

Croatia (HR)

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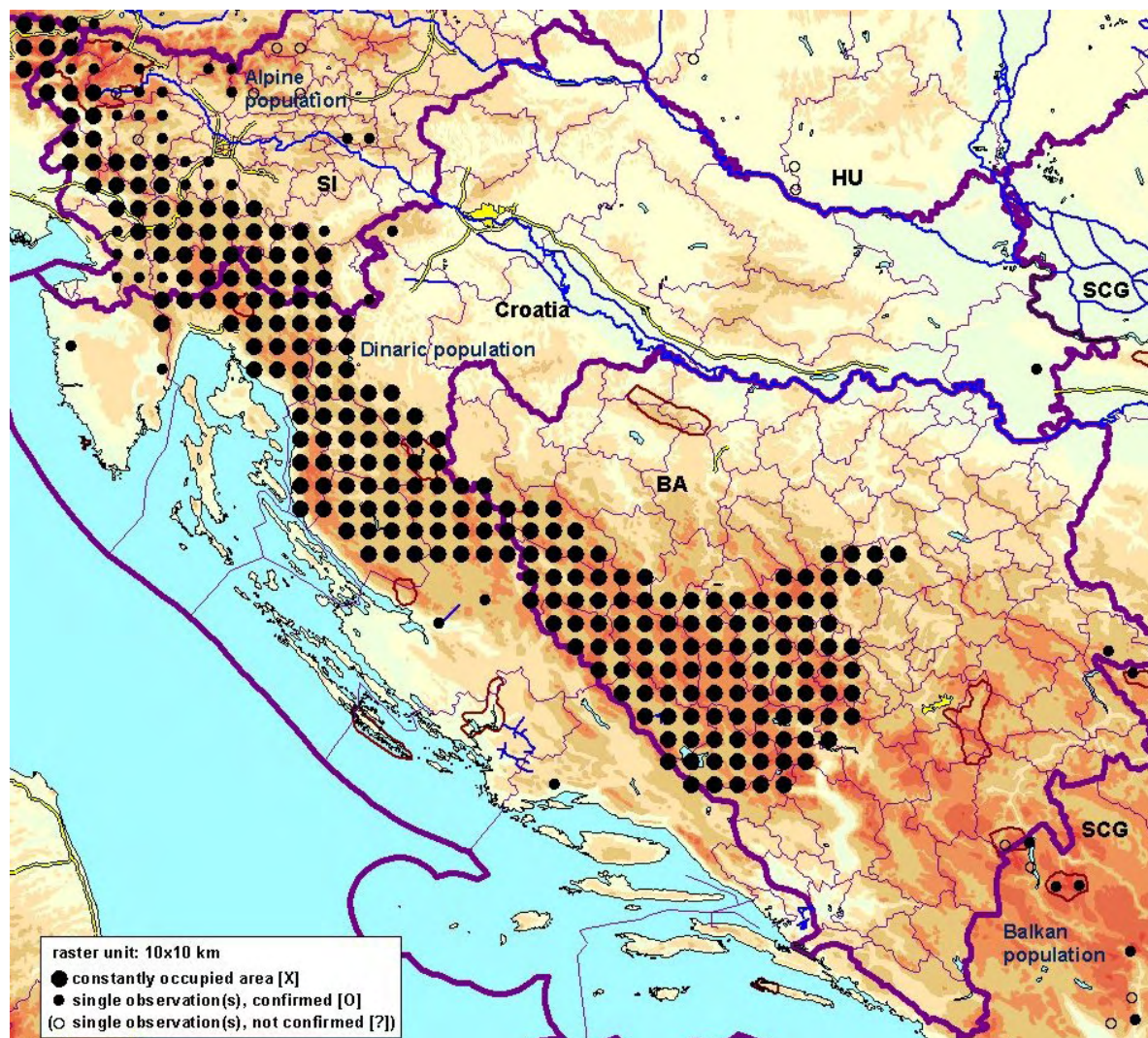
Area: 56'542 km²

Forests & Woodland: 31.9 % (2000)

Human population: 4'334'142 (2001)

Population density: 76.7 / km²

1. Lynx distribution in Croatia in 2001:



Geographical range of the population(s)

Dinaric population: Gorski Kotar, Lika; no subpopulations.

Methods: sightings & signs, snow tracking, unspecific survey, inquiry, lynx mortality. Major source of distribution data are confirmed sites of dead (mostly shot) animals.

2. Lynx population(s):

Population	Pop. size (Ø 1996-2001)	Lynx distribution area [km ²]				[X] & [X+O] / country area [%]	Pop. density [lynx/100 km ²]
		[X]	[O]	[?]	[X+O]		
Dinaric	50	8'400	700	0	9'100	14.9 / 16.1	0.6
Total	50	8'400	700	0	9'100	14.9 / 16.1	0.6

3. Population size:

3.1. Estimations

Population	Year	Official estimation	Additional estimation	Accuracy	Tendency
Dinaric	1996	100		2001: The lower value of this range is more likely.	decreasing
	2001		40-60		
Ø 1996-2001		100	50		

3.2. Methods and institutions responsible for the estimations

Population	Official estimation	Additional estimation
Dinaric	Survey, calculation based on available prey (roe and red deer; estimates by hunting organizations). ^a	
<i>Institution</i>	Ministry for environment and physical planning	Biology department of the Veterinary Faculty

^a Data used by the Ministry of environment and physical planning are elaborated by the Biology Dep. of the Veterinary faculty.

4. Legal situation, harvest and losses of lynx:

4.1. International treaties

EU Habitat Directive	Bern Convention	CITES
-	ratified 2000	ratified 2000

4.2. Legal status

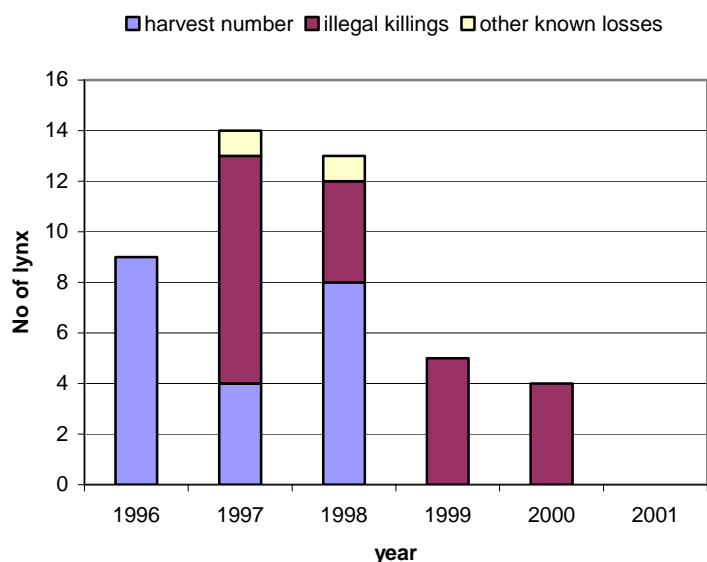
Controlled hunting of lynx until 1998; since then fully protected by law.

Hunting season: 15.11. - 28.02.
 Yearly quota: Until 1998 a yearly quota has been assigned for lynx hunting. Since then no more quotas were allowed. Quotas 1996-98 based on population estimates of 80-120 animals. The suspicion of this estimate was the main reason not to allow quotas after that.
 Institution responsible: Ministry for environment and physical planning. Its "committee for large carnivores" gives advice and the Ministry decides.
 Method quota setting: Questionnaire for game managers.

4.3. Harvest numbers and other known losses to the population(s)

Population	Year	Quota	Harvest number	Traffic	Other accidents	Illegal killings	Removal problem animals	Diseases	Unknown cause	Orphans	Other	Total	% of population
Dinaric	1996	14	9	0	0	0	0	0	0	0	0	9	9
	1997	4	4	1	0	9	0	0	0	0	0	14	14-28 ^a
	1998	8	8	0	0	4	0	0	1	0	0	13	13-26 ^a
	1999	no	0	0	0	5	0	0	0	0	0	5	5-10 ^a
	2000	no	0	0	0	4	0	0	0	0	0	4	4-8 ^a
	2001	no	0	0	0	0	0	0	0	0	0	0	0
Total 1996-2001		-	21	1	0	22	0	0	1	0	0	45	-
Yearly Ø		-	7	0.17	0	3.67	0	0	0.17	0	0	7.5	7.5-15 ^a
Known mortality / 100 km² [X+O]		-	0.08	0.00	0	0.04	0	0	0.00	0	0	0.08	-

^a when a population size of 50 - 100 animals is taken



Number of known losses to the Dinaric lynx population in Croatia from 1996-2001.

4.4. Lynx management

Population	Authority in charge		Management / Conservation Plan
	National level	Regional level	
Dinaric	Ministry for environment and physical planning	none	(2003: Corporative 33 authors (through workshops); not yet published)

5. Depredation:

5.1. Depredation losses & compensation paid

Population	Year	Sheep	Goat	Rein-deer	Other species	Total	Compensation (in Euro)	Compensation other predators
Dinaric	1996	0	0	-	0	0	0 €	0 €
	1997	0	0	-	0	0	0 €	0 €
	1998	0	0	-	0	0	0 €	175'000 €
	1999	} 1	} 10	-	0	} 11	} 720 €	119'000 €
	2000			-	0			96'000 €
	2001	0	0	-	0	0	0 €	160'000 €
Total 1996-2001		1	10^a	-	0	11	720 €	550'000 €^b

^a The goats might have been killed by dogs.

^b The blame for most of the livestock damage is attributed to wolves.

5.2. Regional & seasonal differences

→ None.

5.3. Compensation systems

Population	Description	Who is paying?	Procedures to verify lynx kills
Dinaric	Compensation payment	The government	Certified "experts" have to confirm on site the damage and the animal species responsible for it. The remains of the killed animal must be present. They follow the description of signs from a special book.

5.4. Prevention

→ None. (It is believed that the recorded illegal killings were to get the trophy and to "protect" the game (roe deer)).

6. Major threats to the lynx population(s) in the country:

Population	Past (<1996)	Present (1996-2001)	Future (>2001)
Dinaric	Infrastructure development: Road building	Infrastructure development: Road building Shooting Vehicle and train collision Prey / food base High juvenile mortality (?)	Infrastructure development: Road building Shooting Vehicle and train collision Prey / food base High juvenile mortality (?) Inbreeding (?)

7. Conservation measures:

Conservation measure	Lacking / proposed	Drafted / ratified	Implemented / applied
Management plans		X	
Legislation on an international level			X
Legislation on a national level			X
Public involvement		X	
Formal education		X	
Awareness		X	
Capacity-building / Training		X	
Taxonomy		X	
Population numbers and range			X
Biology and Ecology			X
Habitat status			X
Threats			X
Uses and harvest levels		X	
Conservation measures		X	
Monitoring / Trends			X
Genetic status		X	
Human attitude / Human dimensions		X	
Maintenance / Conservation			X
Corridors			X
Identification of new protected areas	X		
Establishment of protected areas			X
Management of protected areas		X	
Expansion of protected areas	X		
Community-based initiatives	X		
Sustainable use / Harvest management		X	
Recovery management		X	
Disease, pathogen, parasite management		X	
Limiting population growth		X	

8. Judgement of the status of the population(s) within the country & most urgent actions needed:

Population	Judgement	Most urgent actions needed
Dinaric	vulnerable	<ul style="list-style-type: none"> Increase of prey availability

Comment: Attempt is under way (through "management plan") to reduce the illegal killings of lynx by allowing a very restrictive yearly quota. There is a hope that quota will facilitate the cooperation with hunters.

9. Projects:

Population	Title	Duration	Contact
Dinaric	Study of fossil and recent large carnivores in Croatia	since 2001	Djuro Huber: huber@vef.hr

10. Contact:

Population	Name	Address
Dinaric	Djuro HUBER	Veterinary Faculty, Heinzelova 55, 10000 Zagreb e-mail: huber@vef.hr
Collaborators:	Josip KUSAK	Veterinary Faculty, Heinzelova 55, 10000 Zagreb e-mail: kusak@vef.hr
	Tomislav GOMERCIC	Veterinary Faculty, Heinzelova 55, 10000 Zagreb e-mail: tomislav.gomercic@zg.tel.hr

Country assessment:

Soon after the re-introduction in neighbouring Slovenia (1973), lynx crossed the border, expanded south and settled along the Dinaric mountain chain. The current distribution indicates that lynx probably inhabits most of the available suitable habitat (see map, but also FRKOVIC 2001). The situation in the southern part seems to be unclear. On one side, there might indeed not have been an expansion further south to Dalmatia (although the area on the same latitude across the border in Bosnia-Herzegovina is indicated as continuously occupied by lynx, but is actually also more mountainous). On the other hand, at least during the war (1991-95) only the northernmost part of Croatia (Istria peninsula and Gorski Kotar) was monitored, and there was no data from the south at that time (COP & FRKOVIC 1998). The monitoring effort in the south and along the border with Bosnia-Herzegovina might still be less than elsewhere and probably needs improvement.

Croatia is going through a time of upheaval. It is only recently that international treaties have been ratified (Table 4.1). Lynx is now (since 1998) fully protected by law. A management plan has been finished since fall 2002, the approval from the Ministry of Environment is soon to be expected (D. HUBER, pers. comm.). To counteract the still ongoing illegal killings, it is suggested to allow for an official quota hunting on a low level again (comment Table 8). It is however questionable whether this would help as illegal killings already occurred before 1998 (see Table 4.3). Additionally, quotas would need to be carefully set regarding the fact, that there is a certain discrepancy between different population estimations, and that the current number could be as low as 40 individuals (Table 3.1). According to FRKOVIC (2001) a number of less than 50 individuals is indicated by the low availability of prey; the alternative estimation he mentions is 70-90 animals. The prey base seems to be the most important limiting factor for the lynx in Croatia (Table 8). The scientific basis for this assumption as well as for lynx-prey relationship in general (e.g. for population estimations as practised) is however missing. Data in FRKOVIC (2001) on known

lynx mortality rather highlight shooting (legal and illegal) as most important mortality factor (157 of 211 lynx from 1974-2000). Traffic accidents, a major threat listed in Table 6 were responsible for only 17 known deaths in the same time period (FRKOVIC 2001).

Having in mind the negative trend seen during the past few years (Tab. 3.1), Croatia should undertake everything necessary to stabilize and strengthen the central part of the Dinaric population. As seen above, measures regarding prey base on one hand and against human induced direct mortality on the other hand need to have highest priority. Further, a common strategy for the whole population has to be developed in co-ordination with Slovenia and Bosnia-Herzegovina (see population report).

References:

COP. J. & FRKOVIC, A. 1998: The re-introduction of the lynx in Slovenia and its present status in Slovenia and Croatia. *Hystrix* 10 (1): 65-76.

FRKOVIC, A. 2001: Ris (*Lynx lynx* L.) u Hrvatskoj - naseljavanje, odlov i brojnost (1974-2000). Sumarski list 11-12: 625-634.