



Greenland White-fronted Geese: arctic changes give exceptional temperate conservation challenges

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The single population of Greenland White-fronted Geese *Anser albifrons* breeds in west Greenland and migrates through Iceland to over-winter in western Britain and Ireland. It has been the subject of detailed monitoring since the early 1980s through twice-yearly, internationally co-ordinated censuses of all wintering sites, organized in Ireland by the National Parks and Wildlife Service and in Britain by the Greenland White-fronted Goose Study (e.g. Fox *et al.* 2013).

As described by Fox *et al.* (in press), this detailed demographic monitoring has documented a recovery of the population, following legal protection in 1982 in UK and Ireland, to a peak of 35 692 in 1999. A rapid decline followed – to 22 156 in 2013 (Fig. 1). As a consequence of this rate of decline and small population size, the Geese are globally threatened and categorized as Endangered using IUCN criteria.

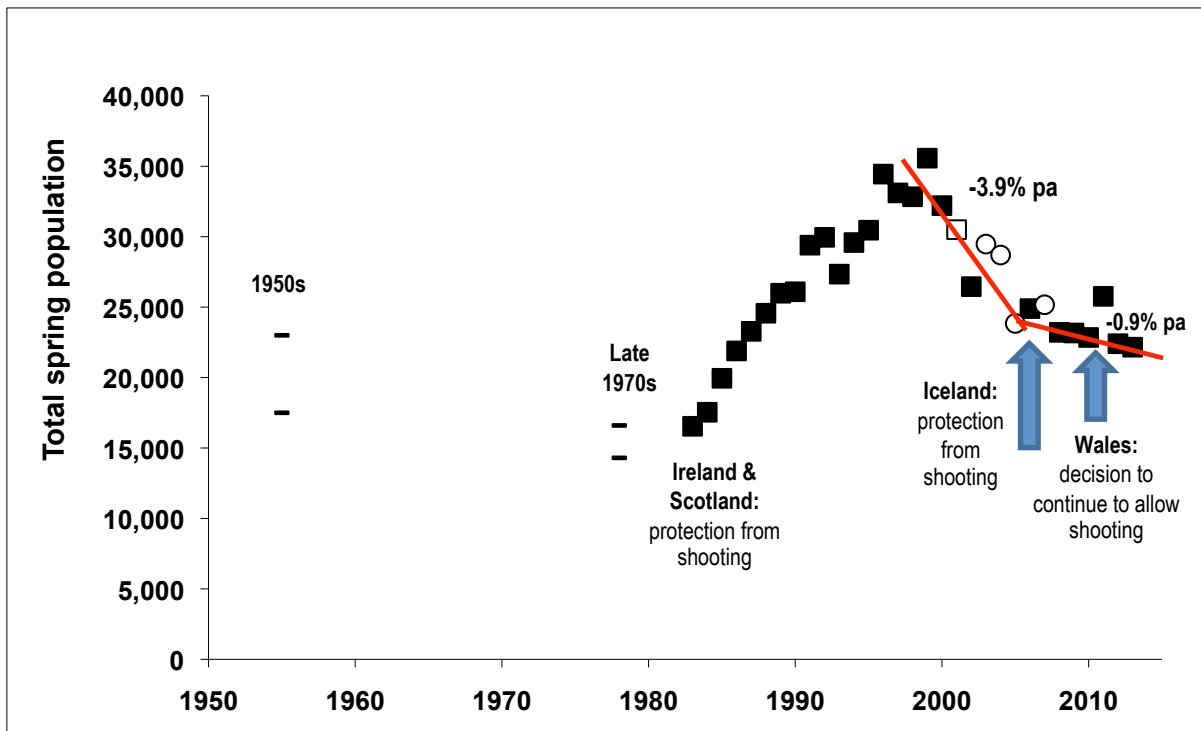


Figure 1 Global population trend of Greenland White-fronted Geese (from Stroud *et al.* 2012, Fox *et al.* 2013)



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The cause of the decline is consistently low productivity. Whilst adult mortality has been calculated from observations of marked Geese at c.16–17% (A. D. Fox unpubl. data), in recent years productivity has been typically <10%, sometimes as low as 5% (Stroud *et al.* 2012). The decline in productivity has been most marked at the main Irish haunt at Wexford Slobs, although unlike the main Scottish wintering area on Islay, numbers at Wexford have declined to a much smaller extent – indicating immigration from other wintering sites.

Reduced production is most likely to be caused by factors impairing the ability of female Geese to restore energetic and nutrient condition on arrival on the breeding areas after a trans-icecap migration from Iceland. These factors are thought to be either high quantities of late spring snowfall (Boyd & Fox 2008) restricting access to critically important early-season lowland feeding sites (Glahder *et al.* 2002) or competition with an increasing population of Canada Geese *Branta canadensis interior* (Fox *et al.* 2011) at those same areas. The relative importance of those factors is unknown but they are likely to act in combination.

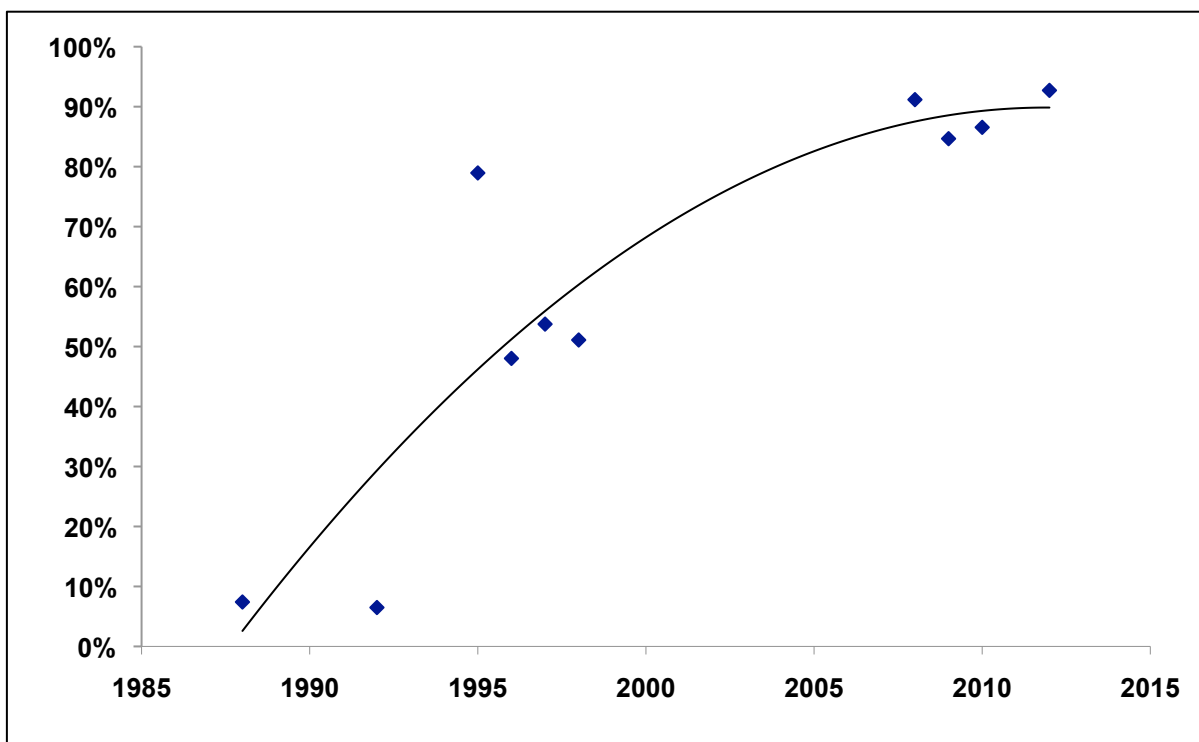


Figure 2 Proportion of moulting geese counted in Isunngua, west Greenland, that are Canada Geese. Updated from Stroud (2011).

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Typically high April/May snowfall has occurred since c.1995 as a result of a switch of the Atlantic Multidecadal Oscillation (AMO) from negative to positive phase (Boyd & Fox 2008), whilst Canada Geese have colonized west Greenland since the late 1980s (Stroud 2011; Fox *et al.* 2011).

Census counts in Isunngua (67°05'N, 50°30'W) between 1988 and 2012 have shown almost the complete local replacement of Greenland White-fronted Geese by Canada Geese (Fig. 2; Stroud 2011; our unpublished data).

In 2007, Greenland White-fronted Geese were added by Scottish Natural Heritage to their list of priority species on Scotland's *Species Action Framework*. This facilitated resources to help develop an international species Action Plan under the African–Eurasian Waterbird Agreement – AEWA (Urquhart *et al.* in press), which was formally adopted in 2012 (Stroud *et al.* 2012).

The Plan's top priority is:

“to investigate the factors acting on geese on the breeding grounds that are responsible for currently reducing the annual production of young.”

But it also recognized that:

“Even knowing the causes of low productivity however, it is unlikely that reproductive success can be enhanced in the short-term. Accordingly it is essential that measures are also taken to:

- ensure that geese arrive in Greenland in optimal condition for successful breeding;
- minimise additional sources of mortality;
- minimise impacts on geese at local scales (such as disturbance or changes in habitat) particularly with regard to smaller flocks, .. so as to avoid further flock extinctions and thus further contractions of range; and
- maintain and further develop monitoring and research programmes... .”

It is hard to see what practical (feasible and sustainable) conservation actions in Greenland could be taken to enhance reproductive output at a population scale. Regional snowfall patterns determined by the AMO are wide-scale and control of increasing numbers of Canada Geese at multiple lowland feeding sites is impractical.



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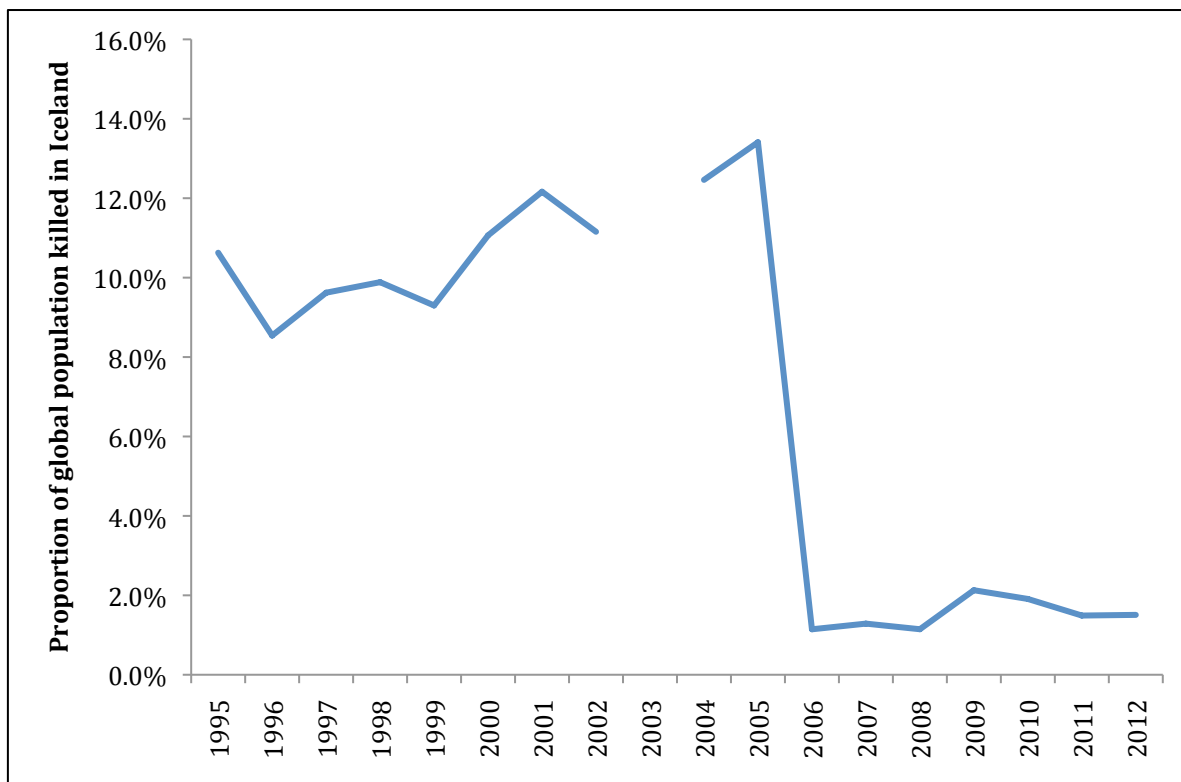


Figure 3 Proportion of global population shot on autumn passage in Iceland. Source: Iceland shooting statistics – <http://ust.is/einstaklingar/veidi/veiditolur>

Protection from shooting during autumnal staging in Iceland from September 2006 has undoubtedly slowed the rate of decline where over 13% of the population was being shot prior to protection (2005). However, the reported illegal kill alone was over 2% in 2009 (493 of 23 163; Fig. 3) – still an unacceptably high addition to mortality. The more recent decision of the Welsh Government not to provide protection in Wales (counter to UK obligations under AEWa and where recent kills are known to have occurred – Welsh Government 2013) is also extremely disappointing.

No resources have yet been found to address the primary action so as to better understand the drivers of low productivity as the issue struggles to be seen as a conservation priority.

In summer 2012, just 582 females were estimated to have bred successfully – a perilously small number for a global population. In conservation education, contrasts can be instructive, and in this light we calculate this is smaller than the global total of female Giant Pandas *Ailuropoda melanoleuca*, a species of massive public concern.

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Relevant web-sites

[Greenland White-fronted Goose Study](#)

[GWGS virtual library of links & resources](#)

[International workshop on Greenland White-fronted Geese; Islay, February 2009](#)

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