

The Benefit of Early Arctic Snowmelt for Pink-Footed Geese

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Introduction: During spring, pink-footed geese (*Anser brachyrhynchus*) migrate to breed in Svalbard. This extreme arctic environment experiences a short summer; therefore geese are under a tight schedule to successfully complete their breeding cycle. On first arrival in the Arctic, access to suitable forage is critical for replenishment of fat stores depleted during migration. However, at this time geese often encounter an extensively snow-covered landscape with limited habitat accessibility.

Aim: Determine how snow cover affects habitat access and use by pink-footed geese during spring in the Arctic.

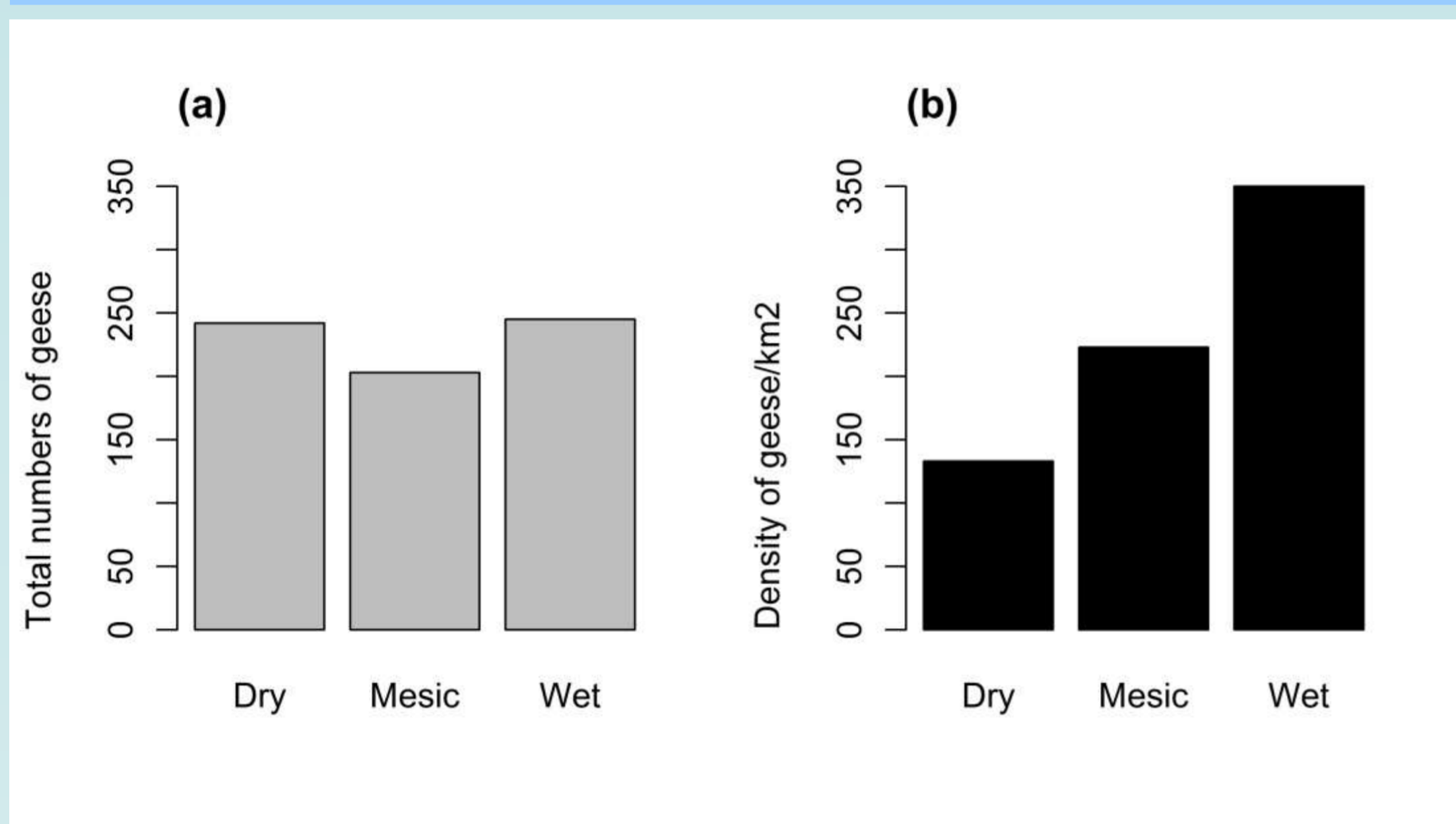


Figure 1 Use of three different habitats by pink-footed geese during May in Adventdalen, Svalbard. (a) Total numbers of foraging geese and (b) Density of foraging geese in dry, mesic and wet habitats. Geese were surveyed and mapped over a total area of 3.44 km². Habitat types were identified and then classified across the total area in ARC GIS by training aerial photographs on the basis of targeted field habitat surveying. Despite almost equal numbers of geese using each habitat, the density of birds in wet habitat was significantly greater than in dry or mesic habitats.

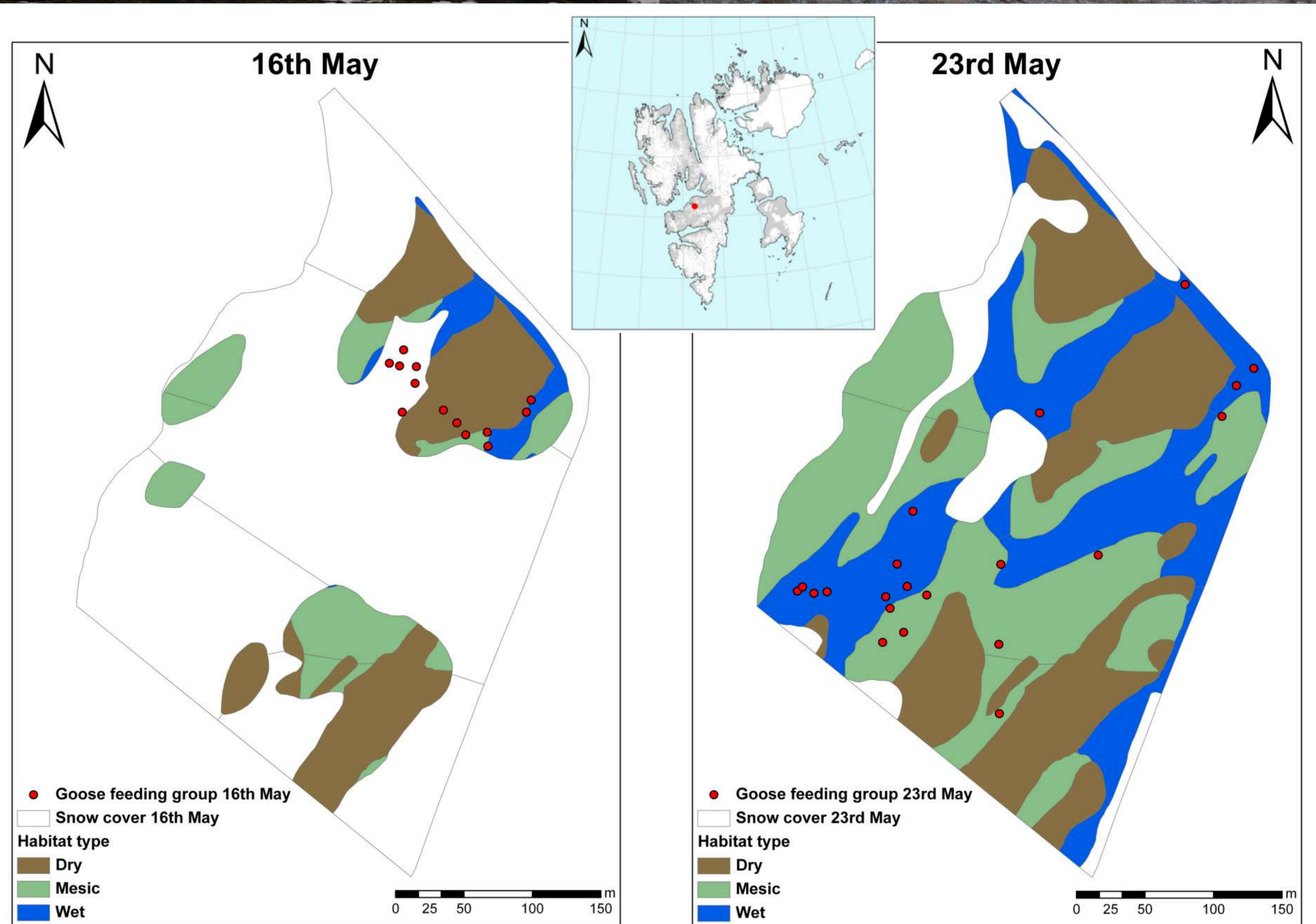


Figure 2 Snow cover, habitat types and locations of foraging pink-footed geese during May in Svalbard. GIS layers based on field survey maps showing feeding geese locations (red dots), snow-cover extent (white areas) and habitat types (dry in brown, mesic in green and wet in blue) recorded on 16th and 23rd May in Adventdalen, Svalbard. Extensive snow-cover restricted geese to feeding in small patches of newly snow-free tundra. These tended to be drier areas, as wet habitats were generally last to be snow free.

Key Findings

- Geese fed in wet habitats significantly more than predicted, on the basis of areas of available habitat ($\chi^2_2 = 61.3, p = 0.001$, Fig 1)
- Wet habitats exposed last by snowmelt (see image left)
- Snow cover restricted access to favoured foraging habitats (Fig 2)

- Climatic warming predicted to have detrimental impacts on terrestrial Arctic species.
- Earlier snow melt may improve access to favoured goose foraging habitat in spring.
- Climatic warming and earlier snowmelt may therefore be beneficial to Arctic breeding geese.