Testing ash for resistance to dieback: an amateurish approach

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The work has been accomplished within the LIFE+ Nature project "Saving wooded Natura 2000 habitats from invasive alien fungi on the Island of Gotland, Sweden" (ELMIAS) (NAT/SE/001139) (years 2013-2018)

- coordinated by Swedish Forestry Agency
- tasks of Swedish University of Agricultural Sciences (SLU):

i) identify and map at least 100 presumably dieback-resistant *F. excelsior* genotypes native to Gotland;

ii) collect seeds from those;

iii) establish seed bank as a sawn plantation;

iv) monitor health status both of mapped "mother" trees and eventually emerging sawn seedlings in the plantation

An example of Natura 2000 site in Gotland: wooded meadow





Differences in susceptibility to dieback clearly manifested on a long-term basis



Identification and GPS-mapping of dieback-resistant genotypes





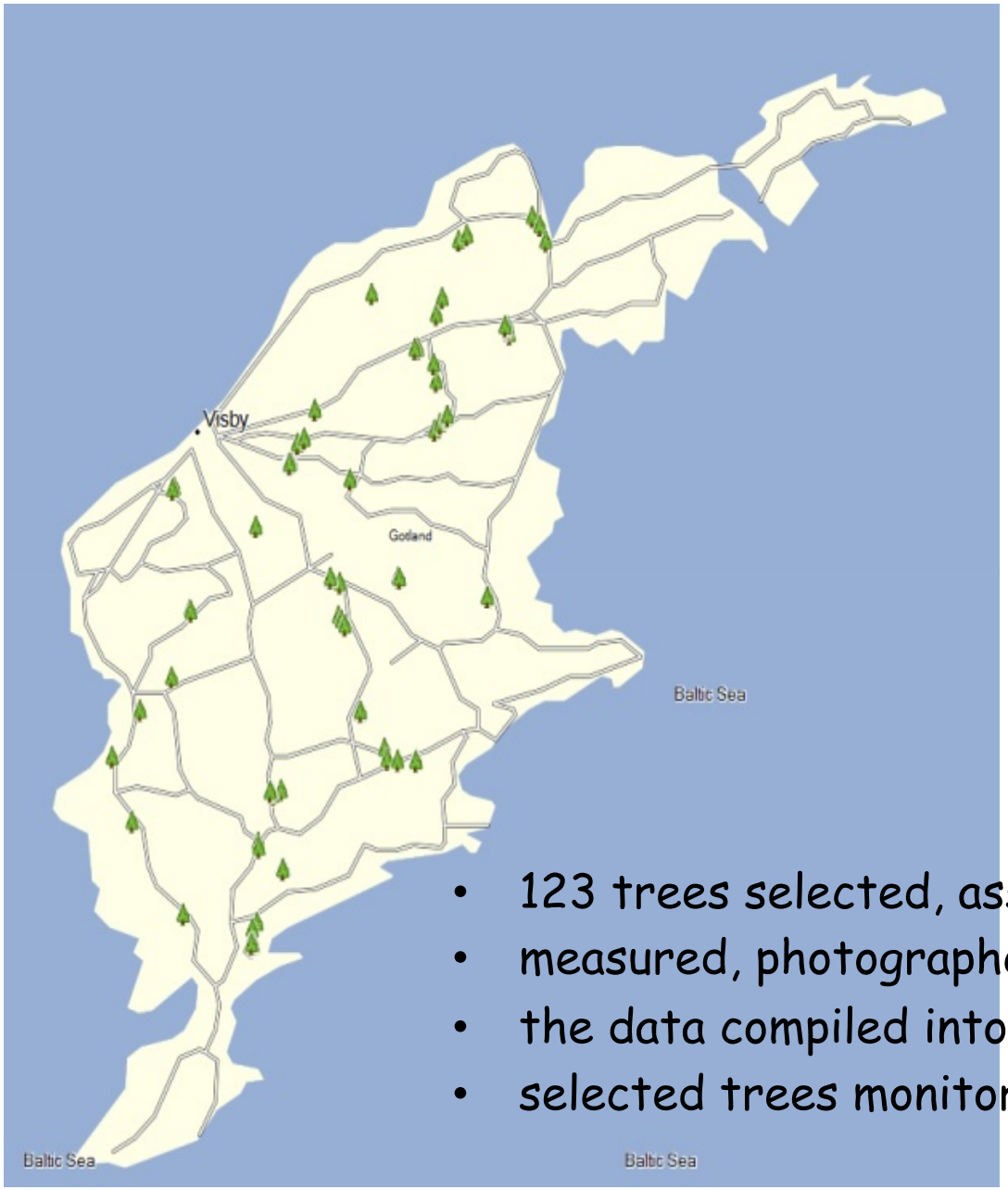


Criteria for selection: just two

1) Good-looking (symptomless)

2) Adjacent to ash trees killed by dieback long time ago (10 years or so)

Mapping (GPS, Gotland)



- 123 trees selected, assigned a unique ID and labelled
- measured, photographed and GPS recorded
- the data compiled into a database
- selected trees monitored for health status and vitality

Establishment of seed bank of dieback-resistant *F. excelsior*



1. Collection of seeds



2. Selection of site (former barley field) & 3. Seeds sown in massive amounts (September 2014)



… just after a year, by September 2015,
the results were just beautiful!



... only no ash ... (authorities)

… but after the second year, by September 2016, the results were not so charming …



... and no ash as well ...

Susceptible saplings smashed by ADB already during the 1st season



… consequently, in order to deliver deliverables of the ELMIAS project (A5. Establishing presumably dieback-resistant seed bank plantation), the following decisions / actions have been taken:

i) to plant on the site 2 – 3 year-old symptomless saplings excavated from forest stands of Gotland;

ii) "planting team" from the Latvian Forest Research Institute hired (buying services);

iii) in April 2017, plantation established composed of 1032 dug-out & planted saplings in 43 rows × 24 trees, spacing 3 × 3 m;

iv) "protection plates" against competing vegetation placed around each planted sapling.

Inventory of the plantation accomplished in mid-August 2017

i) each planted sapling assigned individual number and its location & health status recorded;

ii) health status accounted in three categories (this time the criteria were more sophisticated, as suggested by Jan):

0 – dead;

1 – living with dieback symptoms;

2 – symptomless;

(ev. damage by hare noted)

0- dead:
ADB





0- dead: hare damage



The terrible animal



1- living with dieback





1- living with dieback





2- no symptoms







2-despite:

i)dug-out;

ii)planting

iii)drought

iv)hare

... stress ...



… and then, sudden observation …

a) sawn?

b) planted



Another angle:

a) 1st year seedling looking better than b) the one from planted 2- symptomless category



… a closer look …



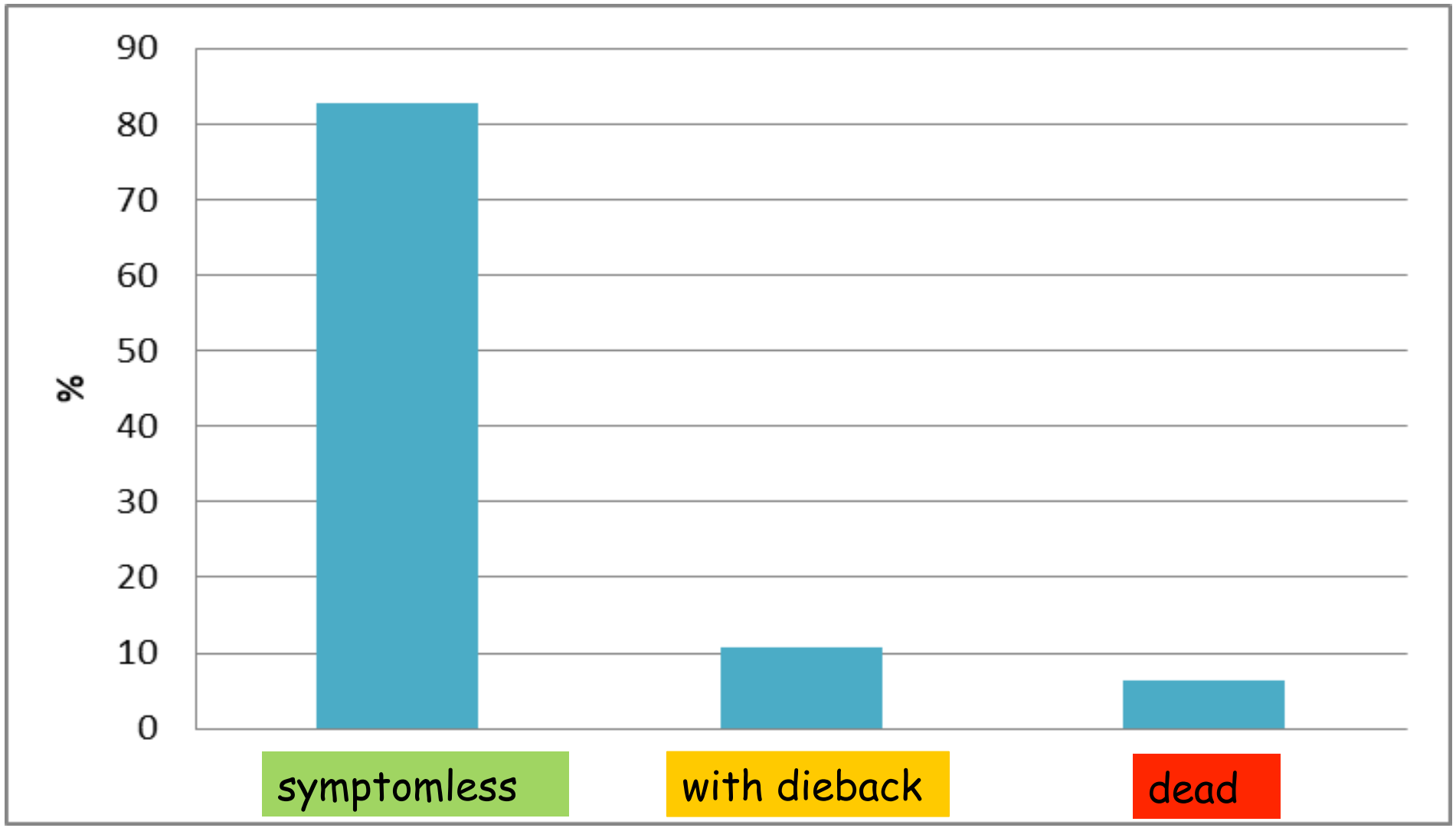
… then, numerous more closer looks …



each observed sawn ash:
category 2- symptomless



Results (of planted 1032, sawn excluded)



Fencing in and out …

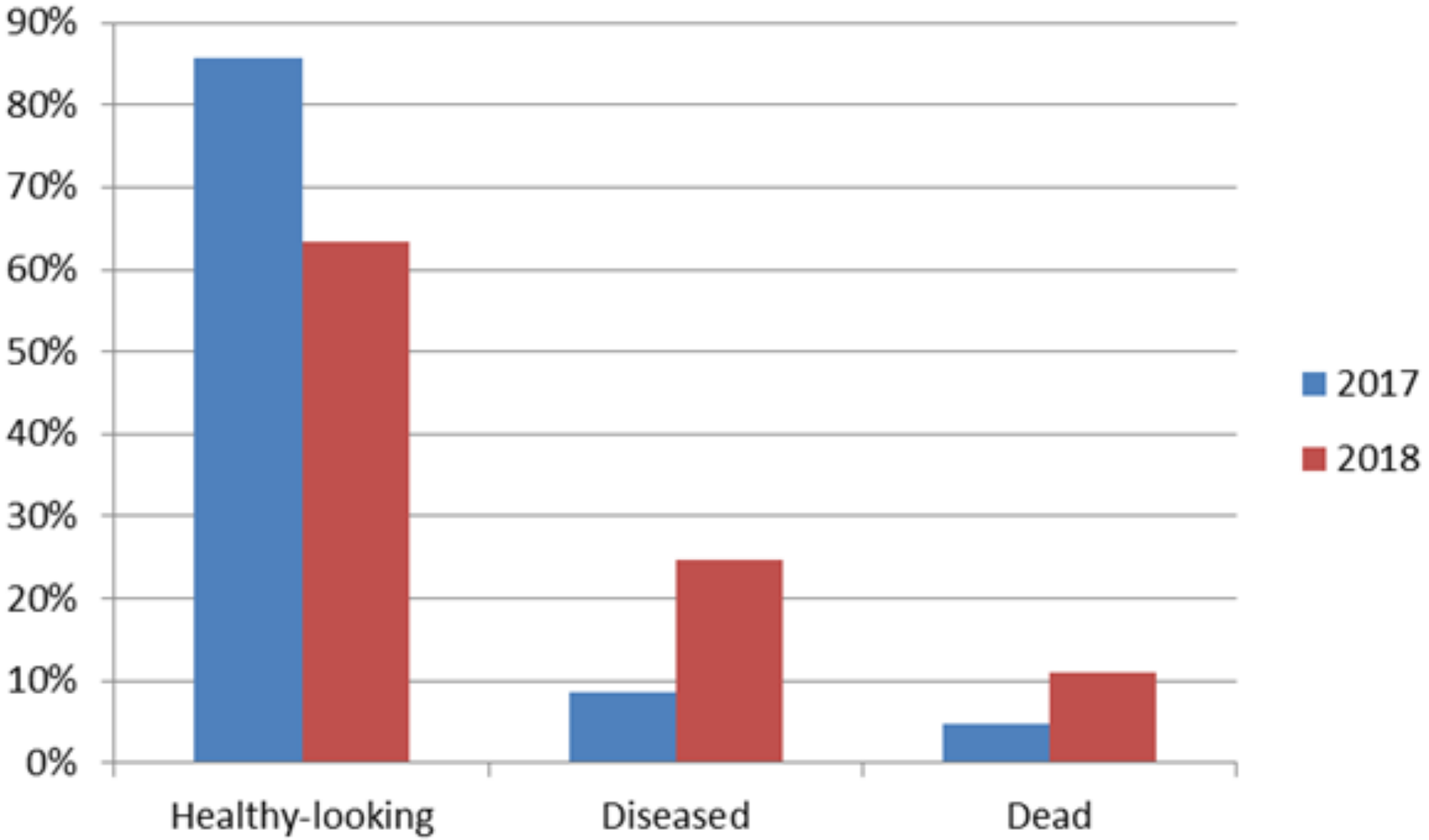




Record drought of 2018 (begining of August)



Results after 2nd year (of planted 1032)



Two year-old sawn: no ADB symptoms observed on any of those seen



Monitoring health status of 123 "mother" trees:

over three vegetation seasons mostly symptomless, and no one with over 10% defoliation



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