

2 Soils and Nutrients in Northern Mountain Birch Forests: A Case Study from the Finnmarksvidda, Northern Norway

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The research area is situated north of the Arctic circle and covers about 2420 km² (110×22 km) of the Alta-Kautokeino drainage basin (Fig. 2A). The fieldwork was carried out along 19 W-E transects crossing the channels of the Alta and Kautokeino Rivers and their tributaries. The vegetation was studied at 164 localities, the soils at 135 sites. For closer examination, some 90 test pits (60--100 cm deep, 1 m wide) were dug down to the parent material covering all forest types from the alluvial plains of the valley floors to the forest line ecotone. Soil samples were taken from each site and profiled for laboratory analysis. For comparison 19 Finnish (Utsjoki-Kaamanen) and 11 Swedish (Abisko-Riksgränsen) birch forest soil profiles were studied as well (Table 2A).

Glossary Chapter 2

- Abluation:** Slope wash, sheet wash.
- Colluvisol:** Soil of unconsolidated, unsorted earth material being transported or deposited on side slopes and/or at the base of slopes by mass movement (e.g. direct gravitational action) and by local, unconcentrated runoff.
- Cryoturbation:** Movement within soils composed of material of a heterogeneous density and water content under the influence of ground frost and gravity.
- Gelifluction:** Slow mass movement, directed downslope, occurring at slope angles between 2° and 30°, controlled by the melt of the ground frost in spring, characterized by a laminar-turbulent movement, decreasing with depth.
- Gley:** The product of waterlogged soil conditions, and hence an anaerobic environment; it encourages the reduction of iron compounds by microorganisms and often causes mottling of soil into a patchwork of grey and rust colours. The process is known as gleying, or gleyization (US usage).
- Paternia:** Immature alluvial soil with a profile consisting of humiferous A/alluvial C/hydromorphic C. It is a soil formed in recent fluvial sediments that have very little or no carbonate -- less than 2%. Syn. Fluvisol (FAO).
- Rambla:** Soil type of the Fluvisols (FAO). A shallow developed soil originating from recent deposits of rivers. Most of the time with pioneer vegetation only, because of flooding, erosion and drought stress. In the Soil Taxonomy the rambla is equivalent to the Udifluvents or Udipsamments.
- Ranker:** Soil with well-developed homogeneous humus-bearing horizon, having a distinct boundary with the C or R horizon and characterizing the humid mountains. The rankers constitute a group in the subclass of the humus-bearing immature soils. They form a unit which encompasses all soils, except those formed on recent alluvial deposits, having an umbric A horizon which is not

more than 25 cm thick, no other diagnostic horizon (unless buried by 50 cm or more of fresh material), without any traces of hydromorphy in the top 50 cm, without diagnostic characteristics of the Andosols (FAO).

- Regosol: A weakly developed soil originating from loose rock material. Any soil of the azonal order without definite genetic horizons and developing from or on deep, unconsolidated, soft mineral deposits such as sands, loess, or glacial drift. Nonclimatic, unweathered mineral soil (undeveloped) of erosion on soft rock, loess or dune sands, for example. The regosols constitute a subgroup in the unweathered mineral soils of erosion.
- Syrosem: Unweathered mineral soil with A/C profile on hard rock (calcareous, gypsic, siliceous or silicate) with the upper boundary of the compact portion of the C horizon less than 30 cm from the surface.
- Till: Unsorted and unstratified earth material, deposited by glacial ice, which consists of a mixture of clay, silt, sand, gravel, stones and boulders in any proportion.
- Vega: Soil type of the class Fluvisols (FAO) with the upper horizons aAh+aM more than 40 cm and aAh+aM+(IIaIc) more than 80 cm.