6. Europe

This part includes summarising information from all countries across Europe to different aspects of the conservation and management of the Eurasian lynx. Several maps demonstrate the evolution of the lynx distribution from 1960 until 2001, the latest year covered by the current survey. Tables present data and information on the legal status, harvest and known losses, population sizes and trends, threats, depredation, and monitoring. They correspond to the Tables 1-6 in the Eurasian Lynx Action Plan (BREITENMOSER *et al.* 2000). Finally, conclusions are drawn regarding the current status and conservation of *Lynx lynx* in Europe.

6.1. Development of the lynx distribution area 1960-2001

2001:

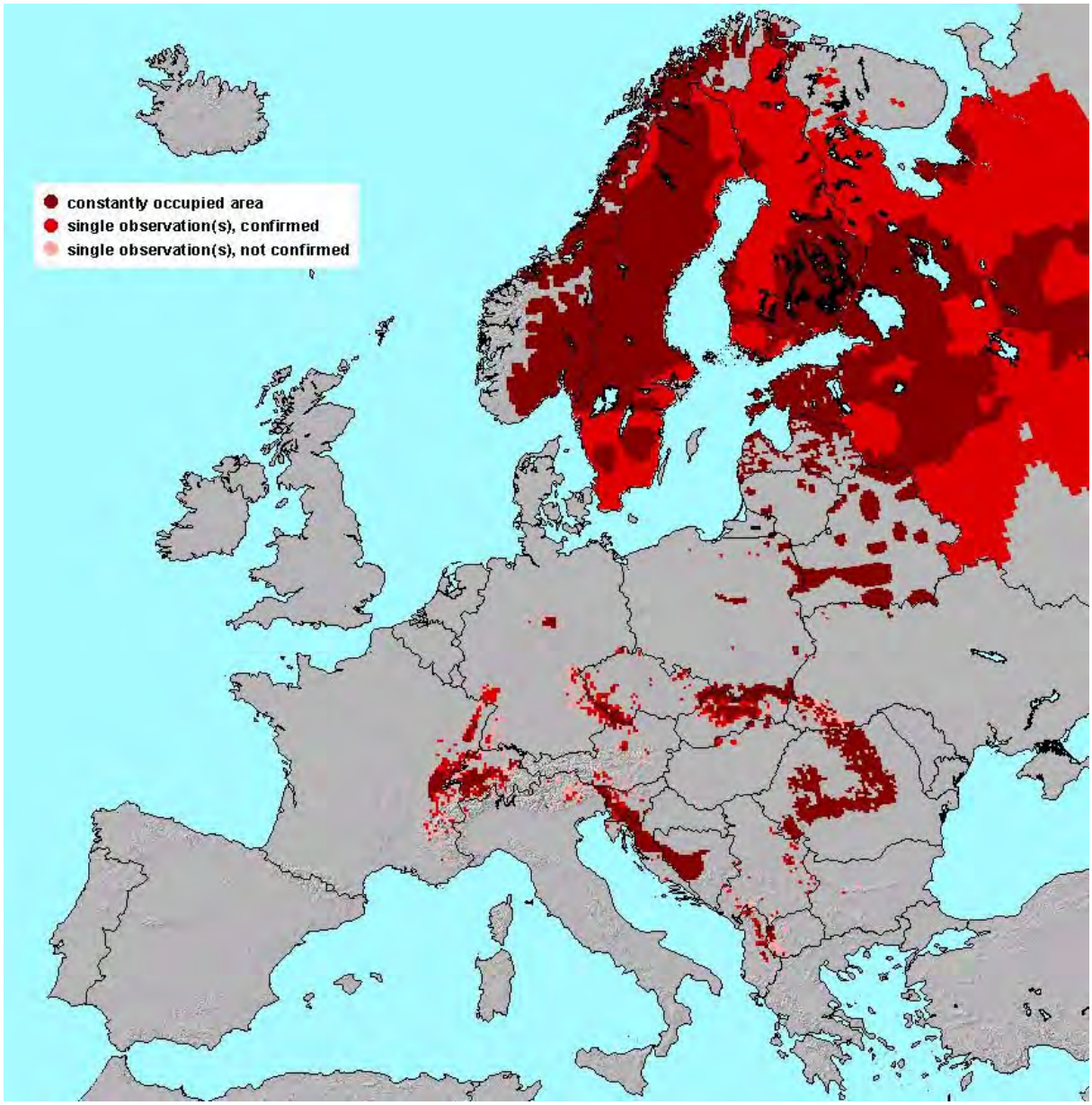

Figure 1: Recent distribution of *Lynx lynx* in Europe according to the information received during the current survey.

The contacts participating in the current European survey on the Eurasian lynx provided information on the distribution of the species per 10x10 kilometre raster of the country surface. A distinction between three different qualities was made: constantly occupied area; single observation(s), confirmed; single observation(s), not confirmed (for details see Material and methods). The compilation of all country maps gave the following picture of the current distribution of *Lynx lynx* in Europe (see Fig. 1 above).

For reasons of comparison, and to have an idea on the development of the distribution of the Eurasian lynx across Europe during the past few decades, maps for 1968, 1976, 1990 and 1995 are shown:

1968:

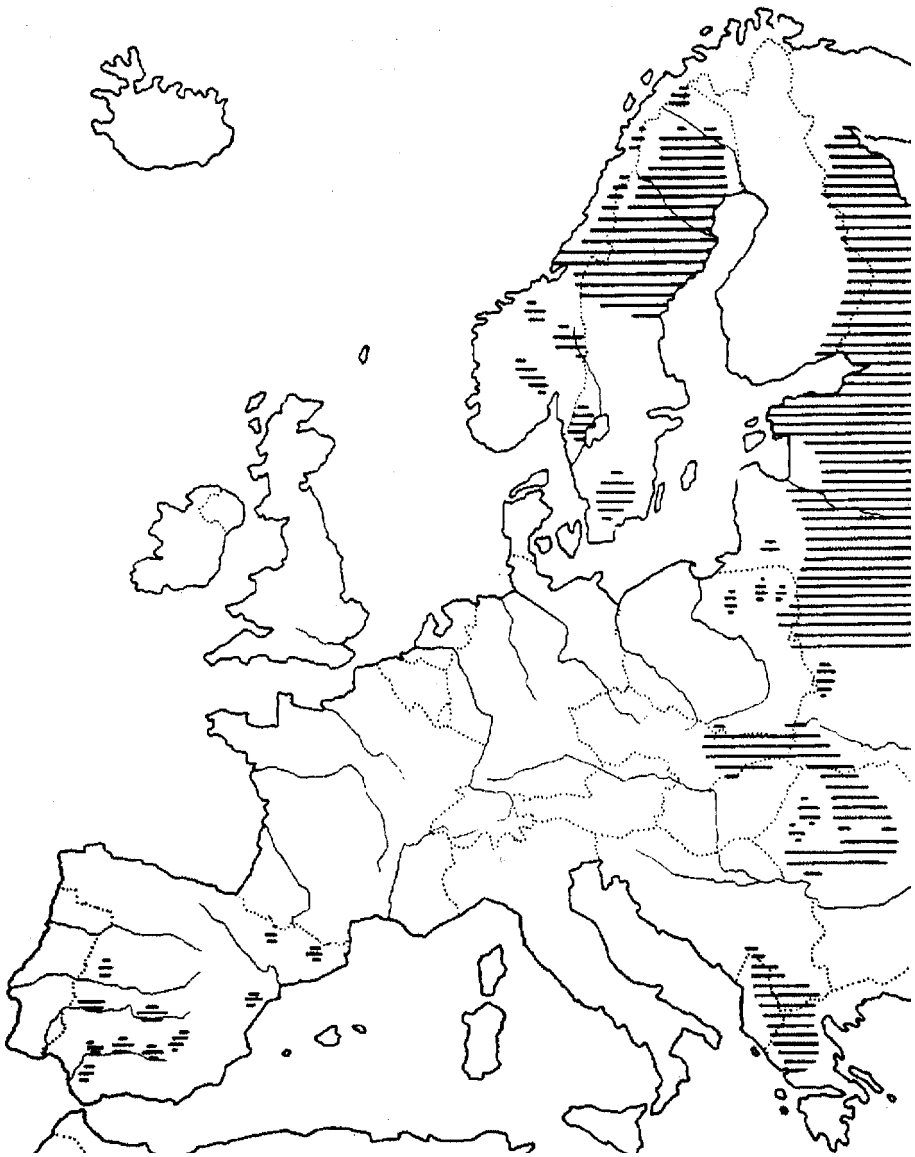

Figure 2. Distribution of the Eurasian lynx *Lynx lynx* (and the Iberian lynx *L. pardinus*) in Europe in the 1960s (KRATOCHVIL *et al.* 1968). From north-west to south: Nordic, Baltic, Carpathian and Balkan populations.

1976:

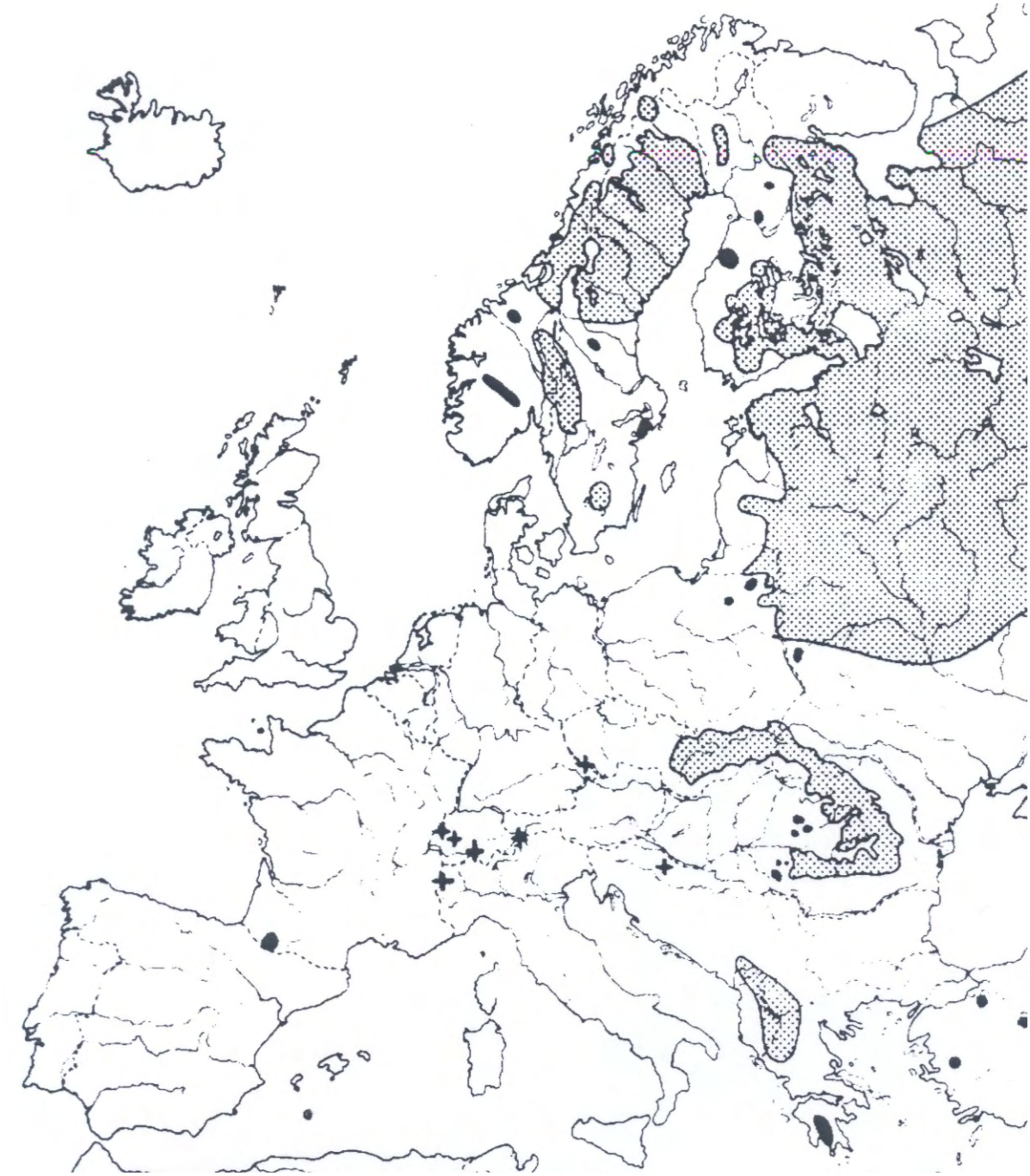

Figure 3. Distribution of the Eurasian lynx (*Lynx lynx*) in the 1970s (SMIT & VAN WIJNGAARDEN 1976). Compared to the 1960s slight expansions in Sweden and Finland (Nordic population), as well as in Slovakia and the Czech Republic (Carpathian population). First re-introductions in western Europe indicated by a "+".

1990:

Figure 4: Distribution of *Lynx lynx* in Europe in 1990 (BREITENMOSER & BREITENMOSER-WÜRSTEN 1990). Dark grey = occupied area, light grey = occasionally occupied area or area with low population density, dotted zone = lynx area according to literature, asterix = isolated observations. Re-introduction of animals in the 1970s/1980s led to the establishment of the Dinaric (YU), Bohemian-Bavarian (CS/DE), Alpine (CH, FR, IT, AT), Jura (FR/CH), and Vosges (FR) populations. Compared to the 1970s the Nordic population has expanded, too, the Balkan population, however, has considerably declined.

1995:

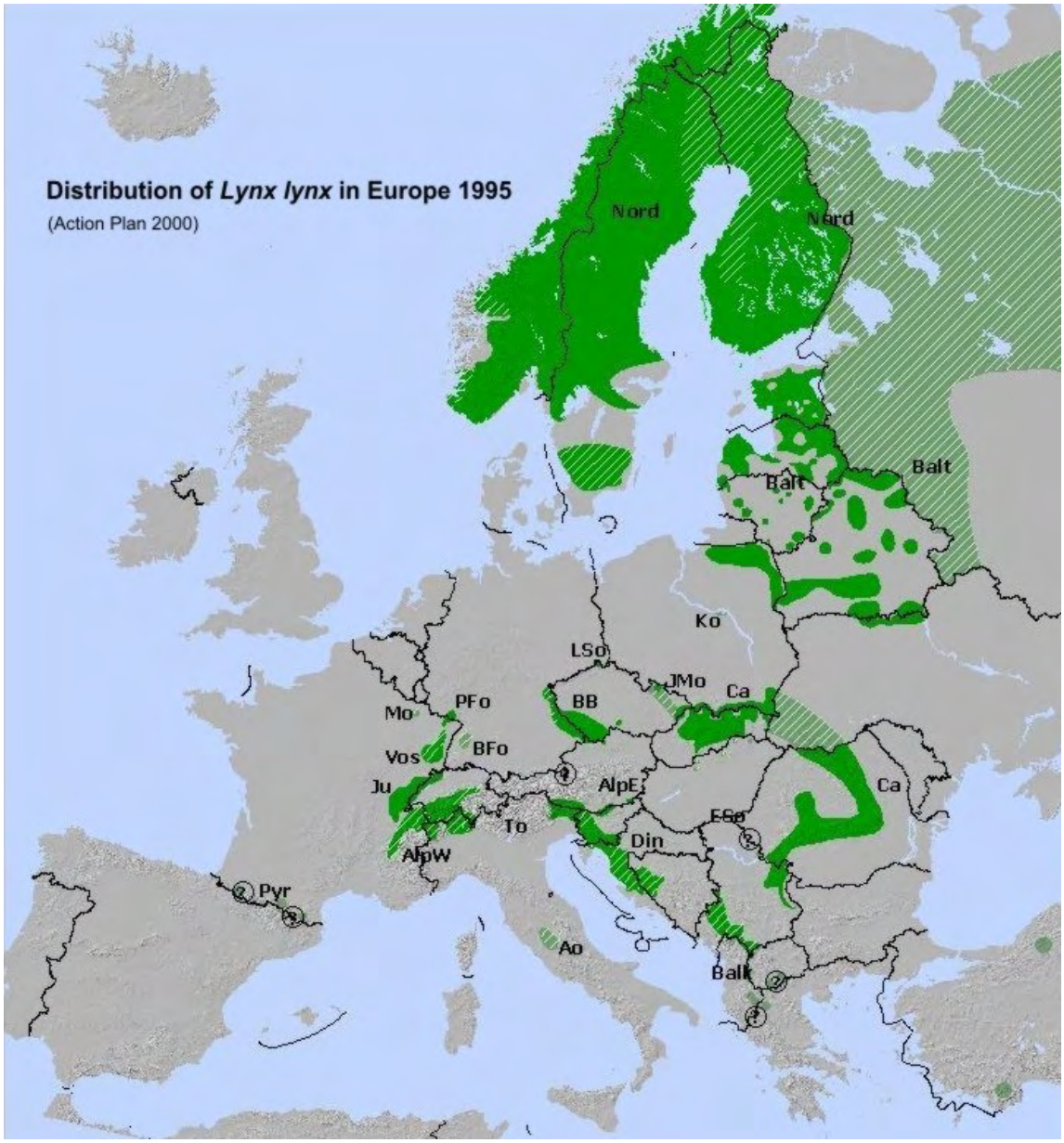

Figure 5: Distribution of *Lynx lynx* in Europe due to the information from the former inquiry (1995), and published in the Action Plan for the Conservation of the Eurasian Lynx in Europe (BREITENMOSER *et al.* 2000). Area: dark green = permanent, dark green striped = sporadic, light green-and-white striped = undetermined, ? = questionable.

References:

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BREITENMOSER, U. , BREITENMOSER-WÜRSTEN, CH., OKARMA, H., KAPHEGYI T., KAPHEGYI-WALLMANN, U. & MÜLLER, U. 2000: Action Plan for the Conservation of the Eurasian lynx in Europe (*Lynx lynx*). Nature and environment No. 112, Council of Europe Publishing, Strasbourg: 1-83.

KRATOCHVIL, J. *et al.* 1968a: History of the distribution of the lynx in Europe. *Acta sc. nat. Brno* 4: 1-50.

SMIT, C. J. & VAN WIJNGAARDEN A. 1976: Threatened mammals in Europe, Chapter 18: *Lynx lynx*. European Committee for the Conservation of Nature and Natural resources, Council of Europe, Strasbourg: 4 pp.

6.2. Populations

Table 1. Current populations and occurrences of the Eurasian lynx *Lynx lynx* in Europe. The definitions were taken from the Eurasian Lynx Action Plan (BREITENMOSER *et al.* 2000), but see also "Introduction". Origin (status): aut = autochthonous population, spo = spontaneous recolonisation, rei = re-introducted, uo = unknown origin, ext = extinct.

Population	Region	Countries	Origin
Nordic population	Fenno-Scandia and Karelia	Sweden, Norway, Finland	aut, spo
Baltic population	Russia, Baltic States, Białowieza	Russia (incl. Kaliningrad Oblast), Estonia, Latvia, Belarus, Poland, Lithuania, Ukraine	aut, (spo)
Carpathian population	Carpathian Mountains	Romania, Slovakia, Poland, Ukraine, Czech Republic, Hungary, Serbia and Montenegro, (Bulgaria)	aut
Balkan population	Albanian Alps and adjacent mountains in eastern Albania, western FYR Macedonia, Kosovo and Montenegro	Albania, FYR Macedonia, Serbia and Montenegro, Greece, (Bulgaria)	aut
Dinaric population	Dinaric Mountains	Bosnia-Herzegovina, Croatia, Slovenia	rei
Bohemian-Bavarian population	Sumava Mts. and foothills, Oberpfälzer and Bayerischer Forest, Mühl- and Waldviertel	Czech Republic, Germany, Austria	rei, (spo)
Alpine population	Alps, Julian Alps	Western sub-population: Switzerland, France, Italy; Eastern sub-population: Slovenia, Austria, Italy	rei
Jura population	Jura Mountains	France, Switzerland	rei
Vosges-Palatinian population	Vosges Mountains, Palatinian Forest	France, Germany	rei
Additional occurrences			
Kampinos NP occurrence	Kampinos national park	Poland	rei
Jeseniky Mts. occurrence	Jeseniky Mts and foothills	Czech Republic	spo
Laberiver Sandstone Mts. occurrence	Sandstone area, Saxony, Osterzgebirge, Westlausitz	Czech Republic, Germany	uo (spo or rei)
Western Serbia occurrence	Western Serbia incl. Tara, Mokra Gora, and Zlatar moutains	Serbia and Montenegro	uo (spo?)
Black Forest occurrence	Black Forest, south-west DE	Germany	uo
Harz occurrence	Harz Mountains, central DE	Germany	rei
Trentino occurrence	Trentino, north-east Italy	Italy	probably ext
Abruzze occurrence	Central Abruzze Mountains	Italy	probably ext
Metz occurrence	Western Lorraine	France	ext

6.3. Legal status

6.3.1. European treaties

For the conservation of the Eurasian lynx *Lynx lynx* in Europe two international treaties are especially relevant:

Convention on the conservation of European wildlife and natural habitats (Bern Convention, Council of Europe, 1979):

"The aims of this Convention are to conserve wild flora and fauna and their natural habitats, especially those species and habitats whose conservation requires the co-operation of several States and to promote such co-operation" (Article 1).
Lynx lynx is listed in **Appendix III** (protected fauna species). "Each contracting party shall take appropriate and necessary legislative and administrative measures to ensure the protection of the wild fauna species specified in Appendix III. Any exploitation of wild fauna specified in this Appendix shall be regulated in order to keep the populations out of danger" (Article 7, http://www.nature.coe.int/english/cadres/bern.htm).

Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (EU Habitat Directive, 1992):

"The aim of this Directive shall be to contribute towards ensuring bio-diversity through the conservation of natural habitats and of wild fauna and flora in the European territory of the Member States to which the Treaty applies (Article 2.1). Measures taken pursuant to this Directive shall be designed to maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of Community interest (Article 2.2). Member States shall undertake surveillance of the conservation status of the natural habitats and species (Article 11). "
Lynx lynx (except the Finnish populations) is listed in **Annex II** (Animal and plant species of Community interest whose conservation requires the designation of special areas of conservation) and in **Annex IV** (Animal and plant species of Community interest in need of strict protection). *Lynx lynx* is however not considered a priority species. "Member States shall take the requisite measures to establish a system of strict protection for the species listed in Annex IV in their natural range, prohibiting (for instant) all forms of deliberate capture and killing, and disturbance of the species" (Article 12.1). The incidental capture and killing of animal species in Annex IV has to be monitored (Article 12.4, http://europa.eu.int/comm/environment/nature/).

Table 2: The significance of the international treaties EU Habitat Directive, Bern Convention, and CITES for the individual countries sharing the range of the Eurasian lynx *Lynx lynx*. X (year) = year of ratification, (X) = signed, not yet ratified.

Country	EU Habitat Directive	Bern Convention	CITES
Albania	-	X (1999)	-
Austria	X (1995)	X (1983)	X (1982)
Belarus	-	-	X (1995)
Bosnia-Herzegovina	-	-	-
Bulgaria	-	X (1991)	X (2001)
Croatia	-	X (2000)	X (2000)
Czech Republic	(X)	X (1998)	X (1993)
Estonia	-	X (1992)	X (1992)
Finland	X (1995)*	X (1985)	X (1976)
France	X (1992)	X (1990)	X (1978)
FYR Macedonia	(X)	X (1998)	X (2000)
Germany	X (1992)	X (1984)	X (1976)
Greece	-	X (1983)	X (1992)
Hungary	(X)	X (1989)	X (1985)
Italy	X (1992)	X (1980)	X (1979)
Kaliningrad Oblast (RU)	-	-	X (1992)
Latvia	-	X (1997)	X (1997)
Liechtenstein	-	X (1980)	X (1979)
Lithuania	(X)	X (1996)	X (2001)
Norway	-	X (1986)	X (1976)
Poland	-	X (1995)	X (1989)
Romania	(X)	X (1993)	X (1994)
Serbia and Montenegro	-	-	X (2001)
Slovakia	X (2002)	X (1996)	X (1993)
Slovenia	-	X (1999)	X (2000)
Sweden	(X)	X (1983)	X (1974)
Switzerland	-	X (1981)	X (1974)
Ukraine	-	X (1999)	X (1999)

* Reservation

6.3.2. Legal status and management

Table 3. Legal status and management of *Lynx lynx* in the individual European countries. Management level: nat. = national, reg. = regional.

Country	Legal status	Institution in charge	Action plan	Management level
Norway	(reg.) quota hunting 01.02.-30.04.	National Directorate for Nature Management	government White Paper	nat. / reg.
Sweden	quota hunting 10.01.-31.03.	Swedish Environmental Protection Agency (SEPA)	yes (2000)	nat. / reg.
Finland	fully protected [a]	Ministry of Agriculture and Forestry	yes (1996)	nat.
Estonia	quota hunting 01.11.-28.02.	Estonian Ministry of Environment	yes (2001)	nat. / reg.
Latvia	hunting 01.10-15.03. [b]	State Forest Service	yes (2002)	nat. / reg.
Lithuania	fully protected	Ministry of Environmental Protection	no	nat. / reg.
Belarus	fully protected	Min. for Natural Resources and Nature Protection	no	nat.
Kaliningrad Oblast (RU)	fully protected	Region State Hunt Inspection	no	nat.
Ukraine	fully protected	Min. of Ecology and Natural Resources	prepared	nat. / reg.
Poland	fully protected	Ministry of Environment	no	nat.
Romania	quota hunting 01.09.-31.03.	Forest Dep. in the Min. of Agriculture, Food Industry and Forests	Minister order (2003)	nat. / reg.
Slovakia	hunting until 2001, since then protected	Ministry of Environment and Ministry of Agriculture	in preparation	nat.
Hungary	fully protected	Ministry of Environment	prepared	nat. / reg.
Czech Republic	fully protected	Ministry of Environment, Ministry of Agriculture	no	nat. / reg.
Serbia and Montenegro	fully protected	Bureau for Nature Protection of both, Serbia and Montenegro	no	nat. / reg.
Bulgaria	fully protected	Min. of Environment; Nat. Board of Forests (Min. of Agriculture and Forests)	no	nat. / reg.
Albania	fully protected	Gen. Directorate of Forest and Pastures	no	nat. / reg.
FYR Macedonia	fully protected	Ministry of Agriculture and Forestry	no	nat. / reg.
Greece	fully protected	Ministry of Agriculture	no	nat.
Bosnia-Herzegovina	no legislation	none	no	none
Croatia	quota hunting 15.11.-28.02., since 1998 fully protected	Ministry for environment and physical planning	yes (2003)	nat.
Slovenia	quota hunting 01.11.-28.02.	Ministry of Agriculture, Forestry and Food	no	nat.
Germany	fully protected	none (regional states = Bundesländer)	no	reg.
Austria	fully protected	none (regional hunting associations)	no	reg.
Switzerland	fully protected, removal problem lx	Swiss Agency for the Environment, Forests and Landscape SAEFL	yes (2000)	nat. / reg.
Italy	fully protected	Istituto Nazionale Fauna Selvatica	no	nat.
France	fully protected, removal problem lx	Min. de l'Environment, Office nat. de la chasse et de la faune sauvage	implemented/ in prep. [c]	nat. / reg.
Liechtenstein	fully protected	Amt für Wald, Natur und Landschaft	no	nat.

[a] protection can be derogated in accordance with article 16 of the EU Habitat Directive [resulting in a kind of quota hunting]
[b] new regulations since 2003: hunting season is now from 01.12.-31.03. with a yearly quota set
[c] implemented: protocol for the elimination of problem animals / in preparation: restoration plan

6.3.3. Harvest and other known losses

Table 4. Harvest numbers and known losses due to illegal killings, traffic, and other causes. All numbers are mean annual values for 1996-2001. Whenever numbers were available per population; they are separated, and the relative annual loss for the population indicated. "-" = not applicable, n.a. = not available, n.d.a. = no data available.

Country	Population	Legal killings	Illegal killings	Traffic accidents	Other losses	Total losses	% of population
Norway	Nordic	89.5	(incl. in other losses)		15.8	105.3	25.9
Sweden	Nordic	94	0	11.5	3.8	109.3	7.3
Finland	Nordic	58.8	0	0	0	58.8	7.1
Estonia	Baltic	168.7	0	0.17	1.17	170	15.5
Latvia	Baltic	87	n.a.	n.a.	n.a.	(87)	12.7
Lithuania	Baltic	-	n.d.a.	n.d.a.	n.d.a.	n.d.a.	-
Belarus	Baltic	-	n.d.a.	n.d.a.	n.d.a.	n.d.a.	-
Kaliningrad Oblast (RU)	Baltic	-	n.d.a.	n.d.a.	n.d.a.	1-3	n.a.
Ukraine	Carpathian only	-	2 (4 y)	0	0	n.a.	n.a.
Poland	Carpathian only	-	7 (1 y)	1 (1 y)	3 (1 y)	11 (1 y)	n.a.
Romania	Carpathian	7.2	n.d.a.	n.d.a.	n.d.a.	(7.2)	0.36
Slovakia	Carpathian	14.7	0.3	0.5	2.7	18.2	4.55
Hungary	Carpathian	-	n.d.a.	n.d.a.	n.d.a.	n.d.a.	-
Czech Republic	Boh.-Bav.	-	6.5	0	0.66	7.2	10.3
	Carpathian		0.3	0	0	0.3	0.8
Serbia and Montenegro	(unknown)	-	1.83	0.17	0	2	-
Bulgaria	(unknown)	-	0.67	0.17	0	0.83	-
Albania	Balkan	-	3.8	0	0	3.8	~19
FYR Macedonia	Balkan	-	0	0	0.33	0.33	0.94
Greece	Balkan	-	0	0	0	0	-
Bosnia-Herzegovina	Dinaric	2.3	0	0	0	2.3	5.75
Croatia	Dinaric	7 (96-98)	3.67	0.17	0.17	7.5	7.5-15
Slovenia	Dinaric/Alpine	1	0	0.5	0.33	1.83	3.66
Germany	Boh.-Bav. only	-	0.17	0.17	0.33	0.67	1.2
Austria	Boh-Bav. only	-	0.3	0.17	0	0.47	8.3
Switzerland	Alpine	-	1.8	1	6.87	9.7	13.9
	Jura	-	0.17	0.5	0.97	1.7	8.5
Italy	Alpine	-	0	0	0	0	-
France	Jura	-	0.33	2.5	2	4.83	10.3
	Vosges-Palat.	-	0	0.17	0.17	0.33	2.1
	Alpine	-	0	0.17	0.17	0.33	-
Liechtenstein	Alpine	-	0	0	0	0	-

6.4. Population size

Table 5. Number and distribution of *Lynx lynx* in Europe by countries in 2001. Distribution area: constantly occupied area / constantly + occasionally occupied area. Density: calculation see "Reference file countries". Methods: ss = sightings and signs, st = snow tracking, in = inquiry (hunters, foresters), un = unspecific survey, mo = analysis of lynx mortality data, rt = radio telemetry, pt = photo trapping, ld = data on livestock depredation. Trend: → = stable, ↘ = decreasing, ↗ = increasing, exp = expanding, ? = unknown.

Country	Population	No. of lynx 2001	Distribution area (km²)	Density (lynx/100 km²)	Methods	Trend 1996-2001
Norway	Nordic	327 [a]	215'600	0.19	ss, st, rt, mo, ld, family groups	→ (N, SE), ↘ (C, SW)
Sweden	Nordic	1400-1800 [a]	312'500 / 429'400	0.48	ss, st, rt, family groups	→, exp
Finland	Nordic	870 [a]	123'900 / 320'800	0.67	ss, st, in, family groups	↗, exp
Estonia	Baltic	900 [a]	42'700	2.58	st (hunters)	↘
Latvia	Baltic	648 [a]	29'000	2.36	ss, st, in, mo (hunting)	→
Lithuania	Baltic	103 [a]	4'500	2.1	ss, un, in	↘
Belarus	Baltic	(250)	(61'200)	-	-	probably ↘
Kaliningrad Oblast (RU)	Baltic	8-10 [b]	700	1.14-1.43	in, st	→
Ukraine	Baltic	20 [a] / 27 [b]	1'300 / 2'300	1.38	ss, st, un, in	↗
	Carpathian	230 [b]	5'800 / 7'400	4.53	ss, st, un, in	↘
Poland	Baltic	60 [b]	5'700 / 6'200	1.05	un, ss, st, rt	↘
	Carpathian	97 [b]	9'500 / 9'600	1.02	un, ss, st	↘
	Kampinos NP occ.	22 [b]	1'900 / 2'000	1.16	un, ss, st	↗, exp
Romania	Carpathian	2050 [a]	59'600	3.39	ss, st, un, in, mo	→
Slovakia	Carpathian	400 [a]	14'500 / 21'400	2.67	ss, st, un, in, mo	↘
Hungary	Carpathian	1-5 [a]	1'500 / 3'200	-	in	?
Czech Republic	Carpathian	40 [b]	1'300 / 1'900	3.08	ss, st, in	→
	Boh.-Bav.	60 [b]	4'500 / 9'200	1.56	ss, st, in, rt	↘
	Jeseniky Mts. occ.	10 [b]	400 / 1'300	2.5	ss, st, in	→
	Laberiver S. occ.	10 [b]	200 / 500	5	ss, st, in	↘
Serbia and Montenegro	Carpathian	45 [b]	500 / 2'900	-	ss, un, mo	↗, exp / → [c]
	Balkan	30 [b]	100 / 1'000	-	ss, un, mo	↘
	Western Serbia occ.	5 [b]	0 / 500	-	ss, un, mo	↗, exp
Bulgaria	(Carpathian / Balkan)	single individuals	(0) / (200)	-	ss, un, mo	?
Albania	Balkan	15-25 [a]	2'300 / 3'800	0.65-1.09	ss, st, in, mo	?
FYR Macedonia	Balkan	35 [a]	1'700	2.06	ss, un	↘
Greece	Balkan	(no confirmed evidence)		-	ss, in	?
Bosnia-Herzegovina	Dinaric	40 [b]	12'100	0.33	mo, ss	→
Croatia	Dinaric	40-60 [b]	8'400 / 9'100	0.6	ss, st, un, in, mo	↘
Slovenia	Dinaric	40	2'800 / 3'900	1.43	ss, st, in, rt	→ to ↘
	Alpine	10	1'900 / 3'400	0.53	ss, st, in, rt	→ to ↘

Country (cont.)	Population	No. of lynx 2001	Distribution area (km²)	Density (lynx/100 km²)	Methods	Trend 1996-2001
Germany	Boh.-Bav.	12 [a]	1'700 / 2'300	0.97	ss, st, un, rt	↘
	Vosges-Palatinian	3-4 [a]	0 / 2'900	-	ss	↘
	Laberiver S. occ.	1-3 [a]	0 / 600	-	ss, in	↘
	Black Forest occ.	a few individuals	0 / 700	-	ss, st, in	?
	Harz occ.	12 [a]	1'600 / 1'700	0.44	No. of released animals (ss, st, in, pt)	↗
Austria	Boh.-Bav.	4 [b]	1'700 / 2'300	0.35	ss, st, in	↘
	Alpine	20 [b]	700 / 2'300	-	ss, st, in	(inconsistent)
Switzerland	Alpine	70 [a]	7'900 / 12'200	0.89	ss, mo, pt, ld	→, exp
	Jura	20-25 [a]	1'900 / 3'200	1.05-1.32	ss, mo, pt, ld	↗, exp
Italy	Alpine	10 (E) / 3 (W) [b]	1'200 / 3'000	0.58 (E)	ss, st, in	↗, exp (E); →(W)
France	Alpine	single individuals	0 / 4'500	-	ss, st, un	exp
	Jura	54 (-94) [b]	5'300 / 8'300	0.89	ss, st, un, rt	exp
	Vosges-Palatinian	18 (-37) [b]	2'000 / 3'500	0.8	ss, st, un	exp (except N)
Liechtenstein	Alpine	(no confirmed evidence)		-	-	-

[a] official number
[b] additional estimate
[c] increasing & expanding: Eastern Banat occurrence; stable: Southeastern Banat occurrence

6.5. Depredation, compensation, prevention

Table 6. Livestock depredation, compensation paid and prevention methods applied in the range of *Lynx lynx* in Europe. Compensation: nat. = national institution, reg. = regional institution responsible for the payments. Prevention: gd = guarding dogs, ef = electric fences, sh = shepherds, ab = temporal abandonment of pastures, sy = sheep yards, dk = donkeys, fl = flashing lights.

Country	Sum of animals killed by lynx 1996-2001				Compen-sation?	Total Euro (€) paid 1996-2001	Prevention
	Sheep	Goats	Reindeer	Others			
Norway	53’108	0	(extensive)	0	yes: nat.	30'841’966 [a]	partly: ef, gd
Sweden	589 (5 y)	1 (3 y)	20’000-40'000 / y	6	yes: nat.	6’422’000 (4 y)	yes: ef
Finland	0	0	669	0	yes: nat.	n.d.a.	yes: ef, sh
Estonia	0	0	-	0	no	0	no
Latvia	0	0	-	0	no	0	no
Lithuania	0	0	-	0	no	0	no
Belarus	n.d.a.	n.d.a.	-	n.d.a.	no	0	no
Kaliningrad Oblast (RU)	n.d.a.	n.d.a.	-	n.d.a.	no	0	no
Ukraine	0	0	-	1	no	0	yes: sh, gd
Poland	0	0	-	0	no	0	no
Romania	n.d.a.	n.d.a.	-	n.d.a.	yes: reg.	n.d.a.	yes: gd
Slovakia	0	0	-	n.d.a.	(since 2003)	0	sy, ef, gd, bells
Hungary	0	0	-	0	no	0	no
Czech Republic	yes (n.d.a.)	yes (n.d.a.)	-	yes (n.d.a.)	yes: nat.	n.d.a.	yes: ef, partly gd
Serbia and Montenegro	n.d.a. (rare)	n.d.a. (rare)	-	n.d.a. (rare)	no	0	no
Bulgaria	1	0	-	0	no	0	yes: gd
Albania	0	0	-	0	no	0	no
FYR Macedonia	0	0	-	0	yes: nat.	0	no
Greece	0	0	-	0	yes: nat.	0	yes: gd
Bosnia-Herzegovina	0	0	-	0	no	0	no
Croatia	1	10	-	0	yes: nat.	720	no
Slovenia	269	14	-	10	yes: nat.	84’250	no
Germany	9 (Bohemian-Bavarian pop.)			15	yes: NGO	2’779	no
	4 (Harz occ.)		-	-	yes: reg.	200	no
Austria	26	0	-	0	yes: hunters	2’980	no
Switzerland	775	76	-	44	yes: nat.	219’704	yes: ef, dk, gd, sh, fl
Italy	0	0	-	0	yes: [b]	0	no
France	980	19	-	-	yes, nat.	198’406	yes: gd, ab
Liechtenstein	0	0	-	0	no	0	no

[a] all large predators (lynx, bear, wolf, wolverine and golden eagle plus unspecified)
[b] different for each “Provincia” and “Regione”

6.6. Monitoring and research

Table 7. Monitoring and research on *Lynx lynx* in Europe. Monitoring: ss = sightings and signs, st = snow tracking, in = inquiry (hunters, foresters), un = unspecific survey, mo = analysis of lynx mortality data, rt = radio telemetry, pt = photo trapping.

Country	Monitoring	Research
Norway	winter census (st)of family groups	population dynamics, social organisation, predation, depredation
Sweden	winter census (st) of family groups	lynx-roe deer, lynx in reindeer area
Finland	triangle transect scheme (st), no. of family groups	no
Estonia	(hunting data)	LC project with LV, LT, PL & NO
Latvia	(hunting data)	game management, analysis of hunting bag, LC project with LV, LT, PL & NO
Lithuania	(hunters' data, unspecific survey)	LC project with LV, LT, PL & NO
Belarus	no	no
Kaliningrad Oblast (RU)	no	no
Ukraine	(inquiry, ss, st)	population status of rare predators
Poland	no	ecology
Romania	(ss, hunting data; by game management admin.)	(Carpathian Large Carnivore Project)
Slovakia	(ss, mo)	no
Hungary	(inquiry game managers)	LIFE Nature project LC conservation
Czech Republic	st, rt (Boh.-Bav.), in	no
Serbia and Montenegro	(ss, un, mo)	no
Bulgaria	(ss, un, mo)	predator-prey, conservation status
Albania	(ss, st, in, mo)	no
FYR Macedonia	(ss, un)	no
Greece	(ss, in)	no
Bosnia-Herzegovina	(mo, ss)	no
Croatia	ss, st, un, in, mo	fossil and recent LC
Slovenia	mo, livestock depredation, ss, st, in, rt	no
Germany	(only on regional level, partly volunteer work: mainly ss, st)	regional monitoring initiatives and information campaign
Austria	(unsolicited reports by hunters' associations)	regional monitoring on volunteer basis
Switzerland	in game wardens, ss, mo, depredation, pt, rt	monitoring, ecology, genetics
Italy	(ss, st, in on volunteer basis)	no
France	"réseau lynx": network of trained local correspondents who collect, verify and transmit data (ss, mo)	no
Liechtenstein	no	no

6.7. Threats

Table 8. Major threats to the lynx *Lynx lynx* populations (and the species) in Europe, compiled from the country reports. Populations: Alp = Alpine, Balk = Balkan, Balt = Baltic, Boh.-Bav. = Bohemian-Bavarian, Carp = Carpathian, Din = Dinaric, Jura, Nord = Nordic, VosPf = Vosges-Palatinian.

Population ► Threat ▼	Alp	Balk	Balt	Boh. -Bav.	Carp	Din	Jura	Nord	VosPf	*Lynx lynx* Europe
Agriculture		X			X					
Extraction of wood		XX			XX					XX
Infrastructure development: Industry										
Infrastructure development.: Human settlement	X				X					
Infrastructure development: Tourism / recreation		X			XX					X
Infrastructure development: Road building	XX		X	X	X	X	X			XX
Legal hunting & trapping						X		X		
Shooting (illegal)	XX	XX	XX	XX	XX	XX	X	XX	X	XXX
Trapping / snaring (illegal)		XX	X		X			XX		XX
Poisoning	X				X		X			
Vehicle and train collision	XX					XX	X			XX
Storms / flooding										
Wildfire										
Avalanches / landslides	X									
Competitors	X	XX			X					X
Prey / food base	X	XX			X	XX				XX
Pathogens / parasites	X				X		X			
Limited dispersal	XX	XX	X		X		X			XX
Poor recruitment / reproduction / regeneration		X								
High juvenile mortality		X	X							
Inbreeding		X								
Low densities	X	XX	X							X
Skewed sex ratios					X					
Slow growth rates		X								
Population fluctuations					X					
Restricted range		XX	X		X					X
Recreation / tourism		X			XX					X
Research										
War / civil unrest		X								
Transport						X				
other					X					

For the future the most often named threats were: Road constructions, illegal killings, and prey/food base, followed by extraction of wood, infrastructure development due to tourism/recreation, limited dispersal, and recreation/tourism.

7. Conclusions

This status report bases on information for the year 2001 and follows six years after the inquiry made for the Action Plan for the Conservation of the Eurasian Lynx in Europe (BREITENMOSER *et al*. 2000). Since then, considerable progress has been made in many European countries regarding the survey of the lynx populations. Furthermore, the Action Plan was not meant to be a status report at the first place, and did therefore not list the information gathered for each country in detail. It was nevertheless clear that the country approach is not the best possible way to address the conservation of a large carnivore such as the lynx. Most of the populations expand over several countries, and the "populations" within many countries would not be viable. Although countries are (and will remain) the monitoring and management units, goals regarding the conservation of the species should be defined on the level of the populations. To facilitate such an approach, we have summarised the country reports for the populations.

Table 1. Status of the Eurasian lynx *Lynx lynx* populations in Europe in 2001. For comparison, the population size 1995 and the trend 1990-1995 are included. Origin: aut = autochthonous, spo = spontaneous recolonisation, rei = re-introduced. Area: cont. = continuous range, frag. = fragmented range. Trend: → = stable, ↗ = increasing, ↘ = decreasing, exp = expanding. Judgement: LC = Least Concern, EN = Endangered, CR = Critically Endangered.

Population	Origin	Area (km²)	Size 2001	Size 1995	Trend 96-01	Trend 90-95	Judgement 2001 *
Nordic	aut, spo	965'800 (cont.)	~2800	~2500	→	↗	LC
Baltic	aut, (spo)	143'200 (frag.)	~2000	>2000	↘	(→)	LC
Balkan	aut	5'600 (frag.)	~80	n.d.a.	↘	↘	CR
Carpathian	aut	100'500 (± cont.)	~2800	~2400	→	→	LC
Bohemian-Bavarian	rei, (spo)	14'200 (± cont.)	~75	~100	↘	↗ & exp	(EN)
Dinaric	rei	24'400 (cont.)	~130	~200	→ to ↘	(→)	(EN)
Alpine	rei	18'100 (frag.)	~120	~120	→, exp	→	(EN)
Jura	rei	11'500 (cont.)	~80	~100	exp, ↗	→	(EN)
Vosges-Palatinian	rei	6'400 (± cont.)	~20	~30	exp/↘	↗	(CR)

* Judgement according to the „Guidelines for Application of IUCN Red List Criteria at Regional Levels" (IUCN 2003). Judgement for re-introduced populations in brackets as 30 years of existence are obviously not enough to fulfil the criteria for the not threatened categories.

The assessment of the populations has revealed several methodical problems. First, the definition of the population – taken from the Action Plan (BREITENMOSER *et al*. 2000; Europe Table 1) – is not always easy and needs to be reconsidered for future works. Second, the compilation of the country reports into population reports is not a straight-forward procedure and was often done as a subjective interpretation of the editors. Third, the information provided from the country contacts did in some cases differ from one to the other side of the border in such way that a comprehensive judgement was not possible. This is, however, part of the process: Such inconsistencies should motivate all of us to review the procedures applied and the information gathered.

There are some points, which we think can be listed as general conclusions from this inquiry and status report:

1. The Eurasian lynx in Europe as a whole is not a threatened species. There was, in spite of local fluctuations and cutbacks, a continuous increase both of the area occupied and the number of lynx since the 1950/60s. The general situation of the lynx across Europe is today better than it was in any of the previous Pan-European status reports (see previous chapters).

2. The one exception is the Balkan population. This population has very likely significantly decreased over the past decades. All previous reports were suffering from a lack of data for this population, and even now, the information is limited. Nevertheless, the population must be considered Critically Endangered, and this is even more alarming as we have good indication that the Balkan lynx should be considered an own subspecies *Lynx lynx martinoi*.
3. The lynx has a high potential to recover and to spread further in Central and Western Europe. However, habitat fragmentation and conflicts with human interests hamper this process. This is true for the south-eastern part of the Baltic population – where the subpopulations in Poland and Belarus are now completely isolated – and even more for all reintroduced populations. All these strongly fragmented populations should be considered and managed as metapopulations. This requires even more an international approach and a strong co-operation between the countries sharing the population. In some cases, the country-approach (as depicted in the country reports) provides a too optimistic picture: A local population may do quite well, but the increasing fragmentation and isolation is a potential threat for the future.
4. The monitoring and survey of the species has generally improved. Compared to the earlier inquiries, we see less discrepancy regarding the distribution areas in neighbouring countries. The big challenge, however, remains the estimation of the population size. Here, we do not only see a north-south gradient (what is an expected cline) but also a difference between areas where intensive (research) fieldwork was used to gain the monitoring data. Wherever radio-telemetry was used to calibrate the data gathered extensively, the population density tends to be lower. This indicates that from “traditional” methods, the lynx abundance is normally overestimated. According to so far unconfirmed assumptions the range of overestimation could be 20-30%.
5. The threats listed in the country reports represent the subjective judgement of the contacts and often lack supporting evidence. A more differentiated assessment of threats was not possible, given the fact that a standardised list of threats was provided in the questionnaire to grant compatibility between countries. We must however evaluate new approaches to assess the threats at the population level.
6. Even in the country reports, it is often obvious that the threats listed and the data provided do not match. The threats most often mentioned were (1) illegal killing and (2) infrastructure (road) construction. There is almost no data available regarding illegal killing of lynx, and yet most contacts believe that this is a major threat.
7. Depredation is relatively limited in the whole of Europe – with the exception of Norway –, but can nevertheless be a source of conflicts. The other conflict (although impossible to quantify) is the competition with human hunters for game. It is again more a belief than a fact that a legal harvest (e.g. quota hunt) can mitigate this conflict. Yet, on the other hand, there is no proof that the stop of legally hunting lynx is an efficient conservation measure. Several countries, which have recently legally protected lynx, have still reported declining populations. Restrictive measures to protect a species such as lynx are no option in today’s Europe. Instead acceptable conservation goals must be formulated and interest groups must be informed and involved.
8. The way to advance public awareness and involvement is to develop national conservation strategies and management plans. This was one of the main messages of the Pan-European Action Plans published by the Council of Europe in 2000. Eight out of 27 countries have implemented national action plans over the past years (Europe Table 3), 4 more plans are in preparation, but 15 countries do not yet have started to draft action plans.
9. To promote the preparation of national action plans, we recommend developing conservation strategies on the population level. Long-term conservation goals should be defined for each population or metapopulation, and such strategies can provide a framework for national management plans.

The ELOIS has chosen a new approach compared to earlier inquires for the Eurasian lynx in three points: (1) the questionnaire was adapted to the IUCN standards, (2) the assessment was not only made for the countries, but also for the populations, and (3) the whole project is not only published as a report, but as an online system allowing the easy access to the whole data set. In all three aspects, further improvement is needed, and we are grateful to all comments, critics, and help. The idea is to develop a system that can be easily updated as new information becomes available. To do this is, above all, a challenge on the population level. In spite of the fact that this will be a never-ending task, it is the hope of the editors and of all contributors that the ELOIS may facilitate the conservation of the lynx and its co-existence with people across Europe.

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Name, Surname	Address	Country	e-mail
Bego, Ferdinand	Tirana University Museum of Natural Sciences Rruga e Kavajes no. 132 Tirana	**Albania**	ferdibego@albaniaonline.net
Zoto, Haki	General Directorate of Forest and Pastures Tirana	Albania	
Laass, Jens	Institut für Wildbiologie und Jagdwirtschaft Universität für Bodenkunde Wien Peter Jordan Str. 76 A-1190 Wien	**Austria**	jens.laass@boku.ac.at
Engleder, Thomas	Graben 7 A-4170 Haslach/Mühl	Austria	tho.mas@gmx.at
Huber, Thomas	Tassach 9 A-9542 Afritz	Austria	am.berg@aon.at
Fuxjäger, Christian	Nationalparkallee 1 A-4591 Molln	Austria	daten@kalkalpen.at
Forstner, Martin	Neustiftstrasse 62 A-3952 Arbesbach	Austria	wwn.forstner@uta-net.at
Sidorovich, Vadim	Institute of Zoology Skoring str. 27 Minsk 220 072	**Belarus**	vadimsid@mustbel.open.by
Soldo, Vlado	J.P. "Sume H-B" Mostar Hrvatskih branitelja b.b. 88000 Mostar	**Bosnia-Herzegovina**	vlados@tel.net.ba
Lucic, Ivica	L.S. Herceg-Bosne Siroki Brijeg Mihanoviceva b.b. 88000 Mostar	Bosnia-Herzegovina	logotip@tel.net.ba
Zlatanova, Diana	Environmental Education and Research Centre, Sofia Zoo ul. Srebarna 1 P.O. Box 67 Sofia 1407	**Bulgaria**	zlite@mbox.infotel.bg
Genov, Peter	Institute of Zoology Bulgarian Academy of Science ul. Tzar Osvoboditel 1 Sofia 1000	Bulgaria	genov_bg@yahoo.it
Huber, Djuro	Veterinary Faculty Heinzelova 55 10000 Zagreb	**Croatia**	huber@vef.hr
Kusak, Josip	Veterinary Faculty Heinzelova 55 10000 Zagreb	Croatia	kusak@vef.hr
Gomercic, Tomislav	Veterinary Faculty Heinzelova 55 10000 Zagreb	Croatia	tomislav.gomercic@zg.tel.hr
Bufka, Ludek	Sumava National Park Administration Susicka 399 341 92 Kasperske Hory	**Czech Republic**	ludek.bufka@npsumava.cz
Cerveny, Jaroslav	Institute of Vertebrate Biology Academy of Science of the Czech Republic Kvetna 8 Brno	Czech Republic	jardaryscerveny@centrum.cz

Valdmann, Harri	Department of Integrative Zoology Institute of Zoology and Hydrobology Vanemuise 46 51014 Tartu	**Estonia**	harriva@ut.ee
Kojola, Ilpo	Finnish Game and Fisheries Research Institute Tutkijantie 2 A 90570 Oulu	**Finland**	ilpo.kojola@rktl.fi
Vandel, Jean-Michel	Office nat. de la chasse et de la faune sauvage CNERA PAD Montfort 01 330 Birieux	**France**	jean-michel.vandel@oncfs.gouv.fr
Marboutin, Eric	Office nat. de la chasse et de la faune sauvage CNERA PAD Montfort 01 330 Birieux	France	eric.marboutin@oncfs.gouv.fr
Stahl, Philippe	Office nat. de la chasse et de la faune sauvage CNERA PAD Montfort 01 330 Birieux	France	
Migot, Pierre	Office nat. de la chasse et de la faune sauvage CNERA PAD Montfort 01 330 Birieux	France	
Hristovski, Miso	St. Kozle 88/2/3 1000 Skopje	**FYR Macedonia**	hristovskim@hotmail.com
Angelovski, Dragan	Bul. Jane Sandanski 76/1 1000 Skopje	FYR Macedonia	angelovski@mt.net.mk
Wölfl, Manfred	Trailling 1 a D-94372 Lam	**Germany**	woelfl@i3c.com
Huckschlag, Ditmar	Schloss D-67705 Trippstadt	Germany	ditmar.huckschlag@wald-rlp.de
Hohmann, Ulf	Schloss D-67705 Trippstadt	Germany	ulf.hohmann@wald-rlp.de
Nationalpark-verwaltung Harz (Anders, Ole & Hullen, Meike)	Oderhaus 1 D-37444 St. Andreasberg	Germany	Meike.Hullen@npharz.niedersachsen.de
Kaphegyi, Thomas A.M.	Forstzoologisches Institut der Universität Freiburg Fohrenbühl 27 D-79252 Stegen-Wittental	Germany	thomas.kaphegyi@fzi.uni-freiburg.de
Kaphegyi, Ursula	Forstzoologisches Institut der Universität Freiburg Fohrenbühl 27 D-79252 Stegen-Wittental	Germany	thomas.kaphegyi@fzi.uni-freiburg.de
Riebe, Holm	Nationalpark- und Forstamt Sächsische Schweiz An der Elbe 4 D-01814 Bad Schandau	Germany	Holm.Riebe@nlpfoa.smul.sachsen.de
Panayotopoulou, Maria	Frangini, 9 54624 Thessaloniki	**Greece**	buru@otenet.gr
Godes, Constantinos	7 Aristotelous Sq. 54624 Thessaloniki	Greece	cgodes@arcturos.gr

Szemethy, Laszlo	Saint Stephen University Dep. of Wildlife Biology and Game Management Pater K. str. 1 2100 Gödöllö	**Hungary**	szlaci@ns.vvt.gau.hu
Markus, Marta	Saint Stephen University Dep. of Wildlife Biology and Game Management Pater K. str. 1 2100 Gödöllö	Hungary	mmarti@ns.vvt.gau.hu
Molinari, Paolo	Progetto Lince Italia Via Roma 35 I-33018 Tarvisio (UD)	**Italy**	p.molinari@progetto-lince-italia.it JobinMolinari@aol.com
Catello, Marco	Progetto Lince Italia Via Barozzi 48 I-32100 Belluno (BL)	Italy	marcocatello@hotmail.com
Grishanov, Gennady	University str.2 Kaliningrad 236040 Russia	**Kaliningrad Oblast (Russia)**	grishanov@email.albertina.ru
Andersone, Zanete	Large carnivore project Forest Research Institute “Silava” Rigas Str. 111 Salaspils, LV-2169	**Latvia**	zanete.a@ml.lv or vilkumeitene@hotmail.com
Ozolins, Janis	State Forest Service 13. Janvara Str. 15 Riga, LV-1932 Forest Research Institute “Silava” Rigas Str. 111 Salaspils, LV-2169	Latvia	janiso@vmd.gov.lv
Fasel, Michael	Amt für Wald, Natur und Landschaft Dr. Grass Strasse 10 FL-9490 Vaduz	**Liechtenstein**	michael.fasel@awnl.llv.li
Balciauskas, Linas	Institute of Ecology Akademijos 2 LT-2600 Vilnius	**Lithuania**	linasbal@ekoi.lt
Linnell, John	Norwegian Institute for Nature Research N-7005 Trondheim	**Norway**	john.linnell@nina.no
Brøseth, Henrik	Norwegian Institute for Nature Research N-7005 Trondheim	Norway	henrik.broseth@nina.no
Okarma, Henryk	Institute of Nature Conservation Polish Academy of Sciences Mickiewicza 33 31-120 Krakow	**Poland**	okarma@iop.krakow.pl
Olszanska, Agnieszka	Institute of Nature Conservation Polish Academy of Sciences Mickiewicza 33 31-120 Krakow	Poland	olszanska@iop.krakow.pl
Ionescu, Ovidiu	Neptun Str. No. 1 Ap. 25 Brasov	**Romania**	ovidiu@icaswildlife.ro
Paunovic, Milan	Natural History Museum Njegoseva 51 P.O. Box 401 11000 Belgrade	**Serbia and Montenegro**	paunmchi@eunet.yu

Milenkovic, Miroljub	Institute for Biological Research 29. novembra 142 11000 Belgrade	Serbia and Montenegro	mikim@ibiss.bg.ac.yu
Gregorová, Eva	Zoologicka zahrada Bojnice Zamok a okolie 6 972 01 Bojnice	**Slovakia**	zoobojnice@stonline.sk
Pilinsky, Peter	Ministry of Environment SR Dep. of Nature and Landscape Protection Nam. Ludovita Stura 1 812 35 Bratislava	Slovakia	pilinsky.peter@lifeenv.gov.sk
Hell, Pavel	Forest Research Institute T.G. Masaryka 22 960 92 Zvolen	Slovakia	
Valach, Ivan	Administration of PLA Biosphere Reserve Polana J.M. Hurbana 20 960 01 Zvolen	Slovakia	valach@sazp.sk
Stanisa, Cvetko	Zavod za gozdove Slovenije OE Kocevje Rozna ul. 39 1330 Kocevje	**Slovenia**	cvetko.stanisa@ribnica.si
Liberg, Olof	Grimsö Wildlife Research Station Swedish University of Agricultural Sciences 730 91 Riddarhyttan	**Sweden**	olof.liberg@nvb.slu.se
Andrén, Henrik	Grimsö Wildlife Research Station Swedish University of Agricultural Sciences 730 91 Riddarhyttan	Sweden	henrik.andren@nvb.slu.se
Breitenmoser, Urs	KORA Thunstrasse 31 CH-3074 Muri b. Bern	**Switzerland**	urs.breitenmoser@ivv.unibe.ch
Breitenmoser-Würsten, Christine	KORA Thunstrasse 31 CH-3074 Muri b. Bern	Switzerland	ch.breitenmoser@kora.ch
von Arx, Manuela	KORA Thunstrasse 31 CH-3074 Muri b. Bern	Switzerland	m.vonarx@kora.ch
Klee, José Juan (Web publishing & design)	Bleichestrasse 11 CH-3066 Stettlen	Switzerland	jose.klee@freesurf.ch
Zimmermann, Fridolin	KORA Thunstrasse 31 CH-3074 Muri b. Bern	Switzerland	f.zimmermann@kora.ch
Bashta, Andriy-Taras	Institute of Ecology of the Carpathians Koselnytska St. 4 Lviv 79026	**Ukraine**	atbashta@polynet.lviv.ua
Zhyla, Sergiy	Selezivka-Vallage Ovrutsky-rajon, Zhytomyr-oblast 11122	Ukraine	
Dyky, Igor	Lviv National University Zoology Dept. Hrushevsky st. 4 Lviv 79012	Ukraine	
Tkachuk, Yuriy	Vydynivskoho St. 41/2 Storozhynets Chernivtsi-region 59000	Ukraine	

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► Many of the articles are available in the Digital Cat Library of the IUCN/SSC Cat Specialist Group (www.catsglib.org), more will follow…

Legend to the maps:

Large rivers (broken lines – impermanent)

Canals (broken lines – through tunnel)

Toll and other motorways (broken lines – under constr.)

Major internal boundary lines

International boundary lines

Coast line

National parks

Built-up urban areas

Large lakes

Medium lakes

Hypsometric tints, indicating height of land above or below see level

Status Report Eurasian Lynx 2002

QUESTIONNAIRE

Please return the completed form to info@kofa.ch or Manuela von Arx, KORA, Thunstrasse 31, CH-3074 Muri b. Bern, Switzerland

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0 Country, Authors, Addresses

01 Country:

02 Main Contact:

021 Surname:

022 First name:

023 Address:

024 Phone:

025 Fax:

026 E-Mail:

03 Collaborator(s):

031 Surname(s):

032 First name(s):

033 Address(es):

034 E-Mail(s):

04 Date of response:

---

1 Status, Distribution and Development of the Populations

11 Distribution:

111 List of current populations or isolated subpopulations within the country. *Please fill in*:

ulation	Distribution (region)	Area (km²)	Remarks

112 Map of the present distribution of lynx: *You will receive one or several maps (depending on your country's size) with a 10x10 km UTM-grid. Please make three copies of each map. On the first copy indicate any grid where lynx is present following the instructions given in the separate Word-file "Map Instructions" . Indicate sites of releases if lynx have been reintroduced since 1995. Please identify the populations and subpopulations.*

Comments:

113 Changes in the distribution since 1995: *Mark in the second copy any changes (expansion, immigration, reduction) of the distribution of the lynx since 1995.*

Comments:

114 Origin of distribution data: How were the distribution data collected and analysed? *Please tick off:*

sightings and signs	☐	inquiry (hunters, foresters)	☐
snow tracking	☐	radio telemetry	☐
unspecific survey	☐	other	☐

Comments:

115 Additional information: *Please add any other available recent distribution map (ex. polygon maps, GIS layouts; preferably as e-mail attachment with information on the system of coordinates and projection used) or other relevant data on the distribution of the lynx populations within your country.*

Comments:

116 Protected areas and management zones: *Indicate in the third copy any protected areas and management zones >100 km². Please indicate the category.*

Comments:

12 General tendency of the population size 1996-2001:

121 What was the trend of the lynx populations in your country from 1996-2001? *Please tick off:*

Population	increasing	expanding	stable	decreasing	unknown
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐

	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐

122 Please describe the changes and tendencies in the populations (name the population!) if the categories under 121 do not clearly match:

13 Population size:

Please give in the following section all available data on the population size, including your personal estimation if it differs from other estimations.

131 Official estimate of the population size: *Please give the numbers for each population in the respective year(s) of estimation or indicate years without any estimations with a "– ".* If there are no official data go to point 132):

Population	1996	1997	1998	1999	2000	2001

1311 Method of the official population estimation. *Please describe:*

1312 Institution(s) responsible for the estimations:

132 Additional / contrary / personal estimate of the population size. *Please give here numbers for each population if no official data are available or if your estimation is different from the official numbers:*

Population	1996	1997	1998	1999	2000	2001

1321 Method of the additional population estimation. *Please describe:*

1322 Institution responsible for the additional estimation(s):

133 Your judgement of the accuracy of the population estimations:

14 Reintroductions:

141 Have there been reintroductions / restockings (any releases) of lynx between 1996-2001?

yes ☐ * / no ☐

* If yes, please specify where, how many and what kind of animals:

142 Are there any reintroductions / restockings planned?

yes ☐ * / no ☐

* If yes, please specify:

---

2 Legal situation, harvest and losses of lynx

21 Legal status of the lynx:

211 Has your country signed the following international treaties? *Please tick off; if yes, indicate the year of ratification and whether with reservation or not:*

Treaty	**yes (year)**	**no**	**Reservation**	
			yes	**no**
EU Habitat Directive	☐ ( )	☐	☐	☐
Bern Convention	☐ ( )	☐	☐	☐
CITES	☐ ( )	☐		

212 At present, there is: *Please tick off:*

	yes	no
no legal protection of lynx (hunting is free for everybody)	☐	☐
legal, but controlled hunting (by licensed hunters)	☐	☐
legal removal of problem individuals (e.g. livestock raiders)	☐	☐
complete protection of lynx by law throughout the year	☐	☐

2121 Are there differences in the legal status or management of the populations identified under 1? yes ☐ * / no ☐

* If yes, please describe:

213 Conservation action plans or management plans: Has your country adopted a

	no	**yes (year)**	**Authorship**
Conservation action plan	☐	☐ ( )	
Management plan	☐	☐ ( )	
Combined conservation / management plan	☐	☐ ( )	

2131 Give the exact reference(s) for each of these plans and indicate a source (publisher, website, etc.):

2132 Have there been changes in the organisations in charge of the lynx management on a national / regional level since 1995?

2133 Was the management / conservation action plan initiated through the "Action Plan for the Conservation of the Eurasian Lynx in Europe" ("Pan-European Action Plan 2000, Bern Convention / LCIE")?

2134 Did the implementation of your current management plans have an effect so far? *Please describe:*

2135 Did the Pan-European Action Plan 2000 have any other effect regarding the conservation of the lynx in your country? *Please describe:*

22 Harvest:

If there are any differences between populations within your country, please indicate each scope. (If your lynx populations are completely protected you can go to point 23)

221 Start / end date of the open hunting season:

/

222 Restriction in numbers (per hunter / total quota per year):

/

2221 Who establishes the annual number of lynx hunted?

2222 How are the quotas decided upon?

223 Number of lynx legally hunted from 1996-2001 (exclusive problem animals removed). Please indicate the population name:

Population	1996	1997	1998	1999	2000	2001

Comments:

23 Other known losses:

231 Indicate the number of lynx (if available per population) that died of the following causes. Add other:

Cause of death	1996	1997	1998	1999	2000	2001
traffic accidents (roads / railways)						
other accidents						
trapping						
poaching or other illegal killings						
legal removals of problem animals						
diseases						
losses of unknown cause						

232 What kind of diseases were found in lynx?

---

3 Depredation on livestock by lynx

31 Number of losses per species and year 1996-2001

311 Indicate the number of livestock losses for the years 1996-2001:

Livestock species	1996	1997	1998	1999	2000	2001
sheep						
goat						
reindeer						
Total						

3111 If you don't have the information to fill in table 311 please note the livestock species you know that individuals have been depredated on between 1996-2001:

312 Are there remarkable differences between the lynx populations?

313 Are there any particular regions where depredation was outstanding?

314 In what season(s) / months did depredation mainly happen?

32 Compensation of losses

321 Does your country apply a compensation system for livestock losses to lynx? yes ☐ (continue with 322) / no ☐ (go to 33)

322 Describe the compensation system(s) applied in your country (per lynx population and/or livestock species if there is any differentiation):

Compensation System	Description	Lynx Population	Livestock species

323 Compensation (in Euro) paid per livestock species and year 1996-2001:

Livestock species	1996	1997	1998	1999	2000	2001
sheep						
goat						
reindeer						
Total lynx						

For reasons of comparison:

Compensation other predators						

324 Who is paying the compensation?

Please specify:

325 What procedures are applied to verify lynx kills? *Please describe:*

33 Prevention of depredation:

331 Which are the protective measures against lynx attacks in livestock herds applied in your country?

332 Which legal measures were taken in your country against lynx causing damage in the period 1996-2001?

333 Which illegal actions are known to have been taken against lynx attacking livestock in the period 1996-2001?

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4 Major threats to the lynx populations

The following list is derived from the IUCN/SSC Species Information Service (*SIS numbers in brackets*). Please enter “yes” if the threat affects all

populations in your country or indicate the name of those of your populations that have been / are / could be threatened by the following causes. (Make sure that you judge on the level of the population rather than the individual). Specify additional threats under 49 if you feel that the list is incomplete. Any further comments are welcome under 410!:

Threat	**Past (<1996)**	**Present (1996-2001)**	**Future (>2001)**
41 Habitat loss / degradation (human induced): *(1.)*			
411 Agriculture *(1.1.)*			
412 Extraction of wood *(1.3.3.)*			
4131 Infrastructure development: Industry *(1.4.1.)*			
4132 Infrastructure development: Human settlement *(1.4.2.)*			
4133 Infrastructure development: Tourism / recreation *(1.4.3.)*			
4134 Infrastructure development: Road building *(1.4.4.)*			
42 Harvest : *(3.)*			
421 Legal hunting & trapping			
43 Persecution: *(5.)*			
431 Shooting *(4.1.2.2)*			
432 Trapping / snaring *(4.1.2.1.)*			
433 Poisoning *(4.1.2.3.)*			
44 Traffic:			
441 Vehicle and train collision *(4.2.2.)*			
45 Natural disasters: *(7)*			
451 Storms / flooding *(7.2.)*			
452 Wildfire *(7.4.)*			
453 Avalanches / landslides *(7.6.)*			
46 Changes in native species dynamics: *(8.)*			
461 Competitors *(8.1.)*			
462 Prey / food base *(8.3.)*			
463 Pathogens / parasites *(8.5.)*			
47 Intrinsic factors: *(9.)*			

471 Limited dispersal *(9.1.)*			
472 Poor recruitment / reproduction / regeneration *(9.2.)*			
473 High juvenile mortality *(9.3.)*			
474 Inbreeding *(9.4.)*			
475 Low densities *(9.5.)*			
476 Skewed sex ratios *(9.6.)*			
477 Slow growth rates *(9.7.)*			
478 Population fluctuations *(9.8.)*			
479 Restricted range *(9.9.)*			
48 Human disturbance: *(10.)*			
481 Recreation / tourism *(10.1.)*			
482 Research *(10.2.)*			
483 War / civil unrest *(10.3.)*			
484 Transport *(10.4.)*			
49 other:			
491			
492			
493			

410 Comments on the above list of threats:

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5 Conservation measures

Please indicate the present status regarding the conservation of the lynx in your country for any of the following measures. Enter “yes” or the name of the population if there are differences between the lynx populations in your country: *(IUCN SIS numbers in brackets)*

Measure:	**Implemented / applied**	**Drafted / ratified but not implemented**	**Lacking / proposed**
51 Policy-based actions: *(1.)*			

511 Management plans *(1.1.)*			
5121 Legislation on an international level *(1.2.1.1/1.2.2.1.)*			
5122 Legislation on a national level *(1.2.1.2/1.2.2.2)*			
5123 Legislation on a regional level *(1.2.1.3/1.2.2.3.)*			
512 Public involvement *(1.3.)*			
52 Communication and Education: *(2.)*			
521 Formal education *(2.1.)*			
522 Awareness *(2.2.)*			
523 Capacity-building / Training *(2.3.)*			
53 Research actions: *(3.)*			
531 Taxonomy *(3.1.)*			
532 Population numbers and range *(3.2.)*			
533 Biology and Ecology *(3.3.)*			
534 Habitat status *(3.4.)*			
535 Threats *(3.5.)*			
536 Uses and harvest levels *(3.6.)*			
537 Conservation measures *(3.8.)*			
538 Monitoring / Trends *(3.9.)*			
539 Genetic status			
5310 Human attitude / Human dimensions			
54 Habitat and site-based actions: *(4.)*			
541 Maintenance / Conservation *(4.1.)*			
542 Restoration *(4.2.)*			
543 Corridors *(4.3.)*			
5441 Identification of new protected areas *(4.4.1.)*			
5442 Establishment of protected areas *(4.4.2.)*			
5443 Management of protected areas *(4.4.3.)*			
5444 Expansion of protected areas *(4.4.4.)*			
545 Community-based initiatives *(4.4.5.)*			

55 Species-based actions: *(5.)*			
551 Re-introductions *(5.1.)*			
552 Sustainable use / Harvest management *(5.3.)*			
553 Recovery management *(5.4.)*			
554 Disease, pathogen, parasite management *(5.5.)*			
555 Limiting population growth *(5.6.)*			
5561 Captive breeding / Artificial propagation *(5.7.1.)*			
5562 Genome resource bank *(5.7.2.)*			
56 other:			
561			
562			

57 Comments:

58 Most urgent conservation measures / actions:

581 What are in your opinion the most urgent conservation measures / actions to be taken for the lynx population(s) in your country?

Population	Most important conservation measures / actions needed

5811 Comments:

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6 Judgement of the lynx status according to the IUCN/SSC Red List Categories

61 Please consider the status of the lynx populations in your country. *Tick off:*

Population	extinct	endange-red	vulnerable	least concern	data deficient
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐

	☐	☐	☐	☐	☐

7 Further information on the status of lynx in your country

71 Reference list:

You will find a list of references on the status of *Lynx lynx* in Europe attached. Attention was mainly paid on literature published after 1990. Please indicate here any missing reference (including reports and regardless to the language) which is important for your country:

72 Ongoing research projects:

Please list project title, running period and contact (incl. e-mail address) of ongoing research projects on lynx in your country:

73 Further information / Additional comments:

Thank you very much for your collaboration!