

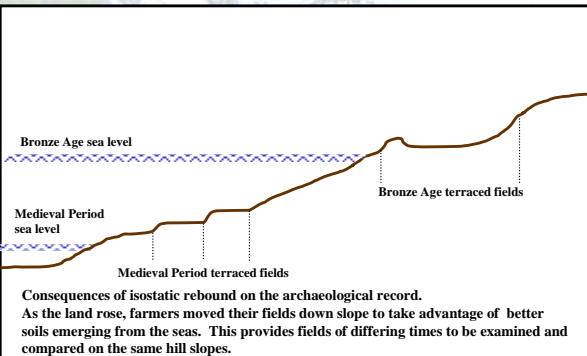
Abstract

We measured legacies in modern landscapes that originated from three separate time periods, the study was conducted in central Sweden. In several locations temporally sequential agricultural fields are present and not overlapping on local landscapes allowing us to measure the rate of successional processes through the last 4,000 years. Farming has impacted the landscape in the study area since the Bronze Age 2,000 BC-500 BC, through the Iron Age, 500 BC-AD 1,000, the Medieval Period AD 1,000-AD 1500 and into the early 1900's. In this study we include agricultural fields from the Bronze, Iron and Medieval Periods. Analysis of plant communities on fields from each of these times shows that legacies reflected in plant community compositions and cover persist on all of the fields. Fields from different time periods show different types of legacies. These may be due to age differences or that different farming techniques in the various periods produced different types of legacies that have persisted through time.

Location

The current study is located north of the Stockholm City center on the property of the National Urban Park (NUP). The study area is the northwest portion of the former Djurgården bounded on the south by Lake Laduviken. Numerous small hills and two low valleys, the Laduviken Valley and the Lappkarrs Valley, dominate this area. The exposure of land by the melting ice and the subsequent rising of the land from the sea are the two major factors have influenced the history of this landscape.

The topography of the park is typical of the surrounding region with areas of exposed glacially smoothed bedrock with low areas filled with silts and clay surrounding the exposed bedrock.

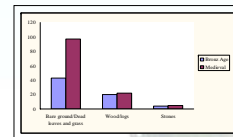
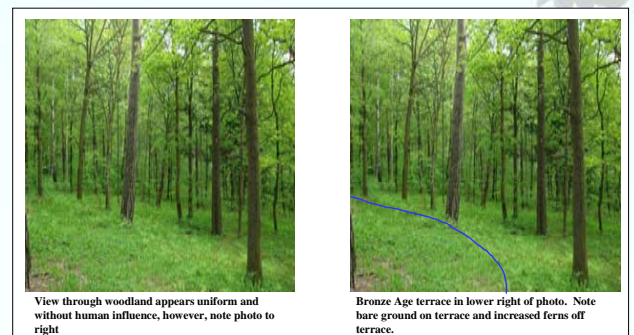
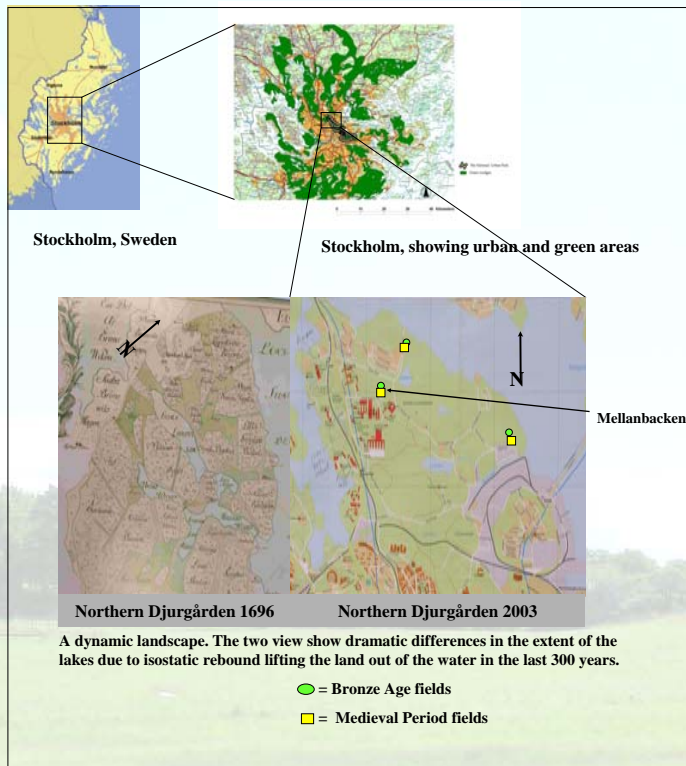


History

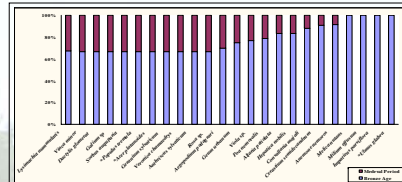
The earliest remaining visible evidence for human activities in the northern Djurgården date to the Bronze Age (2500-500 BC). Numerous fields and large grave mounds from this period dot the modern landscape. The early Iron Age (500 BC-500 AD) has a few visible remains in the area including several stone structures dating to circa 100 AD. Quite a few more remains exist from the late Iron Age (500-1100 AD), a period that includes the Viking Age). Remains from this period include fields, houses and the remains of stone piers. Many remains including fields and a some structures are present on the landscape dating from the Medieval Period and later.

Methods

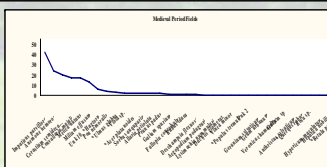
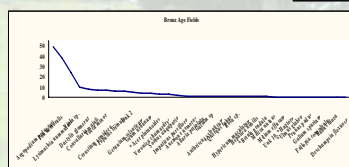
Data were collected during the summer of 2004. Old fields were identified in the northern Djurgården by surveys conducted on foot through the area and consultation with old maps made available through the Royal Archives. Bronze Age fields were located higher on hill-slopes and were round, basin-shaped terraces while Medieval Period fields are located lower on the slopes and are rectangular in construction. Once field were identified, a series of ten 50cm x 50cm quadrats were located randomly on the individual fields. A corresponding number of 50cm x 50cm quadrats were then randomly located in off-field locations. Each quadrat was divided into quarters. In one quarter all plants present were counted by and the number of each individual of each species was recorded. In all four quadrats the cover of each species present was recorded as grouped percentages of cover (<1 = 1%, 1-10% = 2, 10-25% = 3, 25-50% = 4, 50-75% = 5, and 75-100% = 6)



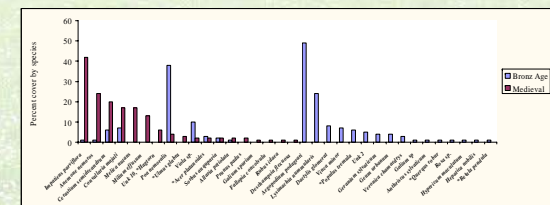
Comparisons of none vegetative surfaces in sample plots. Wood and stone are similar, but bare ground is significantly higher in Medieval Period fields.



Comparison of percentage of the numbers of individual herbaceous plants between Bronze Age and Medieval Period fields. In total there were 979 individuals counted on the Bronze Age fields and only 333 individuals on Medieval Period



Comparisons of species dominance curves for Bronze Age and Medieval Period field vegetation. Though the curves are somewhat similar, the communities are very different—see graph below.



Results

- Old and more recent fields have left legacies detectable in the plants
- Differential legacies have resulted from different ages and field-building techniques
- Human-driven disturbance regimes can have impacts on landscape pattern dynamics that may persist long after the disturbed landscape would be expected to have returned to "normal".
- Human activities create patches on the landscape that can fragment landscapes for thousands of years.

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