

The costs and benefits of Nordic carnivore conservation.

Conflicts and policy instruments

Anders Skonhoft, Department of Economics NTNU Trondheim

(Anders.skonhoft@svt.ntnu.no)

In very many instances, wild animals provide benefits for humans. Quite frequently, however, we may also find that these species incur economic costs. Rodents damaging agricultural production are a typical example. In other instances, wild animals are simultaneously a nuisance and valuable. Large herbivores, for example, may cause grazing damage, but provide value through hunting and trapping. Nuisance may also be channeled through ecological interaction. Some marine species are of this type, where whales, for example, prey upon or compete with commercially valuable species. This holds also for terrestrial animal species, for example where bear and wolves prey upon livestock in addition to wild ungulates.

In the middle of the 1960s, the grey wolf (*Canis lupus*) was regarded as functionally extinct in Sweden and Norway (the Scandinavian Peninsula). In the last part of the 1970s the first confirmed reproduction in 15 years was recorded. Today, the re-colonized wolf population in Scandinavia numbers some few hundred individuals which live in small family groups, or packs, in the western-central part of Sweden and along the border area between Sweden and Norway. Although the wolf population is small in number, the wolf population is associated with several conflicts where the most important is related to predation on livestock, and particularly sheep.

This paper analyses the costs and benefits of this conflict where the efficiency of certain policy instruments are studied. We start to analyze the sheep stocking problem of the individual farmer without predation. We proceed to solve the stocking problem when predation is present, and where we look at the situation where the farmer may, or may not, use effort to protect animals from predation. Compensation for the predation loss for the farmer is then introduced, and this is studied when the per animal loss compensation is less than the slaughter value (market value) of the animals. Additionally, the farmer is given a fixed transfer ('lump sum') because the farmer by law should be given full compensation for the predation loss.

In the last part of the paper 'The Directorate for Natural Resource Management' (DN) is introduced. DN may control the wolf population and may choose between different compensation menus, i.e., mixes of per animal compensation value and size of the lump sum transfer. The interaction between the farmers and DN is formulated as a Stackelberg game where DN first determines the compensation menu while controlling the size of the wolf population. Next, the farmer determines the stocking rate and protecting effort use.