



Универзитет у Београду
Шумарски факултет



Monitoring of large carnivores in Republic of Serbia

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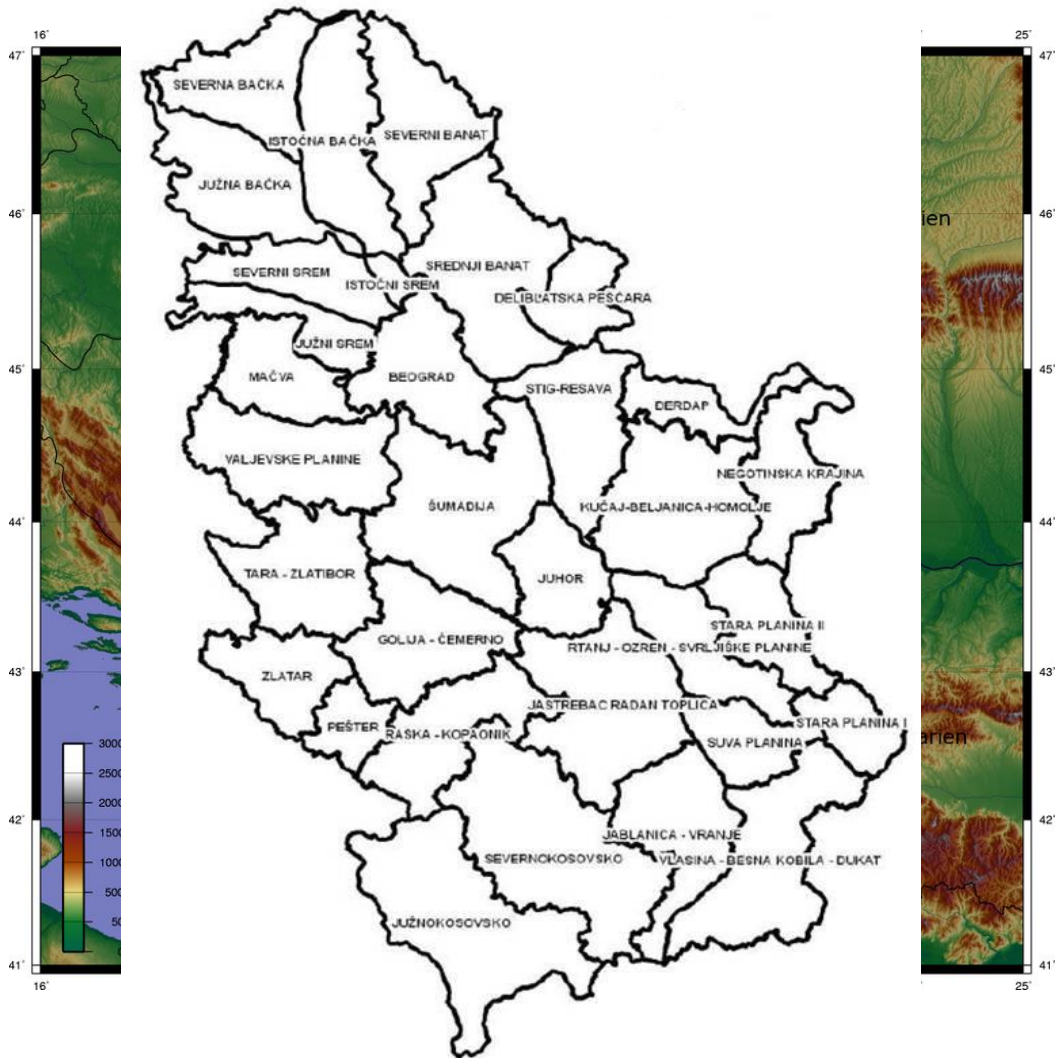
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Hunting sector in Serbia



357 hunting grounds
30 hunting regions
95% of the territory

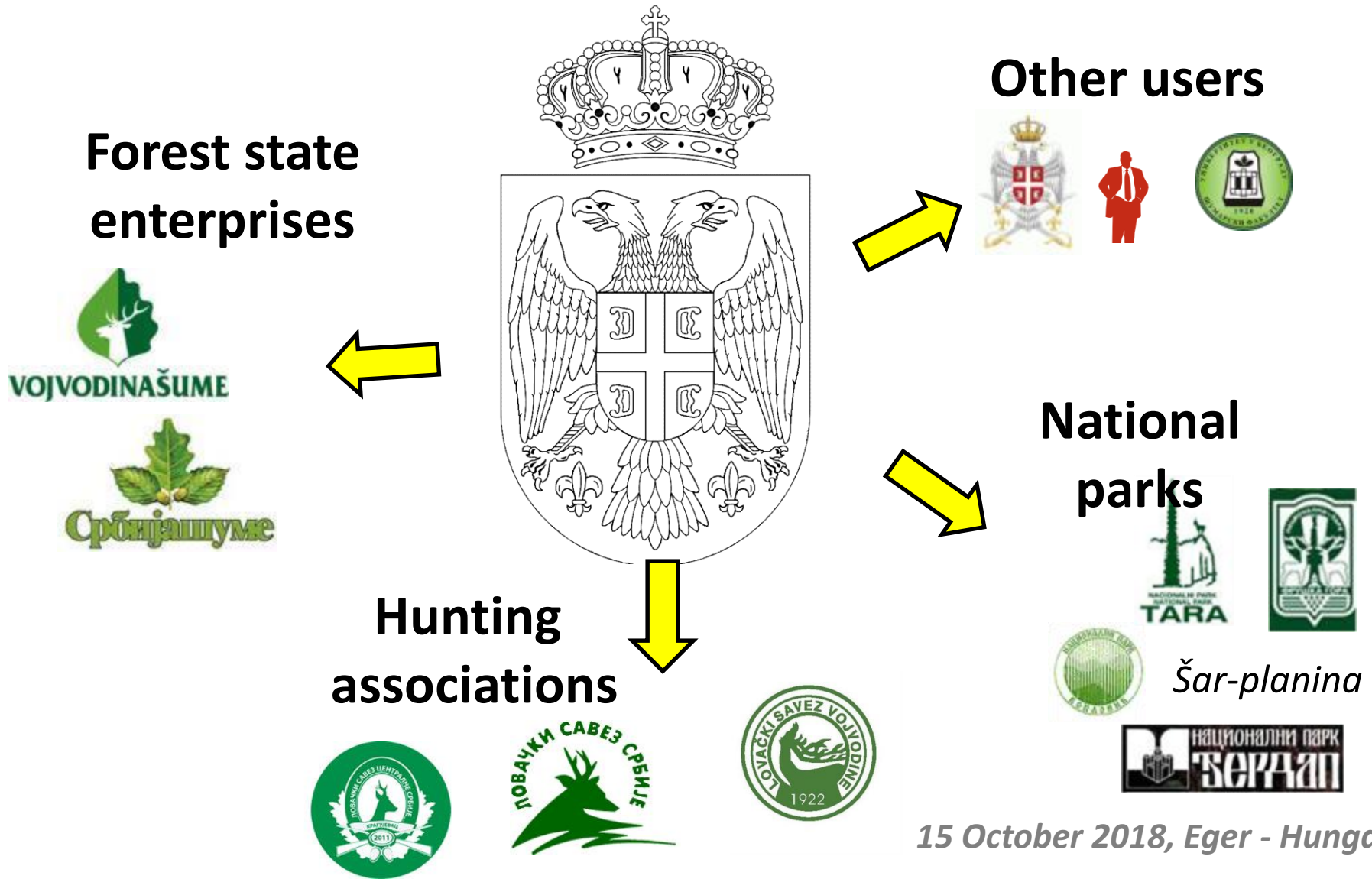
62 game species
The State
- 45 have hunting season
- 17 without



Hunting grounds

Mammals		Birds	
<i>Cervus elaphus</i>	<i>Canis lupus*</i>	<i>Anas crecca</i>	<i>Scolopax rusticola</i>
<i>Capreolus capreolus</i>	<i>Canis aureus</i>	<i>Anas penelope</i>	
<i>Dama dama</i>	<i>Vulpes vulpes</i>	<i>Anas platyrhynchos</i>	<i>Columba palumbus</i>
<i>Odocoileus virginianus</i>	<i>Nyctereutes</i>	<i>Anas querquedula</i>	<i>Streptopelia decaocto</i>
<i>Ovis amon musimon</i>	<i>procyonoides</i>	<i>Aythya ferina</i>	<i>Streptopelia turtur</i>
<i>Rupicapra rupicapra</i>	<i>Felis silvestris</i>	<i>Anser albifrons</i>	
<i>Sus scrofa</i>	<i>Martes martes</i>	<i>Anser fabalis</i>	<i>Phasianus colchicus</i>
	<i>Martes foina</i>		<i>Perdix perdix</i>
<i>Glis glis</i>	<i>Putorius putorius</i>	<i>Fulica atra</i>	<i>Coturnix coturnix</i>
<i>Sciurus vulgaris</i>	<i>Mustela nivalis</i>		<i>Accipiter gentilis</i>
<i>Ondatra zibethica</i>	<i>Meles meles</i>	<i>Garrulus glandarius</i>	<i>P. carbo</i>
<i>Myocastor coypus</i>		<i>Gallinula chloropus</i>	<i>Ardea cinerea</i>
		<i>Corvus frugilegus</i>	
<i>Lepus europaeus</i>		<i>Pica pica</i>	
		<i>Corvus cornix</i>	
<i>Lynx lynx</i>	<i>Lutra lutra</i>	<i>Tetrao urogallus</i>	<i>Anas acuta</i>
<i>Ursus arctos</i>	<i>Mustela erminea</i>	<i>Bonasa bonasia</i>	<i>Anas strepera</i>
	<i>Mustela eversmanii</i>	<i>Alectoris graeca</i>	<i>Anas clypeata</i>
	<i>Castor fiber</i>		<i>Anser anser</i>
	<i>Vormela peregusna</i>	<i>Gallinago gallinago</i>	<i>Anser erythropus</i>
			<i>Aythya fuligula</i>

Hunting sector in Serbia



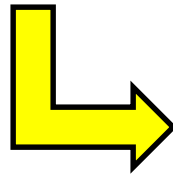
Game census estimation



Hunting ground management plan

10 / 20 years

Predict population dynamics



Annual management plans

- census

- offspring

- realized hunting bag

Hunting year

01 April – 31 March

State of game population in Nth year	Sex	Age												Total	
		Premature				Mature				Elderly					
		1	2	3	4	5	6	7	8	9	10	11	12+	Sex	Σ
Optimal abundance	M	11	7	4	4	4	3	3	3	3	2	2	4	50	100
	F	11	7	4	4	4	3	3	3	3	2	2	4	50	
Census estimate - 1st April	M	2	1	1	1	1	0	0	0	0	0	0	0	6	16
	F	2	2	1	1	1	1	1	1	0	0	0	0	10	
Transition to the higher age class	M		2	1	1	1	1	0	0	0	0	0	0	6	16
	F		2	2	1	1	1	1	1	1	0	0	0	10	
Real growth	M	3	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	3	6
	F	3	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	3	
Number before hunting	M	3	2	1	1	1	1	0	0	0	0	0	0	9	22
	F	3	2	2	1	1	1	1	1	1	0	0	0	13	
Hunters' bag	M													0	0
	F													0	
Number after hunting	M	3	2	1	1	1	1	0	0	0	0	0	0	9	22
	F	3	2	2	1	1	1	1	1	1	0	0	0	13	
Ratio toward optimal abundance	M	-8	-5	-3	-3	-3	-2	-3	-3	-3	-2	-2	-4	-41	-78
	F	-8	-5	-2	-3	-3	-2	-2	-2	-2	-2	-2	-4	-37	

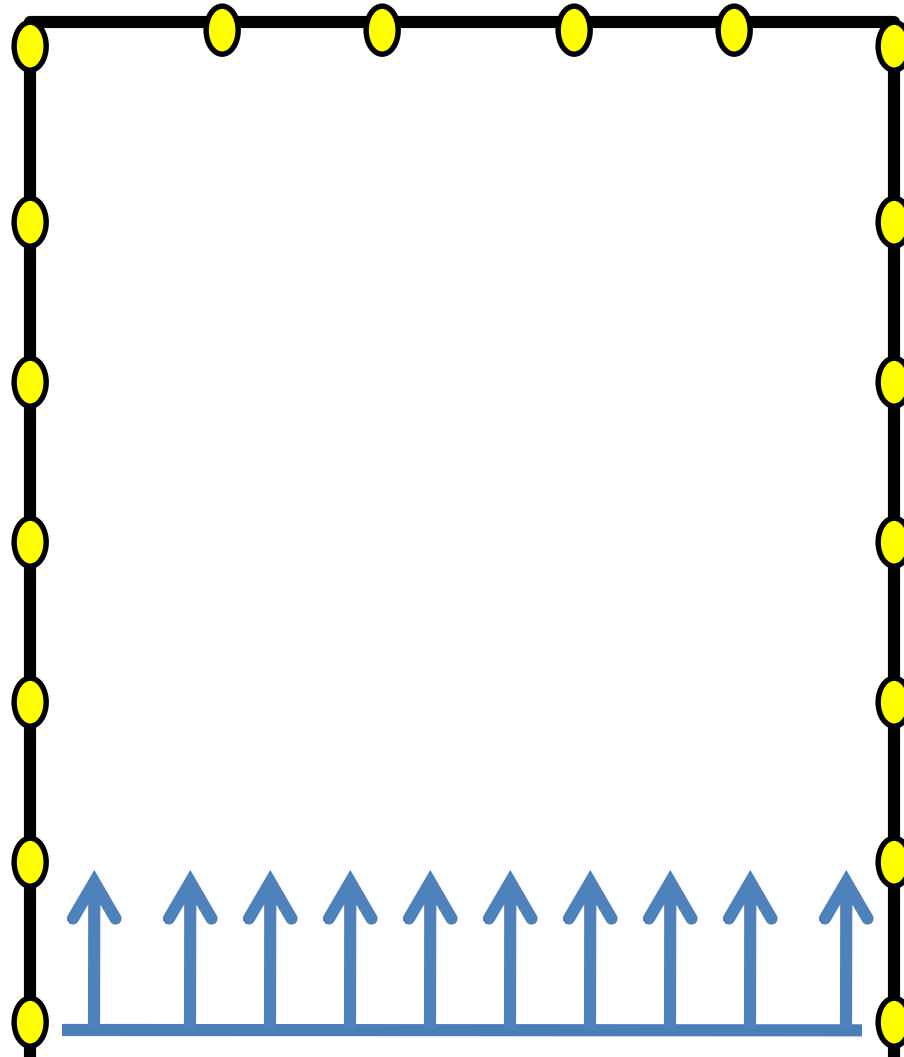
Game census estimation

- 3 sample plots (10-12% of total *LPP*)
- Stratified statistic sample



Game management productive area

Game census estimation



15 October 2018, Eger - Hungary

Large carnivore estimates

Method	Wolf	Bear	Lynx
Feeding station occurrences	+	+	
Trap cameras	+	+	+
Tracks and droppings	+	+	+
Sights	+	+	+
Interviews with locals	+	+	+
Scope of damages	+	+	
Size of hunter's bag	+		
GPS collar marking		+	
Genetic analyses	+	+	
Sampling and projecting			+

15 October 2018, Eger - Hungary

LC estimates

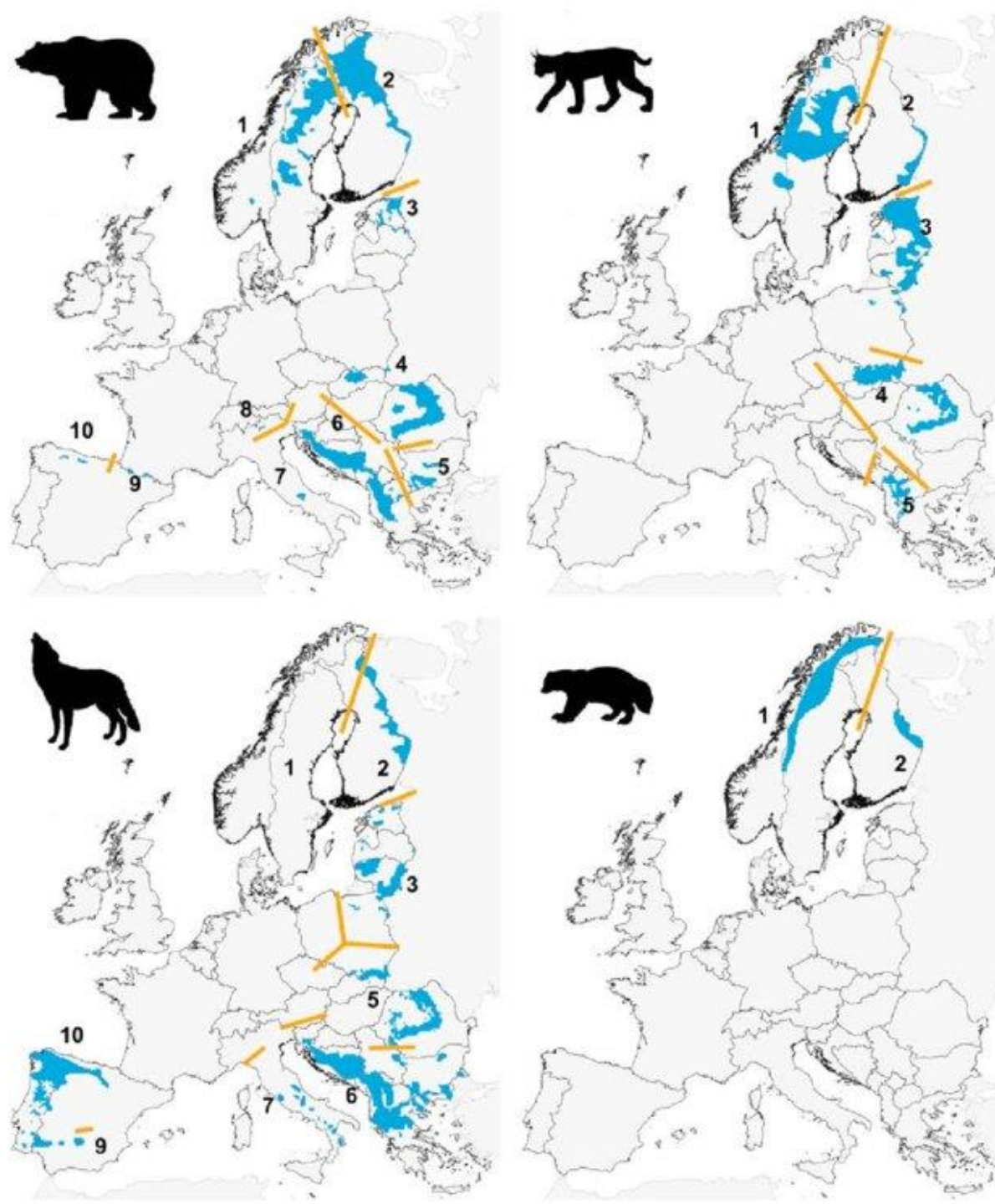


Fig. 1. Distribution of large carnivores in Europe at their lowest extent during the 1950–1970s. Chapron et al., 2014

Estimates

Wolf

Optimal	Estimated	Planned culling	Realized culling
1,344	1,520	432	188
	1,045-1,206		160-180

Bear: 54 / 120 individuals

Lynx: 15 / 60 individuals







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15 October 2018, Eger - Hungary

A black bear is sitting on a wooden picnic table in a park-like setting. The bear is looking to the right. The table is made of wooden planks. In the background, there are trees and a grassy area. A speech bubble is overlaid on the image, containing the text "Thank you for the attention".

**Thank you for
the attention**