

# HOW TO HELP STAG BEETLES

A short guide to make our forested areas stag beetle friendly

people's  
trust for  
endangered  
species  
Bringing the wild back to life

RESEARCH INSTITUTE  
NATURE AND FOREST

## Threats related to forested areas:

The historic reduction of deciduous forests has had a strong effect on the local distribution and connectivity of the remaining populations. Secondly, the low availability of dead wood within these forests, limits the survival of stag beetle populations. Dead wood has become increasingly rare in managed forests, due to intensive management and especially salvage logging which aims to reduce pathogens or the fire risk. However, many pathogens are restricted to weakened or recently died trees while there predators often depend on dead wood and other saproxylic species. Furthermore, decaying wood being humid, appears to be poorly flammable. Finally, stump extraction forms a new threat for stag beetles as with this practice stumps are removed to be used as biomass. Veteran trees are often cut for public safety or to improve the forest production. These trees are important as they bear underground dead wood for the larvae as well as sap runs which are used as food source by adult beetles.



## Habitat requirements:

The low capacity of dispersal is one of the main reasons why this species is so strongly affected by the decrease and fast turnover of suitable dead wood within forested areas. Females often stay within 100 meters of the place where they emerged and colonization is therefore strongly limited to a few 100metres.

Another condition that affects the presence of the stag beetle is the sun exposure of the soil. It has emerged that stag beetles are forest edge species rather than a real forest inhabitants. They prefer open habitats with a warm microclimate and sandy and drier soils, which heats up faster. Also a steep south exposed slope is preferred over those exposed to the north. These habitat requirements are especially important in Northern Europe while the species might be found under more closed canopies towards southern areas. On the southern edge of the distribution, the species is even bound to north slopes as the southern slopes are warm as well. Especially in northern Europe, populations have been declining as the traditional management such as coppicing, grazing and pollarding had to make place for high forests managed for wood production, creating a more closed canopy. Main predators are corvids, owls, picids and wild boar. When overpopulated, corvids or wild boars can become problematic, the latter can dig out a lot of larvae and disturb the habitat.



# How to conserve stag beetles In forests?

- As stag beetle populations might be present quite locally, so it is good to first make a detailed survey of distribution of the species. Asking the broad public might be the best method.
- Guarantee and increase the connectivity between populations by creating dispersal corridors. Males, can fly up to 5km during their short adult life time, and therefore can ensure genetic connectivity. It is assumed that long distance male flights mainly occur along (inner) forest edges with a warm microclimate and a wind shelter. Consequently creating such corridors might stimulate male dispersal. For females, similar requirement might be needed. As they fly smaller distances, stepping stones with oviposition habitat need to be provided preferably every 100m and not more than 1km apart.
- Maintain a complex and heterogeneous vegetation structure, with uneven aged trees including some old trees, dead trees in different decaying stages and tree stumps to ensure habitat continuity of both sap runs and dead wood.
- Maintain a good amount of dead wood. For saproxylic organisms in general, a minimal of 30m<sup>3</sup> dead wood /ha is often advised. It is especially important for stag beetles to retain all stumps and other dead wood in or on top of the ground.
- During management activities, avoid removing, uprooting or damaging stumps, dead and senescent trees.
- Build log piles (see general folder for more info)



*Small scale coppice with standards on steep south exposed slope*



*Restored wood pasture*



*Coppice management of oak stools*

- Create a network of “senescence islets”, to preserve veteran trees and areas with large amount of dead wood. In these islets, trees can age naturally and dead wood is left. It is important that the areas for the islets are big enough or that plenty areas are chosen. By doing this enough spaces are included where future veteran trees can grow.
- Girdling non-native trees can be used to increase the amount of dead wood rapidly. However, diversity of saproxylic organisms on suddenly died trees is lower than on natural dying trees. Partial girdling or inoculation of mycelia are techniques that can be used to weaken trees first.
- Opening the canopy, especially on steep southern slopes or other places with a warm microclimate is important for the conservation of the stag beetle. This can include a small scale mixture of permanent open gaps, coppice or coppice with standard, grazing, islets of senescent and dead trees, combined with a lot of gradual internal or external forest edges (ecotones). This doesn't exclude that the rest of the forest can remain a closed canopy from which many other (saproxylic) species can benefit.
- Reinstalling grazing in wood pastures can open the canopy and remove competitors from veteran trees. Sometimes a start management is needed to gradually liberate the veteran trees from their competitors.
- Don't replant clear cuts immediately but wait about 10 years to allow some generations of stag beetle to use the stumps. This action will also benefit other species and allow natural generations to establish.
- Manage wild boars, corvids and other predators to a natural level.
- Educate visitors and managers about stag beetles and saproxylic fauna.
- As there is still a lot to learn about stag beetle conservation, involve researchers and include monitoring in your management plan.

Pictures and illustrations from: Kris Vandekerkhove, Yves Adams (Vilda), Lars Soerink (Vilda).