Wild boar: population estimation and searching for wild boar carcasses

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Why is necessary to estimate wild boar population density in locality with ASF?

- High population density means high risk of ASF spread in wild boar population

- The number of counted wild boars is important from the point of following steps of eradication

- In case of the Czech republic
  - hunting only by individual hunters
  - hunting by Police snipers

Wild boar monitoring in high risk locations

- Wild boar monitoring in forest stands – by phototraps
- Wild boar monitoring in maize and rape fields
  – by drones (UAVs)
- Monitoring was realized
  in spring and
  summer 2018 (low
  population density)

Monitoring by phototraps

- Processing the data – categorizing of the landscape (forest x agricultural landscape) in the high risk locality, sorting the forest areas according to acreage
- Forest area in fenced locality: ±1445 ha (high risk area was about 4 000 ha) → 1. May 2018 were in the locality randomly placed 14 phototraps
- UOV 595 HD (response 0.9 s, photo quality 12 MP)
- Monitoring ended at 25. July 2018 from several reasons

Monitoring by phototraps

- In total, 21 pictures of wild boars captured → after removing of duplicate individuals, 13 individuals were detected

	1	2	3	4	5	6	7
1. 5. - 23. 5.	0	0	0	0	0	0	0
24. 5. - 8. 6.	1*	0	0	0	0	0	stolen
8. 6. - 25. 7.	0	1▲; 2•	0	0	0	0	
25. 6. - 25. 7.	0	0	stolen	0	0	0	
	8	9	10	11	12	13	14
1. 5. - 23. 5.	1*; 1▲	2*	1*	0	0	0	0
24. 5. - 8. 6.	1*	1*; 1▲	3*	0	0	0	1▲
8. 6. - 25. 6.	1*	stolen	0	stolen	1▲; 1•	0	1▲
25. 6. - 25. 7.	0		0		0	0	1▲

▲ = adult; * = subadult; • = piglet

Wild boar monitoring by phototraps

- In the high risk area were captured 13 individuals → in average 0.93 wild boars per 1 phototrap in 86 days
- Control area – hunting district Rochlov in western part of Bohemia, randomly placed 10 phototraps (1 on area ±100 ha), captured 234 wild boar individuals, after removing duplications ±107 individuals → 10.7 wild boars on 1 phototrap in 3 months period (91 days)
- Simple conversion → in area with ASF was 11.5 times lower wild boar population density (± 0.48 ks/100 ha)

- **These results are only for forest areas!**

Wild boar monitoring by phototraps

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Wild boar UAV monitoring in agricultural crops

- Small drone Parrot thermal (± 600 g), equipped with thermal camera Flir One Pro with resolution of 160x120 pixels was used for monitoring.
- UAV could fly about 25 minutes on one battery set, drone is piloted through mobile phone or tablet with downloaded application FreeFlight Thermal
  - this small type of UAV equipped with Flir thermal camera costs about 2 000 – 3 000 €

- Profesional UAV was also used (HEXACOPTER GD HX-1100F ZODIAC UAV) equipped with Workswell camera (total costs about 21 000 €)

Wild boar UAV monitoring in agricultural crops

Wild boar UAV monitoring – rape and wheat fields

- Monitoring of rape crops was realized 21st and 29th of June

- In total, 56.2 ha of rape (21. 6.) and 69 ha of wheat + 7 ha of rape (29. 6.) were monitored

- Mostly only fallow deer and roe deer were monitored

Wild boar AUV monitoring – maize fields

- Monitoring of maize fields was realized in time period from 11st to 14th of August
- In fenced locality with high risk of ASF were totally 230.7 ha of maize; 156 ha (68 %) were monitored
- In maize fields was found 1 adult individual in field no. 2 and 1 adult female with 3 pigletts in field no. 6
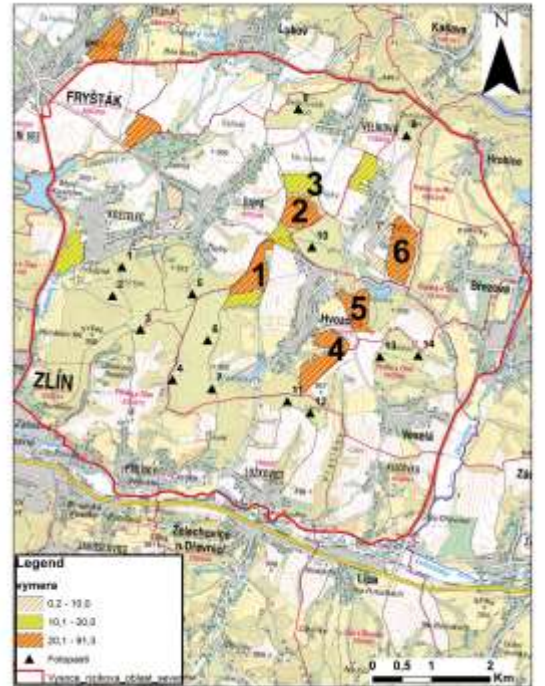
Wild boar AUV monitoring in agricultural crops

- Only few wild boar individuals were found in whole area, which corresponds with data from phototraps → it was not necessary to hunt wild boars in the high risk area by Police snipers

- UAV monitoring was realized after two peaks of ASF spreading

- The presented methods have been proven successful → wild boars could be in ASF areas monitored from the moment when the virus is found

- Based on the numbers of detected individuals, next steps of ASF eradication could be prepared
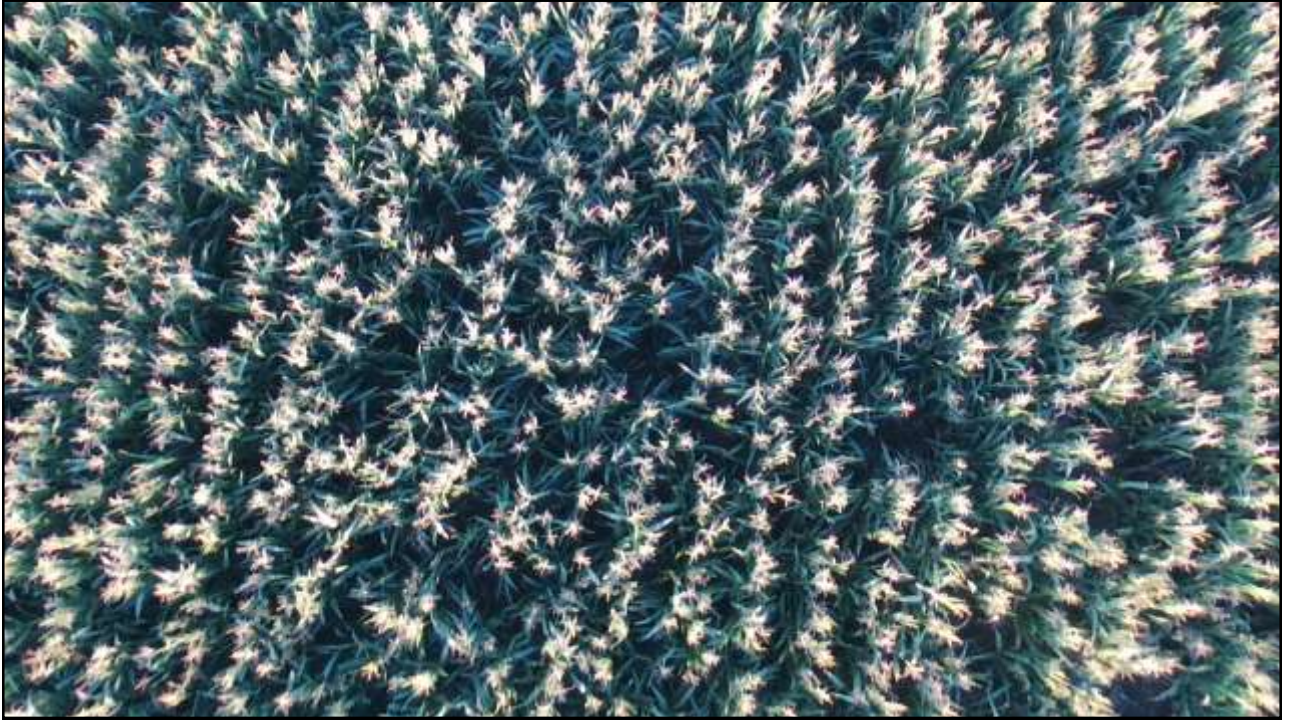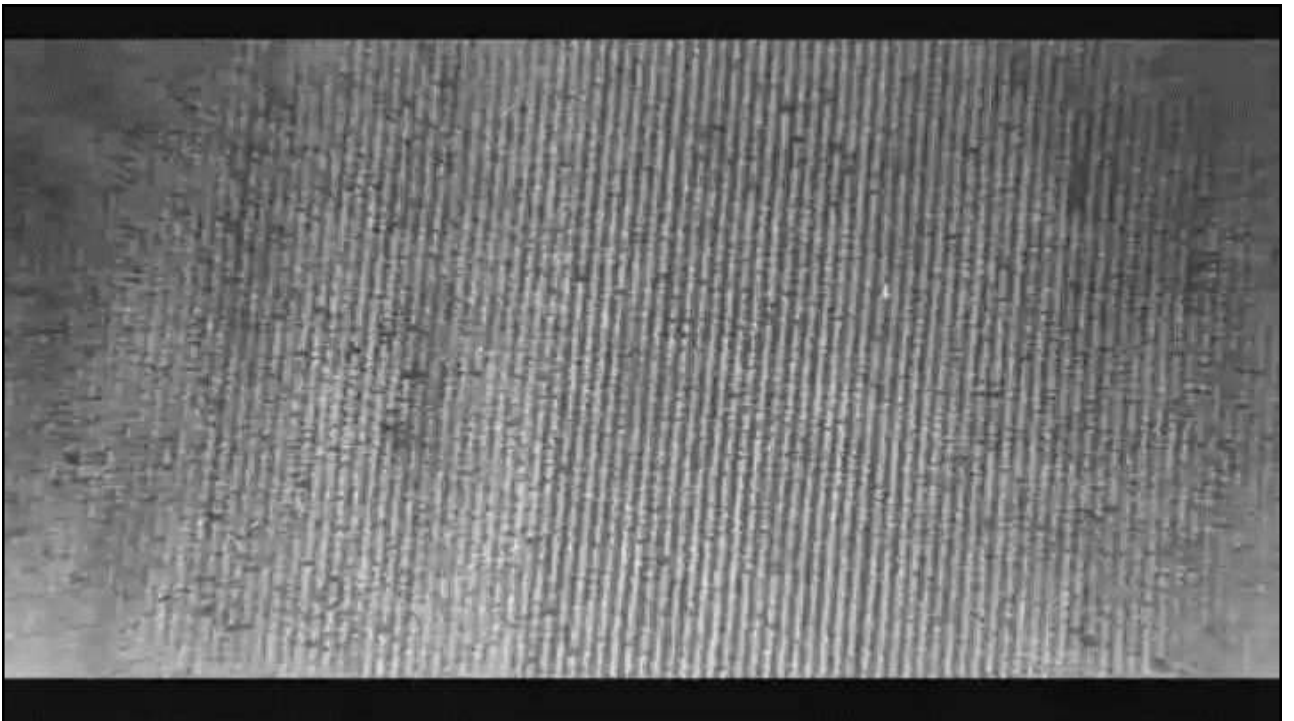
Evaluation of habitats with found carcasses

- In total, 497 wild boar carcasses were found in the Zlin region
- Wild boars killed by the vehicles (car, train) were excluded → 208 positive and 232 negative carcasses were analyzed
- Every GPS position of carcass was firstly sorted to three basic habitats: forest stands, agricultural land or wetland
- Secondly, the habitat was sorted from the point of forest cover in percent, age of forest stands, cover of scrubs in percent, height of herbs in cm, **distance from** water source, forest edge, roads and buildings

- Why we are searching? → positive carcasses are **resource of ASF**

## Evaluation of habitats with found carcasses

- Distribution functions were constructed to estimate effective value for searching of carcasses

- Linear regression analysis was performed to evaluate the relationship of carcass distance from water on mean temperature in the time of death

- The relationship between age and sex of found wild boars was evaluated by Principal Component Analysis (PCA)

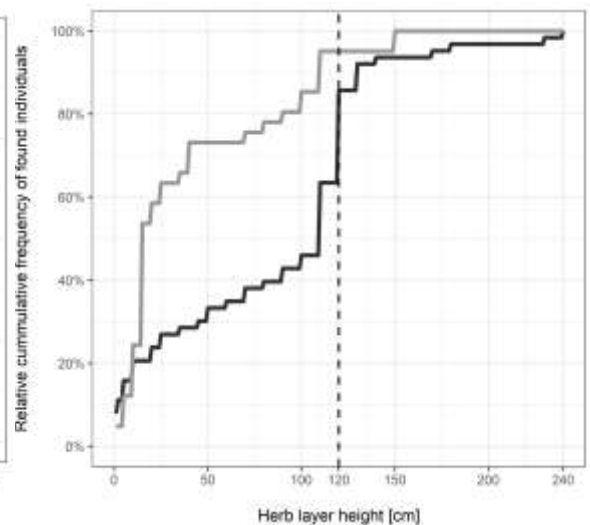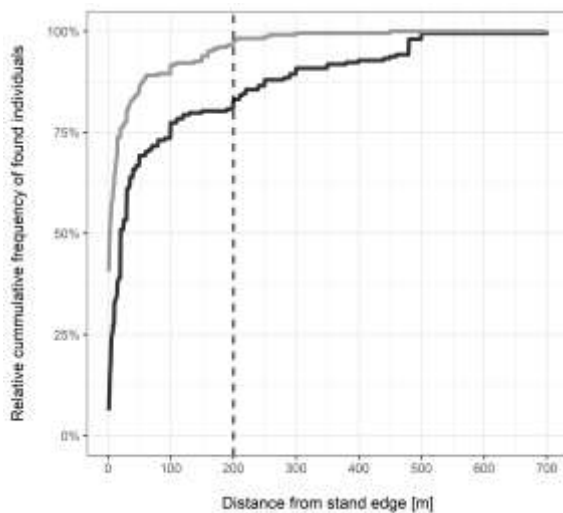## Evaluation of habitats with found carcasses

- About 71% of all analysed wild boar carcasses were found in the forest stands

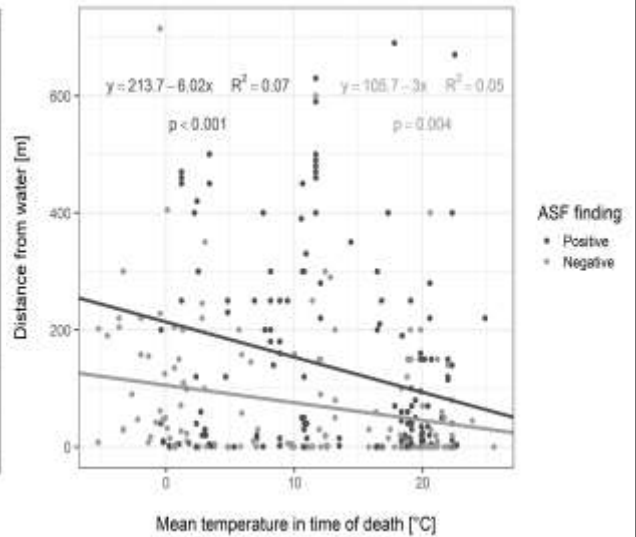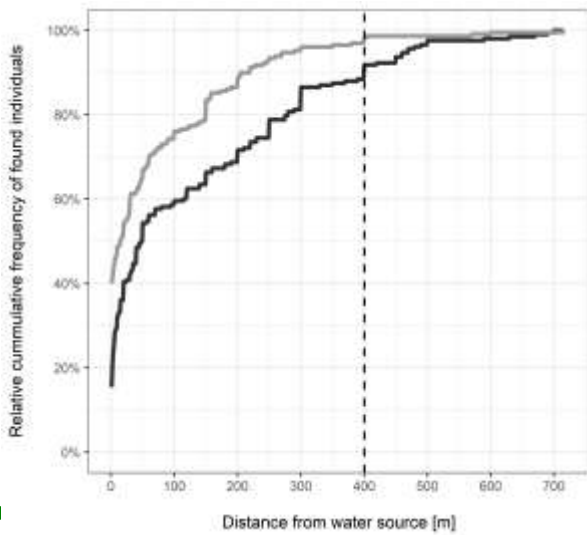|	Positive	Negative
Forest	136	178
Meadow	50	32
Wetland	6	9
Field	16	13

Carcases - the forest cover
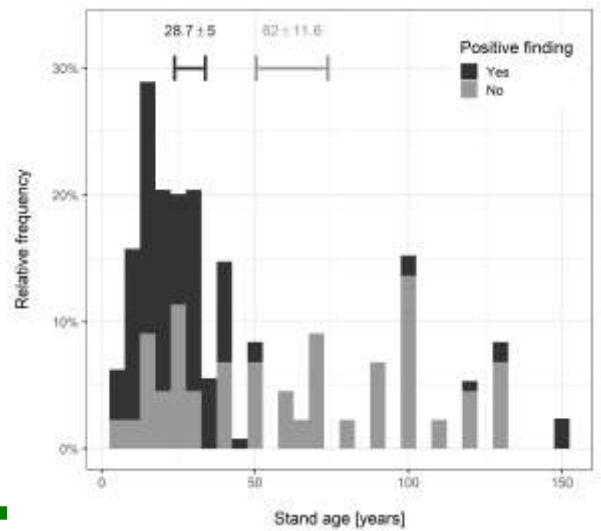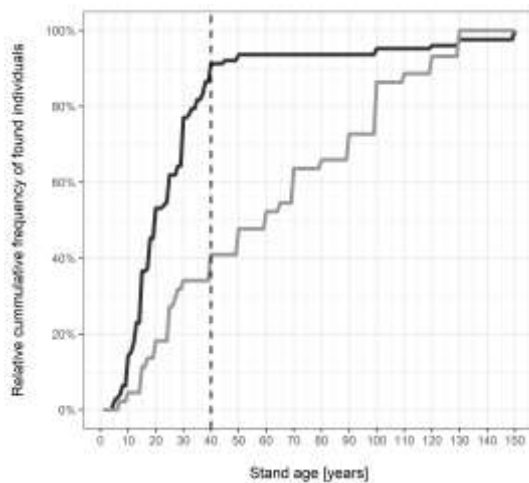
Carcases – forest edge and height of herb vegetation

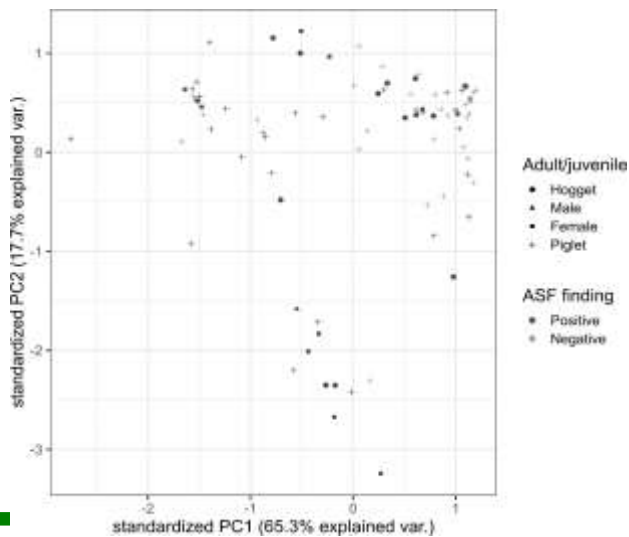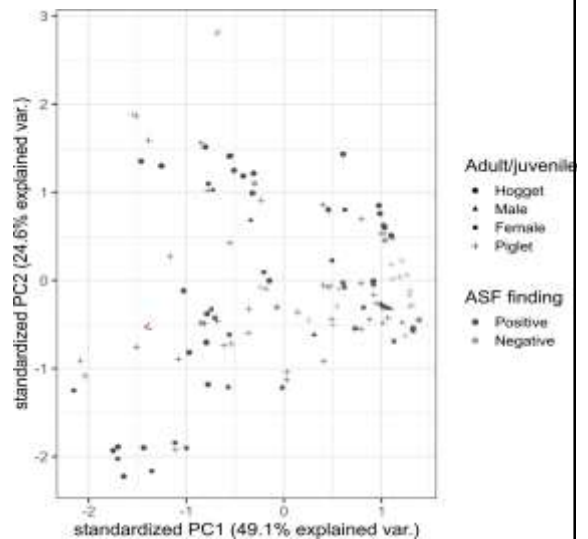# Carcases – distance from the water sources

Relationships between age and sex of found wild boars

Wild boar contacts with carcasses – first results

- For the monitoring of wild boar contacts with carcasses were on the 4th of July placed 5 hunted individuals (±50 kg) into the forest stands → **this results are only for summer season!**
- Wild boars were placed in 2 hunting districts in the central part of Bohemia into the prefered habitats (mostly young forest stands)
- Contacts were monitored on video recorded by phototraps UO Vision
- Next research focused on contacts in autumn, winter and spring season was realized, hovewer the dataset has not been collected yet

Wild boar contacts with carcasses – summer season

- Wild boar behaviour is different according to **phase of decomposition** of wild boar carcass and other factors
- Time to first capture of wild boar on phototrap was ± 9.4 days
- Time to first direct contact with carcass was about ± 22.2 days
- Behaviour process: **nosing → „digging around" → direct contact**

phototrap	date	Firstly captured wild boar	First contact with carcasses
1	4. 7.	8. 7. (4)	15. 7. (11)
2	4. 7.	14. 7. (10)	18. 7. (14)
3	4. 7.	13. 7. (9)	8. 8. (36)
4	4. 7.	8. 7. (4)	3. 8. (31)
5	4. 7.	24. 7. (20)	23. 7. (19)

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