

A long-term study of size variation in Northern Goshawk *Accipiter gentilis* across Scandinavia, with a focus on Norway

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Abstract

Changing climate and growing human impacts are resulting in globally rising temperatures and the widespread loss of habitats. How species will adapt to these changes is not well understood. The Northern Goshawk (*Accipiter gentilis*) can be found across the Holarctic but is coming under more intense pressure in many places. Studies of recent populations in Finland and Denmark have shown a marked decline in body size of Northern Goshawks over the past century. Here we investigate long-term changes to Norwegian populations of Northern Goshawk by including material from the Middle Ages and Viking Age. We measured 240 skeletons of modern Northern Goshawks from Norway, Sweden, Denmark and Finland, and 89 Medieval Goshawk bones. Our results show that Norwegian and Swedish female Goshawks have decreased in size over the past century, whilst males showed little decline. Medieval female Goshawks were larger than contemporary females. The Viking Age specimens showed little difference to modern populations but appeared smaller than specimens from the Medieval period. A decline in forest habitats and a concomitant shift towards smaller prey likely drove a shift to smaller body size in Northern Goshawks. Our study shows that significant body size changes in birds can occur over relatively short time spans in response to environmental factors, and that these effects can sometimes differ between sexes.

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