**Ramsar site Vindelälven**

**Physical features of the site**

The river is flowing through a very complex landscape and has a lot of tributaries. The river originates in the alpine mountain region run 450 km towards the outlet in River Umeälven. In the mountain area the bedrock consists of easily decomposing slate, whereas in the other parts of the river basin the bedrock is mainly hard sedimentary gneiss of greywacke or argillite type. The river flows from the alpine mountainous areas through hilly landscapes dominated by moraine from earlier glaciations. In the upper parts the shores are mainly rocks or stones. In the middle parts the surroundings are mainly thick sandy or fine grained glaciofluvial or river sediments. Downstream from the highest coastline during last ice age, the river is deeply incised into the deposits.

The river is characteristic of free-flowing rivers in the region, with a large and regular seasonal fluctuation in discharge and water-level, fed by the snow-melt in the mountain region. The river is surrounded by alpine mountains in the western parts and mainly coniferous forest and mires in the middle and eastern parts.

**Description of the catchment area**

The catchment area is 12 625 km2 and consists of mountains, forests and mires, whereas farmland and resident land is less common. It stretches from the border between Sweden and Norway in the Scandinavian mountain range, to the outlet in the river Umeälven 30 km from the coast.

The bedrock of the catchment can be divided into two main parts. The western, upstream part consists of bedrocks of the Scandinavian mountain range, formed some 300 million years ago. Schists and amphibolites dominate, with sparagmites and quartzites on the westernmost limits (Kulling 1953). The highest mountain in the catchment (Norra Storfjället) reaches 1 767 m above sea level. The eastern part of the catchment lies on old, pre-Cambrian bedrocks of the Baltic shield (Hjelmqvist 1953). The bedrock is dominated by granites and gneisses. The geomorphology of the catchment is shaped by the repeated glaciations during the Quaternary period (Anonymous 1984, Rudberg 1970).

The soils of the upper parts of the catchment consist of glacial tills and glaciofluvial sediments (Anonymous 1984, Rudberg 1970). Numerous thresholds in the geomorphologically young landscape have led to the formation of large lakes, the largest one being the lake Storvindeln 342 m above sea level. The river crosses the former highest coastline attained following the last ice age (Fredén 1998). Since then, crustal rebound has caused the land to rise about 240 m, and the coastline to recede about 170 km (Fredén 1998). After crossing the former highest coastline, the river start to cut into lacustrine and marine sediments deposited in the river valley.

Where river Vindelälven joins river Umeälven the mean annual discharge is 190 m3/s. The mean annual precipitation is largest in the mountain range in the westernmost parts of the catchment, reaching 1,300 mm/year (Raab and Vedin 1995). To the west of the mountain range, precipitation falls to about 700 mm/year, and is lowest around the lake Storvindeln (about 600 mm/year). Much of the precipitation falls as snow. The mean depth of the deepest snow cover per winter season is >130 cm furthest to the west, about 80 cm in the inland, and about 70 cm closest to the coast (Raab and Vedin 1995). Patterns in runoff mirrors those of precipitation: The highest values, about 800 mm/year, are reached in the westernmost parts of the catchment, but decreases to around 300-400 mm/year in the inland region (Raab and Vedin 1995).