

Effects of captive and free-ranging management on male rutting calls in Siberian wapiti *Cervus elaphus sibiricus*

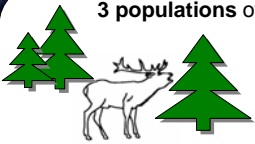


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Idea: in red deer *Cervus elaphus*, captive and free-ranging management potentially affects rutting calls, responsible for male reproductive success.

3 populations of Siberian wapiti originated from the Altai/Khakasian region of Central Siberia:



Wild

0.00206 animals/ha in the wild



Fenced

0.08 animals/ha at 5000 hectares



Farmed

2.0 animals/ha at 70 hectares

Recording calls
Automated recording systems
SongMeter2+



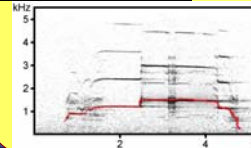
Statistical analysis
•STATISTICA, v. 6.0 •ANOVA

Acoustic analysis

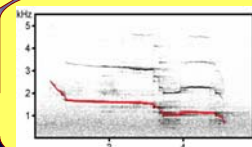
- Avisoft SAS Lab Pro, Praat
- The same set of 14 acoustic variables for each call
- 4 temporal variables, 6 variables of fundamental frequency (f0) and 4 power variables



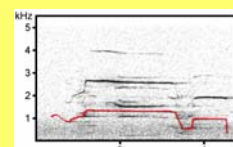
Fundamental frequency contour patterns:



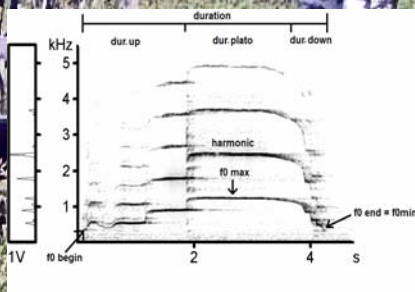
"trapeze"
74.3%



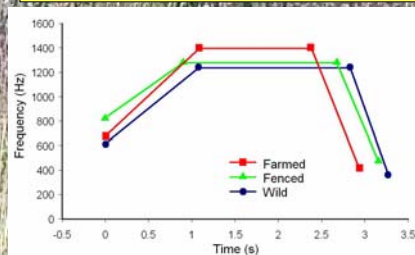
"down"
23.7%



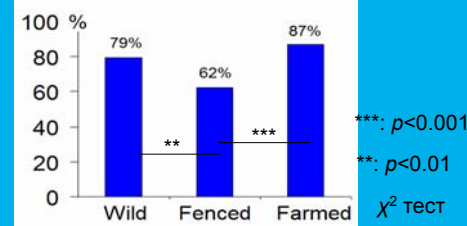
"saddle"
2.1%



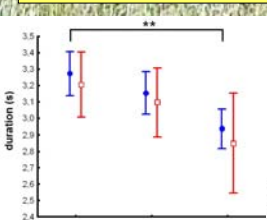
Fundamental frequency contours of "trapeze" calls in 3 populations



High level of the calls with the additional low fundamental frequency!

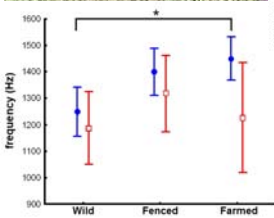


Acoustic variables of rutting calls of "trapeze" and "down" fundamental frequency contour patterns

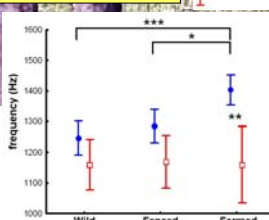


Duration

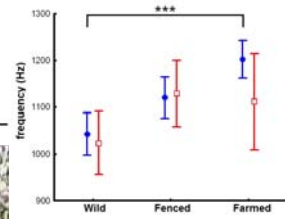
The peak frequency



The frequency of the plato



The mean frequency



Central points indicate mean values; whiskers show \pm SD. Tukey post-hoc results significant differences: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; stars with brackets indicate significant differences between populations; stars without brackets indicate significant differences between fundamental frequency contour patterns

Conclusions

- Siberian wapiti use calls with 3 main fundamental frequency contour patterns: "trapeze", "down" and "saddle".
- Deer, who live in farms, use shorter calls with higher f0 compared to free ranging animals.
- This could be related to better food availability and therefore better physical condition of farmed males as well as their elevated emotional arousal in dense surrounding of potential mates and male competitors.
- The presence of the additional low fundamental frequency is common for rutting calls of Siberian wapiti.