Speeding up the process:

Active vandalism can promote habitat diversity and associated biodiversity in managed forests and recent forest reserves

INTEGRATE webinar

28 sept 2020

How to integrate segregation in sustainable forest management: tools, scales and processes

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Loss – and regain of naturalness

Habitats & processes lost:

- Natural grazing regimes
- Wetlands
- Dead wood
- Veteran trees
- Glades & transitions

The ”beech forest project”

Aim: to provide evidence on management of forest biodiversity, based on multitaxa studies

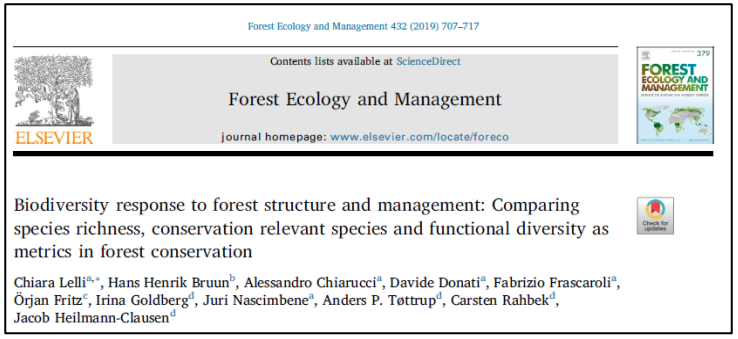
Period: 2014-2020

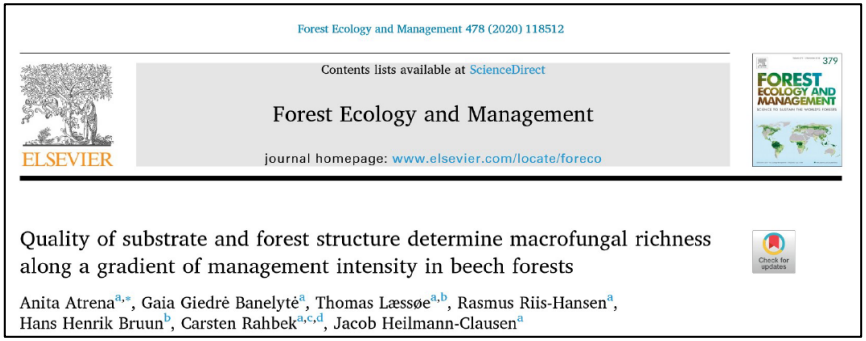
Supported by the 15. June Foundation

In partnership with the Danish State forests

Three components:

1) Experimental study
2) Gradient study
3) Outreach, symposia, workshops, handbook for managers





Project design

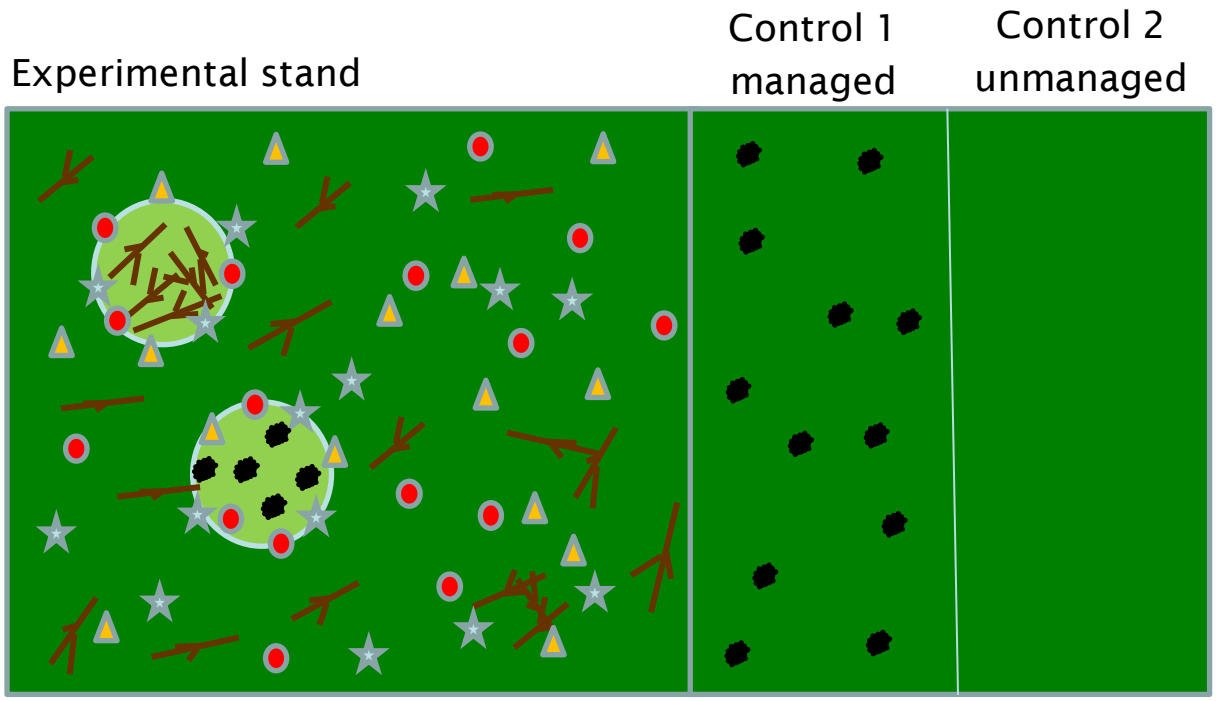
Site: Gribskov, 5600 ha

Beech on mull to mor soils (Habitat directive 9110 & 9130)

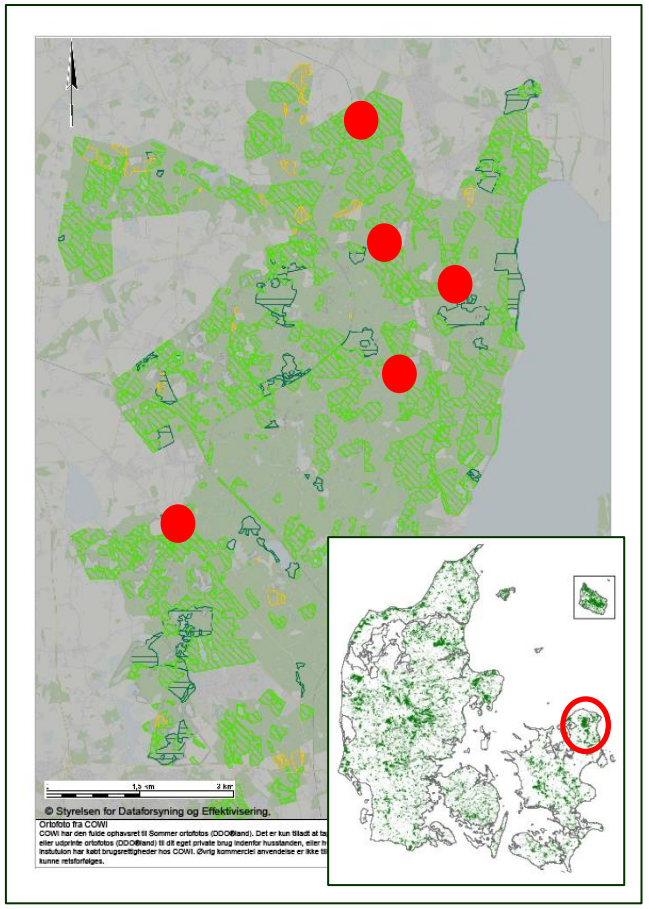
Five stands, each 10 ha

Even aged shelterwood system

Age: 90-110 yrs.



Principal design



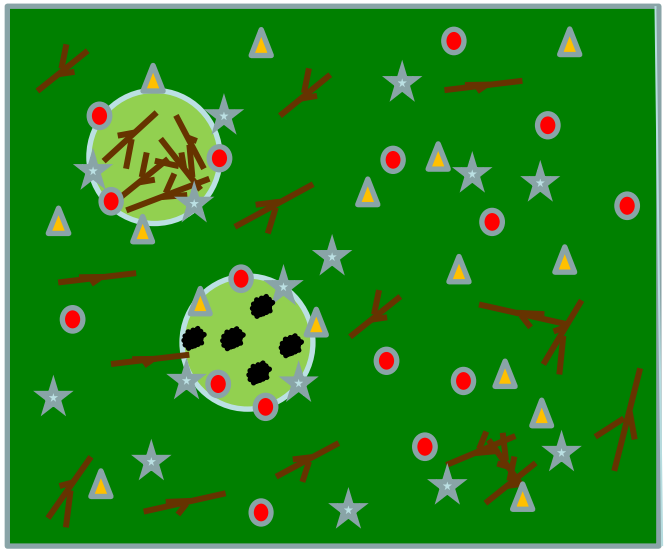
Treatments (2014-5)

Macroscale:

- Canopy gaps (diameter 40 m)

Micro scale:

- Felled trees
- Tree holes
- Ring-barkning
- Basal burning



5 ha experimental stand

Gaps x 2
(with/without dead wood)

Tree holes x 15

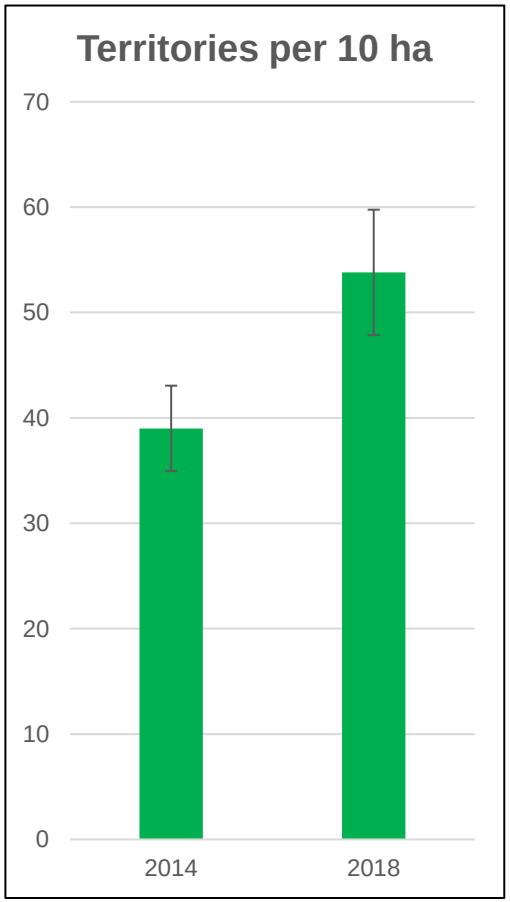
Ring-barking x 15

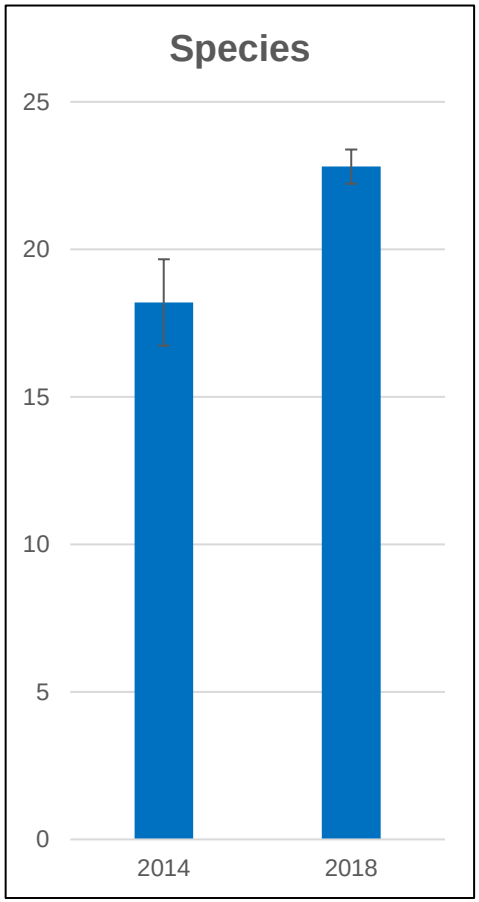
Basal burning x 15

Stand scale response: Birds 2018

38 % increase in breeding bird numbers

Species specific trends in numbers of territories per 10 ha:





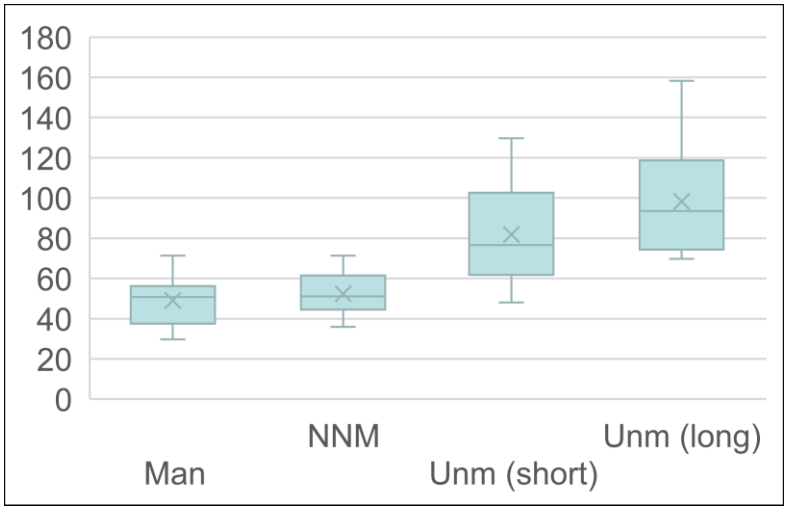
Columbo oenas: ½ - 3

Garrulus glandarius: 1 - 5

Sitta europaea: 4 - 15

Poecile palustris: 2 - 6

Troglodytes troglodytes: 8 - 18



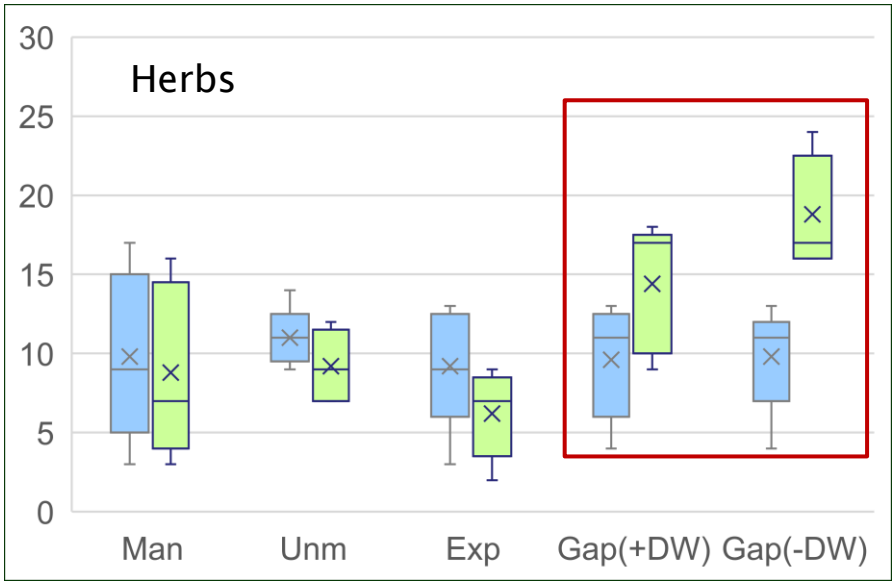
Treatment scale response: vegetation

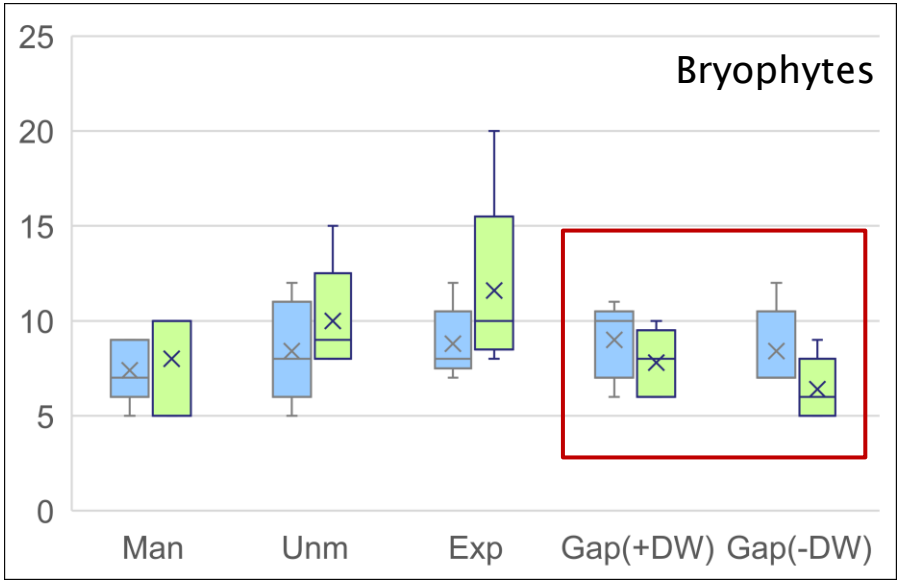
Gap creation enhances herb richness (92 % increase in Gap-DW))

But decreases bryophyte richness (24 % decrease in Gap-DW))

Pre treatment (2014)

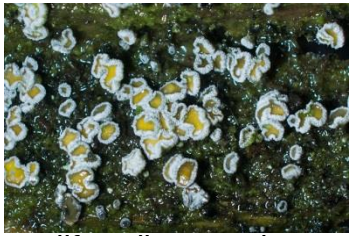
Post treatment (2018)





Tree level response: fungi & beetles 2017

Ring-barking (n = 75)
Relative cost per tree: 2.6
Fungal species: 18 (0 indicators*)
Beetle species: 117 (0 indicators)



Jens H. Petersen

Proliferodiscus pulveraceus

Tree holes (n = 69)
Relative cost per tree: 3.8
Fungal species: 34 (1 indicator)
Beetle species: 135 (9 indicators)

Ole Martin

Hypoxylon rubiginosum

Basal burning (n = 76)
Relative cost per tree: 1.2
Fungal species: 43 (5 indicators)
Beetle species: 127 (5 indicators)

Rasmus Riis Hansen

Coprinopsis angulatus

Felled tree (n = 117)
Relative cost per tree: 1
Fungal species: 104 (36 indicators)
Beetle species: 152 (21 indicators)

Arne Pedersen

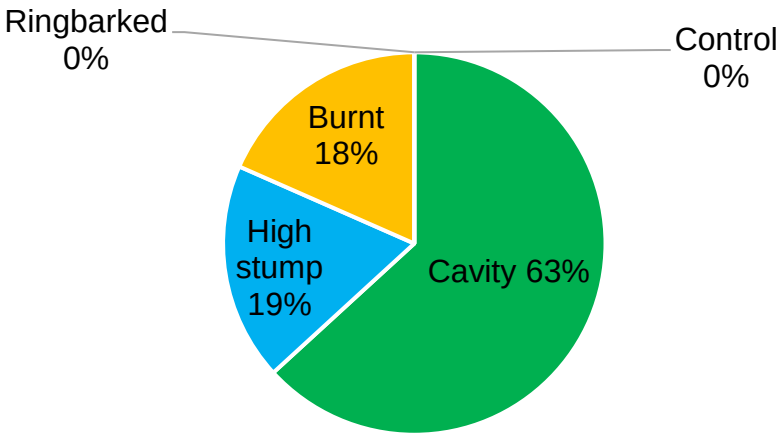
Hypoxylon fragiforme

*Based on indicator species analysis

Species specific responses: beetles

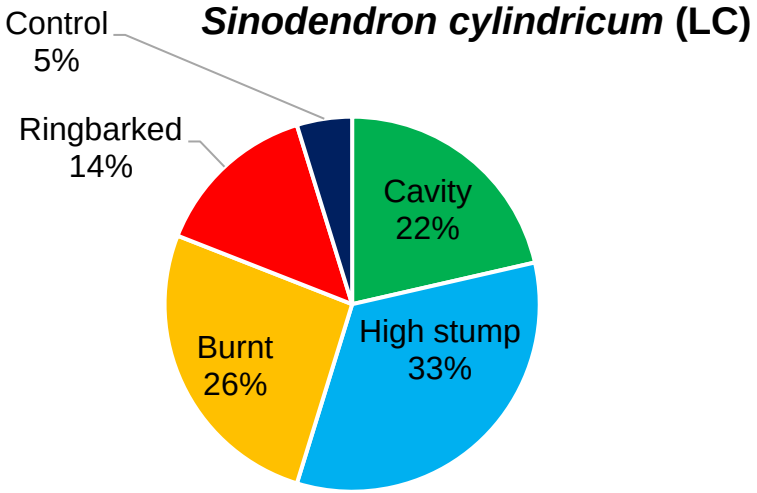
Six red-listed species, hereof one with more than five individuals

***Melasis buprestoides* (EN)**



125 individuals

***Sinodendron cylindricum* (LC)**



42 individuals

Short term conclusions

- ✓ Gap creation is an efficient tool to restore forest structure & dead wood, hereby increasing biodiversity
- ✓ Veteranization can promote threatened species
- ✓ Good supplementary tools to the recreation of natural hydrology and grazing regimes

Thanks for the attention

And to all project partners:

Kasper Grønbech Andersen, Hans Henrik Bruun, Jens Bjerregaard Christensen, Irina Goldberg, Rasmus Riis Hansen, Jan-Erik Løvgren, Carsten Rahbek, Niels Strange, Anders Tøttrup

Treatments10 yrs later (Halland, Sweden)