The analysis of the scores awarded to the trophies of brown bear skulls in the South-Eastern part of the Eastern Carpathians - reflection on the wildlife management.

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Target specie

- *Ursus arctos ,* Linnaeus, 1758

- Conservation status (RO) : vulnerable

- Romanian estimated population: approx. 6000
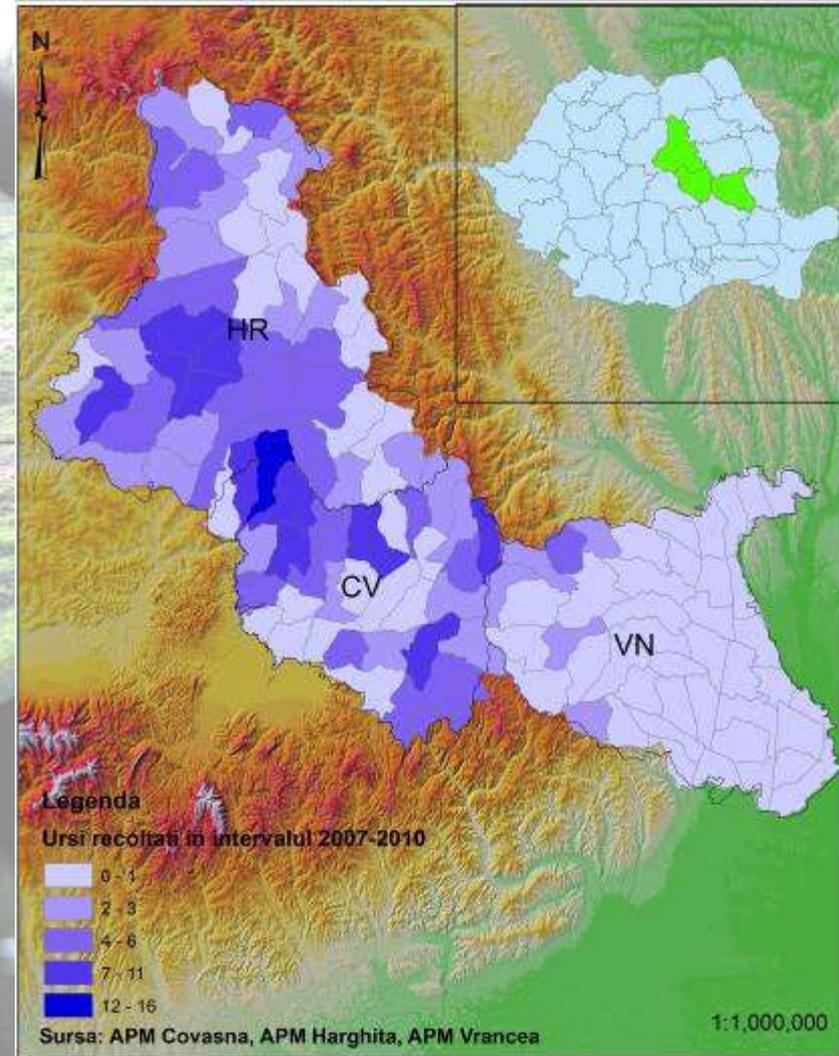
- Hunted individuals: 250-350/year

Context of the study

- High level of hunting quota in Covasna, Harghita and Vrancea county

- Different ways of hunting bears (selective and nonselective)

- 304 shot bears during September 2007 until December 2010

- 304 scores for trophy

- Lack of study regarding shot bears (304, meaning 5% of estimated bear population at national level)

- No impact study on how hunting activities are affecting the structure of bear population

- LIFEURSUS project - LIFE08/NAT/RO/000500

Study area
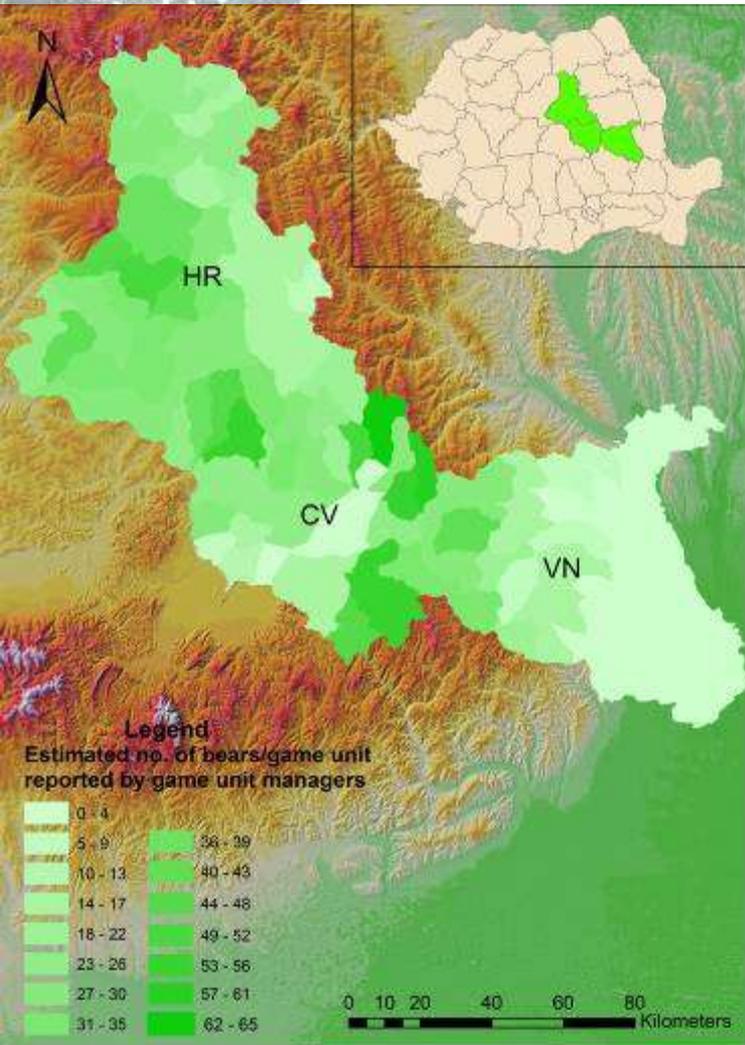
Study area covering approx. 10 % of the estimated brown bear habitat at national level

and approx. 30% of the

estimated brown bear population

Legend
Estimated no. of bears/game unit reported by game unit managers

0 - 4	36 - 39
5 - 9	40 - 43
10 - 13	44 - 48
14 - 17	49 - 52
18 - 22	53 - 56
23 - 26	57 - 61
27 - 30	62 - 65
31 - 35	

Legenda
Ursi recoltati in intervalul 2007-2010

0 - 1
2 - 3
4 - 6
7 - 11
12 - 16

1:1,000,000

Sursa: APM Covasna, APM Harghita, APM Vrancea

Data collection

WHY THE SKULL?

• Impossible to change the size of the trophy.

• Recognized at international level by the International Hunting Committee as the trophy indicates the size of a hunted individual.

• Official reports of the game unit managers for each shot bears according to the Romanian law for derogation of the Habitat Directive

• Data for 50 females and 254 males, different estimated age from 2 years to 28 years
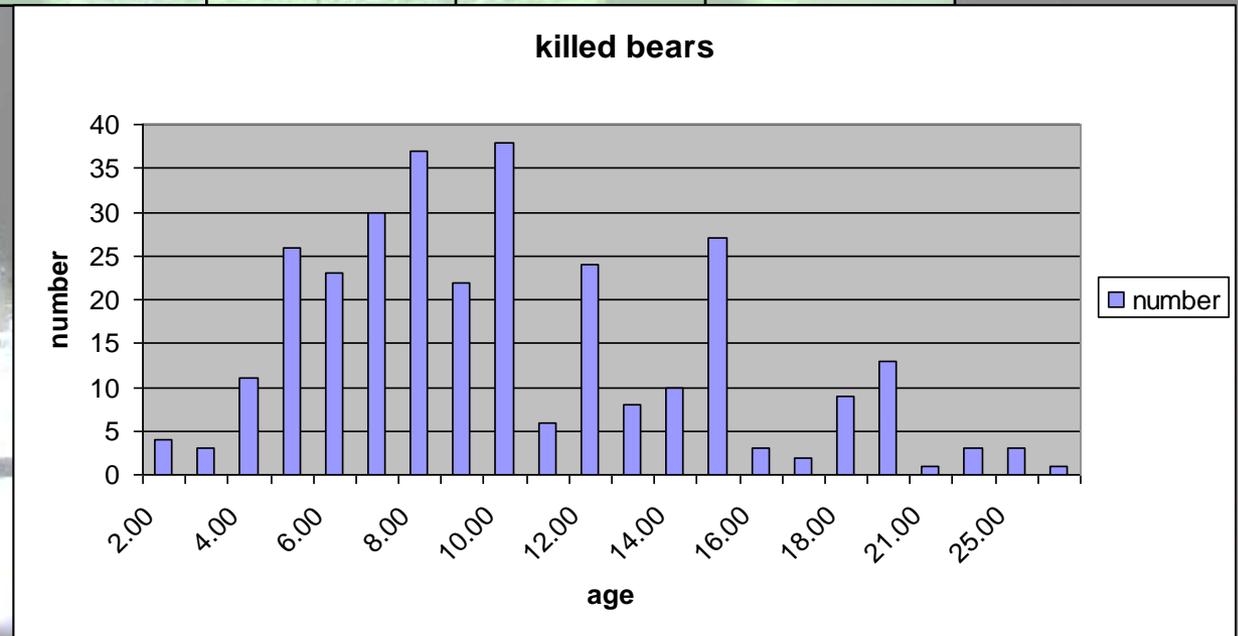
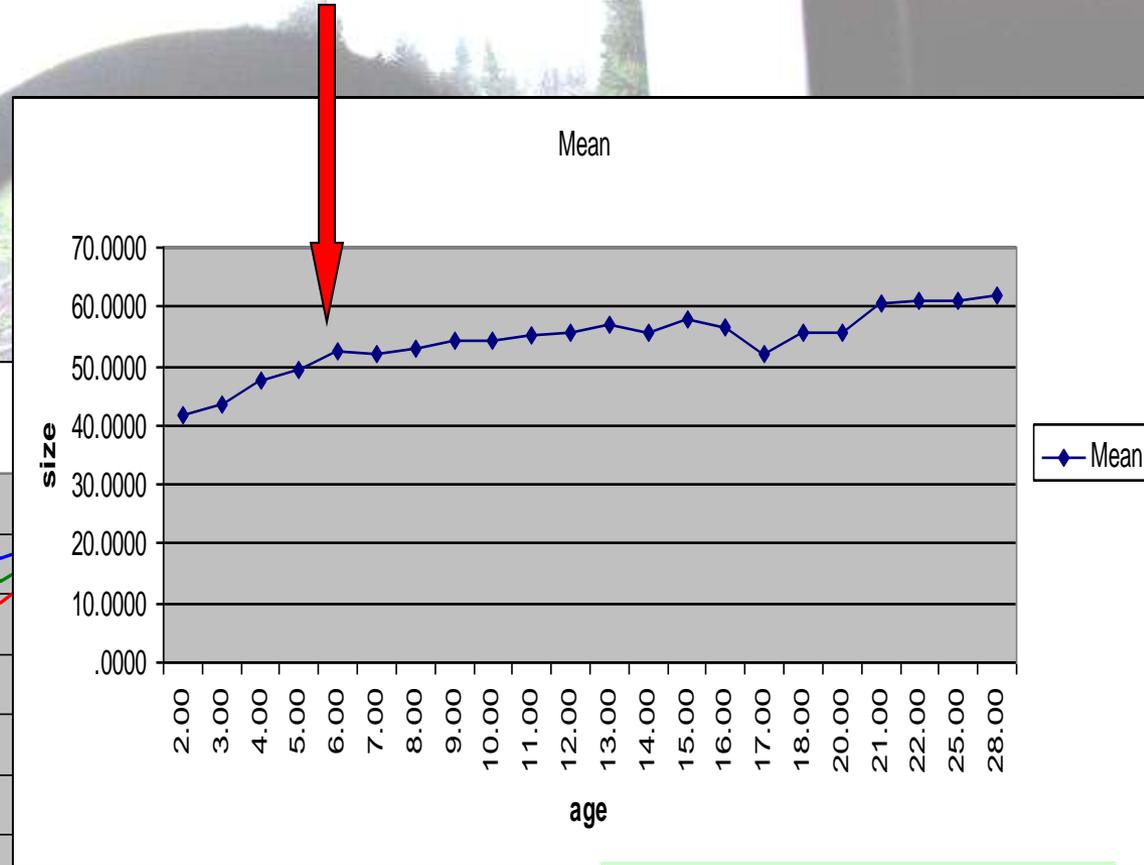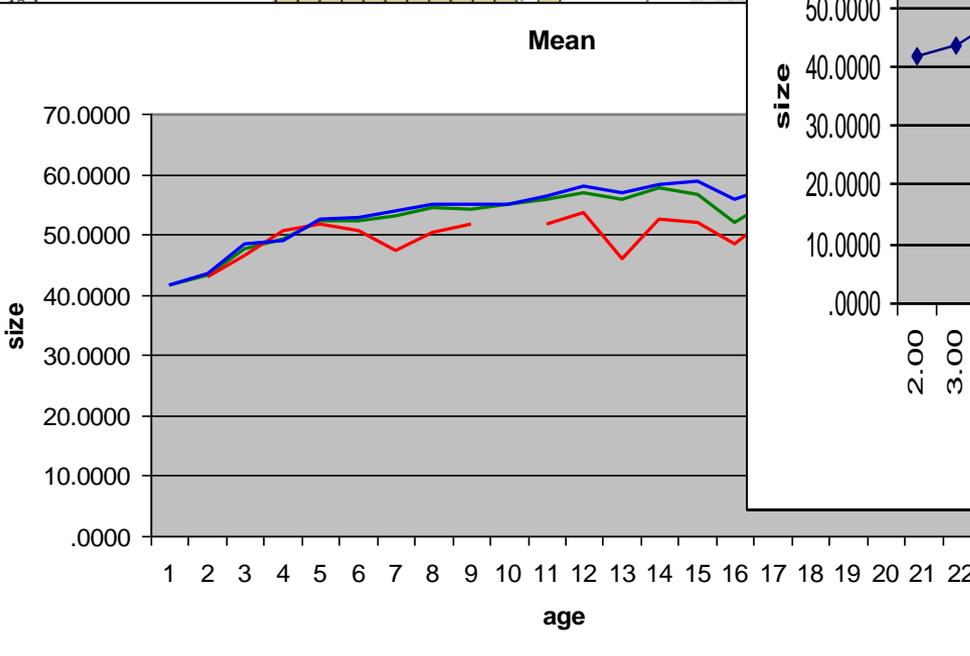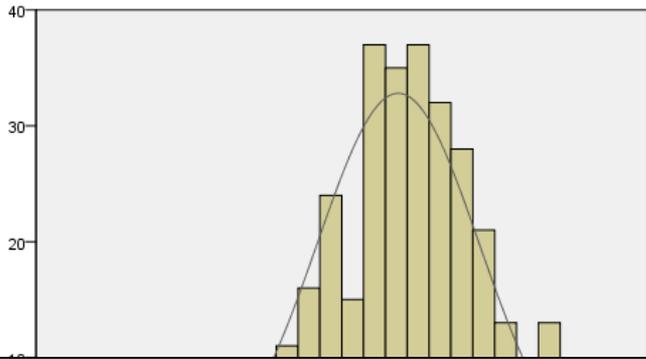# HOW THE SCORES ARE CALCULATED?
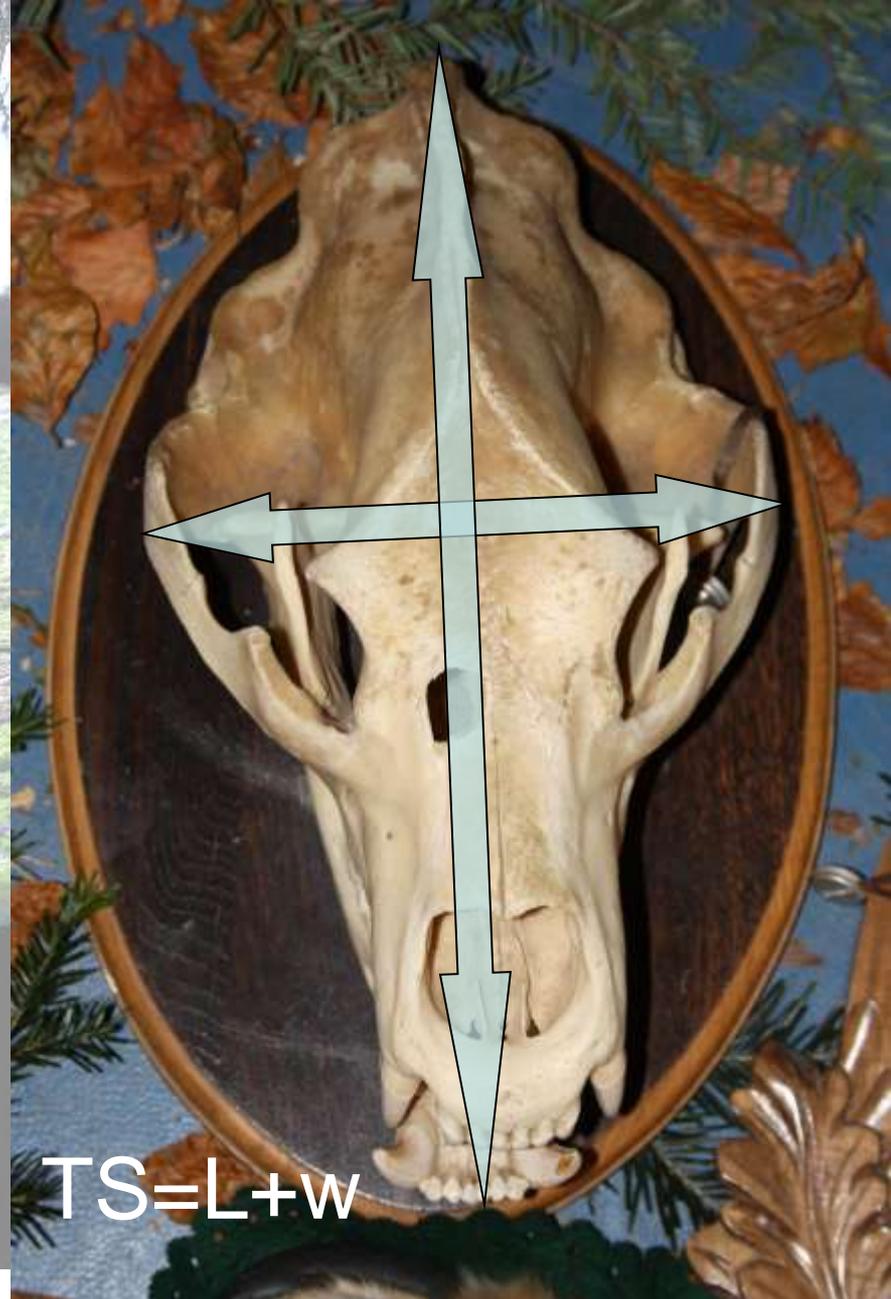
TS=L+w

Results

Estimated age and Trophy Score (TS)

	Sex	N	Mean	Std. Deviation	Std. Error Mean
Age	F	50	10.7000	5.13591	.72633
	M	254	10.1378	4.69554	.29462
TS	F	50	50.6460	3.82085	.54035
	M	254	54.2885	5.32642	.33421

killed bears

Results

Variables: SEX, AGE, Trophy Score (TS)

| Range 2-6	10.7478 cm
Range 6-28	9.6522 cm

Results

Mean of TS based on the hunting season

Month	Mean	Std.Deviation	Range	Skewness	Variance	Median
3.00	54.5895	4.10324	15.00	-.098	16.837	53.8000
4.00	54.7700	5.15088	26.40	-1.092	26.532	55.0000
5.00	54.6217	5.22963	24.00	-.608	27.349	54.0000
7.00	50.0000	.	.00	.	.	50.0000
9.00	53.4630	5.73660	20.20	.207	32.909	53.0000
10.00	52.7300	5.13088	28.90	-.474	26.326	52.9500
11.00	53.0533	6.11992	31.60	-.864	37.453	53.7000
12.00	54.7500	4.28283	16.40	-.766	18.343	55.5500
Total	53.6894	5.28008	32.00	-.637	27.879	54.0000

Mean
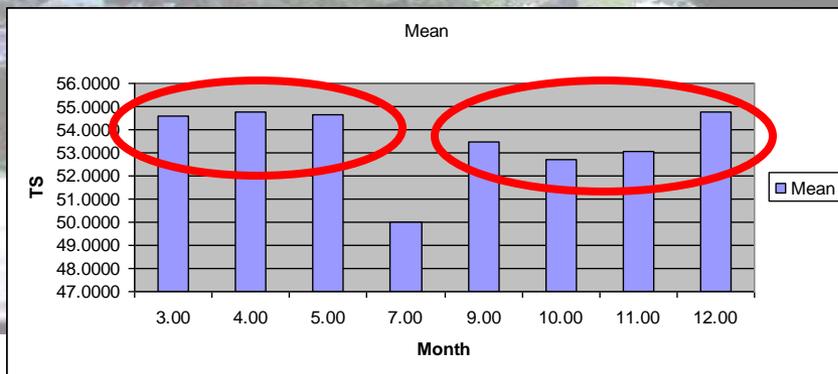
Bears shot in the spring season- 113

Bears shot in the autumn season- 190
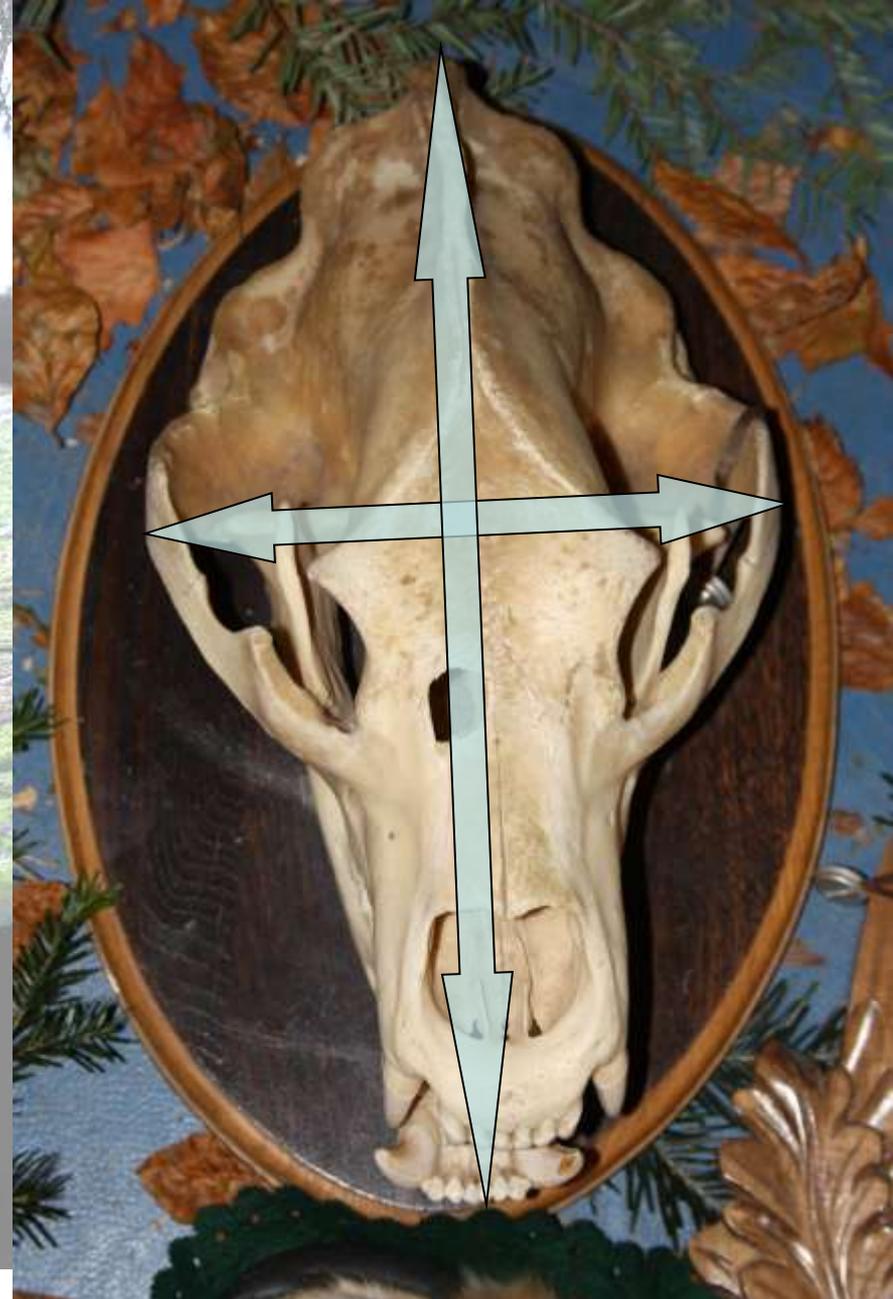
Bears shot in the summer- 1

86% of the female were shot in autumn

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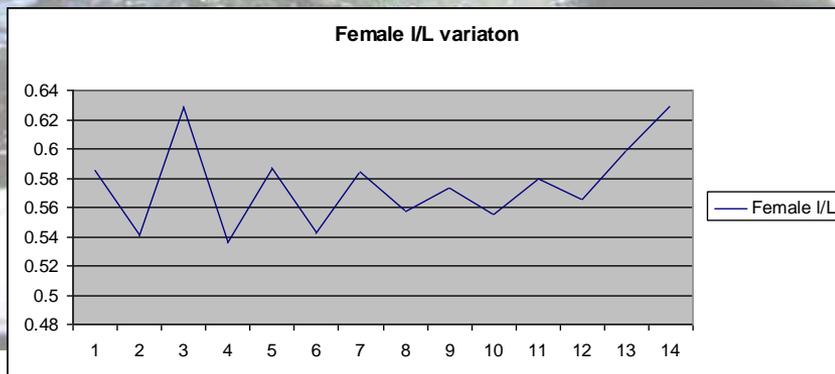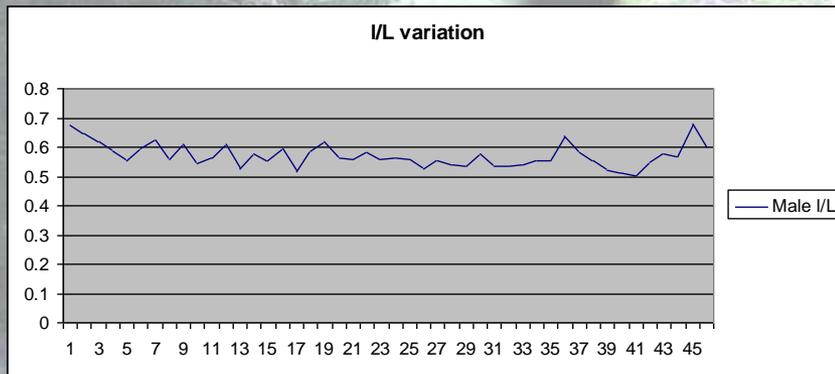23-25 November 2011

Results

Geometric aspect of the skulls for male and females presented as I/L

For 46 males I/L=0.57

For 14 females I/L=0.58

I/L variation

Female I/L variaton

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Results

Mean of TS on geographical units

	Comandau	dl_Tarnavelor	Madaras	Baraolt	Bodoc	Bretcului	Calimani	Ciucului	Gurghiului	Harghita	Intorsurii	Nemira	Vrancei
Mean	**54.5105**	**54.220**	**54.905**	**54.030**	**52.957**	**53.036**	**54.400**	**53.430**	**54.021**	**53.761**	**52.853**	**50.735**	**51.126**
N	19	29	37	23	21	11	13	10	23	55	13	14	19
Std. Deviation	3.22437	5.05459	5.13879	5.55750	5.14942	3.23829	3.89957	6.38262	4.49979	5.02930	6.13455	9.06885	5.66812

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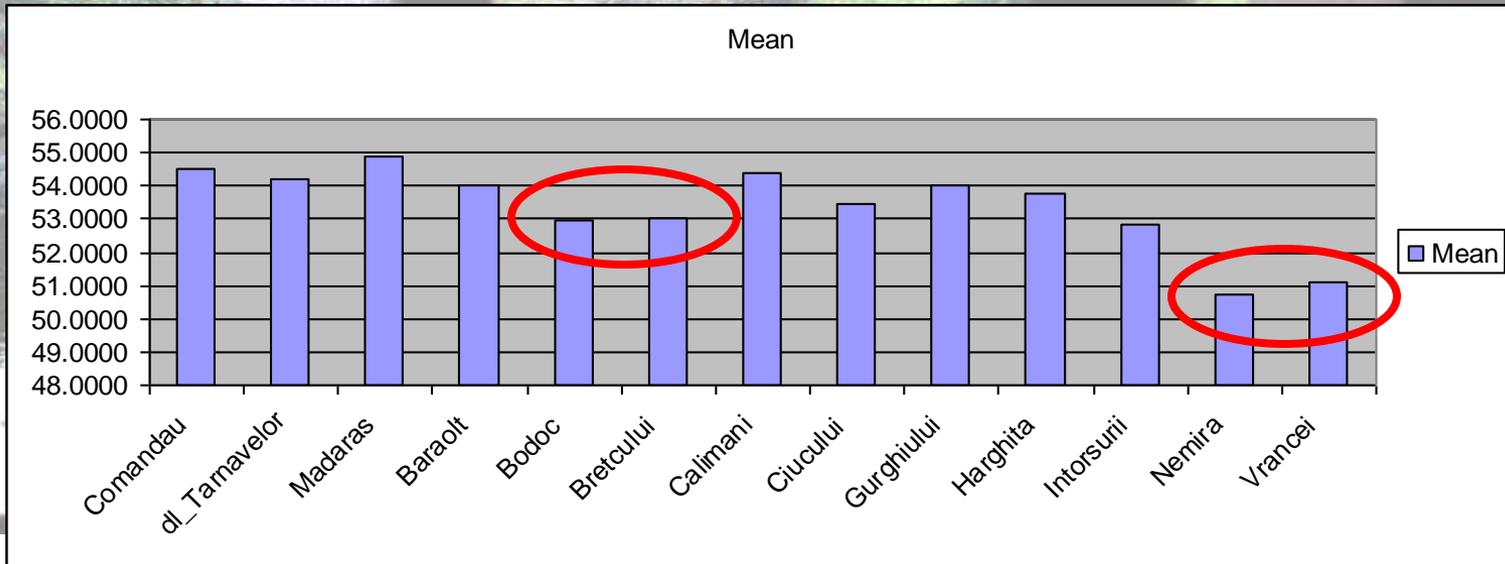
Conclusions

- The increase of the skull is higher in the first six – seven years of life
- Female have a smaller skull than males (approx. 10% smaller)
- The increase of the skulls of male and females are similar in the first years, than the skull of the males have a bigger increase
- There are not significant differences between the geometric report Width/Length in females' and males' skull
- Hunting has a selective character in the spring oriented towards big individuals (hunting at or near feeding points) and a random character in the autumn (in relation to size and sex)
- There are no significant differences between the skull size in different geographical areas
- In relation to the TS there are differences between hunting management

Recommendations

- Brown bear hunting should be a management tool for Romanian Brown bear population, but as a management tool the random character should be reduced

- Hunting has to be oriented towards maintaining a normal structure of the population and not oriented towards trophy size (approx. 35% of the killed individuals were adults, mature individuals over 10 years old)

- Reducing the age of hunted individuals, protecting the adult and old individuals

- Shot animals should be examined and measured to extract all the useful information regarding brown bear biology and ecology

- The age should be more precisely determined to improve the derogation reports to the EU

Thank you

- **www.carnivoremari.ro**
- **www.canivoremari.ro/lifeursus/**
- **www.biodiversitate.ro**

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