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HALF A CENTURY OF MULTIPLE ANTHROPOGENIC STRESSORS HAS ALTERED NORTHERN FOREST UNDERSTORY PLANT COMMUNITIES

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Study Description

Northern forests are under increasing anthropogenic influence and face multiple environmental stressors. Unique data from the Swedish National Forest Inventory show changes in forest understory vegetation since the mid-20th century at scales not previously documented in the boreal biome. Shade-adapted and nutrient-demanding species have become more common at the expense of light-demanding and nutrient-conservative species. The effects were strongest in regions with greater anthropogenic impact, suggesting links to drivers such as nitrogen deposition and forest management. Our results give insights to how currently more pristine parts of the boreal biome than Sweden may respond under increased anthropogenic pressure.

Hedwall, P.-O., L. Gustafsson, J. Brunet, M. Lindbladh, A.-L. Axelsson, and J. Strengbom. 2019. Half a Century of Multiple Anthropogenic Stressors has Altered Northern Forest Understory Plant Communities. Bull Ecol Soc Am 100(3):e01538. https://doi.org/10.1002/bes2.1538



Photo 1. *Vaccinium vitis-idaea* (upper left) and *V. myrtillus* (upper right) are the most common dwarf shrubs in Sweden and examples of nutrient-conservative species, characteristic of the vegetation types that have declined since the 1950s. *Maianthemum bifolium* (lower left) and *Oxalis acetosella* (lower right) are forbs adapted to high nutrient availability and shady conditions, species characteristic of the vegetation types that have increased. Photo credit: Jörg Brunet (*Vaccinium vitis-idaea, Maianthemum bifolium,* and *Oxalis acetosella* photos) and Joachim Strengbom (*V. myrtillus* photo).

These photographs illustrate the article "Half a century of multiple anthropogenic stressors has altered northern forest understory plant communities" by Per-Ola Hedwall, Lena Gustafsson, Jörg Brunet, Matts Lindbladh, Anna-Lena Axelsson, and Joachim Strengbom published in *Ecological Applications*. https://doi.org/10.1002/eap.1874