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Forsmark site investigation

Inventory of vascular plants and classification of calcareous wetlands in the Forsmark area

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September 2006

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Abstract

19 wetlands south-east of Forsmark Nuclear plant, Uppland, were classified from bogs to extremely rich fens according to the composition of vascular plants. Species indicating various amounts of calcareous influence and species indicating bog, fen and rich fen were used. 18 wetlands were heavily dominated by common reed (Phragmites australis). Therefore most plant species were found in just a small strip of more or less open fen close to the adjacent forest.

All wetlands except one were classified as rich fens with calcareous influence in different degrees. In total five extremely rich fens, eleven rich fens, and one fen were identified. Two wetlands were classified as mixed wetlands. On these many species indicated peat bog but indicators of rich, calcareous conditions were also found.

Sammanfattning

19 våtmarker sydost om Forsmarks kärnkraftverk, Uppland, klassificerades mellan mosse och extremrikkärr utifrån dess artsammansättning. Arter som indikerar kalk och arter som indikerar mosse, kärr och rikkärr användes. 18 våtmarker dominerades helt av bladvass. Merparten av arterna växte därför endast i en smal, någorlunda öppen kant mot skogen.

Alla våtmarker utom en var kalkinfluerade i varierande grad. Totalt hittades fem extremrikkärr, elva rikkärr och ett fattigkärr. Två våtmarker klassades som blandmyrar. På dessa fanns många arter som indikerade mosse men också arter som indikerade kalkrikkärr.

Contents

1 Introduction

In the Forsmark area the soils are rich in calcareous material and a marked land rise has resulted in a diverse array of wetlands from lime-poor peat bogs to fens highly influenced by calcareous material. How these wetlands are dispersed is rudimentary known. The nutritional status and the amount of calcareous material present are of importance for the carbon flow in the ecosystem.

This document reports the results gained in a field study to classify 19 wetlands southeast of the Forsmark Nuclear plant in the fall of 2006. It is one of many activities performed within the site investigation at Forsmark. The work was carried out in accordance with activity plan AP PF 400-06-068. In Table 1-1 controlling documents for performing this activity are listed. Activity plans are SKB's internal controlling documents.

Table 1-1. Controlling documents for performance of the activity.

Activity plan	Number	Version
Klassning av våtmarker	AP PF 400-06-068	1.0

2 Objective and scope

The aim of this study was to classify 19 wetlands (Figure 2-1) into the following classes: bog, fen, rich fen and extremely rich fen, according to the composition of vascular plants. Each wetland is shortly described.

The primary data are stored in two data-bases, SICADA and GIS, and they can be traced by the activity plan number.

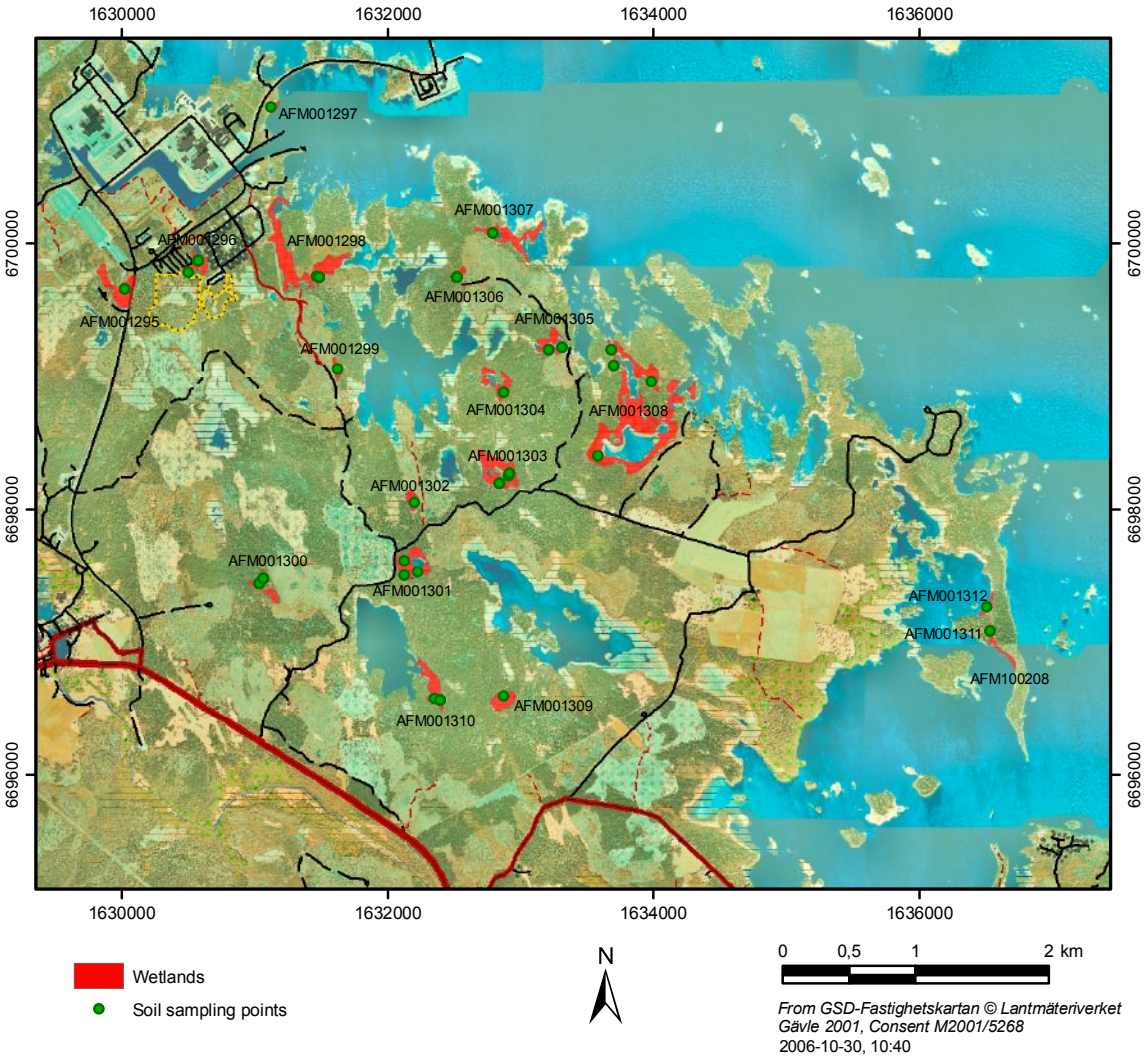

Figure 2-1. *Botanically investigated wetlands and soil sampling points south-east of Forsmark nuclear plant.*

3 Execution and equipment

3.1 Fieldwork

Fieldwork was carried out between August 28 to September 1, 2006. The time for fieldwork was limited to a short visit to each wetland. Therefore only a small part of most wetlands was investigated. A botanist with many years of experience performed the fieldwork. As several wetlands varied greatly, those parts not visited in this survey can have different species composition and characters.

Vascular plant species (and a few mosses) were noted as a slow walk through the wetland progressed. The plant composition was censused on open patches (not covered by dense reeds) along the route, mostly along the edges where the wetland meets the surrounding forest. At irregular intervals we dropped to our knees and examined an area of 1–5 m^2 more closely. When only a few specimens of a species were found this was noted.

3.2 Classification systems

Two tools are used to classify the wetlands, one based on presence of indicator species for different types of wetlands and one based on a point system classification of plants growing on calcareous ground. The wetlands were classified without predefined boundaries between classes. The total indicator values ranked the wetlands from low to high calcareous influence. The classification is based upon the combined results from the two tools complemented with a subjective evaluation of each wetland. In Section 4.1 each wetland is shortly described and its classification is motivated.

3.2.1 Point system classification for calcareous influence

21 vascular plants (not only species occurring in fens) were used as indicators of calcareous influence. Each species was given a value from 1 (low indicator value) to 5 (high indicator value) (see Table 3-1) based on characteristics from several references and own experience. Species indicating rich fen in /Rydin et al. 1999/ were given a high indicator value and their indicator value was confirmed with /Sjörs 1971/. Species that are stated to grow exclusively in calcareous habitats in /Mossberg and Stenberg 2003/ were also given high values. Species stated to only prefer calcareous conditions were given lower values.

For each wetland the values of indicator species were added. These values ranked the wetlands respectively (from 0 to 49). This classification separates the respective wetlands more than the presence of bog/fen/rich fen species does.

Table 3-1. Vascular plants used as indicators for calcareous influence. Species and values from /Rydin et al. 1999/, /Sjörs 1971/, /Mossberg and Stenberg 2003/ and own experience. High values indicate strong dependence on calcareous conditions.

Swedish name	Scientific name	Indicator value
Tagelstarr	*Carex appropinquata*	5
Hårstarr	*Carex capillaris*	5
Kärrknipprot	*Epipactis palustris*	5
Majviva	*Primula farinosa*	5
Axag	*Schoenus ferrugineus*	5
Klubbstarr	*Carex buxbaumii*	4
Slankstarr	*Carex flacca*	4
Ängsnycklar	*Dactylorhiza incarnata*	4
Tagelsäv	*Eleocharis quinqueflora*	4
Dvärglummer	*Selaginella selaginoides*	4
Älväxing	*Sesleria caerulea*	4
Loppstarr	*Carex pulicaris*	3
Smalfräken	*Equisetum variegatum*	3
Slåtterblomma	*Parnassia palustris*	3
Snip	*Trichophorum alpinum*	3
Ängsmyskgräs	*Hierocloë odorata*	2
Krissla	*Inula salicina*	2
Tätört	*Pinguicula vulgaris*	2
Knagglestarr	*Carex flava*	1
Slokstarr	*Carex pseudocyperus*	1
Ormtunga	*Ophioglossum vulgatum*	1

3.2.2 Presence of indicator species for different types of wetlands

The number of indicator species for different types of fens in /Rydin et al. 1999/ was used as to rank the wetlands in a bog to rich fen gradient (see Table 3-2). /Rydin et al. 1999/ do not give definitive boundaries between different fen types. They just state that many species indicating rich fen will give an extremely rich fen.

Most species typical for fens are not avoiding calcareous environments; they can also grow on highly calcareous wetlands. Fen species are however rare on bogs and bog species are rare in extreme rich fens but in both cases they do occur in non-typical types of wetlands.

The wetlands are coarsely classified as: bog, fen, rich fen, and extremely rich fen without strictly defined boundaries between the types. Separating wetlands into absolute fen types cannot be done and this is an estimate from our side.

Table 3-2. Vascular plants that separate different types of wetlands according to /Rydin et al.1999/. Only species found in this study are included.

Bog	Fen	Rich fen (many species and dominance indicate extremely rich fen)
Andromeda polifolia	*Carex lasiocarpa*	*Carex appropinquata*
Betula pubescens	*Carex rostrata*	*Carex capillaris*
Calluna vulgaris	*Eriophorum angustifolium*	*Dactylorhiza incarnata*
Carex limosa	*Menyanthes trifoliata*	*Eleocharis quinqueflora*
Drosera anglica	*Molinia caerulea*	*Epipactis palustris*
Drosera rotundifolia		*Equisetum variegatum*
Eriophorum vaginatum		*Primula farinosa*
Empetrum nigrum		*Schoenus ferrugineus*
Myrica gale		
Picea abies		
Pinus sylvestris		
Rhododendron tomentosum		
Rhynchospora alba		
Rubus chamaemorus		
Vaccinium myrtillus		
Vaccinium oxycoccos		
Vaccinium uliginosum		
Vaccinium vitis-idaea		

3.3 Nonconformities

One or more soil samples have previously been taken on each wetland. The plan was to investigate the flora more closely within a ten-metre radius of these points. Since almost all soil samples were taken in dense stands of common reed (*Phragmites australis*), this method was not useful to classify the wetlands into different fens. Therefore we sought species in open patches with less dense reed stands and on the edges of the wetlands where species typical for a bog/fen occurred.

4 Results

The original results are stored in the primary databases (SICADA and GIS), and these will be used for further interpretation (modelling).

4.1 Classification

All wetlands are classified as calcareous fens of different degrees except for AFM001311 (Table 4-1). AFM001311 is classified as a fen since it has no species indicating calcareous influence (indicator value 0). In all the other fens we have found species indicating rich fens. The richest fens are AFM001304, AFM001307, AFM001310, and AFM001298 with five to six indicator species for rich fens and indicator values of 49–36. The least rich fens are AFM001295–97 with one and two species indicating rich fen and indicator values less than 10. They clearly differ from the high-ranked wetlands, both in species number and composition.

Table 4-1. Wetlands in the Forsmark area ranked according to the total number of indicator points, based on the presence of vascular plants. Additional data from the inventory are also presented.

ID	Indicator points	Number of indicator species	Number of species: bog/fen/rich fen	Total number of species	Type
AFM001311	0	0	0/0/0	44	Fen
AFM001296	6	2	3/3/1	28	Rich fen
AFM001297	7	2	0/0/1	27	Rich fen
AFM001295	9	2	5/3/2	32	Rich fen
AFM001305	11	3	5/4/1	32	Rich fen
AFM001300	12	3	16/5/1	32	Mixed wetland*
AFM001312	13	5	0/0/1	31	Rich fen
AFM100208	13	5	0/0/1	30	Rich fen
AFM001302	16	4	6/1/2	31	Rich fen
AFM001303	20	5	6/3/3	33	Rich fen
AFM001308	20	7	0/0/2	72	Rich fen
AFM001306	21	5	2/3/3	39	Rich fen
AFM001309	22	6	7/4/3	42	Rich fen
AFM001299	26	8	4/4/2	41	Extremely rich fen
AFM001301	28	8	9/4/2	48	Extremely rich fen
AFM001298	36	11	3/2/5	71	Extremely rich fen
AFM001310	43	11	14/4/5	53	Mixed wetland**
AFM001307	48	13	3/3/6	72	Extremely rich fen
AFM001304	49	14	5/3/5	53	Extremely rich fen

* = Mixed wetland: Approximately 15% rich fen and 85% bog.

** = Mixed wetland: Approximately 40% extremely rich fen and 60% bog.

Two wetlands, AFM001300 and AFM001310, are to a large extent covered by low grown pines and with many species characteristic for bogs. However, AFM001310 also has many species indicating calcareous influence, in fact it has the third highest value. The middle area of AFM001300 is dominated by *Schoenus ferrugineus*, a species typical of extremely rich fens. Both wetlands are classified as mixed wetlands.

Most wetlands are heavily dominated by a dense and high grown stand of common reed (*Phragmites australis*). This dense "canopy" restricts other species to places where the reed is less dense. These areas, often a small strip of the fens adjacent to the surrounding forest, have a richer flora. Some fens (e.g. AFM001310 and AFM001304) have a somewhat less dense stand of reed and therefore a more diverse plant community spread over a large area. In AFM001300 reed was present only in small numbers.

Some fens are situated close to brackish water and therefore have species typical for shore meadows. This is obvious in AFM001312, AFM100208, and the eastern part of AFM001307.

Most fens have at least some open water. The water in these shallow "ponds" is clear and several have a dense vegetation of Charophytes.

4.2 Redlisted species

Carex pulicaris (VU) and *Campanula cervicaria* (NT) are red listed according to /Gärdenfors 2005/. *C pulicaris* was found in three fens and *C cervifolia* was noted along the road north of AFM001301.

4.3 The Wetlands

4.3.1 AFM001295

Indicator species/value: 2/9 Bog/fen/rich fen: 5/3/2 Type: Rich fen

This wetland is dominated by a lower and less dense stand of reed than on most other wetlands. There is a very hummocky area with *C elata* and *C appropinquata*.

A few species indicate bogs and fen and *C appropinquata* and *D incarnata* indicate calcareous influence. The latter are not widely dispersed but they have indicator values of 5 and 4, respectively. The wetland has some calcareous influence but it has the fourth lowest indicator value and it is barely classified as a rich fen.

4.3.2 AFM001296

Indicator species/value: 2/6 Bog/fen/rich fen: 3/3/1 Type: Rich fen

AFM001296 is almost completely dominated by a dense and high stand of reed with a very narrow strip of more open land towards the surrounding forest. There is a large pond in the north-east.

C lasiocarpa (a fen indicator) is amongst the dominating species as is the rich fen indicator *C appropinquata*. *C appropinquata* is common on the edges of the wetland and a few specimens of *C pseudocyperus* are growing to the southwest. These species gives this wetland the class of rich fen. It is a low ranked rich fen with only two indicator species and the second lowest indicator value.

4.3.3 AFM001297

Indicator species/value: 2/7 Bog/fen/rich fen: 0/0/1 Type: Rich fen

This is the smallest wetland in this study. It borders to brackish water but it does not have the character of a shore meadow. It is almost completely dominated by dense and high reeds with a very narrow strip of more open land towards the surrounding forest. *Eupatorium cannabinum* dominate the open border to the surrounding forest. In the small open water Charophytes are numerous.

A handful of *D incarnata* indicates that AFM001297 is a rich fen. The presence of *D incarnata* and *P palustris* gives a total indicator value of 7, the third lowest indicator value. It is classified as a low ranked rich fen.

4.3.4 AFM001298

Indicator species/value: 11/36 Bog/fen/rich fen: 3/2/5 Type: Extremely rich fen

A large, L-shaped wetland where the northern part stretches to brackish water while the eastern part reaches a body of water connected to brackish water. Both parts are heavily dominated by a dense stand of reed. In a narrow strip in the southeast and along a tractor road several species indicating calcareous influence are growing. This is the only fen with *Gentianella uliginosa* and *Carex capillaris* and it is one fen (out of three) with the redlisted *Carex pulicaris* (VU).

No species indicating calcareous influence were found in the northern part of the wetland. On the rest of the wetland eleven species indicating calcareous influence are growing with sub dominance of *E palustris* (value 5) and *P palustris* (value 3). *O vulgatum* (1 specimen), a typical shore meadow species was found. The diverse flora indicating calcareous influence coupled with sub dominance of some of these species merits this wetland as an extremely rich fen.

4.3.5 AFM001299

Indicator species/value: 8/26 Bog/fen/rich fen: 4/4/2 Type: Extremely rich fen

AFM001299 is the third smallest fen in this inventory. It has only a sparse and low grown stand of reed. Instead *M gale* and *C lasiocarpa* dominate in some parts.

C lasiocarpa, a fen indicator is a subdominant in some parts. *C appropinquata* is common and several specimen of *D incarnata* are growing on the wetland. In total eight species indicate calcareous influence. This diversity is enough to classify it as an extremely rich fen although it is close to the lower edge of the class.

4.3.6 AFM001300

Indicator species/value: 3/12 Bog/fen/rich fen: 16/5/1 Type: Bog / Rich fen

This wetland mainly has a bog character with small pines. Reed is present in only a small area. The edges are dominated by pine forest with shrubs typical for bogs.

AFM001300 has the highest number of species (16) indicating bogs. This strongly suggests AFM001300 as a bog. However, five fen indicators are present and *C lasiocarpa* and also *M caerulea* dominate parts of the fen. A large area in the centre is dominated by *S ferrugineus*, a high ranked (value 5) rich fen indicator. This is the key reason why this wetland is classified as a mixed wetland. The dominating character is bog but certain parts are rich fens.

This wetland resembles AFM001310 but this one is more dominated by bog elements.

4.3.7 AFM001301

Indicator species/value: 8/28 Bog/fen/rich fen: 9/4/2 Type: Extremely rich fen

There is a dense and high stand of reed around a large, open pond. On the rest of the wetland the reed is less dense and lower. There is no vegetation in the pond. There was also water in two small patches. Along the road the red listed *Campanula cervicaria* (NT) was found.

Most species were found in the north and north-western parts of the wetland. Nine species indicating bog were found as well as four indicating fen. However, *C appropinquata* and *E quinqueflora* indicate rich fen and six more indicators of calcareous influence, e.g. *S selaginoides* and *C buxbaumii* were also found. These species classify this wetland as a low ranked extremely rich fen.

4.3.8 AFM001302

Indicator species/value: 4/16 Bog/fen/rich fen: 6/1/2 Type: Rich fen

A small wetland with a relatively sparse and low reed population and lots of small pines and birches. This wetland has the most dense tree cover. A ditch runs along the eastern part of the wetland.

There are several species indicating bog and *M gale* is dominant in certain areas. Four species are indicating calcareous influence. Two high-ranked species occur. *S ferrugineus* is common in the centre and *C appropinquata* is present but not common. These species along with *P palustris* and *T alpinum* classify this wetland as a rich fen.

4.3.9 AFM001303

Indicator species/value: 5/20 Bog/fen/rich fen: 6/3/3 Type: Rich fen

Dense and high reeds dominate AFM001303. *Thelypteris palustris* is common. Alder is growing in the stretch closest to the surrounding pine forest. In the south-eastern part the alder develops into a marsh with sockets.

Several species indicate bog and a few fen and rich fen. None of these species are dominant. Five species were indicating calcareous influence and *E palustris* and *C appropinquata* are among the more common of these. However, the indicator value is not high enough to classify it as an extremely rich fen. The wetland is classified as a rich fen.

4.3.10 AFM001304

Indicator species/value: 14/49 Bog/fen/rich fen: 5/3/5 Type: Extremely rich fen

Reed dominates on the wetland but it is not very dense and high and therefore other plants are distributed over most of the fen. A narrow and thin alder forest edges the wetland. The red listed *C pulicaris* (VU) grows in the wetland. In the big pond there is fish but hardly any vegetation. An old, dried up pond is close to the point for geological sampling.

As there are 14 species indicating calcareous influence, several of them high ranked, this wetland has the highest indicator value. The species are dispersed over a large part of the wetland. AFM001304 is classified as the highest ranked extremely rich fen.

4.3.11 AFM001305

Indicator species/value: 3/11 Bog/fen/rich fen: 5/4/1 Type: Rich fen

The reed is not as high on this wetland as on many other. Small birches, pines and alders are dispersed over the wetland. Species like *M gale*, *C rostrata* and *T palustris* are common in many places. *Dryopteris cristata* was found on this wetland.

On AFM001305 the species *P palustris, T alpinum* and *C appropinquata* were indicating calcareous influence. Of these only *C appropinquata* is high ranked and this is one of the least rich fens albeit still a rich fen.

4.3.12 AFM001306

Indicator species/value: 5/21 Bog/fen/rich fen: 2/3/3 Type: Rich fen

This is the second smallest wetland in the study and it is dominated by a dense and high stand of reed. A narrow and thin alder forest edges the wetland. To the north-east there is a large and almost completely dried-up area.

On a small area in the alder forest some calcareous influence is evident but as a whole the wetland is only slightly affected by lime. Two species indicate bog, two relatively common species indicate fen and three species indicate rich fen. The small area with clear calcareous influence is enough to classify AFM001306 as a rich fen but despite its high indicator value it is not considered close to an extremely rich fen.

4.3.13 AFM001307

Indicator species/value: 13/48 Bog/fen/rich fen: 3/3/6 Type: Extremely rich fen

AFM001307 is a large and diverse wetland with many vegetation types. It is partly bordering brackish water to the east. The area between the brackish waters is more or less open with a character of shore meadow. A small pond in the western part is bordered by high and dense reed. In the western part many groves of trees divide the wetland into smaller areas with extremely rich fen vegetation. The redlisted species *E Pulicaris* was found on this wetland.

AFM001307 has the highest total species number. Despite being very varied it only has three species indicating bog and three indicating fen. In contrast six species indicate rich fen and many of these are subdominants.

In the western part there are many species indicating calcareous influence and AFM001307 has the second highest number of such species and also the second highest indicator value. Several species with indicator value 5 are dominants *(E palustris)* or subdominants (*C appropinquata, P farinosa*). AFM001307 is classed as the second richest extremely rich fen.

4.3.14 AFM001308

Indicator species/value: 7/20 Bog/fen/rich fen: 0/0/2 Type: Rich fen

This is the largest wetland in this study. It has a very irregular shape with jagged edges and many open ponds. Only the south-eastern and north-western parts were visited. The wetland is dominated by high and dense reed and along the edges alders are growing.

It had the second highest total species number but for its size few indicator species of any kind were found. Zero species indicate bog or fen and two species indicate rich fen. Most of the fen has few species indicating calcareous conditions. To the south-east there is an open area close to the alders and seven indicator species were found here. H odorata (indicator value 2) is a subdominant but most of the other indicator species are infrequent. AFM001308 is classed as a rich fen.

4.3.15 AFM001309

Indicator species/value: 6/22 Bog/fen/rich fen: 7/4/3 Type: Rich fen

There is a very dense and high stand of reed in the central parts of the wetland with more open areas towards the edges, especially in the south. Along the western edge there is an alder marsh with well developed sockets.

Seven species are indicating bog, four are indicating fen, and three rich fen. Among the six indicator species *E palustris* and *C appropinquata* are of high rank (value 5). These are not dominant enough to classify it as an extremely rich fen. AFM001309 is therefore classified as a high ranked rich fen, bordering to an extremely rich fen.

4.3.16 AFM001310

Indicator species/value: 11/43 Bog/fen/rich fen: 14/4/5 Type: Bog / Extremely rich fen

AFM001310 is an elongated wetland south-east of lake Eckarfjärden. The reeds do not grow as high and dense as on most other wetlands. Pines and small birches are dispersed over central parts of the wetland. On the edge in south-west there is a bog pine stand with its typical undergrowth of woody bushes. In some parts dense stands of *M gale* grow. These characters are typical for bogs.

Fourteen species indicate bog and several of them are common. Four species indicate fen. Albeit the typical bog indicators this wetland also includes four indicators of rich fen and 14 species indicate calcareous conditions, especially to the north and south-east. Such species are *E palustris, P farinosa, C appropinquata, S ferrugineus, S caerulea,* and *C buxbaumii*.

The mixture of bog and rich fen-habitats makes this wetland resemble AFM001300 but in AFM001310 the rich fen species are more numerous. The great amount of bog and rich fen elements and the high calcareous influence in some parts results in the classification of a mixed wetland. Parts of AFM001310 are bog and parts are extremely rich fen.

4.3.17 AFM001311

Indicator species/value: 0/0 Bog/fen/rich fen: 0/0/0 Type: Fen

AFM001311 is completely dominated by dense reed. In an alder swamp along the eastern edge there is a large stand of *Galium odoratum*. There are notably few *Carex*-species. The flora is trivial without any of our indicator species. AFM001311 is classified as a fen.

4.3.18 AFM001312

Indicator species/value: 5/13 Bog/fen/rich fen: 0/0/1 Type: Rich fen

AFM001312 is an elongated wetland along brackish water that is similar to AFM100208. High and dense reeds along the water become thinner and lower further ashore. Along the eastern edge, close to the surrounding forest, there are several small, open areas where most plants grow. There are notably few *Carex*-species.

AFM001312 has no indicators of bog or fen. Several species typical of shore meadows, *O vulgatum, P palustris,* and *I salicina* that also indicate calcareous influence are growing here. A more typical fen species, *E palustris*, is also present. AFM001312 is classified as a rich fen with shore meadow features.

4.3.19 AFM100208

Indicator species/value: 5/13 Bog/fen/rich fen: 0/0/1 Type: Rich fen

The wetland runs along brackish water. High and dense reeds grow along the water. This thins out towards the pine forest to the north and east. The character is very similar to that of AFM001312. There are notably few *Carex*-species.

AFM100208 has no indicators of bog or fen. In an open area in the northern part the indicator species *E palustris* grows. Several species like *O vulgatum, P palustris, H odoratum*, and *I Salicina* are typical for shore meadows but they also indicate calcareous influence. The species composition classifies AFM100208 as a rich fen with shore meadow features.

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Appendix 1

Presence of indicator species for classification of wetlands

Data from inventory and classification of wetlands in the Forsmark area, performed by Calluna AB in August–September 2006.
Bold text in capital letters indicates heavy dominance. Bold text indicates dominance and italic text indicates subdominance.

Vascular plant species indicating calcareous influence.

Swedish name	Scientific name	Wetland ID Name code	Indicator-value	AFM001295	AFM001296	AFM001297	AFM001298	AFM001299	AFM001300	AFM001301	AFM001302	FM001303
Tagelstarr	*Carex appropinquata*	C approp	5	*C approp*	**C approp**		C approp	C approp		C approp	C approp	C approp
Hårstarr	*Carex capillaris*	C capill	5				C capill					
Kärrknipprot	*Epipactis palustris*	Epip pal	5				*Epip pal*					Epip pal
Majviva	*Primula farinosa*	Prim far	5									
Axag	*Schoenus ferrugineus*	Scho fer	5						*Scho fer*		*Scho fer*	
Klubbstarr	*Carex buxbaumii*	C buxaum	4							C buxaum		
Slankstarr	*Carex flacca*	C flacca	4				C flacca	C flacca	C flacca	C flacca		
Ängsnycklar	*Dactylorhiza incarnata*	Dact inc	4	Dact inc		Dact inc	Dact inc	Dact inc				Dact inc (3)
Tagelsäv	*Eleocharis quinqueflora*	Eleo qui	4				Eleo qui			Eleo qui		
Dvärglummer	*Selaginella selaginoides*	Sela sel	4							Sela sel (1–2)		
Älväxing	*Sesleria caerulea*	Sesl cae	4					Sesl cae				
Loppstarr	*Carex pulicaris*	C pulica	3				C pulica					
Smalfräken	*Equisetum variegatum*	Equi var	3									
Slåtterblomma	*Parnassia palustris*	Parn pal	3			*Parn pal*	*Parn pal*	Parn pal		Parn pal	Parn pal	Parn pal
Snip	*Trichophorum alpinum*	Tric alp	3					Tric alp	Tric alp	Tric alp	Tric alp	Tric alp
Ängsmyskgräs	*Hierocloë odorata*	Hier odo	2					Hier odo				
Krissla	*Inula salicina*	Inul sal	2									
Tätört	*Pinguicula vulgaris*	Ping vul	2									
Knagglestarr	*Carex flava*	C flava	1				C flava	C flava		C flava		
Slokstarr	*Carex pseudocyperus*	C pseudo	1		C pseudo (5)		C pseudo					
Ormtunga	*Ophioglossum vulgatum*	Ophi vul	1				Ophi vul (1)					
Number of indicator species/points				2/9	2/6	2/7	11/36	8/26	3/12	8/28	4/16	5 / 20

Vascular plant species indicating calcareous influence.

Swedish name	Scientific name	Wetland ID Name code	AFM001304	AFM001305	AFM001306	AFM001307	AFM001308	AFM001309	AFM001310	AFM001311	AFM001312	AFM100208
Tagelstarr	*Carex appropinquata*	C approp										
Hårstarr	*Carex capillaris*	C capill	C approp	C approp	C approp	*C approp*		*C approp*	*C approp*			
Kärrknipprot	*Epipactis palustris*	Epip pal	*Epip pal*		*Epip pal*	**Epip pal**		Epip pal	Epip pal		Epip pal	Epip pal
Majviva	*Primula farinosa*	Prim far	Prim far			*Prim far*			Prim far			
Axag	*Schoenus ferrugineus*	Scho fer							Scho fer			
Klubbstarr	*Carex buxbaumii*	C buxaum							C buxaum			
Slankstarr	*Carex flacca*	C flacca	C flacca		C flacca	C flacca	C flacca		C flacca			
Ängsnycklar	*Dactylorhiza incarnata*	Dact inc	Dact inc		Dact inc (4)	Dact inc	Dact inc (3)	Dact inc (5)	Dact inc (1)			
Tagelsäv	*Eleocharis quinqueflora*	Eleo qui	Eleo qui			Eleo qui	Eleo qui					
Dvärglummer	*Selaginella selaginoides*	Sela sel	Sela sel (1)			Sela sel (5)						
Älväxing	*Sesleria caerulea*	Sesl cae	Sesl cae			Sesl cae			Sesl cae			
Loppstarr	*Carex pulicaris*	C pulica	C pulica (1)			C pulica						
Smalfräken	*Equisetum variegatum*	Equi var				Equi var (3)						
Slåtterblomma	*Parnassia palustris*	Parn pal	Parn pal	*Parn pal*	*Parn pal*	Parn pal	Parn pal	Parn pal	Parn pal		Parn pal	Parn pal
Snip	*Trichophorum alpinum*	Tric alp										
Ängsmyskgräs	*Hierocloë odorata*	Hier odo	Tric alp	Tric alp				Tric alp	Tric alp			
Krissla	*Inula salicina*	Inul sal	Hier odo			Hier odo	*Hier odo*	Hier odo			Hier odo	**Hier odo**
Tätört	*Pinguicula vulgaris*	Ping vul					Inul sal				Inul sal	Inul sal
Knagglestarr	*Carex flava*	C flava	Ping vul (3)			Ping vul						
Slokstarr	*Carex pseudocyperus*	C pseudo	C flava						C flava			
Ormtunga	*Ophioglossum vulgatum*	Ophi vul					Ophi vul				*Ophi vul*	*Ophi vul*
Number of indacator species/points			14 / 49	3 / 11	5 / 21	13 / 48	7 / 20	6 / 22	11 / 43	0 / 0	5 / 13	5 / 13

Vascular plant species indicating bogs, fens and rich fens.

Swedish name	Scientific name	Wetland ID Namecode	AFM001295	AFM001296	AFM001297	AFM001298	AFM001299	AFM001300	AFM001301	AFM001302	AFM001303
Bog indicators											
Rosling	*Andromeda polifolia*	Andr pol						Andr pol			
Glasbjörk	*Betula pubescens*	Betu pub	Betu pub	Betu pub		Betu pub	Betu pub	Betu pub (3)	Betu pub	Betu pub	Betu pub
Ljung	*Calluna vulgaris*	Call vul						Call vul			
Dystarr	*Carex limosa*	C limosa	C limosa	C limosa (5)				C limosa	C limosa	C limosa	
Storsileshår	*Drosera anglica*	Drose ang							Drose ang		Drose ang
Rundsileshår	*Drosera rotundifolia*	Drose rot						Drose rot	Drose rot		Drose rot
Tuvull	*Eriophorum vaginatum*	Erio vag						*Erio vag*			
Sydkråkbär	*Empetrum nigrum*	Empe nig					Empe nig	Empe nig		Empe nig	
Pors	*Myrica gale*	Myri gal	Myri gal	Myri gal			Myri gal	**Myri gal**	Myri gal	**Myri gal**	Myri gal
Gran	*Picea abies*	Pice abi	Pice abi (3)			Pice abi (1)			Pice abi		
Tall	*Pinus sylvestris*	Pinu syl				Pinu syl	Pinu syl	*Pinu syl*	Pinu syl (3)	Pinu syl	Pinu syl
Skvattram	*Rhododendron tomentosum*	Rhod tom						*Rhod tom*			
Vitag	*Rhynchospora alba*	Rhyn alb						Rhyn alb	Rhyn alb		
Hjortron	*Rubus chamaemorus*	Rubu cha						Rubu cha			
Blåbär	*Vaccinium myrtillus*	Vacc myr						Vacc myr			
Tranbär	*Vaccinium oxycoccos*	Vacc oxy	Vacc oxy					Vacc oxy	Vacc oxy	Vacc oxy	Vacc oxy
Odon	*Vaccinium uliginosum*	Vacc uli						Vacc uli			
Lingon	*Vaccinium vitis-idaeus*	Vacc vit						*Vacc vit*			
Fen indicators											
Trådstarr	*Carex lasiocarpa*	C lasioc	C lasioc	**C lasioc**			C lasioc	C lasioc	*C lasioc*	C lasioc	C lasioc
Flaskstarr	*Carex rostrata*	C rostra	C rostra	C rostra			C rostra	C rostra			C rostra
Ängsull	*Eriophorum angustifolium*	Erio ang				*Erio ang*	Erio ang	Erio ang	Erio ang		
Vattenklöver	*Menyanthes trifoliata*	Meny tri	Meny tri	Meny tri			Meny tri	Meny tri	Meny tri		Meny tri
Blåtåtel	*Molinia caerulea*	Moli cae				Moli cae		*Moli cae*	Moli cae		
Rich fen indicators											
Tagelstarr	*Carex appropinquata*	C approp	*C approp*	**C approp**		C approp	C approp		C approp	C approp	C approp
Hårstarr	*Carex capillaris*	C capill				C capill					
Ängsnycklar	*Dactylorhiza incarnata*	Dact inc	Dact inc		Dact inc	Dact inc	Dact inc				Dact inc(3)
Tagelsäv	*Eleocharis quinqueflora*	Eleo qui				Eleo qui			Eleo qui		
Kärrknipprot	*Epipactis palustris*	Epip pal				*Epip pal*					Epip pal
Smalfräken	*Equisetum variegatum*	Equi var									
Majviva	*Primula farinosa*	Prim far									
Axag	*Schoenus ferrugineus*	Scho fer						Scho fer		Scho fer	
Number of species: bog / fen / rich fen			5/3/2	3/3/1	0/0/1	3/2/5	4/4/2	16/5/1	9/4/2	6/1/2	6/3/3

Vascular plant species indicating bogs, fens and rich fens.

Swedish name	Scientific name	Wetland ID Namecode	AFM001304	AFM001305	AFM001306	AFM001307	AFM001308	AFM001309	AFM001310	AFM001311	AFM001312	AFM100208
Bog indicators												
Rosling	*Andromeda polifolia*	Andr pol										
Glasbjörk	*Betula pubescens*	Betu pub		Betu pub		Betu pub (3)		Betu pub	Betu pub (3)			
Ljung	*Calluna vulgaris*	Call vul							Call vul			
Dystarr	*Carex limosa*	C limosa						C limosa	C limosa			
Storsileshår	*Drosera anglica*	Drose ang						Drose ang				
Rundsileshår	*Drosera rotundifolia*	Drose rot	Drose rot	Drose rot	Drose rot			Drose rot	Drose rot			
Tuvull	*Eriophorum vaginatum*	Erio vag							Erio vag			
Sydkråkbär	*Empetrum nigrum*	Empe nig			Empe nig				Empe nig			
Pors	*Myrica gale*	Myri gal	Myri gal	**Myri gal**		Myri gal		Myri gal	**Myri gal**			
Gran	*Picea abies*	Pice abi	Pice abi	Pice abi (3)				Pice abi (3)	Pice abi			
Tall	*Pinus sylvestris*	Pinu syl	Pinu syl	Pinu syl		Pinu syl (3)			*Pinu syl*			
Skvattram	*Rhododendron tomentosum*	Rhod tom							Rhod tom			
Vitag	*Rhynchospora alba*	Rhyn alb										
Hjortron	*Rubus chamaemorus*	Rubu cha							Rubu cha			
Blåbär	*Vaccinium myrtillus*	Vacc myr							Vacc myr			
Tranbär	*Vaccinium oxycoccos*	Vacc oxy	Vacc oxy					Vacc oxy	Vacc oxy			
Odon	*Vaccinium uliginosum*	Vacc uli										
Lingon	*Vaccinium vitis-idaeus*	Vacc vit							Vacc vit			
Fen indicators												
Trådstarr	*Carex lasiocarpa*	C lasioc		C lasioc	*C lasioc*	C lasioc		C lasioc	*C lasioc*			
Flaskstarr	*Carex rostrata*	C rostra	C rostra	*C rostra*	*C rostra*	*C rostra*		C rostra	C rostra			
Ängsull	*Eriophorum angustifolium*	Erio ang		Erio ang		Erio ang		Erio ang				
Vattenklöver	*Menyanthes trifoliata*	Meny tri	Meny tri	Meny tri	Meny tri			Meny tri	Meny tri			
Blåtåtel	*Molinia caerulea*	Moli cae	Moli cae						*Moli cae*			
Rich fen indicators												
Tagelstarr	*Carex appropinquata*	C approp	C approp	C approp	C approp	C approp		*C approp*	*C approp*			
Hårstarr	*Carex capillaris*	C capill										
Ängsnycklar	*Dactylorhiza incarnata*	Dact inc	Dact inc		Dact inc (4)	Dact inc	Dact inc (3)	Dact inc (5)	Dact inc (1)			
Tagelsäv	*Eleocharis quinqueflora*	Eleo qui	Eleo qui			Eleo qui	Eleo qui					
Kärrknipprot	*Epipactis palustris*	Epip pal	*Epip pal*		Epip pal	**Epip pal**		Epip pal	Epip pal		*Epip pal*	*Epip pal*
Smalfräken	*Equisetum variegatum*	Equi var				Equi var (3)						
Majviva	*Primula farinosa*	Prim far	*Prim far*			*Prim far*			Prim far			
Axag	*Schoenus ferrugineus*	Scho fer							Scho fer			
Number of species: bog / fen / rich fen			5/3/5	5/4/1	2/3/3	3/3/6	0/0/2	7/4/3	14/4/5	0/0/0	0/0/1	0/0/1