

# On the status and biology of the European Otter, *Lutra lutra* (Carnivora: Mustelidae), in Iran

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**Abstract.** In their natural habitats, the Chub (*Alburnoides bipunctatus*) with 38.1% and the Carp (*Cyprinus carpio*) with 34.8% comprise the major food items of the European Otter in Iran, whereas in fish farms carps dominate with 71.3%. It is estimated that 1-3 Otters are killed annually in each fish farm in Iran. The Otter needs full protection due to the high mortality caused by fish farmers around the country. Illegal shooting, habitat degradation and river pollution have been recognised as the major factors which adversely affect the Otter population. The cranial measurements of 21 specimens are given. CBL for males and females were 118.4 mm and 111.6 mm on average, respectively. No differences could be found when compared with published results from European countries.

**Kurzfassung.** In natürlichen Habitaten des Irans stellen Schneider (*Alburnoides bipunctatus*) mit 38,1% und Karpfen (*Cyprinus carpio*) mit 34,8% die wichtigste Nahrung des Fischotters dar. In Fischfarmen dominiert dagegen mit 71,3% der Karpfen. Es wird geschätzt, dass in jeder Fischfarm des Irans jährlich 1-3 Otter getötet werden. Aufgrund dieser hohen Mortalität benötigt der Otter strengen Schutz. Illegales Töten, Habitatzerstörung und die Verschmutzung von Fließgewässern wurden als die wichtigsten Gefährungsursachen identifiziert. Es werden die Schädelmaße von 21 Ottern gegeben. Die Schädellänge (CBL) beträgt bei Männchen 118,4 mm und bei Weibchen 111,6 mm. Im Vergleich zu publizierten Angaben über Otter aus Europa konnten keine Unterschiede gefunden werden.

**Key words.** Conservation, biology, habitat, food habits, cranial measurements, morphology.

## Introduction

The European Otter, *Lutra lutra* (Linnaeus, 1758), has a wide but patchy distribution in Iran. Its potential range is confined to aquatic habitats and their surroundings, from the Caspian lowlands in the north to the southern coastal area and from the easternmost to the west (in 9 out of 12 water catchments in Iran). Altogether, there are more than 2500 streams and rivers running through Iran (JAFARI 1997). However, little is known about the current distribution, population numbers and population dynamics of the Otter. Published information includes ETEMAD (1985) with some information on the taxonomy of the Otter in Iran, KIABI (1993) and MIRZAJANI (1999) on conservation issues, ZIAIE & GUTLEB (1997) on distribution, HAMZEHPOUR (2006) on a population model in Guilan Province, and MIRZAI (2006) on food habits and habitats in Jajrud River, Tehran Province.

We give here some information on the conservation status of the Otter, based on surveys carried out between 1986 and 2004. The data were collected continuously wherever and whenever possible. The serious threats posed by fish farmers were our main reason and justification for focusing on the conservation aspects of this species.

Table 1. Collection localities and dates.

Province	Localities	Coordinates	Dates
Tehran	Ab-e-Sard	35°42'N, 52°12'E	07/25/1986
	Jajrud	35°44'N, 51°42'E	04/20/1991
Mazandaran	Shirud	36°46'N, 50°51'E	03/05/1989
	Tajan	36°38'N, 53°16'E	10/07/1989
	Chalus	36°35'N, 51°20'E	11/25/1992
Guilan	Masal	37°22'N, 49°11'E	09/12/1999
	Abkenar	37°26'N, 49°21'E	10/16/2000
	Lakaan	37°16'N, 49°34'E	09/02/2001
	Sanguer	37°16'N, 49°45'E	10/13/2003
	Sefid rud	37°13'N, 49°42'E	11/23/2003
	Roodsar	37°12'N, 50°24'E	08/12/2004
	Koomeleh	37°11'N, 50°10'E	10/12/2004
	Golestan	Gorgan rud	36°44'N, 54°30'E
West Azarbajjan	Mahabad	36°47'N, 45°46'E	06/02/2000
Kurdestan	Zarivar	35°34'N, 46°11'E	05/17/1999
Kermanshah	Gamasiab	34°14'N, 47°23'E	05/05/2000
Chahar Mahal-va-Bakhtiari	Lordeguan	31°36'N, 50°51'E	10/24/1987
	Cheshmeh-chenaar	30°25'N, 51°45'E	11/14/1995
	Faaryab	31°16'N, 50°54'E	12/20/2002
Kohkeelooyeh-va-Boyrahmad	Khersaan	31°45'N, 51°28'E	08/08/1995
	Beshaar	30°27'N, 51°40'E	08/29/1995

## Material and methods

Starting in 1986, one of us (BK) started a conservation-oriented survey with the assistance of wildlife students and colleagues all over Iran but mainly in the north, west and parts of the south-west, which amounts to one-third of Iran's surface area (Table 1). Otter tracks, droppings, and Otter holts in and around rivers, ponds, dams, and fish farms were recorded to determine the occurrence of this nocturnal, shy, sleek, retiring and elusive species. Whenever possible, road kills, shot animals and Otter remains were collected for all possible measurements. Otter droppings (spraints) were used to analyse the diet.

Standard abbreviations are used for the cranial measurements.

## Results and discussion

Twenty-one skulls were collected and measured (Table 2). Many more (>100) were found, but were badly damaged and therefore could not be used for cranial measurements. The measurements are in agreement with ETEMAD (1985) and MIRZAJANI (1998): for example, ETEMAD gives CBL= 112.3 mm and ZB= 69.6 mm and MIRZAJANI CBL= 114.5-123.7 mm and ZB= 71.2-76.9 mm, whilst our data shows CBL= 110.2-124.9 mm and ZB= 66.7-81.2 mm. The limited number of specimens does not allow us to draw any conclusion about the similarity and/or differences between the cranial measurements of Otters from different

Table 2. Cranial measurements (mm) for adult specimens of European Otter, *Lutra lutra*, from Iran.

	Sex	n	Average	SD	min	max
Condylobasal Length (CBL)	♂	9	118.4	3.22	110.2	124.9
	♀	12	111.6	3.37	110.8	113.2
Zygomatic Breadth (ZB)	♂	8	77.2	0.65	71.6	81.2
	♀	9	70.8	0.85	66.7	74.1
Least Interorbital Breadth (LIB)	♂	9	18.8	0.44	17.5	20.2
	♀	12	19.8	0.75	18.6	20.7
Maxillary Toothrow Length (MXL)	♂	9	37.8	0.64	36.6	39.8
	♀	12	37.8	0.37	37.3	39.6
Mandibular Toothrow Length (MDL)	♂	7	40.9	0.49	39.2	42.5
	♀	8	41.8	0.26	40.1	42.5
Rostral Breadth at Canine (RB)	♂	9	27.2	0.82	26.1	27.8
	♀	12	26.4	0.34	25.3	27.1

provinces. The cranial measurements of 21 specimens are also in line with the findings of YILMAZ & TOPRAK (2000) in Turkey and VON MOLL (1998) in Holland.

YOM-TOV et al. (2006) discussed the temporal and geographic body size trends in Norway as being possibly due to increased food availability from fish farming and to energy saving due to global warming. Their findings also show that Otter body size conforms to Bergmann's rule. PERTOLDI et al. (1998) believe that habitat quality can affect adult body size and skull traits in the Otter. Droppings in natural habitats contain more food items compared with those found in and around fish farms (Table 3). Taking into consideration the possible errors associated with the determination of food habits using Otter spraints (CARSS & NELSON 1998), our findings show that prey availability and abundance might be a key factor in Otter food selection. In and adjacent to fish farms, the Otter seems to switch to Carp, *Cyprinus carpio* (Cyprinidae), and Rainbow Trout, *Salmo trutta* (Salmonidae), which constitute the two major fishes in fish farming practice in Iran (Table 3). MIRZAI (2006) found that *Alburnoides bipunctatus*, *Leuciscus cephalus* and *Capoeta* sp. (all Cyprinidae) were the preferred food items of the Otter in the Jajrud River; with consumption rates that varied according to different seasons and stations. LUDWIG et al. (2002) found that Otters prefer to forage in predictable habitats where prey items are more available. JACOBSON (2005) showed that the proportion of farm-raised fish increased by about 3 items a few days after stocking in Denmark. PRESTON et al. (2006) believe that although 50% of the Otter diet consists of stickleback, salmonids and cyprinids they may feed on less profitable prey items in Ireland. Our findings as regards Otter food habits, even though tentative, are almost in agreement with most European findings.

As in European countries, the Otter is regarded as a pest by aquaculturists. Although its food is mainly fish, it does not make any significant difference to the stock of a fish. Little is known about the actual number of Otters killed by fish farmers in Iran. We estimate that on average between 1 and 3 Otters are killed per year and per fish farm, but probably even more in the Caspian lowlands. 147 Otter skins were found at 8 selected farms between 1998 and 2004. SKAREN (1990) discusses an electric fence system that is useful in excluding Otters from fish farms. These systems have not yet been employed in Iran. MYSIAK et al. (2004) discuss other preventive measures against Otters in fish farms.



Fig. 1. Slaughtered European Otters in Golestan Province, 2006. Photograph: M. HAMZEHPOUR.

The presence of an alien species, the Common Raccoon, *Procyon lotor*, in Otter habitats in the West Caspian Basin (Guilan Province) may be another important factor influencing the Otter population. Although little is known about competition between the Raccoon and the Otter, it is thought that Raccoons can be vectors of the viral disease of rabies (KAUHALA 1996). River pollution, habitat degradation and road kills are other sources of Otter mortality. A trade in fur has been observed in west Iran in recent years, but quantitative data are not available.

**Acknowledgements.** We wish to thank Mr M. E. SEHHATISABET and F. HAIDARI for their great help.

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Table 3. Food items in 145 sprints from 21 localities and stomach contents of 31 Otters killed in fish farms.

Items	Rivers		Fish farms	
	No.	%	No.	%
<i>Alburnoides bipunctatus</i>	35	38.1	-	-
<i>Carassius auratus</i>	8	8.7	8	8.5
Salmonidae	-	-	13	13.8
<i>Cyprinus carpio</i>	32	34.8	67	71.3
Unknown fish	3	3.2	6	6.4
Birds	4	4.3	-	-
Amphibia	6	6.6	-	-
Crustacea ( <i>Potamon</i> )	4	4.3	-	-
Total	92	100.00	94	100.00

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