

Exit strategy subgroup

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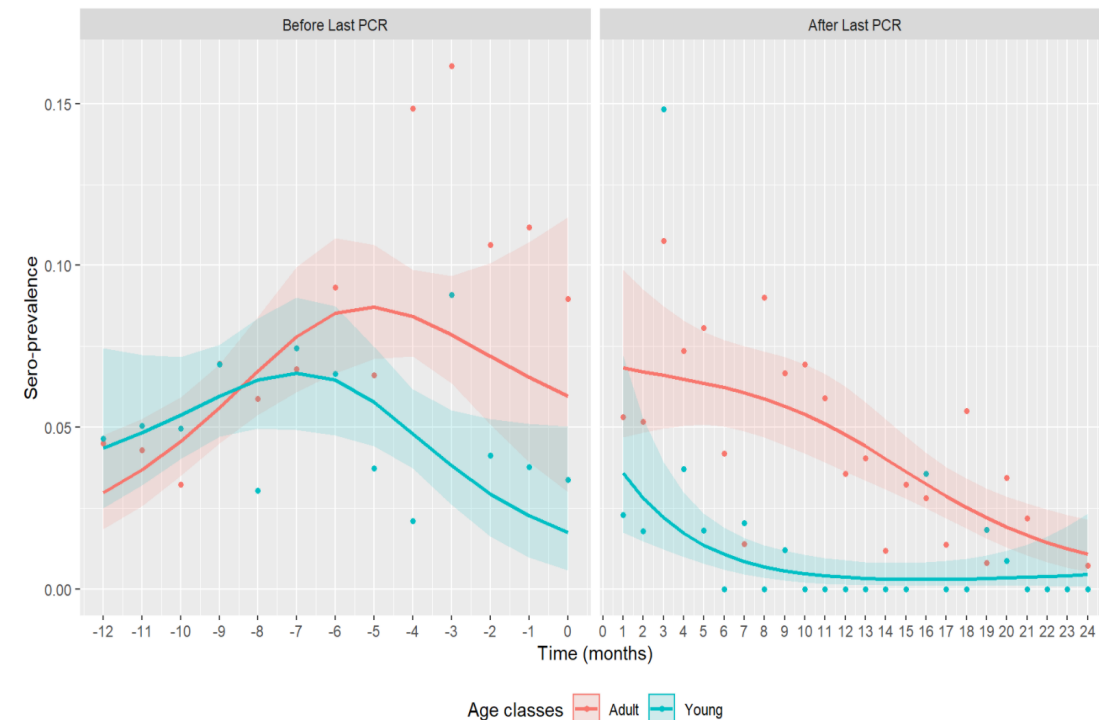
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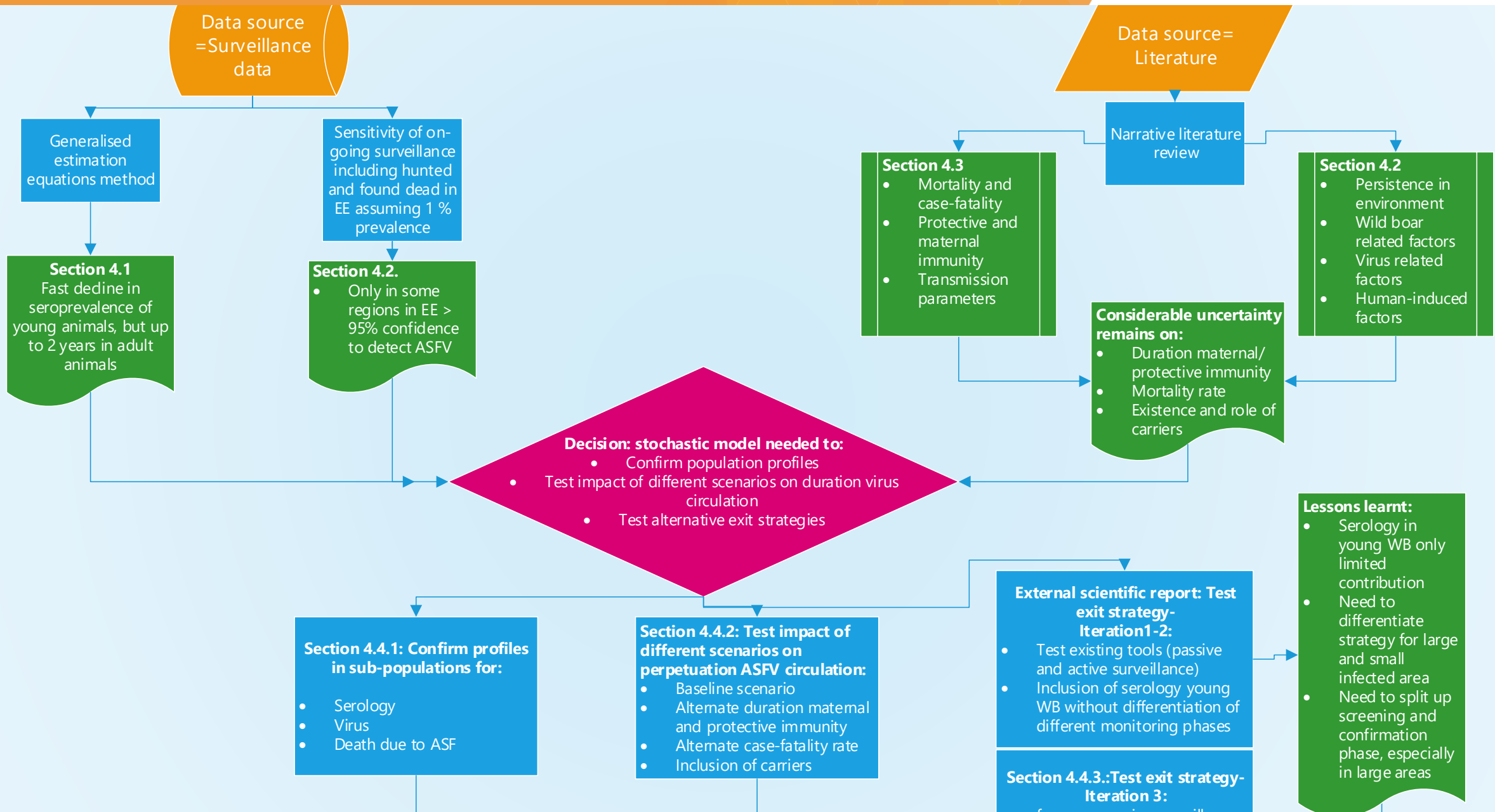
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Exit opinion – TOR's (in brief)

- Factors contributing to multiple years of ASFV circulation in countries under surveillance (persistence).
- Role of seropositive wild boar when ASFV is NOT detected for long period. How reliable are surveillance results?
- Pathways to exit of control status when ongoing surveillance outcomes do not detect any PCR positive samples



Methodological framework



4 Sections

Part 1: Exploring field data

- surveillance efforts & outcome, population profiles around last notification

Part 2: Literature study

- processes associated with prolonged virus circulation or long-term persistence

Part 3: Performance & caveats of exit strategy concepts

- 2-phase approach, alternative surveillance, uncertainty

Part 4: Results & Conclusions:

- Summary proposal for an exit strategy by alternative control scenarios

4 WPs (Chapters): short refresh + deal with solved comments + open discussion on further issues

Part 1: Exploring field data

- surveillance efforts & outcome, population profiles around last notification etc.

Part 2: Literature study

- processes associated with prolonged virus circulation or long-term persistence

Part 3: Performance & caveats of exit strategy concepts

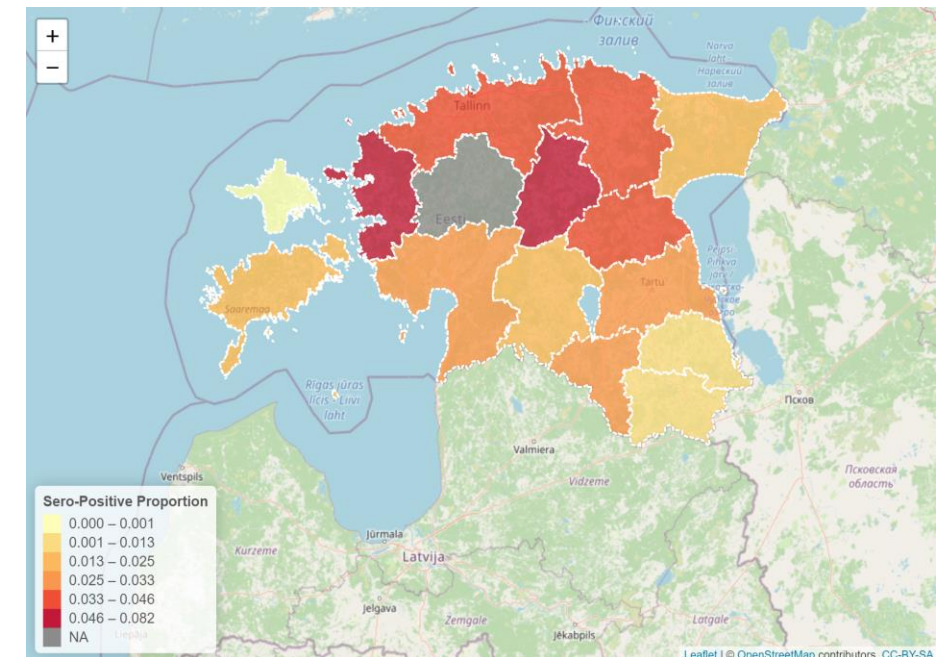
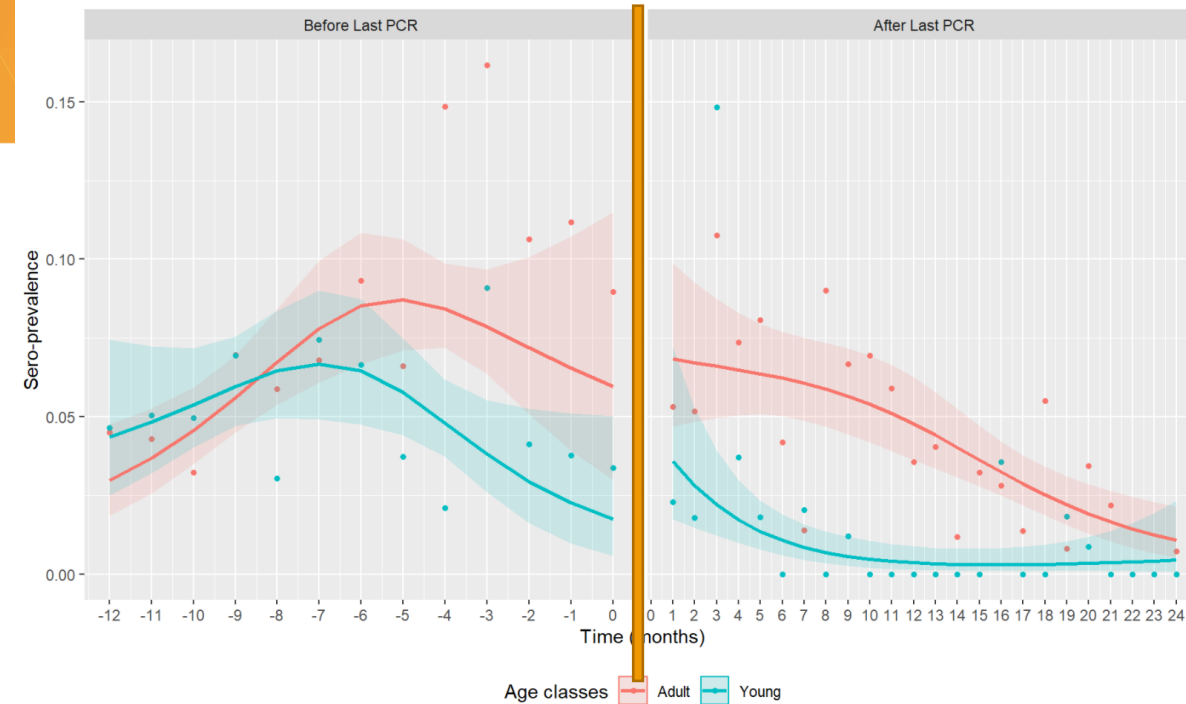
- 2-phase approach, alternative surveillance, uncertainty

Part 4: Results & Conclusions:

- Summary proposal for an exit strategy by alternative control scenarios

1. Exploration surveillance data

- Sample-based population profiles of
 - PCR+ wild boar
 - Sero-positive wild boar
 - Wild boar found dead
- Simulation-based population profiles (model-based)
 - Very low near extinction
 - Fast decline in sub-adult serology after extinction



2. Literature study

4 WPs (Chapters): short refresh + deal with solved comments + open discussion on further issues

Part 1: Exploring field data

- surveillance efforts & outcome, population profiles around last notification etc

Part 2: Literature study

- processes associated with prolonged virus circulation or long-term persistence

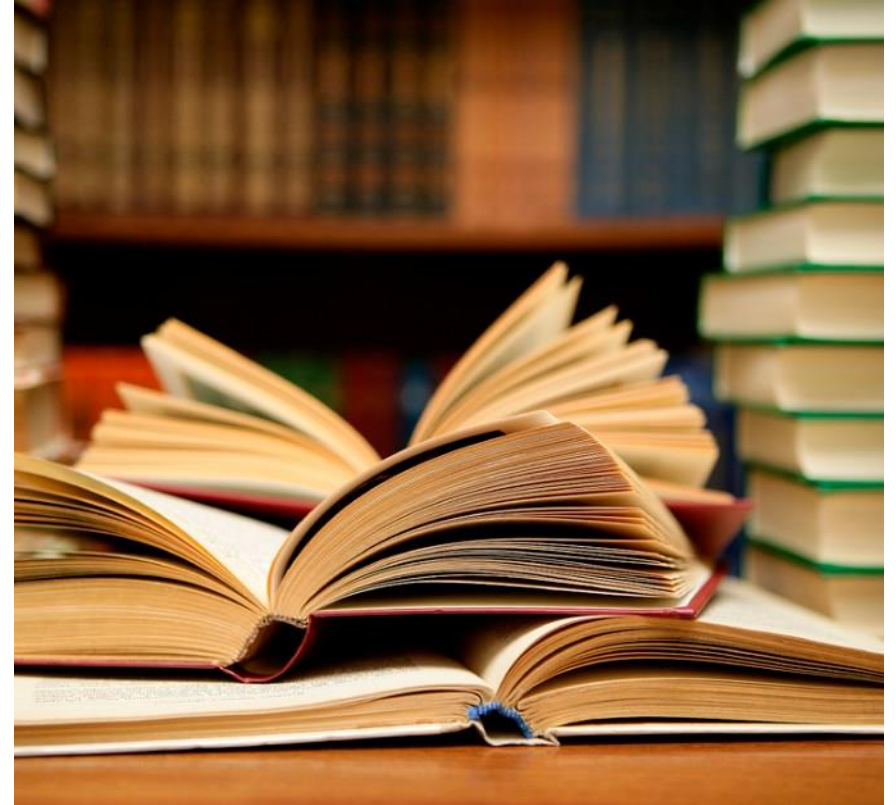
Part 3: Performance & caveats of exit strategy concepts

- 2-phase approach, alternative surveillance, uncertainty

Part 4: Results & Conclusions:

- Summary proposal for an exit strategy by alternative control scenarios

- Narrative literature review
 - Case fatality rate
 - Prolonged infectiousness / carriers
 - Vanishing immunity / Maternal antibodies
 - Human-induced factors
 - Mechanical vectors
- Circulation time with & without mechanism (model-based)
 - Very-long infectiousness (months/years)



4 WPs (Chapters): short refresh + deal with solved comments + open discussion on further issues

Part 1: Exploring field data

- surveillance efforts & outcome, population profiles around last notification etc

Part 2: Literature study

- processes associated with prolonged virus circulation or long-term persistence

Part 3: Performance of stochastic model & caveats of exit strategy concepts

- 2-phase approach, alternative surveillance, uncertainty

Part 4: Results & Conclusions:

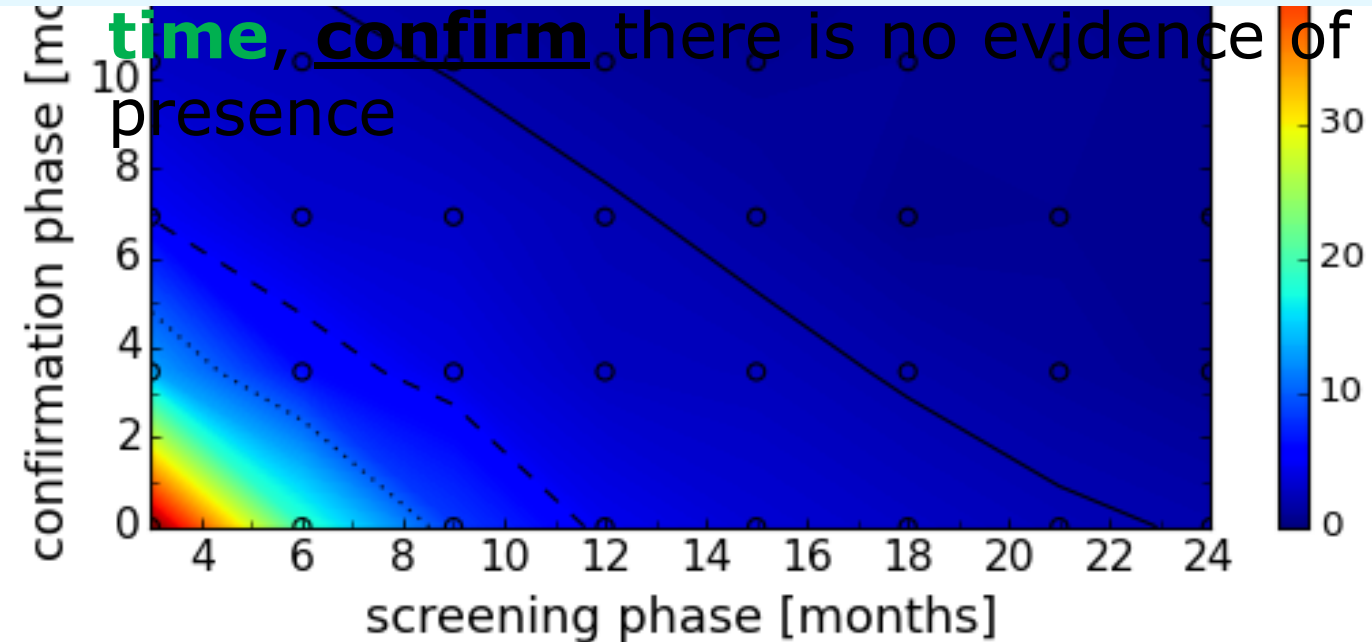
- Summary proposal for an exit strategy by alternative control scenarios

How reliable does the exit approach discriminate...

No fade out

Screening: **"low" effort long time, screen** virus circulation

Confirmation: **"high" targeted effort & short**



Fade out

Exit strategy I Freedom following eradication Scenario

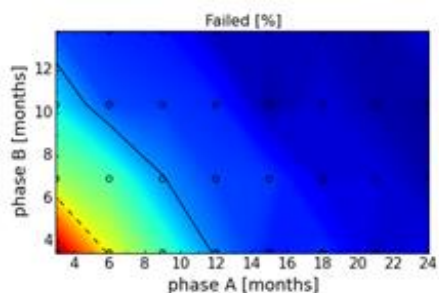


Figure 1 . SP 2% HB + CP 2% HB as carcass; no active surveillance

EXIT Strategy II: Freedom following control scenario

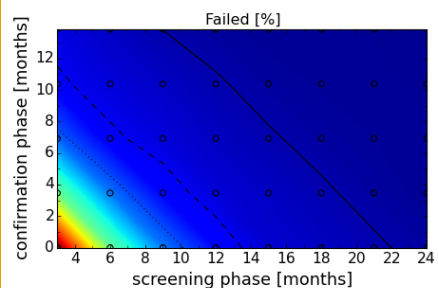


Figure 2a: SP 1 + CP 1 carcass; no serology

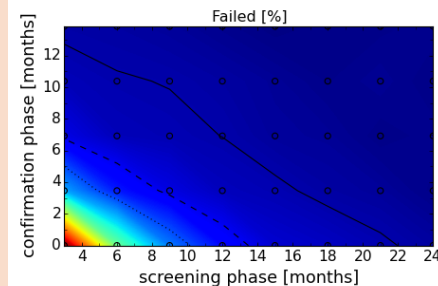


Figure 2b. SP 1 + CP 2 carcasses; no serology

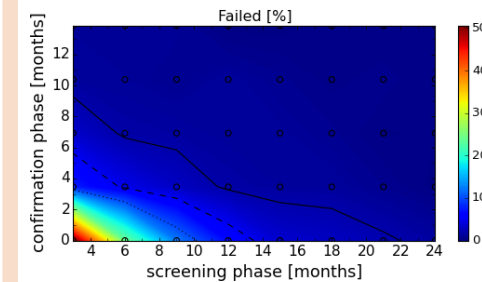
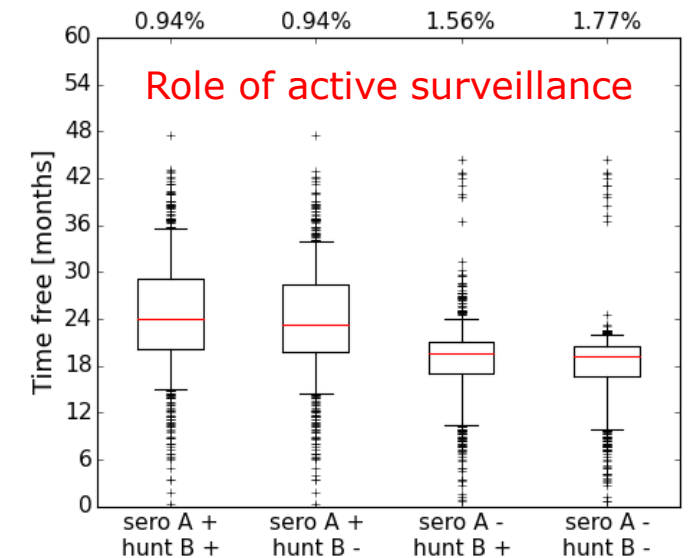
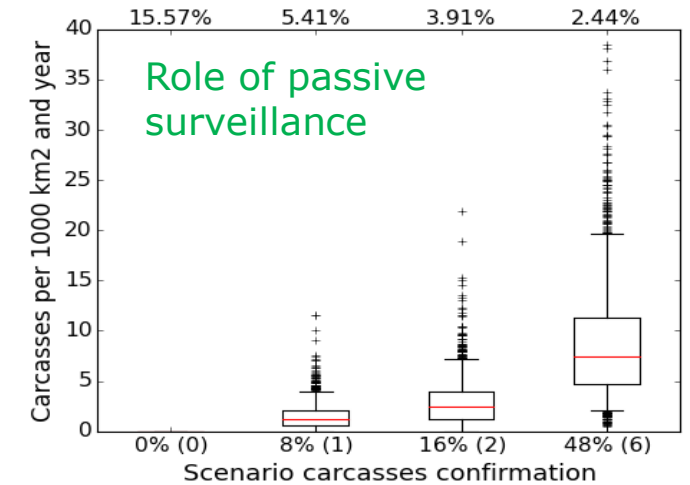


Figure 2c. SP 1 + CP 6 carcasses; no serology

- As a general principle, a two-phase approach (Screening Phase, Confirmation Phase) based on knowledge of virological and serological prevalence profiles.
- Example: after 9 months applying Exit strategy II's screening phase (including 1 carcass per 1000 km² per year one may need to monitor further 14 months in the Confirmation phase with 1 carcass per year and 1000 km² , 10 months with 2 carcasses, 6 months when collecting 6 carcasses

Performance and caveats of exit approaches

- Performance
 - Routine effort = reliable performance
 - More effort shorter monitoring period
- Caveats
 - Natural mortality in a population (higher = longer)
 - Lack of human translocations (lack = longer)
 - CARRIERS lifelong (1:100 exit does not work)
- No Caveat
 - Density! (the higher the more reliable)



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- Model simulations have been used to evaluate different Exit Strategy options, which vary by surveillance options and intensity, and the length of the monitoring period during each phase.
- Each option was assessed in terms of performance (failure rate, being the per cent of simulations for which it was falsely concluded that virus is absent) and monitoring time
- The accuracy of the Exit Strategy approach to demonstrate freedom of ASFV circulation in a wild boar population is increased with an increasing number of carcasses being routinely collected and tested.
- The exit Strategy will only be feasible if the duration and intensity of the passive surveillance can be sustained under field conditions. This is most likely to be achieved with a longer monitoring phase during routine surveillance effort (the Screening Phase) and a shorter monitoring phase of increased surveillance effort (the Confirmation Phase).

- Lengthening of the monitoring periods leads to an improvement in Exit Strategy performance; however, this performance improvement should be reasonably balanced against an unnecessary prolonged 'time free' with only a marginal gain in performance of the Exit Strategy.
- Increased intensity of passive surveillance is associated with a substantial increase in Exit Strategy performance.
- In general, the inclusion of active surveillance in the Exit Strategy has very limited impact on the performance compared with a lengthening the overall monitoring period.
- A declining seroprevalence in sub-adults can add information about the fade-out of the epidemic and trigger the decision to initiate the Exit Strategy, however, including this surveillance activity during the Exit Strategy only marginally improves its performance. This is because information from sub-adult serology will be redundant in the presence of robust passive surveillance.
- An Exit Strategy is problematic in the presence of lifelong infectious carrier animals. That said, it should be emphasised that the existence of such carriers is speculative, based on current knowledge.

- Higher natural mortality that is not caused by ASF or hunting reduces the probability of finding infected carcasses in an affected area, and therefore reduces the performance of passive surveillance. If there were uncertainty about natural mortality rates in a region, a conservative exit criterion would be advisable that can be derived from model outputs using the upper bound of natural mortality (i.e. 80% mortality due to hunting and 20% due to natural mortality).
- Depending on the epidemiological situation, if PCR-positive, skeletonised carcass remains are detected, it is recommended that virus isolation is performed to verify the viability of the virus. This is because PCR is able to detect the virus genome even if the virus is no longer viable/infectious.
- It is rarely possible to accurately determine the date of death of animals on the basis of skeletal remains.
- Animals killed in car accidents should be considered as hunted animals in the Exit Strategy.
- The Exit Strategy recommendations were formulated per 1,000 km² and therefore need to be scaled with the size of the specific region of application. It is expected that the samples are distributed as evenly as possible in time and space in order to provide a good representation of the wild boar population of interest.

- persistence of maternal antibodies against ASFV and the duration of the immunity in survivors;
- long-term transmission of ASFV by wild boar surviving infection (e.g. possible carriers, virus shedders);
- duration of the infectiveness of the environment contaminated with ASFV, role of the environment as a source of the infection for wild boar and domestic pigs;
- role of vectors, mainly arthropods, in mechanic or biologic transmission of ASF in the EU.
- reduction of ASFV virulence due to long-term exposure (i.e. Sardinia) and circulation of less virulent strains



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Question

Carcass collection request by the strategy.

Phase	% mortality hunted/ % carcasse	Target number of carcass/1000 km ² per year	Number of carcasses available	% carcasses that have to be found (chance to find an individual carcass)
Screening	90% / 10%*	1	12.5	8%
Confirmation (2)	90% / 10% *	2	12.5	16%
Confirmation (6)	90% / 10% *	6	12.5	48%
Screening	80% / 20% **	1	25	4%
Confirmation	80% / 20% **	2	25	8%