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Anatoliy Volokh, Melitopol/Ukraine

Expansion and reproduction of wolf populations (*Canis lupus* L.) in the steppe zone of Ukraine

Key words: wolf, *Canis lupus*, area, steppe zone, Ukraine, mammals, population, dynamics, structure, biotopes, hunting, management

Introduction

The wolf is one of the largest predatory animals of Europe, since the old times persecuted by humans (Fig. 1). Nowadays, when people live in cities and know about the wolf only from books and TV programs their idea about the damage caused by this clever and strong beast to hunting and rural economies has little to do with a real situation. Meantime, in 1924/25 in Ukraine the victims of wolves amounted to 3.2 thousand heads of cattle or 0.1 % of all the population of domestic animals. Those years, sheep, calves and young horses dominated in the number of domestic animals, gnawed by wolves. There were registered many cases when wolves attacked people (Krasilnikov 1926).

Increase of the wolf numbers in the 1970s ehnanced its predation on domestic animals. Only in 1975 the number of cattle eaten by these beasts in the USSR was equal to 18521 heads of cattle, including 500 in Ukraine and 1600 in Belorussia, while in 1970 the total amount had constituted 9380 heads of cattle. In addition, the wolf is a crucial source of such a dangerous disease for humans as hydrophobia. It was the reason which above all defined the negative attitude of people to this predator and stimulated development of methods to limit its populations, among which poisons, special traps, taking out of cubs and shooting of animals were used in all seasons of the year. Depending on it, in the 20th century the wolf populatons in Ukraine in different times showed increase or decline. However, the main ecological factors, which determined the dynamics of the range and numbers, were always the intensity of hunting and state of biocoenoses.

Taking into account that in many countries of the world the wolf had disappeared or its numbers declined to such an extent that there is a need to protect and restore its populations, we decided to inform the European community of

Fig. 1 A wolf in the field of Zaporizhzhia region (02.2010) (Photo by Yu. Andryushchenko)

characterstics of distribution and reproduction of this animal in the steppe zone of Ukraine.

Material and methods

Material for this paper was collected in the territory of many regions of Ukraine over the period from 1972 to 2010. This period was characterized by the wolf penetration to the south of the country and formation of new centres of its habitation. To clarify features of its dispersion, in 1980 we provided the inquiry of workers of the hunting farms located in the steppe zone of Ukraine. As a result we got information about presence or absence of this animal from 78 administrative districts of Dnipropetrovsk, Donetsk, Zaporizhzhia, Kirovohrad, Luhansk, Mykolaiv, Odesa, Kharkiv and Kherson regions. Penetration of the wolf into the different regions of Ukraine was studied by us during all the period of researches, as it is a very dynamic process.

The wolf distribution per biotopes was studied by analyzing 631 records of these animals chiefly from Luhansk and Zaporizhzhia regions. A great help in studying the reproduction features was rendered by hunters and workers of hunting farms (Boyko, G.; Brezicky, V.; Konarev, V.; Ovsyannikov, A.; Tyban, V.; Tugarev, V.; Ugnenko, V.; Chernykh, A. and Sheygas, I.) from all the areas of the Ukrainian steppe zone. As a result of the fulfilled researches we succeeded to collect information about 232 wolf litters, which contained 1265 cubs.

Discussion

Range

The wolf always was a common species in South Ukraine. However its permanent persecution, encouraged and encouraging now by the government, in the 20th century led to general reduction of its numbers and range. Firstly, the wolf disappeared in the Crimea, with the last animal shot in 1914. In 1928 six individuals were seen near Sevastopol, one of them hunters succeeded to shoot (Milchenko 1928). After that, wolves repeatedly penetrated to the Crimea, but were also eliminated. The steppe zone, where these predators always were numerous, in the late 1950s supported ~50 individuals, in the early 1960s ~40, and at the beginning of 1970s – none (Gursky 1969). Even in the territory of Belgorod, Kursk and Orel regions of Russia, bordering on Ukraine in the north-east, in 1966–1972 there was a sharp decline of the wolf density to 0.4–0.5 ind./1 thou. km^2 and complete disappearance in many areas (Priklonsky & Osmolovskaja 1975).

However, after diminishing the amount of financial reward for shooting this predator, in the late 1970s hunting pressure on the populations got considerably reduced. It brought about a swift growth of the wolf population. For example, in the neighbouring Republic of Belarus it was registered after the reduction of taking out of animals to 25–30 % per year (Vadkovsky 1978). The period of 1971–1980 was marked with restoration of centres of wolf habitation in Ukrainian Polissia and the Carpathians. Very quickly this process gained strength and wolves began being recorded in different sites of Romania, Poland, Slovakia and other countries (Bibikov 1974).

In the early 1970s in steppe and forest-steppe zones wolves constantly inhabited only few areas (Fig. 2):

A) in Moldova Republic, from where they regularly went into nearby territories;
B) in the north areas of Odesa region, where large forests were situated;
C) in Pavlohrad district of the Dnipropetrovsk region, where in 1972 hunters succeeded to shoot the last animal for that period;
D) in the Syverskyi Donets floodplain in the territory of Kharkiv and Donetsk regions;
E) in the north of Poltava region, where there was a powerful centre of the wolf habitation in borderline districts of Russia and Ukraine. In addition, into the east of the steppe zone in Lugansk and Donetsk regions wolves also constantly penetrated from Russia, where they were quickly exterminated.

According to data of our researches, moving from the western centres of habitation (Fig. 2 – A, B) in 1962–1980 wolves settled the territory of 5 districts of the Odesa region. In spite of the fact that hunters shot there 2–5 beasts annually, some wolves succeeded to survive. In

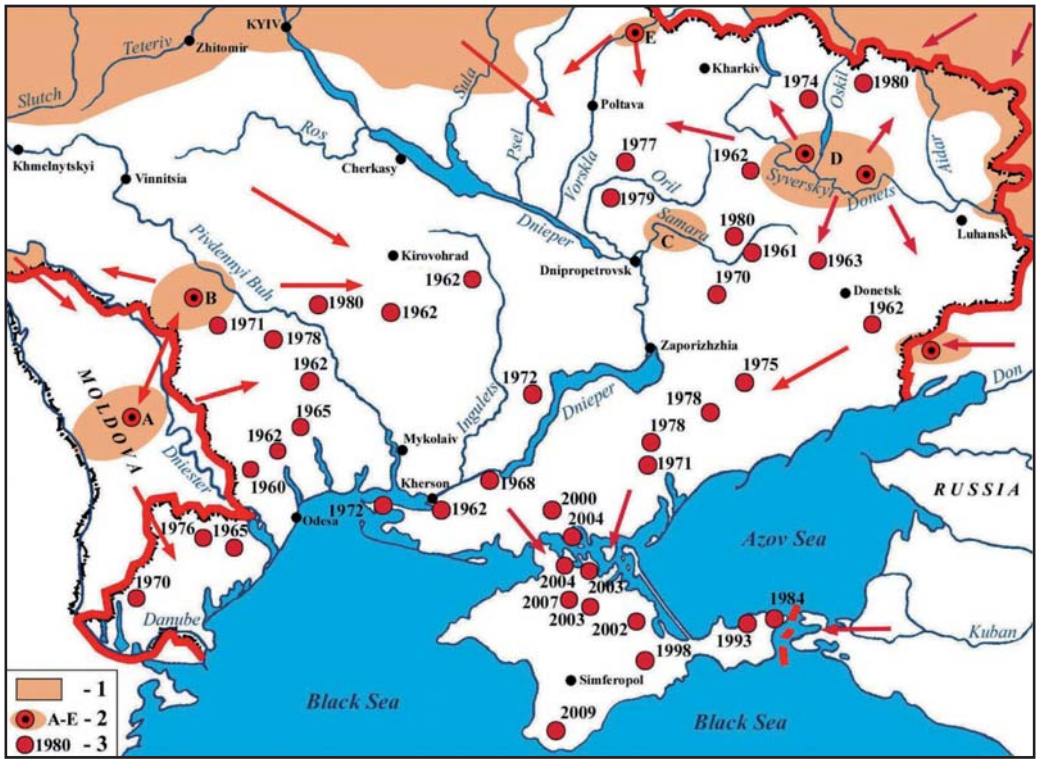

Fig. 2 Dynamics of the wolf range in the steppe zone of Ukraine: 1 – sites of the species distribution in the early 1970s, 2 – sites of indigenous distribution of the wolf; 3 – records of animals in 1962–2009

the indicated period their offsprings penetrated into the north-western areas of Mykolaiv region and in the southern areas of Kherson region. In 1972 wolves appeared in the Black Sea Reserve, where they began inflicting heavy loss on the population of the axis deer (Berestennikov 1977).

Until now, the left bank of the Dnieper Delta remained extensive unpopulated lands represented by sand dunes (~200 thousand ha). From 1834 to nowadays, this territory was planted with a plenty of pine forests covering the area of approximately 84 000 ha. Rather quickly the wolf formed there a steady centre, from which the animals start settling apart into adjoining regions (Fig. 3). Since 1975 these places constantly supported 2–4 wolves (Izdebsky 1979). In 1985/87 the control was provided over an annually breeding wolf pair. For 3 years there were yielded 14 cubs, 1 young female, and 2 animals in the age of 5–6 years (Gursky 1989).

In spite of intensive hunting press (Woloch 2007), the species expansion rate into the steppe areas of Ukraine was rapid. In 1988 in the Black Sea Reserve 22 records of the wolf were registered, in 1990 – 65, and by 1995 the territorial group of this species was formed. In 1999–2000 these protected areas were inhabited by ~20 ind., and the whole region supported about 50 wolves (Selunina 2001). In 2000 for the first time after the long years of absence wolves reappeared in Askania Nova Reserve (Dumenko 2005).

In Zaporizhzhia region especially many wolves occurred in 1946–1955, when hunters shot 651 ind. Later their numbers began decreasing: in 1956–1960 they hunted 116, in 1961–1965 – 31, in 1966–1970 – 70 individuals, although in many southern districts the wolves had vanished as early as 1957–1960.

Much later the species began penetrating in Zaporizhzhia region from the east (several ani-

Fig. 3 Planted forests in the Dniper Delta are important wolf habitats in the steppe zone of Ukraine (Photo by A. Chernykh)

mals were hunted in 1971–1978) and from the west – in 1975–1979. In 1980/81 in the territory of different districts there were observed wolf packs of 3–7 individuals, and in 1979 it was discovered a litter of 6 wolf cubs, that in those years was an unbelievable finding.

In the center of the steppe area, in Dnipropetrovsk region, a steady habitation of the wolf (Fig. 2 – C) had existed for a long time. It was detemined by proximity of large populations of the species and high forestation of areas in the floodplains of the Samara and Orel Rivers. However, even there, in 1964–1972 all predators were shot. Wolves in these areas began to appear only after 1979, and since 1981 they are permanent inhabitants of Dnipropetrovsk region.

In 1960–1972 in the steppe zone the wolves lived in floodplain forests of the Siverskyi Donets (Fig. 2 – D). From there they periodically penetrated into regions of Donetsk (1962–1963) and Kharkiv (1974–1980).

According to the Main Hunting Management Board of Ukraine, in 1970 the wolf got to inhabit 14, in 1974 – 17, in 1976 – 18, and in 1981 – 21 regions of the country. Restoration of the wolf populations in those years became possible mainly due to the intensive development of stock-raising and, in particular, considerable increase of sheep numbers.

To a large extent it was also favoured by the substantial increase of resources of ungulates and reduction of hunting pressure on wolf populations.

In 1982–1991 hunters quite effectively controlled the steppe populations of wolves; 50–100 animals were annually hunted. Reduction of shooting to 35–50 individuals per year, observed after 1992, entailed a sharp growth of their numbers (1997 ~1300). It was accompanied with the wolf expansion into unoccupied territories and by 2000 all the steppe areas, except for the Crimea, were inhabited with the species.

In the Crimea the wolves began being constantly recorded after 2003. The animals penetrated into the Crimean Peninsula from 2 directions: northern – from Kherson region and western – the Kuban Delta (Russia). On Kerch Peninsula records of wolves got relatively frequent after the severe winter of 1984–1985, and in 1993 and 1996 there were hunted 2 single males. Since 1998 wolves periodically started moving from the Kuban into the territory of Belogorsk district and further westward and northward. In the spring of 2004 and 2005 on the border of the Crimea and Kherson region there were observed single wolves which now became a real calamity for villagers of these areas. In 2003–2010 several beasts were shot in different districts of the Crimean Peninsula. Now the process of inhabitation of the Peninsula by the wolf is proceeded.

Expansion of the wolf range and increase of its numbers in the late 20th century, on the one part, was conditioned by the considerable reduction of hunting press on its populations, and on the other – by improvement of ecological conditions due to depression of agricultural industry. After liquidation of the collective farms and focusing of independent Ukraine at the capitalization of economy many fields in the south were abandoned because of low economic efficiency of agriculture. It resulted in their overgrowing with weeds and therefore improved their protective properties for lots of animals. Later, sunflower plantations began prevailing in the region, which even after harvesting are still very comfortable biotopes for the wolf. In addition, it is necessary to mention the sharp decrease in numbers of rural population and even disappearance of many villages that was another essential factor for renewal of wolf populations.

Biotopes

Within its enormous range this predator inhabits a great variety of lands. Thus, an important factor for the species is the concentration of warm-blooded animals that constitute the basis of its diet. In Arctic regions the wolf prefers habitats of the reindeer (Makridin 1976), in Asian steppes and deserts – the saigas, Persian gazelle and sheep (Sludsky 1963), in the Caucasian mountains, in forests of Belorus, Siberia, and Middle Russia – the roe deer, European red deer and wild boars (Filonov 1989). In the south of Ukraine, where the concentration of food is higher, than in the above-mentioned regions, the stay of wolf is determined mainly by the extent of human persecution and availability of sites suitable for giving birth and rearing cubs. In Ukraine the species can be met in different biotopes since this animal is characterized by a large individual territory. Today, the size of the territory in the steppe zone of Ukraine for one pack is equal to 157.5±18 (127–189) km^2 (Shkvira 2008), although in 1945–1975 in the south-western districts it reached to 300–350 km^2. In spite of the fact that wolves often travel for a significant distance, they are regarded as settled animals. Within their territory these animals have a few places, where they do not hunt but only take a rest. Such places are visited by them with periodicity of 3–5, and sometimes – 10 days (Gursky 1978).

Certainly, depending on the regional features of landscape, biotopic distribution of this species differs. For example, in Kherson region wolves often rest in the dense pine plantations, birch-aspen groves, blackthorn thickets, in grass stands among sands, in reedbeds which often occur in different depressions, and only after that in other kinds of lands (Izdebsky 1979). At the same time, out of the season of reproduction and early rearing of cubs, in Luhansk and Zaporizhzhia regions the wolves most frequently use former sunflower fields for their daytime rest (Fig. 4). After harvesting of the sunflower which is finished in late autumn or even winter, a dense paling is formed from remains of dry stalks. Their height is 30–50 cm that allows to a standing animal to view a quite large area, remaining hidden for other dwellers of agrocoenoses and for people. In dry weather wolves leave few footprints in such biotopes and therefore their beds are very difficult to discover. Besides, the sunflower fields actually cover the large area in the steppe zone which in different administrative regions makes 40–50 % of the whole arable lands.

Another major habitat in our region often used by wolves for resting, are abandoned fields, grown with different weeds. In areas with flat landscape for this aim the wolves use thick forest belts and old gardens as well as the gullies

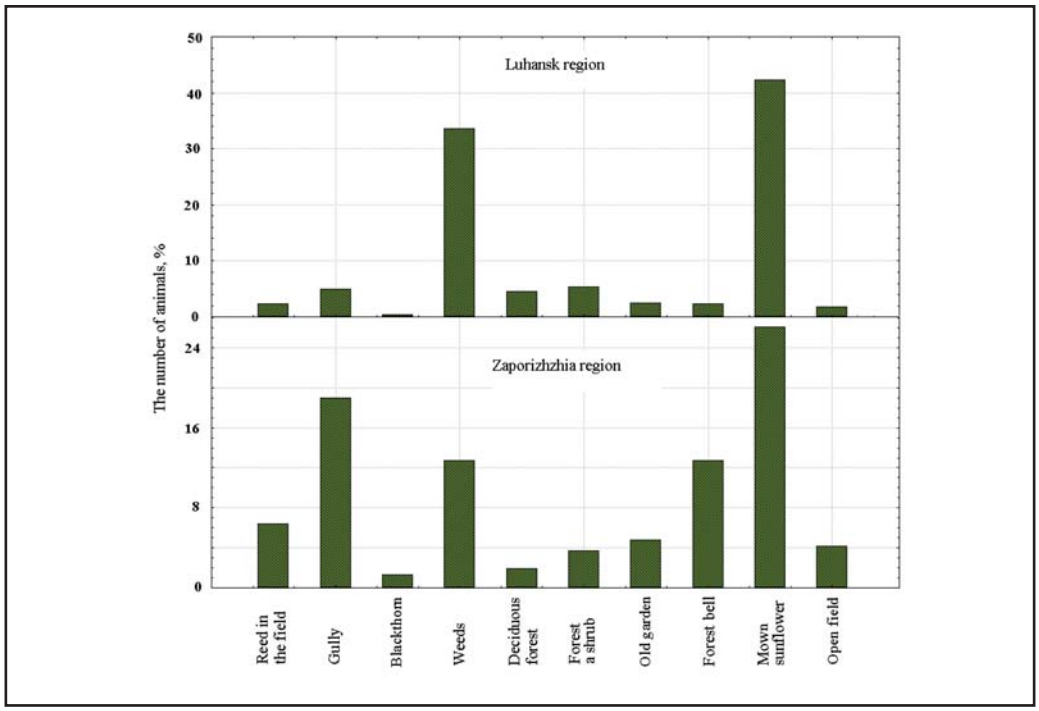

Fig. 4 Autumn-winter distribution of the wolf on biotopes in the north (Luhansk region; n = 478) and in the south (Zaporizhzhia region; n = 163) of the steppe zone

overgrown with the reed and different shrubs. In such sites wolves also often arrange their dens during breeding. It should be noted that the blackthorn shrubs (*Prunus spinosa*), quite widespread in the steppe zone, in spring are favourite places to set dens or holes for raising cubs, however these animals very rarely visit them in other seasons.

It is interesting that in the territory of South Ukraine wolves, opposite to foxes, very rarely arrange beds in reed thickets, located on riverbanks, shores of limans and ponds, and also in forests. During a breeding period these animals can have a rest in the open field; in this case for the bed they choose small piles of dry plants or simply small elevations.

At the same time, according to the research conducted in the steppe zone (Shkvira 1980), wolves during their movement use, if possible, natural biotopes, and only after that – anthropogenic. At this, they quite often move along cart roads and even outskirts of villages. If forest stands are available the wolves also willingly lay paths at their edges.

When making dens for their young the wolves use different biotopes and sites in them. In 2003–2009 hunters of Zaporizhzhia region found 34 dens, majority of them (52.9 %) was situated in agrocoenoses: 3 – on fields with the mown sunflower, 1 – behind a concrete wall of the irrigation canal, 2 – in grass stands at the base of the irrigation aggregate, 1 – in a heap of manure, 1 – in a stack of straw, 3 – on a field grown with weed, 7 - in forest belts. Severeal dens of animals were made in an old cemetery (n = 2), in the territory of a demolished farm (n = 3), in blackthorn shrubs in the middle of the field (n = 3), in the forest stand (n = 1), in a pile of ground among the reed (n = 1) and in a gully (of n = 6).

In the west of the steppe zone the sites of rearing the young were located in different depressions well hidden by plants. Among them there were trenches and dugouts which remains still occur in places of military operations, and also blackthorn thickets, gullies, ravines, abandoned quarries, burial mounds among winter crops, stacks of straw and reedbeds (Gursky 1978).

All researchers record that the wolf is characterized by a steady nest conservatism which is expressed in constanst using of the same places for raising cubs. It is observed even in case of regular taking-out of wolf cubs, that in the Soviet time was a common and financially encouraged matter.

In the steppe zone of Ukraine the wolf willingly uses a great diversity of lands among which in different periods of its life cycle both natural and anthropogenic biotopes are important.

Reproduction

Data about reproduction of animals, received directly in the wild, is of great importance to develop theto activities on the population management. They are the basis to determine the size of exemption of animals from nature as well as to optimize the use of resources and their reproduction in hunting industry. The information about the wolf reproduction is especially essential since the species demonstrates high plasticity in different conditions of the environment.

The reporiduction cycle of these animals is very similar to that of dogs, although, unlike them, the wolves are monogamous animals. The monogamy is supported by the female which for a number of years gives a constant preference to the same full-grown male. Though, when on heat the female can be courted by up to 6 males, more frequently there are 3–4 of them. Even after formation of a mating pair some males continue following the female (Gursky 1978).

Maturity for the wolf, regardless of its sex, comes in the age of 22–23 months, and the rut of every pair lasts for about 1 month. For pureblood wolves its terms are in January-February, although, depending on the regional climatic conditions, they can be shifted (Geptner et al. 1967). A considerable extension in timing of copulation of these animals substantially influences on the terms of giving birth to cubs.

Judging on the terms of appearance of wolf-cubs, in the south of Ukraine the copulation takes place from l December to March inclusive. Interesting is the fact that in the evening of 20.01.2008 in Melitopol district (Zaporizhzhia region) the hunters, hidden in a forest belt at the decoy, attracted several animals which looked like wolfes. After the first shot which killed a female, other predators escaped, but one returned and was hunted – it turned out to be a male of the jackal. It is an evidence of difficult sexual behavior and of presence of positive reaction of males of this species on ready to propagate females of other species.

Duration of the wolf pregnancy is 62–65 days, however the time of copulation for many predators impacts on its duration, and also on the size of litter. The latter increases in case of covering females in the middle (January–February) and in the second half (March) of the breeding season. Early terms of copulation decrease the fertility, while late terms increase it. (Tumanov 1984). Apparently, it depends on the concentration of forage in nature and weather dynamics assistsing survival of even weak cubs.

In the steppe zone of Ukraine to make a dwelling for their litter wolves predominantly use holes (51.62 %), then open dens (25.81 %) and specially digged burrows (16.13 %). The latter can be 1.0–1.5 m in diameter and 0.3–0.6 m deep. Wolf cubs were also found in stacks of old straw (n = 1) and in man-made constructions (n = 3): in a sewage system, under concrete slabs of the gas pipeline and irrigation canal. The highest number of litters (27.4 %) was found in the blackthorn thickets (Fig. 5), characterized by high protective properties. Very often wolves widened holes of foxes (n = 13), badgers (n = 6) and marmots (n = 2). In tundras of Gydan Peninsula in 1989 we found 2 dens of wolves located in old holes of the Arctic fox (Volokh 2000).

Most often in flat areas of the steppe zone wolves made dens for cubs in forest belts, whereas in broken terrain they made them in the gullies overgrown with steppe shrubs and small trees.

In different years in the steppe zone of Ukraine hunters discovered 232 litters of the wolf, with 1265 cubs. One den chiefly sheltered 5 (24.6 %) and very rarely 11–12 cubs (Table 1).

The average size of the wolf litter in the steppe zone of Ukraine is 5.5±0.13, the smallest – 2, the largest – 12 cubs. Regional differences of this index are insignificant (Table 2). The smallest number of cubs in 1 den was revealed in Odesa region (5.0±0.16), the highest – in

Fig. 5 The litter of 7 cubs in the blackthorn shrub (Photo by A. Chernykh)

Fig. 6 Huntsmen found 8 wolf cubs in an old foxhole (Kherson region, 2009) (Photo by A. Chernykh)

Table 1 Frequency of occurrence and the size of wolf litters in the steppe zone of Ukraine

Administrative regions	n	Number of wolf cubs in the litter										
		2	3	4	5	6	7	8	9	10	11	12
Donetsk	8	–	–	2	1	1	2	1	1	–	–	–
Dnipropetrovsk	10	–	3	–	1	4	–	–	1	–	1	–
Zaporizhzhia	23	1	2	5	5	2	2	2	2	1	–	1
Luhansk	28	–	1	3	7	2	6	6	1	1	1	–
Mykolaiv	21	–	6	2	5	2	3	2	–	1	–	–
Odesa	128	8	16	25	36	20	14	4	1	3	–	1
Kherson	14	–	–	2	2	3	4	3	–	–	–	–
Total	232	9	28	39	57	34	31	18	6	6	2	2

Table 2 Size of the wolf litter in the steppe zone of Ukraine

Adminstrative region	Number		Number of wolf cubs in the litter			
	litters	individuals	M ± m	Min – Max	s	CV, %
Donetsk	8	50	6.3±0.65	4 – 9	1.83	3.36
Dnipropetrovsk	10	57	5.7±0.76	3 – 10	2.41	5.79
Zaporizhzhia	23	135	5.9±0.52	2 – 12	2.51	6.30
Luhansk	28	182	6.5±0.37	3 – 11	2.09	3.74
Mykolaiv	21	110	5.2±0.44	3 – 10	2.02	4.09
Odesa	128	645	5.0±0.16	2 –12	1.80	3.25
Kherson	14	88	6.3±0.37	4 – 8	1.38	1.91
Total	232	1267	5.5±0.13	2 –12	1.98	3.93

Lugansk region (6.5±0.37), however statistical discrepancy (p = 0.01) between these sizes is absent. In the USSR predominated 4-7 (64.7 %) in 1 litter (Danilov et al. 1985), in Belarus (57.8 %) – 4–6 cubs (Serzhanin 1961).

When studying charactersitcs of the wolf reproduction in Mylokaiv Zoo and Odesa Zoo, it was stated that the wolf productivity varies from 3 to 9, and on the average 5.4 cubs for a parous female (Gursky 1978). Usually the first litters are small, but for 5–11 year-old females they are maximal (6–9), although in different sites of the wolf range in the USSR they were discovered litters (n = 1135) consisted of 10 (4.0 %), 11 (2.0 %), 12 (0.9 %) and 13 (0.3 %) cubs (Danilov et al. 1985).

It is interesting, that in the 1980s, when the wolf numbers in Ukraine were low, in Odessa region and Moldavia males prevailed over females in litters. The same was observed for the animals, lived in the zoo, with ratio as 1.6:1.0 in favour of males (Gursky 1978). At the same time in other regions with low density of wolves this ratio of cubs of different sex in the litter was equal or females prevailed (Mech 1975). In the areas where it is provided intensive struggle against these predators, the last variant occurs quite often. In late April 2010 in Sinelnikovo district of Dnipropetrovsk region in a spot of weeds in the field there was found a den with the female and 9 sighted cubs. All of them were females, which is a very rare phenomenon. Presumably, it is adaptation to maintain the population structure, since in case of death of one of beasts the pair quickly renews.

With low numbers of studied predators there are formed mating pairs of a wolf and a dog in any combination of sex that results in appearance of wolf-dog hybrids. In inland Ukraine this phenomenon was recorded as early as 1884 in Kirovohrad region (Yuricin 1885). In a blackthorn shrub it was found the den with 8 cubs, one of which was of black color, with white toes and white spots on its breast and neck. Later, the cases of finding hybrids in our country were described by other zoologists (Gursky 1975; Rjabov 1978). They revealed that frequency of appearance of wolf-dog hybrids increased with destruction of the population structure. In Ukraine cases of such hybridization became especially frequent since the late 1950s, as a result of intensive extermination of wolves. However, they were of local character and more typical for Odesa region and Moldova. The investigated hybrids sometimes had a doggy appearance and looked like the German shepherds, and sometimes their appearance was wolvish, evidenced by zonary colouration of all guard hairs and a part of awn hairs. Mostly they were distinguished by different colours, presence of speckles and white spots and less sizes of body than that of pure-blood wolves (Gursky 1975).

Many wolf-dog hybrids appeared in the steppe zone of Ukraine in a period of intensive dispersion of the wolf in the 1990s which was a consequence of reducing hunting press on the species population (Fig. 7).

It was also contributed by typical for the Ukrainian people compassion upon puppies of the mongrel dogs or old animals which careless masters dropped off and continue to drop off in the places remote from their permanent residence. As a result, at first packs of feral dogs are formed, and after that, with occupation of the

Fig. 7 A hunter with wolf-dog hybrids (Zaporizhzhia region, 2009)

territory with the wolves, they develop steady hybrid populations. In 2005 in Zaporizhzhia region there were hunted 114 animals, which were wolvish in appearance. The majority of them were feral dogs with the fur deprived of zonary coloration, fewer were hybrids, and the smallest part constituted pure-blood wolves. In several years the situation became entirely different: feral dogs and wolfdogs began rarely being seen in the wild, and most of animals (n = 48) studied by us in 2007–2009 were identified as wolves.

Conclusions

Another dispersion of the wolf into the steppe zone of Ukraine started in the 1970s and reached its peak in the beginning of the 21st century.

The species expansion and increase in the number of local populations was caused by reduced hunting pressure as well as appearance of a high number of fields covered with ruderal vegetation.

Nowadays the wolf inhabits territories of all the administrative regions of the steppe zone and actively occupies the Crimean Peninsula where it was extinct since 1928.

The most suitable biotopes for this species in the studied region are sunflower plantations, tall weeds and the gullies overgrown with trees and shrubs. In the period of the wolf expansion into the steppe zone it was recorded rather high fertility of females; the size of their litter amounts to 5.5±0.13 cubs.

Predominantly in one den there were found 4–7 (69.4 %) and very rarely – 11–12 (1.7 %) wolf cubs.

In disbalanced steppe ecosystems the wolf populations require special management, which would provide maintenance of centers of the species habitation, and also exemption of animals to the extent which prevents further growth of their numbers.

Summary

Expansion and reproduction of wolf (*Canis lupus* L.) populations in the steppe zone of Ukraine

Present populations of the wolf in the steppe zone of Ukraine started their formation in the 1970s. At first, it was assisted by the reduction of hunting press, and later by appearance of a high number of fields overgrown with weed. Penetration of the wolf into the south of the country went from different directions. In the west of great importance were groups of the wolves, survived in the territory of Moldova Republic and in the north of Odesa region; in the north it was at the expense of the population inhabiting the forest zone; in the east there were centres of the wolf habitations, located in forests of the Syverskyi Donets River and in borderline districts of Russia. By 2000 the wolf had inhabited all the administrative regions of the steppe Ukraine. In 1984 the appearance of this animal was recorded on Kerch Peninsula in the Crimea, although its basic expansion to this area began in the first years of the 21st century.

The most suitable biotopes for this species in the studied region are sunflower plantations, tall weeds and the gullies overgrown with trees and shrubs, although quite often these animals can be seen in the fields deprived of vegetation.

In the steppe zone of Ukraine to make a dwelling for their litter wolves predominantly use holes (51.62 %), then open dens (25.81 %) and specially digged burrows (16.13 %). Most often in flat areas of the steppe zone wolves made dens for cubs in forest belts and blackthorn bushes, whereas in broken terrain they made them in gullies. The average size of the wolf litter in the steppe zone of Ukraine is 5.5±0.13, the smallest – 2, the largest – 12 cubs. Regional differences of this index are insignificant. The smallest number of cubs in 1 den was revealed in Odesa region (5.0±0.16), the highest – in Lugansk region (6.5±0.37).

In transformed steppe ecosystems the wolf populations requires management of their numbers and spatial distribution. It will allow to limit further growth of their numbers as well as save some centres of its distribution.

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Adress:

Prof. Dr. Anatoliy Volokh
Tavricheskiy State Agrotechnological University
Department of Ecology and Environmental Protection
B. Khmelnitskogo Street 18
Melitopol 72312
Ukraine
E-mail: volokh50@ukr.net