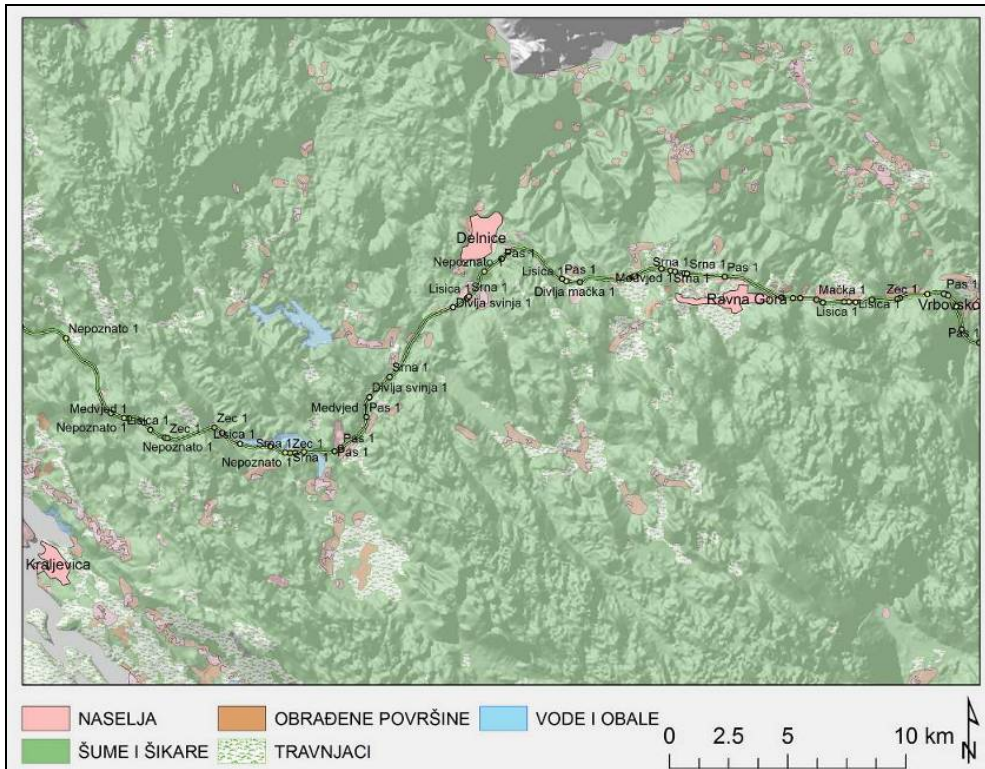


Figure 56: Sites of recorded collisions on the highway A6 section between Vrbovsko and Rijeka.

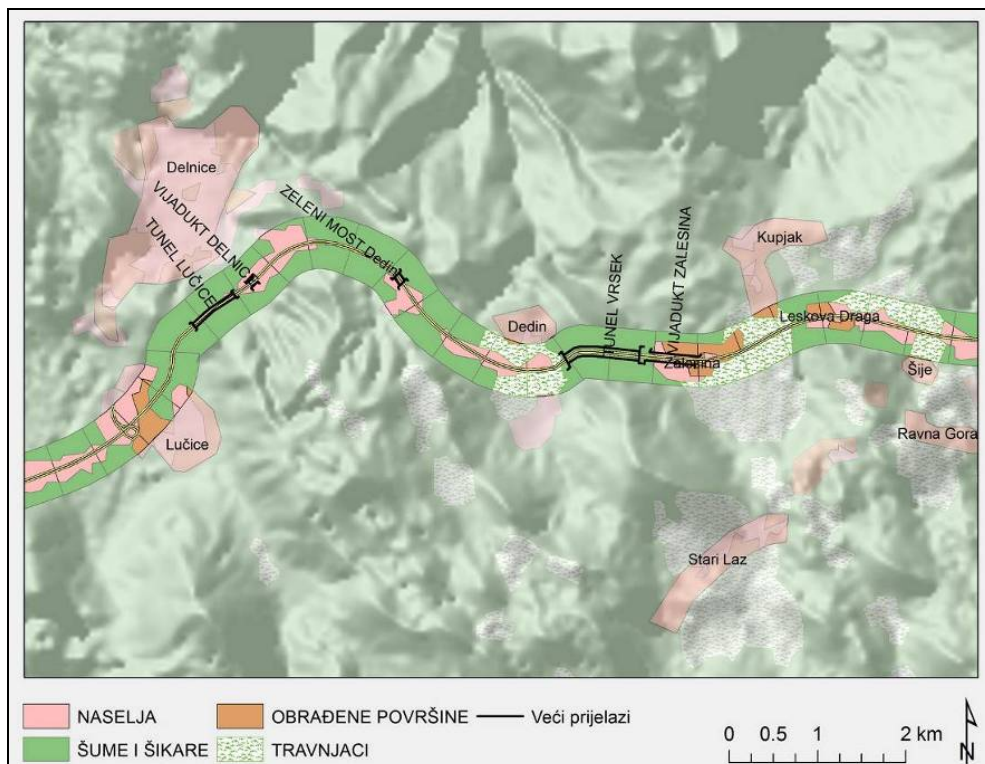


Figure 57: Example of habitat types along the highway route in Gorski kotar

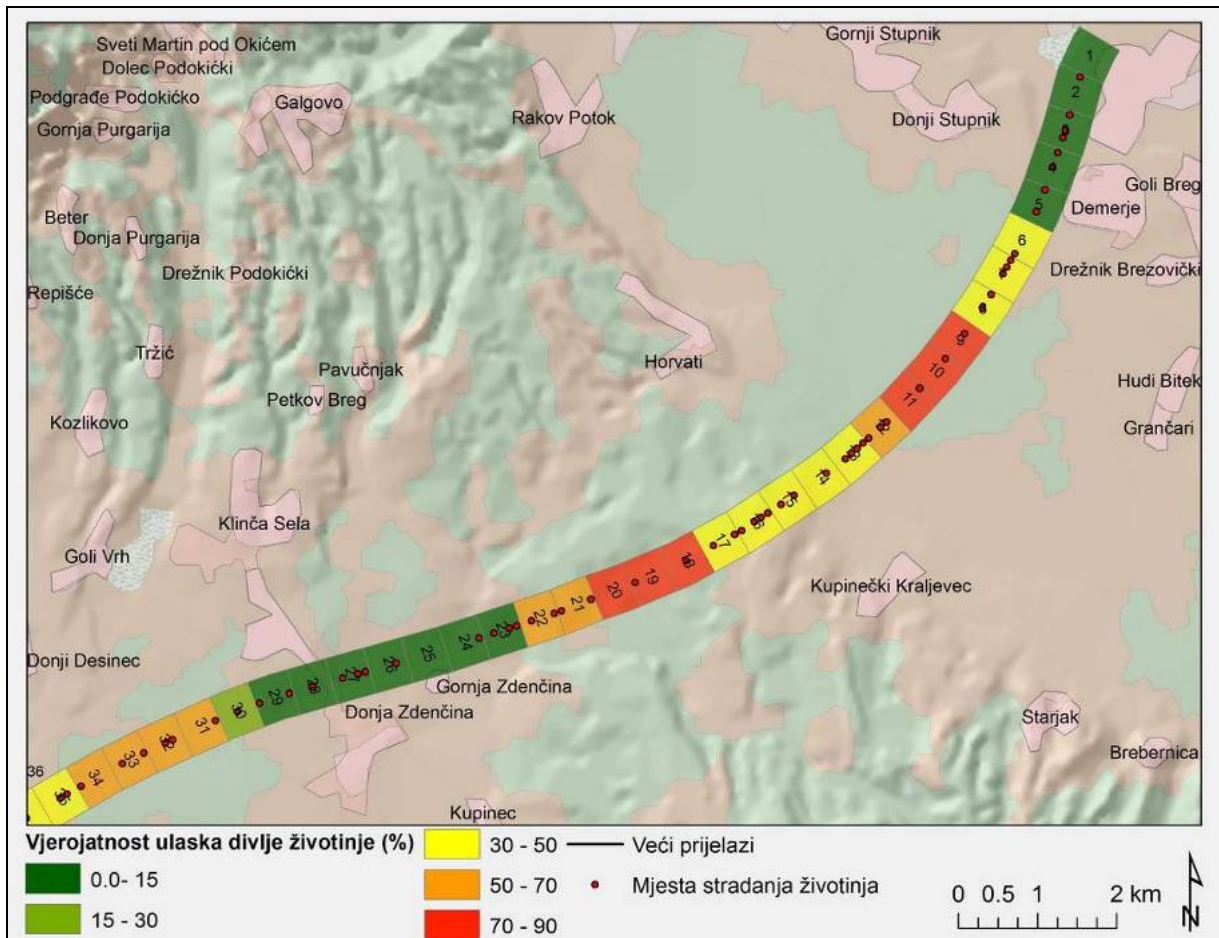


Figure 58: Likelihood of appearance of wildlife on highway and sites of previous traffic collisions with wild and domestic animals – example on section in Gorski kotar. Colors indicate risk (0 -90%).

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## FINANCIAL ACCOUNTING

For our work in 2013 UKWCT generously donated a total of 4000 GBP. Most of fund in 2013 and first quarter of 2014 was spent for field work; fuel for cars and food for field workers with some minor expenses for the consumable equipment like receiver batteries. Josip Kusak, Slaven Reljić and occasional volunteers are doing the entire wolf and lynx related field work.

Table 14: Summary list of expenses made on the project with the use of UKWCT fund during 2013 and first quarter of 2014.

Purpose	N EXPENSES	SUM (HRK)
Car-fuel	31	16889.88
Car-highway	30	1140.00
Car-parking	3	336.00
Personal-food	112	12577.69
Personal-hygiene	2	95.63
Personal-overnight stay	5	2064.50
Personal-transportation	1	1080.00
Technic-equipment	18	2837.99
<b>TOTAL</b>	<b>202</b>	<b>37021.69</b>

The final amount is different from the proposed amount for 289.46 HRK (31.52 GBP) because of fluctuation in exchange rate of GBP value relative to HRK.

Table 15: Detailed list of expenses broken down by activities performed on the project with the use of UKWCT fund during 2013 and first quarter of 2014.

Activity	Activity objective	Time	TO	Purpose	Receipt#	Amount (HRK)
531	Telemetry	17.04.2013 15:55	OMV Hrvatska d.o.o.	Car-fuel	0-0001787522	728.05
531	Telemetry	17.04.2013 16:55	AC RI-ZG	Car-highway	2013041760402165576298	51.00
531	Telemetry	17.04.2013 17:03	PETROL HRVATSKA d.o.o.	Personal-food	703044	12.69
531	Telemetry	17.04.2013 17:04	PETROL HRVATSKA d.o.o.	Technic-equipment	703045	35.49
531	Telemetry	17.04.2013 23:30	Raukar, Marina	Personal-overnight stay	Not recieved	100.00
531	Telemetry	18.04.2013 22:25	Schorpion	Personal-food	2973/POS1/1	57.00
531	Telemetry	18.04.2013 23:00	Raukar, Marina	Personal-overnight stay	Not recieved	100.00
531	Telemetry	19.04.2013 08:54	AC RI-ZG	Car-highway	2013041918006085414920	51.00
531	Telemetry	19.04.2013 20:00	TIFON d. o. o.	Car-fuel	051783	542.16
538	Wolf trapping	24.07.2013 08:43	KARMAT d.o.o.	Technic-equipment	11635/001/1	54.00
538	Wolf trapping	25.07.2013 09:10	KARMAT d.o.o.	Technic-equipment	11777/001/1	16.00
538	Wolf trapping	26.07.2013 22:35	OMV Hrvatska d.o.o.	Car-fuel	0-2600117521	657.12
538	Wolf trapping	27.07.2013 00:04	AC RI-ZG	Car-highway	2013072760402000443898	51.00
538	Wolf trapping	27.07.2013 01:45	AC RI-ZG	Car-highway	2013072775003015552783	35.00
538	Wolf trapping	27.07.2013 09:55	Trgovina Krk d.d.	Personal-food	27014/19/1	517.14

Activity	Activity objective	Time	TO	Purpose	Receipt#	Amount (HRK)
538	Wolf trapping	27.07.2013 11:47	Trgovina Krk d.d.	Technic-equipment	12084/21/1	339.99
538	Wolf trapping	27.07.2013 18:57	NAJMARKET	Personal-food	18613/PJ03/1	48.26
538	Wolf trapping	27.07.2013 19:33	Buffet	Personal-food	3522/001/01	20.00
538	Wolf trapping	27.07.2013 20:00	Trgovina Krk d.d.	Personal-food	58459/39/1	195.42
538	Wolf trapping	28.07.2013 07:32	Trgovina Krk d.d.	Personal-food	12416/N3/1	19.50
538	Wolf trapping	28.07.2013 09:01	NAJMARKET	Personal-food	18951/PJ03/1	22.19
538	Wolf trapping	28.07.2013 11:22	Trgovina Krk d.d.	Personal-food	10555/P2/1	30.00
538	Wolf trapping	28.07.2013 11:56	NAJMARKET	Technic-equipment	5401355	80.00
538	Wolf trapping	28.07.2013 18:46	Aquagun	Technic-equipment	3468/POSL1/3	30.00
538	Wolf trapping	28.07.2013 18:51	Aquagun	Personal-food	7720/POSL1/1	20.00
538	Wolf trapping	29.07.2013 09:18	Centar Brač d.o.o.	Personal-food	9271/23/1	59.99
538	Wolf trapping	29.07.2013 09:25	Pekara Baška	Personal-food	12877/N3/1	29.00
538	Wolf trapping	29.07.2013 09:26	Pekara Baška	Personal-food	12878/N3/1	18.00
538	Wolf trapping	29.07.2013 11:33	KONZUM d. d.	Personal-food	68987/0298/2	194.32
538	Wolf trapping	30.07.2013 09:00	Angelina boat	Personal-transportation	4558	1080.00
538	Wolf trapping	30.07.2013 10:06	Angelina boat	Personal-food	1408/1/1	30.00
538	Wolf trapping	30.07.2013 10:50	Angelina boat	Technic-equipment	418/1/1	70.00
538	Wolf trapping	30.07.2013 11:14	NAJMARKET	Personal-food	5000/1/1/	
538	Wolf trapping	30.07.2013 11:53	NAJMARKET	Personal-food	5020/1/1/	48.00
538	Wolf trapping	30.07.2013 13:09	Aquagun	Personal-food	7294/100/10001	66.00
538	Wolf trapping	30.07.2013 16:42	Angelina boat	Personal-food	1445/1/1/	52.00
538	Wolf trapping	31.07.2013 16:23	Aquagun	Technic-equipment		105.00
538	Wolf trapping	31.07.2013 17:30	NAJMARKET	Personal-food	21436/PJ03/1	27.48
538	Wolf trapping	31.07.2013 18:10	Aquagun	Personal-food	8666/POSL1/1	152.00
538	Wolf trapping	31.07.2013 19:03	Aquagun	Personal-food	11852/P2/1	20.00
538	Wolf trapping	31.07.2013 19:23	Ljekarna DE 01	Personal-hygiene	22767-1-2	45.00
538	Wolf trapping	31.07.2013 21:25	KONZUM d. d.	Personal-food	71154/0296/2	136.21
538	Wolf trapping	01.08.2013 09:36	Trgovina Krk d.d.	Personal-food	28445/19/1	125.30
538	Wolf trapping	01.08.2013 18:12	Aquagun	Personal-food	8989/POSL1/1	20.00
538	Wolf trapping	01.08.2013 18:54	Pekara Baška	Personal-food	14180/N3/1	20.00
538	Wolf trapping	01.08.2013 19:20	Buffet	Personal-food	3950/001/01	32.00
538	Wolf trapping	01.08.2013 20:07	Trgonom d.o.o.	Personal-food		22.00
538	Wolf trapping	02.08.2013 09:01	Pekara Baška	Personal-food	14347/N3/1	41.50
538	Wolf trapping	02.08.2013 18:17	Aquagun	Personal-food	9327/POSL1/1	141.50
538	Wolf trapping	02.08.2013 18:55	Aquagun	Personal-food	9343/POSL1/1	36.00
538	Wolf trapping	02.08.2013 20:16	KONZUM d. d.	Personal-food	26855/0298/3	200.11
538	Wolf trapping	03.08.2013 08:19	TIFON d. o. o.	Car-fuel	118993	564.33
538	Wolf trapping	03.08.2013 09:01	HR autoceste d. o. o.	Car-highway	1190407126	84.00
538	Wolf trapping	03.08.2013 20:49	PARK-94	Car-parking	3308	66.00
538	Wolf trapping	04.08.2013 07:44	KONZUM d. d.	Personal-food	49260/POSL2/1	392.86
538	Wolf trapping	04.08.2013 08:03	Trgovina Krk d.d.	Personal-food		27.00
538	Wolf trapping	04.08.2013 21:35	Caffe Bar	Personal-food	9827/POSL1/1	38.00
538	Wolf trapping	05.08.2013 09:50	Pekara Baška	Personal-food	6656/PJ1/1	17.30
538	Wolf trapping	05.08.2013 10:01	SONIK d. o. o.	Personal-food	52202/129/100	35.65
538	Wolf trapping	05.08.2013 12:11	SONIK d. o. o.	Personal-food	52200/129/100	75.87
538	Wolf trapping	05.08.2013 16:00	Poljak, Davor	Car-fuel		1000.00
538	Wolf trapping	05.08.2013 18:58	HR autoceste d. o. o.	Car-highway	1080244190	58.00
538	Wolf trapping	05.08.2013 20:21	AC RI-ZG	Car-highway	2013080575002202183992	35.00
538	Wolf trapping	05.08.2013 20:45	PETROL HRVATSKA	Car-fuel	137273	470.56

Activity	Activity objective	Time	TO	Purpose	Receipt#	Amount (HRK)
			d.o.o.			
538	Wolf trapping	06.08.2013 11:23	KONZUM d. d.	Personal-food	76008/0298/2	280.00
538	Wolf trapping	06.08.2013 19:28	Polaris	Personal-food	2938/REST/1	56.00
538	Wolf trapping	07.08.2013 07:31	Pekara Baška	Personal-food	16219/N3/1	12.50
538	Wolf trapping	07.08.2013 10:03	Trgovina Krk d.d.	Personal-food	6973/39/2	140.94
538	Wolf trapping	07.08.2013 11:23	Person, Unknown	Personal-food		108.00
538	Wolf trapping	07.08.2013 11:55	Person, Unknown	Car-fuel		100.00
538	Wolf trapping	07.08.2013 18:06	KONZUM d. d.	Personal-food	42971/916220/1	42.90
538	Wolf trapping	07.08.2013 18:20	KONZUM d. d.	Personal-food	91716/0298/1	160.92
538	Wolf trapping	07.08.2013 18:42	Person, Unknown	Personal-food	14312/P2/1	40.00
538	Wolf trapping	08.08.2013 07:40	Pekara Baška	Personal-food	16617/N3/1	13.50
538	Wolf trapping	08.08.2013 10:28	Trgovina Krk d.d.	Personal-food	64790/39/1	59.57
538	Wolf trapping	08.08.2013 17:54	NAJMARKET	Personal-food	27944/PJ03/1	16.98
538	Wolf trapping	08.08.2013 18:52	NAJMARKET	Personal-food	3075/REST/1	26.00
538	Wolf trapping	08.08.2013 19:34	Pekara Baška	Personal-food	16954/N3/1	10.00
538	Wolf trapping	08.08.2013 19:47	Trgovina Krk d.d.	Personal-food	7635/39/2	97.44
538	Wolf trapping	09.08.2013 07:33	Trgovina Krk d.d.	Personal-food	31174/19/1	137.28
538	Wolf trapping	09.08.2013 12:02	Trgonom d.o.o.	Personal-food	15322/P2/1	40.00
538	Wolf trapping	09.08.2013 12:31	Trgonom d.o.o.	Personal-food	15322/P2/1	40.00
538	Wolf trapping	09.08.2013 13:36	Risnjak, NP	Personal-food	6674/PO1/1	13.00
538	Wolf trapping	09.08.2013 18:43	AC RI-ZG	Car-highway	2013080975002184390832	35.00
538	Wolf trapping	10.08.2013 13:11	Trgovina Krk d.d.	Personal-food	31759/19/1	80.99
538	Wolf trapping	11.08.2013 08:16	Trgovina Krk d.d.	Personal-food	31977/19/1	75.99
538	Wolf trapping	11.08.2013 18:40	Aquagun	Personal-food	5336/POSL1/3	60.00
538	Wolf trapping	11.08.2013 18:42	Aquagun	Personal-food	12213/POSL1/1	36.00
538	Wolf trapping	12.08.2013 11:37	Ljekarna DE 01	Personal-hygiene	25850-1-2	50.63
538	Wolf trapping	12.08.2013 12:08	KONZUM d. d.	Personal-food	95091/0298/1	174.94
538	Wolf trapping	12.08.2013 18:04	Aquagun	Personal-food	12540/POSL1/1	114.75
538	Wolf trapping	12.08.2013 18:32	Aquagun	Personal-food	12550/POSL1/1	32.00
538	Wolf trapping	13.08.2013 08:29	Trgovina Krk d.d.	Personal-food	32582	139.65
538	Wolf trapping	13.08.2013 19:11	Buffet	Personal-food	5193/001/01	98.00
538	Wolf trapping	13.08.2013 19:35	Pekara Baška	Personal-food	18918/N3/1	8.50
538	Wolf trapping	14.08.2013 10:49	PETROL HRVATSKA d.o.o.	Car-fuel	773124	427.95
538	Wolf trapping	14.08.2013 13:09	Trgovina Krk d.d.	Personal-food	32960/19/1	148.24
538	Wolf trapping	14.08.2013 22:08	AC RI-ZG	Car-highway	2013081475004220814137	35.00
538	Wolf trapping	16.08.2013 17:54	Caffe Bar	Personal-food	41044/PO1/1	36.00
538	Wolf trapping	17.08.2013 22:43	Adria Oil d.o.o.	Personal-food	098707	31.00
538	Wolf trapping	18.08.2013 00:37	TIFON d. o. o.	Car-fuel	184915	575.07
538	Wolf trapping	18.08.2013 00:59	AC RI-ZG	Car-highway	2013081818005932698	69.00
538	Wolf trapping	18.08.2013 14:51	Person, Unknown	Car-parking		262.00
539	Wolf trapping	19.08.2013 19:06	Kaufland	Personal-food	28134/1230/006	235.14
539	Wolf trapping	20.08.2013 13:03	McDonald's Dubrava	Personal-food	62267/11/03	73.50
539	Wolf trapping	20.08.2013 14:11	TIFON d. o. o.	Personal-food	168461	12.00
539	Wolf trapping	20.08.2013 15:29	AC RI-ZG	Car-highway	2013082060402152968153	51.00
539	Wolf trapping	20.08.2013 17:34	Schorpion	Personal-food	7949/POSL/1/1	74.00
539	Wolf trapping	20.08.2013 18:02	KONZUM d. d.	Personal-food	4936/0284/8	460.98
539	Wolf trapping	21.08.2013 10:49	INGRO d.o.o.	Equipment	29443/05/1	12.99
539	Wolf trapping	22.08.2013 07:57	INGRO d.o.o.	Personal-food	29619/05/1	86.25
539	Wolf trapping	22.08.2013 19:54	Schorpion	Personal-food	8075/POSL1/1	84.00
539	Wolf trapping	22.08.2013 20:14	KONZUM d. d.	Personal-food	107170/0284/2	222.14
539	Wolf trapping	22.08.2013 20:25	PETROL HRVATSKA d.o.o.	Car-fuel	781672	1041.01
539	Wolf trapping	23.08.2013 09:47	Raukar, Marina	Personal-overnight stay	2981	742.50

Activity	Activity objective	Time	TO	Purpose	Receipt#	Amount (HRK)
539	Wolf trapping	23.08.2013 16:12	AC RI-ZG	Car-highway	2013082318005161241095	51.00
541	Wolf trapping	16.09.2013 09:00	CRODUX DERIVATI DVA d.o.o.	Car-fuel	0-2630084360	510.04
541	Wolf trapping	16.09.2013 14:43	CRODUX DERIVATI DVA d.o.o.	Personal-food	0-2280228246	11.49
541	Wolf trapping	17.09.2013 08:04	TISAK d.d.	Technic-equipment	34455/921860/1	100.00
541	Wolf trapping	18.09.2013 13:50	AC RI-ZG	Car-highway	2013091810303135002575	18.00
541	Wolf trapping	18.09.2013 16:57	KONZUM d. d.	Personal-food	54157/1310/1	252.35
541	Wolf trapping	19.09.2013 11:58	ENERGOINVEST d.o.o.	Car-fuel	68043/1116/1	620.00
541	Wolf trapping	19.09.2013 14:12	JU NP Plitvička jezera	Personal-food	32102/1408/1	122.00
541	Wolf trapping	19.09.2013 15:28	KONZUM d. d.	Personal-food	91471/0547/2	42.55
541	Wolf trapping	19.09.2013 19:40	Lidl	Personal-food	48600/POSLO169/10102	63.90
541	Wolf trapping	22.09.2013 13:51	INA d. d.	Car-fuel	132046-S062-1	558.21
541	Wolf trapping	22.09.2013 13:54	INA d. d.	Technic-equipment	132048-S062-1	164.99
541	Wolf trapping	24.09.2013 15:24	AC RI-ZG	Car-highway	2013092418006152439989	18.00
541	Wolf trapping	24.09.2013 18:06	TIFON d. o. o.	Car-fuel	142637	380.15
541	Wolf trapping	25.09.2013 11:44	INA d. d.	Car-fuel	144380-S409-1	504.98
541	Wolf trapping	26.09.2013 19:43	AC RI-ZG	Car-highway	3201172053	6.00
541	Wolf trapping	27.09.2013 16:38	Chipoteka	Technic-equipment	85364/1/1	419.00
541	Wolf trapping	27.09.2013 17:32	CRODUX DERIVATI DVA d.o.o.	Personal-food	0-22820244255	10.99
541	Wolf trapping	28.09.2013 19:08	CRODUX DERIVATI DVA d.o.o.	Car-fuel	0-2270156338	496.06
541	Wolf trapping	29.09.2013 07:28	BILA ZG 02	Personal-food	92999/221/4	229.48
541	Wolf trapping	29.09.2013 08:58	TISAK d.d.	Technic-equipment	115727/914920/1	50.00
541	Wolf trapping	29.09.2013 10:46	CRODUX DERIVATI DVA d.o.o.	Personal-food	0-2600238156	43.49
541	Wolf trapping	29.09.2013 11:15	AC RI-ZG	Car-highway	201309291030311131835	18.00
541	Wolf trapping	29.09.2013 13:32	Konoba VOLTA	Personal-food	9024/1K/1	493.20
541	Wolf trapping	29.09.2013 14:25	JU NP Plitvička jezera	Personal-food	25940/2030/2	330.00
541	Wolf trapping	29.09.2013 17:12	JU NP Plitvička jezera	Personal-food	26692/1410/1	27.00
541	Wolf trapping	29.09.2013 18:11	JU NP Plitvička jezera	Personal-food	29464/1809/1	25.00
541	Wolf trapping	29.09.2013 18:16	JU NP Plitvička jezera	Personal-food	13639/1507/1	73.00
541	Wolf trapping	29.09.2013 19:33	HR autoceste d. o. o.	Car-highway	1080343433	8.00
541	Wolf trapping	29.09.2013 20:58	Caffe Bar	Personal-food	65543/1/1	32.00
541	Wolf trapping	29.09.2013 21:30	AC RI-ZG	Car-highway	2013092975002213035208	35.00
541	Wolf trapping	30.09.2013 11:25	Restoran Bitoraj	Personal-food	16177/BAR/1	81.00
541	Wolf trapping	30.09.2013 11:47	AC RI-ZG	Car-highway	2013093060402114796572	5.00
541	Wolf trapping	30.09.2013 11:52	PETROL HRVATSKA d.o.o.	Car-fuel	802480	600.35
541	Wolf trapping	30.09.2013 14:08	Mlin trgovina	Personal-food	27538	108.65
541	Wolf trapping	30.09.2013 16:04	KONZUM d. d.	Personal-food	95066/0453/2	131.00
541	Wolf trapping	01.10.2013 18:38	Rac, Krunoslav	Personal-food	30018	200.00
541	Wolf trapping	02.10.2013 08:52	VILLA UNA	Personal-overnight stay	89/13	672.00
541	Wolf trapping	02.10.2013 16:30	INA d. d.	Technic-equipment	138240-S062-1	86.99
541	Wolf trapping	03.10.2013 11:47	AC RI-ZG	Car-highway	2013100103105021147732 98	30.00
541	Wolf trapping	03.10.2013 13:15	AC RI-ZG	Car-highway	2013100318007131562974	31.00
541	Wolf trapping	03.10.2013 20:51	CRODUX DERIVATI DVA d.o.o.	Car-fuel	0-2280252090	414.99
542	Wolf trapping	18.10.2013 19:40	BILA KC 01	Personal-food	24788/221/3	501.31



Activity	Activity objective	Time	TO	Purpose	Receipt#	Amount (HRK)
542	Wolf trapping	19.10.2013 07:36	TIFON d. o. o.	Car-fuel	207768	600.74
542	Wolf trapping	19.10.2013 07:38	TIFON d. o. o.	Personal-food	78015-702-55	20.00
542	Wolf trapping	19.10.2013 08:34	HR autoceste d. o. o.	Car-highway	1090410158	69.00
542	Wolf trapping	19.10.2013 16:30	Bistro AM	Personal-food	5277/Bistro/1	194.00
542	Wolf trapping	19.10.2013 18:35	Komunalac KC	Car-parking	74516/02/3	8.00
542	Wolf trapping	20.10.2013 19:55	INA d. d.	Car-fuel	149596-S062-1	475.12
542	Wolf trapping	22.10.2013 08:37	Mlin trgovina	Personal-food	30595/PJ1/3	96.85
542	Wolf trapping	24.10.2013 17:35	Adria Oil d.o.o.	Car-fuel	118861/05/1	309.90
542	Wolf trapping	25.10.2013 20:03	Bistro MANJAN	Personal-food	15686/Bistro/1	126.00
542	Wolf trapping	26.10.2013 08:07	Mlin trgovina	Personal-food	31194/PJ1/3	28.00
542	Wolf trapping	26.10.2013 13:16	INA d. d.	Car-fuel	152749-S=62-1	560.17
542	Wolf trapping	26.10.2013 13:17	INA d. d.	Technic-equipment	152750-S062-1	299.99
542	Wolf trapping	27.10.2013 10:59	MOST d.o.o.	Personal-food	38226/012/01	156.87
542	Wolf trapping	27.10.2013 19:05	Bistro MANJAN	Personal-food	15826/Bistro/1	172.00
542	Wolf trapping	28.10.2013 13:41	INA d. d.	Car-fuel	154028-S062-1	529.02
542	Wolf trapping	28.10.2013 15:12	JU NP Plitvička jezera	Personal-food	15699/1507/1	49.00
542	Wolf trapping	28.10.2013 16:21	KONZUM d. d.	Personal-food	41650/0453/4	166.50
542	Wolf trapping	30.10.2013 11:28	AC RI-ZG	Car-highway	2013103018007131386571	69.00
542	Wolf trapping	30.10.2013 12:40	INA d. d.	Personal-food	336751-S430-2	10.00
542	Wolf trapping	30.10.2013 15:45	Chipoteka	Technic-equipment	96526/1/1	469.00
542	Wolf trapping	30.10.2013 17:12	HG Spot	Technic-equipment	49063/500/1	65.55
542	Wolf trapping	30.10.2013 20:27	CRODUX DERIVATI DVA d.o.o.	Car-fuel	0-2280285730	589.00
544	Wolf search	17.12.2013 11:47	Chipoteka	Technic-equipment	113411/1/1	439.00
544	Wolf search	21.12.2013 08:38	INA d. d.	Car-fuel	277241-S006-2	515.78
544	Wolf search	23.12.2013 08:40	AC RI-ZG	Car-highway	2013122360302084019390	45.00
544	Wolf search	23.12.2013 20:15	INA d. d.	Car-fuel	163181-S151-2	568.10
544	Wolf search	23.12.2013 21:11	TIFON d. o. o.	Personal-food	284930	28.00
544	Wolf search	23.12.2013 21:40	AC RI-ZG	Car-highway	2013122318005214056351	51.00
544	Wolf search	24.12.2013 12:36	INA d. d.	Car-fuel	280096-S006-1	280.04
547	Wolf search	06.02.2014 13:30	AC RI-ZG	Car-highway	201402060304133079095	18.00
547	Wolf search	06.02.2014 13:45	LUKOIL	Car-fuel	13674/29/1	485.96
547	Wolf search	07.02.2014 18:08	AC RI-ZG	Car-highway	2014020718006180828414	18.00
547	Wolf search	07.02.2014 18:35	CRODUX DERIVATI DVA d.o.o.	Personal-food	0-2280380723	33.97
547	Wolf search	07.02.2014 20:04	TIFON d. o. o.	Car-fuel	017045	599.29
549	Telemetry	05.04.2014 08:13	KONZUM d. d.	Personal-food	97849/0019/1	36.47
549	Telemetry	05.04.2014 10:13	KONZUM d. d.	Personal-food	5232/0205/7	2014.50
549	Telemetry	05.04.2014 11:39	OMV Hrvatska d.o.o.	Personal-food	43805-701-55	21.00
549	Telemetry	05.04.2014 11:50	TIFON d. o. o.	Car-fuel	057780	553.00
549	Telemetry	05.04.2014 12:16	AC RI-ZG	Car-highway	2014040560402121622217	51.00
549	Telemetry	06.04.2014 06:56	INGRO d.o.o.	Personal-food	14921/05/1	33.99
549	Telemetry	06.04.2014 08:01	Raukar, Marina	Personal-overnight stay	5-2014	450.00
549	Telemetry	06.04.2014 09:01	INGRO d.o.o.	Personal-food	14994/05/1	32.74
549	Telemetry	06.04.2014 16:31	HR autoceste d. o. o.	Car-highway	1600271351	26.00
549	Telemetry	06.04.2014 19:29	AC RI-ZG	Car-highway	2014040618005192900796	18.00
549	Telemetry	06.04.2014 19:55	CRODUX DERIVATI DVA d.o.o.	Car-fuel	80106/32283228/1	632.73
			TOTAL			<b>37021.69</b>

23 APRIL 2014

Here I close another yearly report with all the thanks to UKWCT for all the support since 2006, and for considering our proposal for the continuation of work on conservation, management and research of wolf and lynx in Croatia. We would understand any reserves or other limitations in meeting our demands.

A handwritten signature in blue ink that reads "Josip Kusak". The signature is written in a cursive style with a large initial 'J'.

Josip Kusak