

## Distribution update

### The grey wolf in Iraq: notes on its current distribution, major threats and conservation status

Omar F. Al-Sheikhly<sup>1\*</sup>, Mukhtar K. Haba<sup>2</sup>, Laith A. Al-Obeidi<sup>3</sup> and Husham K. Abdulzahra<sup>4</sup>

<sup>1</sup> Department of Biology, College of Science, University of Baghdad, Baghdad, Iraq.  
Email: [alsheikhlyomar@gmail.com](mailto:alsheikhlyomar@gmail.com)

<sup>2</sup> Department of Biology, College of Science for Women, University of Baghdad, Baghdad, Iraq.

<sup>3</sup> Independent Researcher, Al-Qadissiyah, Iraq.

<sup>4</sup> Independent Researcher, Basra, Iraq.

\* Correspondence author

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#### Abstract

The grey wolf *Canis lupus* is a flagship carnivore still roaming the mountains, steppes, marshland fringes, and deserts of Iraq. However, its current distribution, population size, and potential threats are little known. Evidence of the confirmed occurrence of the grey wolf in Iraq (e.g. confirmed sightings, dead/live specimens, tracks, scats, wolf attacks, and dens) were collected from April 2017 to May 2020. The species' current occurrence was confirmed in 89 sites distributed across 13 provinces. Grey wolves were sighted at 49 (55%) sites, persecuted at 31 (35%) sites, and had reliably confirmed occurrence at 81 (91%) sites throughout Iraq. The uncontrolled poaching is highlighted as a major threat for the species in Iraq. In addition, the capture/collection of grey wolf pups from the wild is documented as a new threat to the species' population. Furthermore, melanism in grey wolves is reported for the first time in Iraq, a phenotype targeted by locals wherever possible.

#### Introduction

The grey wolf *Canis lupus* is the largest wild canid and is widely distributed throughout the northern hemisphere north of 15°N latitude in North America and 12°N in India. It has become extinct in much of its zoogeographical range in Western Europe, Mexico, and much of the United States (Mech and Boitani 2004, Boitani et al. 2018). In the Middle East, three distinct subspecies of the grey wolf are recognized: the Indian wolf *C. l. pallipes*, is widely distributed throughout the region, the Eurasian wolf *C. l. lupus* is reported from Turkey and Syria, and the Arabian wolf *C. l. arabs* is confined mainly to the Arabian Peninsula (Nowak 1995, Mech and Boitani 2004, Mallon and Budd 2011, Cohen et al. 2013, Zafar-ul Islam et al. 2019). However, the distribution of the grey wolf lineages in the wild of Iraq is not entirely clear and requires further investigation. Recent genetic studies suggest that the Indian wolf in Southwest Asia and Indian subcontinent falls into different clades, with the southwest Asian wolves being grouped with the shallower Eurasian wolf clade (Ersmark et al. 2016, Hamid et al. 2019).

In Iraq, two subspecies occur; the Indian wolf and Arabian wolf (Al-Sheikhly et al. 2015). The Indian wolf was recorded from Al-Shaiba, At Tanumah, Ur, Rawanduz, Diyala, Sulaymaniyah, Khaniqin, Sinjar, Karadagh (Qara Dagh), near Jarmo in Erbil Liwa, eastern Kurkuk Liwa, Lake Habbaniya, near Haditha, Jazira west of Mousel, near Majar, Central Marshes, Makhmore, Jabal Himreen, Jabal Makhool, Wadi Al-Tharthar, and Hammar Marsh (Hatt 1959, Harrison and Bates 1991). The Arabian

wolf was first recorded in Rutba in Anbar province in extreme western Iraq (Al-Sheikhly 2012b, Al-Sheikhly et al. 2015). Furthermore, the occurrence of the grey wolf was recently confirmed in 24 Key Biodiversity Areas (KBAs) throughout Iraq. It was recorded from Fishkhaboor, Dure, Bakhma and Bradost Mountain, Haji Omran Mountain, Dukan Lake, Assos Mountain, Sharbazher Area, Parazan, Qara Dagh, and Hawraman Area in northern Iraq (Kurdistan Region); Jabal Makhool and Ga'ara in central and western Iraq, respectively; Jazman, Shuweicha Marsh, Dalmaj, Hoshiya and Saaroot, Teeb, Sinnaf wetlands, Wadi Al-W'eir and Sh'eeb Abu-Talha, Hawizeh, Suwaibaat, East Hammar, Salman, and Jabal Senam in southern Iraq (Nature Iraq 2017) (Figure 1).

Despite wolf-human interaction, exaggerated concern of wolves being a danger to the public, and habitat fragmentation unsustainable for the long-term viability of populations, the grey wolf has retained a relatively wide-spread range and stable population trend estimated to be 200,000 – 250,000 individuals. Therefore, the species is listed as Least Concern (LC) by the International Union for Conservation of Nature (IUCN) (Boitani et al. 2018). The current distribution range, subspecies involved, and conservation status of the grey wolf in Iraq is unknown (Mech and Boitani 2004). Therefore, the main objectives of our current research were to (i) provide a preliminary attempt to fill the gaps in the knowledge of the species distribution and (ii) shine light on the major threats affecting the species survival in Iraq which will aid its conservation strategies.

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## Methods

Grey wolf confirmed occurrence and current distribution in Iraq were investigated through (i) in situ observations, (ii) interviews with local villagers, hunters, and livestock farmers conducted by the authors, (iii) personal communications, and (iv) reviewing unpublished materials (e.g. photographs, video footage, and reliable personal field observations/reports) submitted by several collaborators (see acknowledgments). From April 2017 to May 2020, wolf signs were collected, including visual sightings of wolves in the wild, dead/live specimens in captivity (killed or trapped by locals), evidence of wolf attacks (on human, livestock, and prey carcasses), and occupied wolf dens. Due to the possibility of misidentification with other canid species, such as domestic dog *C. l. familiaris* and Asiatic jackal *C. aureus*, the collected signs were carefully reviewed by the authors and assigned to grey wolf based on the morphological features of the observed animals which supported the submitted materials above. Grey wolf morphological identification was based on Harrison and Bates (1991). Sites with distinguished wolf signs were considered sites of confirmed occurrence (CO). Canid tracks/scats could not be confirmed as grey wolf or free-ranging dog signs; however, if they were recorded at sites where grey wolves have been reliably observed, they were assigned as grey wolf tracks/scats. Sites with only canid tracks/scats records and unverified canid predatory attacks were considered as sites of unconfirmed occurrence (UO); yet they were mentioned to attract further investigation. The reliability of grey wolf occurrence at each site is reported in Table 1. The genetic analysis of the canid tracks and scats was not performed due to lack of resources and laboratory analysis capabilities, but they are considered to be achievable and encouraged for further studies.

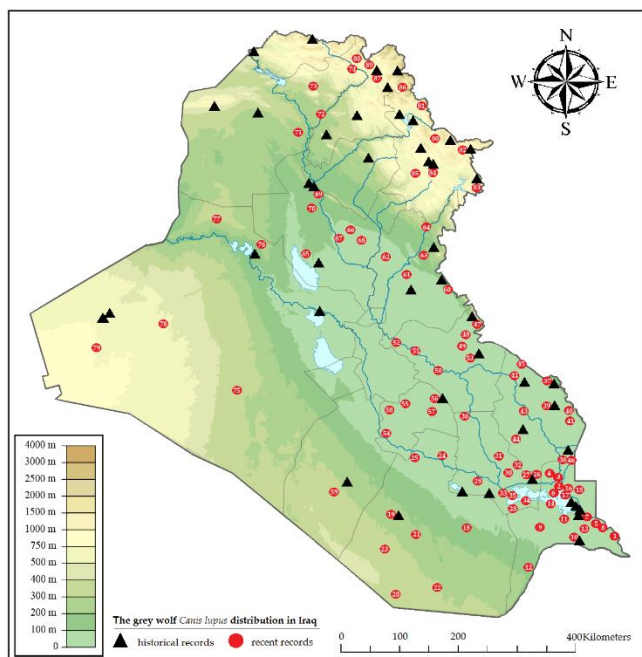


Figure 1. Previous and current grey wolf records in Iraq (records were assessed based on the description of morphological traits).

## Results

In our current research, grey wolf occurrence was confirmed from 89 sites distributed in 13 Iraqi provinces (Table 1, Figure 1). Grey wolves were sighted in 49 (55%) sites and persecuted (killed/trapped) specimens were reported from 31 (34.8%) sites throughout Iraq. Wolf predatory attacks were reported from 21 (23.5%) sites situated mainly in southern and northeastern Iraq. However, six records (28.5%) could not be verified as grey wolf attacks. A total of 15 grey wolf dens were located and dug by locals except one at Al-Jwassin village, Al-Shafia'yah in Al-Qadissiyah province which may also belong to Asiatic jackal, however the exact numbers of the kidnapped grey wolf pups were unknown. Grey wolf tracks and scats were recorded from 12 sites, except of that at Al-Chirbasi, Western Al-Hammar in

DhiQar province which was considered a site of UO. The reliability of grey wolf occurrence in our dataset was 81 (91%) sites of CO and eight (9%) sites of UO. Furthermore, two grey wolves with melanistic phenotype were killed at Umm Al-Shwich, Mudianah and at Al-Sewirah in Basra and Wasit provinces, respectively (Figure 2).

## Discussion

### Distribution

The grey wolf is still roaming the mountains, steppes, marshland fringes, and deserts of Iraq. However, its ecology, detailed distribution range and current population size are unknown. According to Lawrence (1956), *C. l. pallipes* and *C. l. arabs* occur in Iraq, and a zone of hybridization between the two subspecies is known in the western part of the country (Hatt 1959). Al-Sheikhly and Haba (2014) indicated that *C. l. pallipes* is common in the northern mountains, steppes, and arid plains of the eastern bank of the Euphrates River, while *C. l. arabs* is restricted to the desert plateau of western and southwestern Iraq. However, the hybridization pattern and overlapping boundaries of the two subspecies in western and southwestern Iraq is not fully studied. Grey wolf tracks and scats are rather difficult to distinguish from those of the domestic dog (Olaus 1995). Regardless, canine tracks reported from Al-Chirbasi, Western Al-Hammar in DhiQar province were eliminated as being free-ranging dog tracks due to the remoteness of the site away from human settlements and were assigned to grey wolf tracks. However, these sites were evaluated as UO and require additional monitoring. The species' current distribution in Iraq seemed to be nomadic and clustered in areas of southern and southwestern Iraq. This may be attributed to the number of reports collected from these areas compared to those from northern Iraq. Nevertheless, the species' distribution in western and northern Iraq is not fully explored and requires further investigation (Figure 1).

### Threats on the grey wolf in Iraq

#### Poaching

Persecution of grey wolves due to predation on livestock and wolf-human interaction was recognized as a major threat to the species' survival (Boitani et al. 2018). In Iraq, grey wolves are considered dangerous to humans and detrimental to livestock, so they are targeted by local farmers and villagers whenever and wherever possible (Al-Sheikhly 2012a, Al-Sheikhly et al. 2015). Due to low availability of wild prey, agricultural expansion, and lack of proper livestock husbandry methods, grey wolf predatory attacks on freely grazing livestock near human settlements were reported from western Iran (Behdarvand and Kaboli 2015). In recent years, due to rapid agricultural expansion and urbanization (IMO 2019), large areas of the species' natural habitats have been disturbed and/or destroyed. Our interviews indicated that 21 grey wolf attacks occurred on grazing livestock in open rangelands and near human settlements in rural areas and are frequently occurring. The grey wolf packs in the mountains of northern Iraq are said to be dangerous to lone humans, mainly to shepherd boys. However, when a wolf is sighted, shepherd boys have a very distinct alarm call which is easily recognized, and every shepherd boy within hearing immediately rounds up his flock (Hatt 1959). Furthermore, there is a general belief among local communities that grey wolves have no fear of humans and that they closely approach and fiercely attack their victim while they are busy with livestock or engaging in outdoor recreation. It is worth mentioning that the majority of victims of grey wolf attacks in western Iran were children (12 years old or younger; 62%) and most frequent human activities at the time of attacks were recreational (Behdarvand and Kaboli 2015). The local shepherds, farmers and villagers are alerted by the grey wolf attacks and/or them roaming nearby. Retaliation hunts through community-organized hunting campaigns (Sillero-Zubiri and Switzer 2004, Treves et al. 2004) are then practised in order to protect their livestock and families (Figure 2A-J). Recent reports indicated that more than 30 grey wolves were solely killed by one local hunter to protect his livestock in eastern Iraq (Al-Zaidi 2015).

In Arabia, grey wolves have been persecuted due to traditional practices and/or myths for decades (Harrison 1968). In addition, the Bedouins are known to chase grey wolves in the western desert of Iraq in order to collect their eyes, claws, and teeth, which are all used as symbols of glory according to the Arabian tradition (Al-Sheikhly et al. 2015).

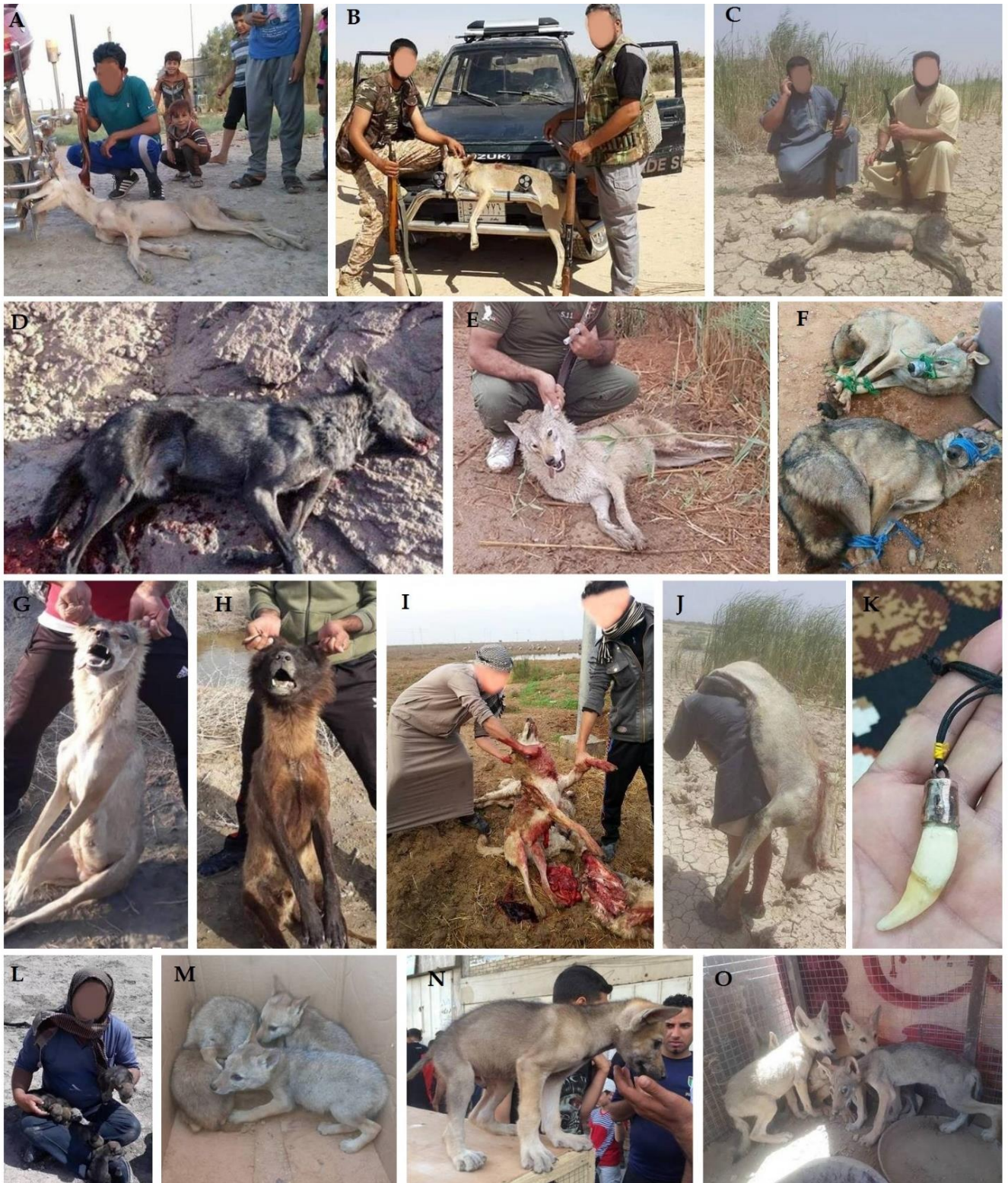


Figure 2. A collage of grey wolves poached, trapped, and pups collected from the wild in Iraq. A-J: wolves killed by farmers to protect livestock in south-eastern Iraq; B: wolf killed as a game by hunters in Badrah; D: melanistic wolf killed in the desert near Al-Sewirah; F: wolves trapped by Bedouins of Busaiyah to be raised as pets; G: nursing female killed in Aslin Marsh to kidnap her pups; H: melanistic wolf killed in Umm Al-Shewich, Mudianah; K: wolf canine teeth used by locals as a necklace to repel evil spirits; L: local hunter with kidnapped pups ca. six weeks old; M-O: pups in local animal markets of Iraq (photos © Iraqi Hunters Association, Al-Nahrain Iraqi Association for Sustainable Hunting, Moa'mal A. Al-Gadri, Awab A. Samaraei, Ali K. Al-Batat, Ali M. Al-Mousawi, Ala'adin Al-Khirsan, and Omar Al-Sheikhly).

Our interviews indicated that grey wolves are illegally persecuted by professional hunters for their body parts (e.g. skull, eyes, teeth, forearms, claws, and fur) and internal organs (mainly heart, liver, and female vaginal tissues) which are used in traditional medicine and black sorcery (Figure 2K). Hunters equipped with modern hunting rifles and fleets of all-terrain vehicles are extensively searching for grey wolves in the open steppes and deserts mainly in western and southern Iraq throughout the year, with extensive poaching occurring mainly in winter (Figure 2F, G). Furthermore, our investigation showed that grey wolves are killed as status symbols by uncontrolled amateur hunters who are advantaged by the trade recovery and availability of hunting gear (Figure 2B, E).

Melanistic polymorphism is an anomalous morphological trait found in many grey wolf populations and is attributed as a result of a natural combination of alleles in the coat-colour determining gene, mutation in the K locus, an ecological response to habitat conditions, or as a reliable sign of hybridization with free-ranging dogs (Khosravi et al. 2015). Grey wolves with black coat-colour are reported from the Middle East (Khosravi et al. 2015, Zafar-ul Islam et al. 2019). In our recent investigation, the melanistic phenotype in the grey wolf was documented for the first time in Iraq. Large numbers of free-ranging dogs were observed especially in rural areas throughout Iraq. Due to low prey abundance (Behdarvand and Kaboli 2015), grey wolves are approaching human settlements and hybridization with free-ranging dogs is possibly occurring; yet this claim requires further research. Besides hybridization with free-ranging dogs, melanistic wolves were recorded in bushlands dominated with *Tamarix* sp. and their black coat-colour may be attributed as an ecological response to densely vegetated habitats. However, further genetic investigation is required for better assessment. Our interviews showed that local communities believed that melanistic “black” wolves (locally named “Sheeb” or “Seeb”) are rare, fiercer, and cause more damage to human and livestock than normal coloured conspecifics. Therefore, they are persecuted as soon as they are encountered (Figure 2D, H). Melanistic wolves are also trapped by local hunters to be tamed as rare pets.

#### Capture/collection of pups from the wild

Hatt (1959) indicated that a wolf den had been dug in Kirkuk Liwa and, in another incident, four-month-old pups were captured and offered for sale as pets. Al-Sheikhly et al. (2015) also mentioned that Bedouins usually trap wolf pups in order to raise them as pets. Our recent investigation indicated that the capture/collection of grey wolf pups is commonly practised on a large scale in Iraq and possibly emerges as a new threat to the species in the country. Local hunters and villagers believe that the presence of the tamed grey wolf will protect the household from evil spirits and keep it safe from thieves (Al-Zaidi 2015). During the pup-rearing season (March – June), pregnant grey wolf females are chased by local hunters/villagers to locate their dens, and nursing/feeding females are observed for a while to find out the exact age of their pups (preferably 2 – 3 weeks). When females leave to hunt, dens are dug and pups are kidnapped (Figure 2L, M). The grey wolf pups are offered for sale in the local animal markets and/or in local social media to be kept as pets, used in sorcery, or raised to crossbreed with guard/shepherd dogs in the future (Figure 2N, O). The price ranges from US\$300 – 500 for a grey wolf pup and US\$800 – 1200 for a tamed adult. It is worth mentioning that grey wolf and Asiatic jackal pups are rather difficult to distinguish by inexperienced local hunters during early weeks of their lives. As a result, on many occasions Asiatic jackal pups are offered for sale as grey wolf pups. This implies further impact on the wild canids in Iraq which warrants urgent awareness outreach.

The conservation of the grey wolf is in fact of great concern due to intrinsic difficulty in managing the large spatial needs of these generalist predators and their conflicts with human activities (Chapron et al. 2014). Further, the persecution of the grey wolf in Iraq has continued, especially in recent years. The poaching of grey wolves is mainly attributed to the lack of public awareness among local communities of the species' ecological importance, increased wolf-human interaction due to human intrusion and disturbance, habitat destruction as a result of residential development, increased rate of nomadic grazing, and uncontrolled poaching and illegal wildlife trade. The grey wolf plays an important ecological role by controlling the population expansion of many prey species. Wild boar *Sus scrofa* is one of the most frequently consumed prey by grey wolves in the wild (Ciucci et al. 2018). Our interviews showed that the wild boar populations have increased in certain rural areas throughout Iraq where large herds are raiding farms and causing severe damage. These incidents may be attributed to the reduction of the grey wolf population, the main natural predators of wild boars in these

areas, as a consequence of severe poaching. Poaching of the grey wolf in Iraq is banned by the Iraqi Wild Animal Protection Law (no. 17 issued on 15th of February 2010), but the weak enforcement encourages hunters to pursue their illegal activities. Raising public awareness in collaboration with local communities, especially in areas where frequent and potential wolf-human interactions occur, enforcement of the wildlife protection laws to control the illegal poaching and capturing, and the establishment of protected areas (PAs) may contribute significantly to the conservation of the grey wolf in Iraq. Cunningham and Wronski (2010) indicated that wolves may be able to establish in areas where active persecution is limited such as in certain protected areas. PAs may certainly act as a refuges and reproduction sites, but it is the core area that contains most of the population and sustains its long-term viability which requires planning and management (Santini et al. 2016). Besides the grey wolf, Iraq has recently established its first PAs network which will give its native mammals, especially those under severe poaching pressure such as the Persian goitered gazelle *Gazella subgutturosa*, Arabian gazelle *G. marica*, Asiatic mouflon *Ovis orientalis gmelini*, and wild goat *Capra aegagrus* (Al-Sheikhly et al. 2020), a chance for survival. However, defining the PA boundaries, estimating the population size and home range of species under protection, engaging local communities and implementing environmental legislations remain major challenges facing the future of large carnivore conservation in Iraq.

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## Biographical sketch

**Omar F. Al-Sheikhly** is a senior wildlife expert, teaching at the Biology Department University of Baghdad, Iraq's member in the SSC/IUCN Otter Specialist Group, the Middle East coordinator of the International Otter Survival Fund (IOSF), founder of the Iraqi Wildlife Center (IWC), and the senior author of the Mammals of Iraq checklist.

**Mukhtar K. Haba** is a senior wildlife expert, Head of the Biology Department College of Science for Women, Director of the Iraqi Green Climate Organization (IGCO), national expert of Iraq's CBD, and author of the Mammals of Iraq checklist.

**Laith A. Al-Obeidi** is a wildlife researcher, field expert, environmental activist, member in the Threatened Waterfowl Specialist Group (TWSG) since 2013, and has participated in several environmental field surveys and programs which aimed to conserve the biota of Iraq during the past ten years.

**Husham K. Abdulzahra** is a wildlife conservationist, contributing member of the Iraqi Wildlife Center (IWC), and has participated in several *in situ* environmental projects in cooperation with the University of Basra to monitor and conserve the wild fauna of southern Iraq, especially wild mammals and herpetofauna.

## Appendix 1

Table 1. Recent records of the grey wolf *Canis lupus* (exact subspecies is not determined) in Iraq (April 2017-May 2020). m= melanistic phenotype; CO=confirmed occurrence; UO=unconfirmed occurrence.

No.	Province	Site name	Coordinates		Confirmed observation	Specimens (killed/trapped)	Tracks	Scats	Attacks	Occupied dens	Occurrence reliability
			N	E							
1	Basra	Mihrag, Fao	30° 6'	48°21'	+	0	0	0	0	0	CO
2	(17 records)	Aslin Marsh, Mudianah	30°40'	47°24'	+	0	0	0	0	0	CO
3		Saed Noor village, Nashwah	30°49'	47°36'	0	+	0	0	+	0	CO
4		Umm Al-Shewich (Shuwayj), Mudianah	30°59'	47°13'	0	+m	+	0	0	0	CO
5		Doweab, Fao	30°15'	48°19'	0	+	+	0	0	0	CO
6		Al-Mansouri, north of Al-Masshab	30°42'	47°37'	+	0	+	0	0	0	CO
7		Kut Al-Zain, Abu Al-Khasib	30°25'	47°53'	+	0	+	0	0	0	CO
8		Katta'h, Abu Al-Khasib	30°19'	48°10'	0	+	0	0	0	0	CO
9		Ghuzeil	30°13'	46°59'	0	+	0	0	0	0	CO
10		Near Jabal Sanam, Safwan	30° 8'	47°37'	+	0	0	0	0	0	CO
11		north of Rumaila	30°35'	47°19'	0	+	0	0	0	0	CO
12		Khidhr Al-Mai, Zubair	29°41'	46°52'	0	+	+	0	0	0	CO
13		Khwissat, Khaour Al-Zubair	30°20'	47°49'	0	+	+	0	0	0	CO
14		Ebrah umm Al-Sijean	30°44'	47°23'	0	+	0	+	0	+	CO
15		Majnon plain	30°53'	47°47'	+	0	0	0	0	0	CO
16		Al-Sweeb, southeast of Al-Qurnah	30°57'	47°31'	+	0	0	0	0	0	CO
17		marshy plains near Al-Shafi	30°52'	47°26'	0	+	+	0	0	0	CO
18	Al-Muthana	Khubary Umm-Rahal, Busaiyah	30° 6'	46° 7'	0	+	0	0	0	0	CO
19	(8 records)	near As-salman (Salman)	30°27'	44°33'	+	0	0	0	0	0	CO
20		Faidhatt Al-Rawag	29°22'	44°43'	+	0	+	0	0	0	CO
21		Sada'ah, east As-salman	30°28'	44°41'	+	0	0	0	0	0	CO
22		Wadi Al-Amghar	29°27'	45°16'	+	0	0	0	0	0	CO
23		Takhadid	30°19'	44°30'	0	+	0	0	0	0	CO
24		desert south of Al-Khidhir	31° 9'	45°31'	0	+	0	0	0	0	CO
25		eastern bank of Sawah lake	31°19'	45° 1'	+	0	0	0	0	0	CO
26	DhiQar	Ishan Al-Azraq, Central Marshes	31° 1'	47°11'	+	0	+	0	+	+	CO
27	(11 records)	Ishan Gubah, Central Marshes	31° 4'	47° 0'	0	0	0	0	+	0	CO
28		Al-Khamisiyah	30°46'	46°28'	+	0	0	0	0	0	CO
29		Al-Bathah	31° 4'	45°55'	0	+	0	0	0	0	CO
30		Al-Erithim, Al-Eslah	31° 2'	46°40'	+	0	0	0	0	+	CO
31		Al-Mutrag, north of Dawaiyah	31°28'	46°27'	0	+	0	0	+	0	CO
32		Gubaibah, Central Marshes	31°14'	46°59'	+	0	0	0	0	0	CO
33		Ekaikah (Ukaikah)	30°55'	46°28'	+	0	0	0	0	0	CO
34		Al-Chirbasi, Western Al-Hammar	30°46'	46°45'	0	0	+	0	0	0	UO
35		Kirmashiyah, Western Al-Hammar	30°51'	46°37'	+	0	0	0	0	0	CO
36		Al-Fajar	31°54'	46° 0'	+	0	0	0	0	0	CO
37	Mayssan	Sharhani, Teeb	32° 1'	47°40'	0	0	0	0	+	0	UO
38	(10 records)	south of Al-Ezair	31°19'	47°25'	0	0	0	0	+	0	UO
39		Al-Sinaf Marsh	31°55'	47°15'	0	0	0	0	+	0	UO
40		Sheeb	31°51'	47°45'	+	0	0	0	0	0	CO
41		Al-Edhaeim, north of Hawizeh Marsh	31°45'	47°47'	+	0	0	0	0	0	CO
42		Abu-Chitif, Ali Al-Gharbi	32°25'	46°41'	0	+	0	0	+	+	CO
43		Al-Saniyah Marsh, Kumait	31°55'	46°51'	+	0	0	0	0	0	CO
44		Al-Auda Marsh	31°37'	46°52'	+	0	0	0	0	+	CO
45		Chailat	32°35'	46°55'	0	+	0	0	0	0	CO
46		Lissan Ejerdah, south of Hawizeh Marsh	31°17'	47°31'	+	0	0	0	0	0	CO
47	Wasit	Zurbatiyah	33°11'	46° 7'	+	0	0	0	0	+	CO
48	(7 records)	Badrah	33° 4'	45°59'	+	0	0	0	+	+	CO
49		Jassan	32°57'	45°57'	+	0	0	0	+	+	CO
50		Numaniyah	32°40'	45°30'	0	+	0	0	0	0	CO
51		A-Aziziyah	45°17'	45°17'	0	0	0	0	+	+	UO
52		desert near Al-Sewirah	32°52'	44°45'	0	+ m	0	0	+	+	CO

53		Al-Shuwicha Marsh	32°45'	45°55'	0	+	0	0	0	0	CO	
54	Al-Qadissiyah	desert west of Shanafiyah	31°31'	44°34'	+	0	0	0	0	+	CO	
55	(5 records)	Al-Jwassin village, Al-Shafia'yah	31°54'	44°48'	0	0	0	0	0	+	UO	
56		Dalmaj Marsh (Haur Adalmaj)	32° 5'	45°28'	0	+	0	0	0	0	CO	
57		fields near Al-Bdear	31°54'	45°17'	0	+	0	0	0	0	CO	
58		Desert near Shamiyah	31°54'	44°41'	0	+	0	0	0	0	CO	
59	Al-Najaf (1 record)	Shibicha (Shabakah)	30°47'	43°41'	0	+	0	0	0	0	CO	
60	Diyala	Wdi Hirab, Mandli	33°46'	45°36'	+	0	0	0	0	0	CO	
61	(5 records)	Mansouriyatt Al-Jabal	34° 2'	45° 1'	0	0	0	0	+	0	UO	
62		Al-Edhaiem plain	34°28'	44°44'	+	0	0	0	0	+	CO	
63		Eastern bank of Himreen lake, Jalwla'a	34°15'	45° 4'	0	+	0	0	0	0	CO	
64		Kalar	34°41'	45°18'	0	+	0	0	0	0	CO	
65	Salahadin	Tharthar Lake	34°25'	43°12'	+	0	0	0	0	0	CO	
66	(6 records)	Al-Khuzaiifi	34°45'	43°48'	+	0	0	0	+	+	CO	
67		Al-Alam	34°43'	43°40'	+	0	0	0	+	0	CO	
68		Al-Sidir	34°45'	44° 1'	+	0	0	0	+	0	CO	
69		Jabal Makhool	35° 4'	43°29'	+	0	0	0	+	+	CO	
70		Al-Sukariyah, near Baiji	34°56'	43°21'	+	0	0	0	0	0	CO	
71	Ninavah	Al-Shorah	35°59'	43°11'	+	0	0	0	+	0	CO	
72	(4 records)	south of Al-Gwair	35°59'	43°31'	+	0	0	0	+	0	CO	
73		Shekhan	36°41'	43°21'	0	+	0	0	0	0	CO	
74		Akre	36°46'	43°54'	0	+	0	0	0	0	CO	
75	Anbar	Faidhatt Al-Habbariyah, Al-Nikhaib	32°10'	42° 0'	+	0	0	+	0	0	CO	
76	(5 records)	Wadi Abu-Dalaiyah, Haditah	34°13'	42°30'	+	0	0	0	0	0	CO	
77		Wadi Al-Ammah, north of Rawa	34°48'	41°54'	+	0	0	0	0	0	CO	
78		Wadi Horan, Tleha	33° 7'	40°48'	0	+	0	0	0	0	CO	
79		Sha'aeeb Al-Tarfat, Rutba	32°42'	39°57'	0	+	0	0	0	0	CO	
80	Sulymaniyah	Mawat	35°53'	45°25'	+	0	0	0	0	0	CO	
81	(6 records)	Halsho	36°12'	45°15'	0	0	0	0	+	0	UO	
82		Panjween	35°38'	45°57'	+	0	0	0	+	0	CO	
83		Tawilah, Hawaraman	35°11'	46°11'	+	0	0	0	0	0	CO	
84		Qara Dagh	35°17'	45°19'	+	0	0	0	0	0	CO	
85		Sanjaw	35°17'	45° 9'	0	+	0	0	0	0	CO	
86	Erbil	Choman	36°37'	44°54'	+	0	0	0	0	0	CO	
87	(4 records)	Bradoust Mountain	36°43'	44°21'	+	0	0	0	0	0	CO	
88		Barzan area	44° 5'	44° 5'	+	0	0	0	0	0	CO	
89		Merga Sur	36°49'	44°17'	+	0	0	0	0	0	CO	
					Total	49	31	10	2	21	15	91%