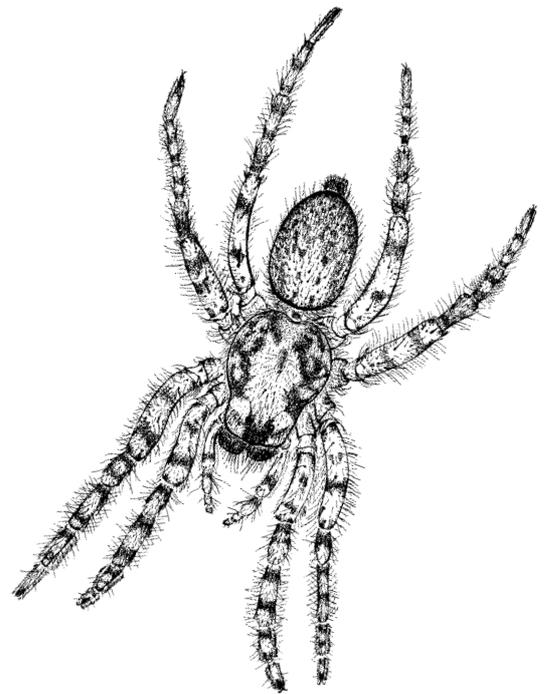


042

FAGRAPPORT

Provisional list of rare and
potentially threatened spiders
(Arachnida: Araneae) in Norway
including their proposed
Red List status

Kjetil Aakra
Erling Hauge



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Referat

Aakra, K. & Hauge, E. 2000. Midlertidig liste over sjeldne og potensielt truede edderkopper (Arachnida: Araneae) i Norge inkludert deres foreslåtte Rød Liste status. - NINA Fagrappport 42: 1-38.

Alle edderkopper registrert i Norge har vært gjenstand for en gjennomgåelse med tanke på deres truethet og verne status. Totalt 91 arter eller 16.4 % av de 555 kjente norske edderkopperarter er inkludert i dette Rødlisteforslaget. For hver art er utbredelse både i Norge og resten av verden oppgitt, sammen med trusselfaktorer, habitatkrav og taksonomiske spørsmål hvor det er nødvendig.

Tyve arter er gitt statusen "Utdødd", en er "Direkte Truet", en er "Sårbar", 21 er "Hensynskrevende", 25 er "Usikker" og 23 er "Utilstrekkelig Kjent". Størstedelen av artene hører til i østlige (31.8 %) eller sørøstlige (44 %) deler av Norge.

Flest arter hører hjemme i skogen (31 %) eller i åpne habitattyper (22 %). Av den siste gruppen er 15 % varmekjære, inkludert flere arter i de strengeste rødlistekategoriene. Arter som lever i urtevegetasjon, busker og små trær utgjør 19 % av totalen. Edderkopper i andre habitattyper, som myrer, våtmarker, elvebredder og strandsonen er relativt færre, men flere av de mest interessante og sjeldne artene hører til i disse biotopene. Av de ulike taxa står hjulspinner familien Araneidae i en særstilling, hele 35 % av alle antatt utdødde arter hører til denne familien. Årsaken er trolig å finne i flere forhold; innsamlingsteknikker som favoriserer andre grupper, en reell tilbakegang i antall og vanskelig tilgang til disse artenes habitater.

Generelle trusselfaktorer er gitt for artene med hensyn på deres habitater. Åpenmarksarter er sårbare for gjengroing som følge av at kulturmarker ikke lenger skjøttes og for enkelte jordbrukspraksiser, skogsarter er svært sårbare ovenfor moderne skogbruksmetoder, spesielt hogst av urskog og gammel kontinuitetsskog, våtmarks og myrarter er sensitive ovenfor drenering og annen forandring i hydrologi, ripare og kystarter er sårbare for trækkeffekter, forurensing, jordbruks og anleggsvirksomhet mens alpine høyfjellsarter er sårbare ovenfor alle faktorer som fører til forandringer i deres mikrohabitater. Generelle forslag til vern og skjøtsel av disse artene er gitt, best vern av edderkopper oppnåes ved varig fredning og beskyttelse av deres habitater.

Norske ansvarslistene er gitt for myr/våtmark-, skogs- og åpenmarksarter basert på rødlistene fra andre land i Europa.

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Abstract

Aakra, K. & Hauge, E. 2000. Provisional list of rare and potentially threatened spiders (Arachnida: Araneae) in Norway including their proposed Red List status. - NINA Fagrappport 42: 1-38.

All Norwegian spider species known to occur in Norway have been surveyed and their conservation status assessed. Altogether 91 species or 16.4 % of the 555 species known to occur in Norway have been included in the current Red List proposal. Distribution in both Norway and the rest of the world, habitat preferences, threat factors, worldwide conservation status and taxonomy, where necessary, are detailed for each species.

Twenty species have been assigned to the "Extinct?" Category, one is considered "Endangered", one is "Vulnerable", 21 are "Declining, care demanding", 25 are "Indeterminate" and 23 are "Insufficiently Known". The majority of the species occur in the eastern (31.8 %) or the southeastern parts (44 %) of Norway.

The largest number of species are forest inhabitants (31 %) or inhabitants of open biotopes (22 %). Of the latter group 15 % are thermophilous, including several species in the strictest Red List categories. Species living in herbaceous vegetation, bushes and on low branches of trees represent 19 % of the total. Spiders living in other habitats, including wetlands and peatlands, river banks and seashores are fewer in numbers but some of our most vulnerable and rarest species are found in these biotopes. Of the taxonomic groups the orb-weaver family Araneidae has a disproportionately large number of species in the "Extinct?" category (35 % of all in the category). This is probably caused by a combination of collection bias, genuine decline and lack of suitable sampling methods in what is often inaccessible habitats.

General threat assessment is provided for the species in respect to their habitat. Open habitats are vulnerable to regrowth and agricultural practices, forest species are sensitive to modern forestry methods, particularly the removal of old-growth stands, peatland and wetland species are vulnerable to changes in hydrology, coastal and riparian species are vulnerable to trampling effects, pollution, agricultural and construction activities while alpine species are sensitive to changes in their microhabitats. General suggestions regarding the conservation of these rare spiders are given, as with most invertebrates preservation are best facilitated through protection and monitoring of their habitats.

Norwegian Responsibility Lists are presented for peatland/wetland species, high-altitude alpine species and forest, grassland and open land species, based on comparison with Red Lists of other countries in Europe.

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Preface

The official Norwegian Red Lists are based on proposals in reports and publications by specialists which are considered, approved and published by Direktoratet for naturforvaltning (DN). Red Lists are increasingly used in Norway today when planning the management and conservation of biological resources. The first Norwegian Red Lists dealt solely with vertebrates but from the early 1990s invertebrates were also considered and included in the lists. The latest Red List, published in 1999, embraces 11 groups of insects and four groups of other invertebrates (DN 1999b).

It is obvious that certain groups will be left out, either because specialists are lacking or data have not yet been published. No arachnids have previously been included in these lists, but recent advances in our knowledge of one group, spiders, have finally made this possible. Work on this Red List proposal was initiated by the first author and supported and supplemented by valuable information and suggestions by the second author.

Contributions from a lot of people made this paper possible. Special thanks goes to Theo Blick for his valuable comments on the ecology and taxonomy of *Saaristoa firma*, for providing some very important papers, for help with nomenclatorial problems and the distribution of certain species; to Lars L. Jonsson for providing information on the occurrence and distribution of the various species in Sweden; to Dr. Seppo Koponen for providing copies of the Finnish Red Lists; to Dr. Ralph Platen for comments on the habitat of *Dipoena torva*; to Dr. Konrad Thaler for comments on the taxonomy of *Scotinotylus clavatus* and to Dr. Torbjørn Kronestedt who verified the identification of *Arctosa stigmosa* and provided useful comments and help. Additionally, several investigators as well as NINA (Norwegian Institute for Nature Research) allowed us to publish material from their interesting collections: thanks to Reidun Pommeresche, Per Grimsby, Sigurd Einum, Ove Magne Aasen, Arne Bretten and especially to John Skartveit and Karl Thunes of the forest biodiversity project "Miljøregistrering i skog" of the Norwegian Forest Research Institute (NISK). Furthermore, Oddvar Hanssen, Bjørn Åge Tømmerås and Frode Ødegaard from NINA and Lars Ove Hansen, Zoological Museum, University of Oslo, kindly allowed the first author access to their material from Mosvik, Gaula and the Oslofjord region which contained several new and important records. We also thank Lawrence Kirkendall for commenting on and correcting the English and Bjørn Åge Tømmerås, Oddvar Hanssen and Frode Ødegaard for their valuable comments and suggestions regarding the layout and composition of the manuscript.

Trondheim, July 2000

Kjetil Aakra

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1 Introduction

Spiders have so far not been considered in the official Norwegian Red Lists (DN 1992, DN 1999b). This is unfortunate as spiders represent a pivotal element of virtually all terrestrial ecosystems (Turnbull 1973, Coddington & Levi 1991) as well as being important biological indicators of anthropogenic stress and environmental deterioration (Maelfait & Hendrickx 1998). Given the current emphasis on management and conservation of natural resources, there is a need for up-to-date information on rare and potentially threatened spiders in our country. Present knowledge regarding the distribution, rarity and vulnerability of rare spiders in Norway is far from complete, but some important patterns have emerged, allowing preliminary identification of species which should be considered to be of conservation importance and in some cases vulnerable, endangered or care demanding.

2 Methods and material

The list of species presented here is a national proposal for which all species of spiders recorded in Norway (including both published and unpublished records) have been surveyed. Our presentation deviates somewhat from that in previous Red List proposals for invertebrates. Rather than using a simple tabular format we treat each species in a separate box, detailing its distribution, known Norwegian records, total distribution, habitat preferences and relevant points regarding the conservation of each species (as in Hansen & Aarvik 2000). We believe this procedure will highlight each species' vulnerability and make information on the various aspects more accessible to potential non-specialist users so that they do not have to browse through the literature to obtain this information.

The revised Red List categories introduced by Hanssen et al. (1997) and Ødegaard & Coulianos (1998) have been used, and their reasoning and arguments behind the allocation of categories to the different species have been followed, including the assessment chart. In general terms the selection of species is based on careful consideration of a few important aspects:

1. Rarity (scarcity of records, low population levels and/or a restricted range)
2. Vulnerability of habitat (applicable to stenotope species)
3. Populations at the extreme margins of their geographical range, and hence likely to have a limited distribution in Norway.

Spiders, being polyphagous predators, are only indirectly bound to specific plant associations (Turnbull 1973, Edwards 1997). The use of the assessment chart therefore presents some methodological problems as the distribution of several spider species in Norway are more restricted by micro- and macroclimatic factors (temperature, moisture and photoperiods) than by availability and vulnerability of specific and suitable habitats. They may therefore be rare in Norway even if their habitat is not. Consequently, the potential geographical range of each species is also used as a basis for assessment.

We have therefore mostly limited the inclusion of uncommon or rare species to those whose geographical range in Norway appears to be restricted to high-pressure regions, in particular the south-eastern coastal region, as implied by Hanssen et al. (1997) and Ødegaard & Coulianos (1998). In other words, species which have been found only a few times but in widely separated faunal regions have in most cases not been included in the list. For some species however, it is evident that they are present in very low numbers only, are generally rare or uncommon throughout their known range and these species have been assigned to the category "Insufficiently Known".

Attention has also been given to the distribution of the species in our neighbouring countries, i.e. the rest of Fennoscandia and Great Britain and Ireland. If a species is included in the Red Lists of other nations (notably Sweden, Finland, Germany and Great Britain) this has also influenced the allocation of a Red List category. Red List categories vary among countries, but are still useful when trying to understand the international rarity and conservati-

on status of these species. Several regional Red Lists have been published in Germany, but we have only used the latest National Red List (Platen et al. 1996, 1998). Two Red Lists have been produced for Slovakia (Gajdos & Svaton 1994, Gajdos et al. 1999), only the latter have been used here. Threat categories used by other countries have been directly translated (e.g. "Stark Gefährdet" = Strongly Threatened) and are capitalised in the text to differentiate them from more general comments on rarity or status.

Species not recorded in Norway for the last 50 years or more are listed as extinct, in accordance with Hanssen et al. (1997) and Ødegaard & Coulianos (1998), even if this is highly unlikely to be correct (see below). New records are needed if they are to be reinstated as members of the Norwegian spider fauna.

Most species described by E. Strand from Norwegian material and some lycosids described by R. Collett which have not been collected since (see Hauge 1989) are not included in this survey as the validity of the species are very much in doubt and the apparent loss of type material prevents us from checking this. Several records published by Strand are also doubtful as they have not been verified by more recent findings. They have nevertheless been included in the present list, but should be treated with scepticism. We have attempted to adopt older names of localities to the modern faunal provinces, but this was not always possible. Faunistic regions (Figure 1) follow Økland (1981), taxonomic nomenclature for most families follows Platnick (1998, 2000), linyphiid nomenclature follows Tanasevitch (2000) with a few exceptions (see Blick 1998). Only naturally occurring species are included.

- | | | | |
|-------------|------------------------|-------------|--------------------------|
| Ø: | Østfold | NSY: | outer Nordland |
| AK: | Akershus and Oslo | NSI: | inner southern Nordland |
| HES: | southern Hedmark | NNØ: | north - eastern Nordland |
| HEN: | northern Hedmark | NNV: | north - western Nordland |
| OS: | southern Oppland | TRY: | outer Troms |
| ON: | northern Oppland | TRI: | inner Troms |
| BØ: | eastern Buskerud | FV: | western Finnmark |
| BV: | western Buskerud | FI: | inner Finnmark |
| VE: | Vestfold | FN: | northern Finnmark |
| TEY: | outer Telemark | FØ: | eastern Finnmark |
| TEI: | inner Telemark | | |
| AAV: | outer Aust - Agder | | |
| AAI: | inner Aust - Agder | | |
| VAV: | outer Vest - Agder | | |
| VAI: | inner Vest - Agder | | |
| RY: | outer Rogaland | | |
| RI: | inner Rogaland | | |
| HOY: | outer Hordaland | | |
| HOI: | inner Hordaland | | |
| SFY: | outer Sogn og Fjordane | | |
| SFI: | inner Sogn og Fjordane | | |
| MRY: | outer Møre og Romsdal | | |
| MRI: | inner Møre og Romsdal | | |
| STY: | outer Sør - Trøndelag | | |
| STI: | inner Sør - Trøndelag | | |
| NTY: | outer Nord - Trøndelag | | |
| NTI: | inner Nord - Trøndelag | | |

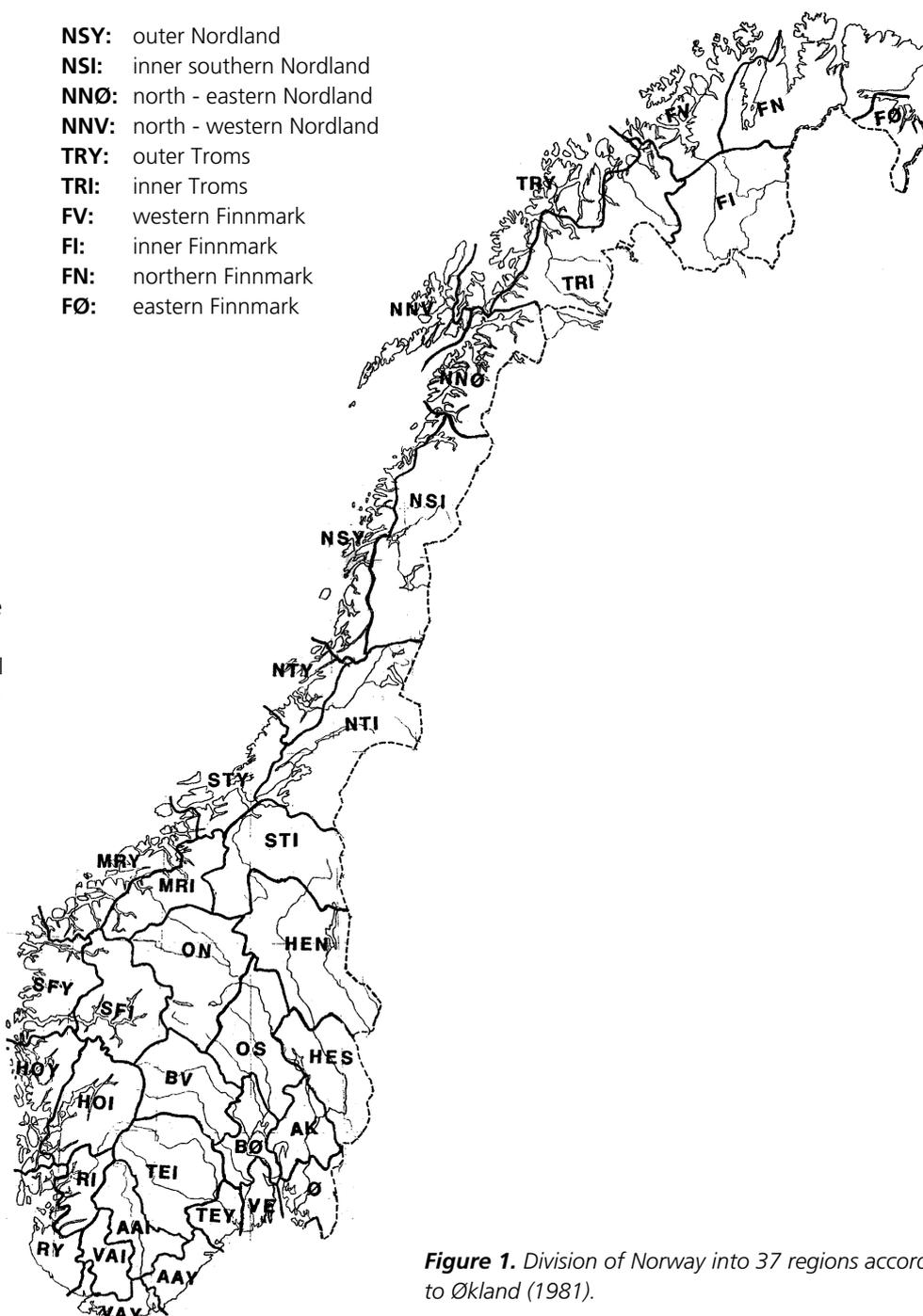


Figure 1. Division of Norway into 37 regions according to Økland (1981).

3 Present state of knowledge

The best sampled region in Norway is the coastal parts of the western and southwestern region (Rogaland and Hordaland). Several long-term and extensive investigations have been carried out here in the late 1980s and 1990s, mostly using pitfall trapping (which yield a large number of species and specimens and which is, on balance, the most efficient sampling method). We estimate that the large majority of epigeic species in the coastal and lowland parts of the region have been registered, although new discoveries are still being made (Aakra 1998, 2000, Pommeresche 1999).

The southeastern and eastern parts of Norway (Vest-Agder to Østfold and Hedmark) are also reasonably well sampled with pitfall traps, but we believe this fauna is insufficiently known and many more interesting discoveries are surely to be expected, indeed, some are reported for the first time here. Fortunately, a considerable amount of undetermined material from the region was made available to the first author for this survey, and some new localities of rare spiders are presented for the first time here.

A few localities in northern Norway (i.e. north of Trondheim) have also been sampled with pitfall traps and other methods, but these are far apart and many important areas remain unsampled. Knowledge is only superficial compared to southern and western Norway. The area around Trondheim and northwestern Norway (Sogn og Fjordane og Møre og Romsdal) are virtually unexplored as far as spiders are concerned, most published records being nearly a century old, but again a considerable amount of unpublished material from the region was made available to the first author for study.

Even if large areas in Norway remain unsampled or only superficially known with respect to spiders, knowledge is sufficient to present preliminary information on rare and potentially threatened species because these mostly occur in the relatively well-known southern and southeastern parts. The likely range of several species is fairly obvious given their distribution in the other Fennoscandian countries (the spider faunas of which are much more completely known). The regional habitat requirements and autecology of the species treated here are in general very well known, probably equal to or surpassing that of many other groups of terrestrial invertebrates.

4 Definition of Red List threat categories

The Red List threat categories and their respective interpretations as used in this paper are as follows:

Ex? - Extinct? - Probably extinct.

Includes all species not recorded for the last 50 years. It is very difficult to prove beyond doubt that a given species has disappeared from the Norwegian fauna, but we have chosen to assign this status consistently to all species not recorded during the last 50 years.

E - Endangered - Directly threatened by extinction.

Used on rare species restricted to habitats which are uncommon and under degradation in Norway today.

V - Vulnerable.

Includes species which are likely to become endangered if the current trends in habitat degradation and fragmentation continues. The known sites of occurrence are heavily influenced by human activity and interests.

DC - Declining, care demanding - In need of protection.

Includes species which we believe are in recession or in danger of recession because of human activities and pressure. These species may be locally abundant and/or widespread but maintenance of viable populations may require species-specific actions.

I - Indeterminate - Uncertain status.

This category is used on species which may be threatened, vulnerable or care demanding but which we suspect have a wider distribution than current records indicate. The status is a reflection of this insecurity. If the distribution of these species are not extended through new records they should probably be transferred to a stricter category.

K - Insufficiently known.

Used on species which may belong to one of the above categories but which cannot be assigned to any of them due to lack of supporting evidence. It must be noted that this category is not necessarily a "threatened" category but is used as a precaution to ensure that species of possible conservation value are included in the survey.

5 Rare and potentially threatened spiders in Norway

5.1 Araneidae

• *Aculepeira ceropegia* (Walckenaer, 1802)

Norwegian records: HEN Åmot, HES Elverum (Collett 1877)

Distribution: In Sweden north to Dalarna (Jonsson pers. comm.), southeastern parts of Finland (Palmgren 1974a), known from a single location in Great Britain (Locket et al. 1974), but not Ireland (van Helsdingen 1996), otherwise central and southern Europe, eastwards to Middle-Siberia and China (Esyunin & Efimik 1996, Mikhailov 1997).

Habitat: Low vegetation and bushes (Maurer & Hänggi 1990, Roberts 1993).

Proposed Red List status: Extinct?

Conservation considerations: Probably close to its northern limit of distribution. Considered Vulnerable in Sweden (Gärdenfors 2000) and Finland (Rassi & Väisänen 1987, Rassi et al. 1992). Due to its striking colours and shape it is unlikely to have been overlooked by collectors.

• *Agelenatea redii* (Scopoli, 1763)

Norwegian records: RY Egersund (Collett 1877 sub *Epeira sollers* Walckenaer, 1805).

Distribution: Southern Sweden; north to Västergötland (Jonsson pers. comm.) but uncommon (Kronstedt 1983), not recorded from Finland (Palmgren 1977a), southern parts of Great Britain and Ireland (Locket et al. 1974, van Helsdingen 1996), North Africa, most parts of continental Europe, most parts of Asia east to Japan and south to India (Esyunin & Efimik 1996).

Habitat: Bushes and low vegetation (Roberts 1993).

Proposed Red List status: Extinct?

Conservation considerations: Probably reaches its north-western limit of distribution in southern Norway.

• *Araneus alsine* (Walckenaer, 1802)

Norwegian records: BV Hol and Ål (Strand 1899 sub *Epeira lutea* C. L. Koch), ON Dovre (Collett 1877 sub *E. lutea*), STI Trondheim Mostadmarka (?) (Storm 1898 sub *E. lutea*).

Distribution: Most parts of Sweden (Jonsson pers. comm.), most parts of Finland (Palmgren, 1974a), north to Scotland in Great Britain, not found in Ireland ((Roberts 1995), van Helsdingen 1996), otherwise Europe and east to Kamtchatka (Esyunin & Efimik 1996, Mikhailov 1997).

Habitat: Damp woodland clearings (Roberts 1995).

Proposed Red List status: Extinct?

Conservation considerations: Probably overlooked in Norway. Threatened in Germany (Platen et al. 1996).

• *Araneus angulatus* Clerck, 1757

Norwegian records: NTY Namdalen: "Foldenfjorden", OS Lillehammer: Fåberg (Collett 1877), Ø Marker: Ødemark, near Gjølsjøen (Strand 1900a), Hvaler (Collett 1877),

Distribution: North to Dalarna in Sweden (Jonsson pers. comm.), southern half of Finland (Palmgren 1974a), southern coastal counties of Great Britain, not recorded from Ireland (Locket et al. 1974, van Helsdingen 1996), otherwise continental Europe, east to continental Far East, Japan and North-America (Esyunin & Efimik 1996, Mikhailov 1997).

Habitat: On bushes and trees (Roberts 1995), mainly coniferous trees, prefers dark, mature forest stands (Palmgren 1974a, 1979).

Proposed Red List status: Extinct?

Conservation consideration: Not recorded for a century and possibly in decline. Palmgren (1979) noted that *A. angulatus* had become increasingly less common in the Finnish forests since the 1930s and -40s and it is quite likely that modern forestry practices are detrimental to this species. Near Threatened in Sweden (Gärdenfors 2000).

• *Araneus nordmanni* (Thorell, 1870)

Norwegian records: AK Oslo: Ullensaker, NTI Mosvik (Tømmerås et al. 2000), also NSI Hattfjellidal: Hattfjellidalen, Skarmodalen and Klovimoen (Strand 1900b), ON (?) Valdres, OS Lillehammer: Fåberg (Collett 1877), "Hallingdal" (Strand 1899).

Distribution: South to Uppland in Sweden (Jonsson pers. comm.), most parts of Finland but rare (Palmgren 1974a), not recorded from Great Britain or Ireland (Locket et al. 1974, van Helsdingen 1996), central and northern Europe, most parts of Asia and North-America (Esyunin & Efimik 1996, Mikhailov 1997).

Habitat: Canopy of coniferous trees and bushes (Maurer & Hänggi 1990, Heimer & Nentwig 1991).

Proposed Red List status: Declining, care demanding.

Conservation considerations: Studies indicate that *A. nordmanni* is sensitive to modern forestry practises (Ehnström & Walden 1986, Petterson 1996) and the scarcity of records suggests that this species is rare, despite the difficulty of accessing its habitat. Its status in other countries also emphasises the conservation needs of *A. nordmanni*; it is Threatened by Extinction in Germany (Platen et al. 1996) and Critically Endangered in Slovakia (Gajdos et al. 1999).

• *Araneus saevus* (L. Koch, 1872)

Norwegian records: **AK** Ullensaker, **BØ** Drammen, **HEN** Åmot, **HES** Elverum (Collett 1877 sub *Epeira sinistra* Thorell) and **NTI** Mosvik (Tømmerås et al. 2000).

Distribution: North to Åsele lappmark in Sweden (Jonsson pers. comm.), found almost north to the Polar Circle in Finland but rare (Palmgren 1974a, sub *A. zimmermanni* ?, Palmgren 1977a), not recorded from Great Britain or Ireland (Locket et al. 1974, van Helsdingen 1996), otherwise Central Europe, Northern Asia and North-Amerika (Esyunin & Efimik 1996, Mikhailov 1997).

Habitat: On coniferous and deciduous trees (Levi 1971).

Proposed Red List status: Declining, care demanding.

Conservation considerations: Probably under-recorded in Norway. Considered Near Threatened in Sweden (Gärdenfors 2000), Declining in Finland (Rassi & Väisänen 1987, Rassi et al. 1992) and Critically Endangered in Slovakia (Gajdos et al. 1999), Threat Situation Uncertain in Germany (Platen et al. 1996). Sensitive to modern forestry practices (see Petterson 1996).

Comments: Listed as *A. sinister* in Hauge (1989). Males may easily be confused with *A. nordmanni* (Levi 1971).

• *Araniella alpica* (L. Koch, 1869)

Norwegian records: **AK** Asker, **HES** Åmot, **NTI** Namdalen, "Foldenfjorden" (Collett 1877) and Mosvik (Tømmerås et al. 2000), **STI** Trondheim: Byneset (Hauge 1972).

Distribution: All parts of Sweden (Jonsson pers. comm.), a single record from Åland, Finland (Lethinen et al. 1979), a few sites in southern Great Britain, not Ireland (Locket et al. 1974, van Helsdingen 1996), most parts of continental Europe except the Benelux Countries and the Iberian Peninsula (Maurer & Hänggi 1990), otherwise east to western Siberia (Mikhailov 1997).

Habitat: On trees and bushes (Bratton 1991), pine and spruce in mountaneous areas (Levi 1974).

Proposed Red List status: Insufficiently Known.

Conservation considerations: Considered rare by Hauge (1989) and Rare in Great Britain (Locket & Millidge 1953, Bratton 1991). The older Norwegian records are somewhat doubtful.

• *Gibbaranea bituberculata* (Walckenaer, 1802)

Norwegian records: **STI** Trondheim: Mostadmarka (?) (Storm 1898 sub *A. omoedus* (Thorell, 1870) - see Tambs-Lyche 1941).

Distribution: Only known from Scania in Sweden (Jonsson pers. comm.), one uncertain record from Finland (Palmgren 1974a), a single locality in Great Britain, not known from Ireland (Locket et al. 1974, Bratton 1991, van Helsdingen 1996), otherwise North-Africa, south and central Europe and most parts of the former Soviet Union (Esyunin & Efimik 1996, Mikhailov 1997).

Habitat: On bushes, hedgerows and low vegetation (Bratton 1991, Roberts 1993).

Proposed Red List status: Extinct?

Conservation considerations: Considered Endangered, possibly extinct in Great Britain (Roberts 1993, Bratton 1991), listed as Regionally Extinct in the Swedish Red List (Gärdenfors 2000).

• *Gibbaranea omoeda* (Thorell, 1870)

Norwegian records: **AK** Oslo, **BØ** Drammen (Collett 1877), **NTI** Mosvik (Tømmerås et al. 2000), **VE** Sande and Botne (N.B. only juveniles – see Strand 1900a).

Distribution: North to Uppland in Sweden (Jonsson pers. comm.), north to about 63° in Finland (Palmgren 1974a), absent from Great Britain and Ireland (Locket et al. 1974, van Helsdingen 1996), known from other parts of continental Europe, west and central Siberia, Shakalin and east to Japan (Esyunin & Efimik 1996, Mikhailov 1997).

Habitat: On coniferous trees (Palmgren 1974a), probably preferring mature forests (Niemelä et al. 1996).

Proposed Red List status: Indeterminate.

Conservation considerations: Sensitive to modern forestry (Petterson 1996). Hippa and Mannila (1975) indicate that this species belong to an eastern faunal element unlikely to reach oceanic parts of western Europe, also see Lethinen et al. (1979).

Comments: Listed as *Araneus omoedus* in Hauge (1989).

• *Larinioides sclopetarius* (Clerck, 1757)

Norwegian records: **AK** «around Oslo» and **RY** Egersund (Collett 1877).

Distribution: North to Hälsingland in Sweden (Jonsson pers. comm.), not listed from Finland (Palmgren 1974a), southern parts of Great Britain (Locket et al. 1974), a few records from Ireland (van Helsdingen 1996), otherwise continental Europe, Russian and the Russian plain, the Baltic states, Ukraine, China, Korea, Japan and North America (Esyunin & Efimik 1996, Mikhailov 1997).

Habitat: Buildings, bridges and fences near water, rarely found in vegetation - synanthropic - (Roberts 1993), Collett (1877) found the species by the sea.

Proposed Red List status: Extinct?

Conservation considerations: Probably reaches its north-western limit of distribution in southern Norway. Possibly overlooked.

• *Mangora acalypha* (Walckenaer, 1802)

Norwegian records: **AAY** Arendal (Hauge 1989), **BØ** Hurum: Mølen (Hauge & Hansen 1991), **TEY** Bamble: Langøya (Aakra unpub.), **VAY** Kristiansand and **VE** Tjøme (Hauge 1989).

Distribution: North to Östergötland in Sweden (Jonsson pers. comm.), absent from Finland (Palmgren 1974a, 1977), southern parts of Great Britain and Ireland (Locket et al. 1974, van Helsdingen 1996), Europe, North Africa including the Canary islands, Middle Asia, Caucasus, east to South

Siberia (Esyunin & Efimik 1996, Mikhailov 1997).

Habitat: Low vegetation and bushes (Roberts 1993).

Proposed Red List status: Insufficiently Known.

Conservation considerations: So far only found in coastal sites in the high-pressure region of the southeastern coast. This predominantly southern species may be quite local in northern Europe.

• *Nuctenea silvicultrix* (C. L. Koch, 1844)

Norwegian records: **AK** vicinity of Oslo, **HES** Løten and **OS** Lillehammer: Fåberg, **ON** (?) Valdres (Collett 1877).

Distribution: Most parts of Sweden except Scania (Jonsson pers. comm.), all of Finland (Palmgren 1974a), not recorded from Great Britain or Ireland (Locket et al. 1974, Roberts 1993, van Helsdingen 1996), most parts of the former USSR (Mikhailov 1997).

Habitat: On pines in connection with wet habitats (Palmgren 1974a, Roberts 1993), may prefer lichens on stunted pines growing on infertile, moist ground (Levi 1974).

Proposed Red List status: Extinct?

Conservation considerations: Generally rare or uncommon, although not in Fennoscandia (Roberts 1993). Has a restricted distribution in Germany (Platen et al. 1996) and is critically endangered in Slovakia (Gajdos et al. 1999).

Comments: It is easily confused with *N. umbratica* (Clerck, 1757) which is widespread and common in Norway (Hauge 1989), but the habitat differs.

• *Singa nitidula* C. L. Koch, 1844

Norwegian records: **STI** Midtre Gauldalen: Mo (Aakra unpub.).

Distribution: Known from Uppland and Dalarna in Sweden (Jonsson and Kronstedt pers. comm.), southeastern Finland and coastal parts of western Finland (Palmgren 1974a), not recorded from Great Britain or Ireland (Locket et al. 1974, Roberts 1995, van Helsdingen 1996), otherwise known from continental Europe, Baltikum and east to the Far East (Esyunin & Efimik 1996, Mikhailov 1997).

Habitat: On vegetation and litter close to running water, also on sandy lake shores (Palmgren 1974a, Roberts 1995).

Proposed Red List status: Declining, care demanding.

Conservation considerations: It is likely that this species is restricted to eastern and northeastern parts of Norway. Given its narrow habitat choice it is likely to be vulnerable to any factors that alter conditions along rivers, including construction of flood reducing walls, water regulation and trampling (see Andersen & Hanssen 1994). *S. nitidula* is considered Threatened in Germany (Platen et al. 1996) and Data Deficient in Sweden (Gärdenfors 2000).

5.2 Clubionidae

• *Cheiracanthium oncognathum* Thorell, 1871

Norwegian records: **AAV** Froland, Jåmåsknutene, **AK** Bærum: Ostøya (Hauge & Midtgaard 1986) and Asker: Bjørkås (Aakra unpub.), **BØ** Hurum: Verket and Nedre Eiker, Solbergfjell (Aakra unpub.), **TEY** Drangedal: Rønno mdalen (Aakra unpub.), **VAY** Farsund: Straumen (Aakra unpub.), **VE** Våle: Langøya, Sande: Kommersøya (Hauge & Hansen 1991).

Distribution: In Sweden only north to Värmland (Jonsson pers. comm.), southern parts of Finland (Palmgren 1943), not recorded from Great Britain or Ireland (Locket et al. 1974, van Helsdingen 1996), otherwise mid- and southeastern continental Europe (Maurer & Hänggi 1990), eastwards to the Urals (Mikhailov 1997).

Habitat: Thermophilous (Thaler 1981); in moss and litter in forests (Maurer & Hänggi 1990), one Norwegian record (Verket) is from a rare type of sandy habitat (see Hanssen & Hansen 1998).

Proposed Red List status: Indeterminate.

Conservation considerations: Probably reaches the north-western margin of its distribution in South East Norway (Hauge & Midtgaard 1986). Three of the Norwegian records are from small islands in the most heavily populated area of Norway (Hauge & Midtgaard 1986) and the species is potentially vulnerable to human disturbance due to its size. Langøya is currently used as a disposal site for toxic wastes, most of Ostøya is now a golf course and Verket is under continued change due to human use. Distribution in Germany is Restricted (Platen et al. 1996), the species is Endangered in Slovakia (Gajdos et al. 1999).

• *Clubiona diversa* O. P. - Cambridge, 1862

Norwegian Records: **VE** Tjøme (Hauge 1989) and Hvasser (Andersen & Hauge 1995).

Distribution: North to Uppland in Sweden (Jonsson pers. comm.), extreme Southwestern tip of Finland (Palmgren 1977a), widespread and common in Great Britain and Ireland (Locket et al. 1974, van Helsdingen 1996), Europe (Braun & Rabeler 1969) and east to Shakalin (Mikhailov 1997).

Habitat: Litter and ground vegetation in moist open sites (Maurer & Hänggi 1990).

Proposed Red List status: Insufficiently Known.

Conservation considerations: Possibly close to the north-western limit of distribution.

• *Clubiona kulczynskii* De Lessert, 1905

Norwegian records: **BV** Gol (Hauge 1989).

Distribution: Arctomontane; most records from central Europe (Thaler 1981), south to Dalarna in Sweden (Tullgren 1946, Jonsson pers. comm.), most parts of Finland (Palmgren 1943), absent from Great Britain and Ireland (Locket et al. 1974), otherwise central and northern Europe and as far east as Shakalin Islands and North America (Esyunin & Efimik 1996, Mikhailov 1997).

Habitat: Subalpine coniferous forests (Thaler 1981, Maurer & Hänggi 1990), moist situations (Hänggi et al 1995).

Proposed Red List status: Insufficiently Known.

Conservation considerations: Probably rare as it is not often found. Threatened in Germany (Platen et al. 1996).

5.3 Dictynidae

• *Archaeodictyna consecuta* O. P.-Cambridge, 1872

Norwegian records: FØ Sør-Varanger: Bjørnevatn (Hauge 1976 sub *Dictyna terricola* Holm).

Distribution: Öland and Gotland in southern Sweden and Västerbotten and northwards (Jonsson pers. comm.), northern Finland (Palmgren 1977a), absent from Great Britain and Ireland (Locket et al. 1974, van Helsdingen 1996), otherwise known from Himalaya to Portugal and northern continental Europe (Kronstedt 1983).

Habitat: Thermophilous species; usually in dry, grassy fields (Kronstedt 1983).

Proposed Red List status: Indeterminate.

Conservation considerations: Two disjunct populations appear to exist in Fennoscandia, one in the south, the other in the north (Kronstedt 1983). Only the northern population is known to extend into Norway. Considered Critically Endangered in Slovakia (Gajdos et al. 1999).

• *Argenna subnigra* (O.P.-Cambridge, 1861)

Norwegian records: VE Tjøme (Klausen 1974, Andersen & Hauge 1995).

Distribution: North to Uppland in Sweden (Jonsson pers. comm.), southern parts of Finland (Palmgren 1977a), southern parts of Great Britain and Ireland (Locket et al. 1974, Roberts 1993, van Helsdingen 1996), known from most parts of continental Europe (Maurer & Hänggi 1990), eastwards to the Urals (Mikhailov 1997).

Habitat: Open, dry sites; "stones on dunes and sandy grassland" (Roberts 1993) and similar dry habitats (Palmgren 1977a).

Proposed Red List status: Indeterminate.

Conservation considerations: Probably restricted to coastal parts of southeastern Norway.

• *Cicurina cicur* (Fabricius, 1793)

Norwegian records: TEY Porsgrunn (Ellefsen & Hauge 1986).

Distribution: In Sweden known from Östergötland to Uppsala, probably more widespread (Holm 1987, Jonsson pers. comm.), a single record from southern Finland (Palmgren 1977a), southern and western parts of Great Britain (Locket et al. 1974), not recorded from Ireland (van Helsdingen 1996), various other parts of continental Europe (Maurer & Hänggi 1990).

Habitat: Damp and dark situations, predominantly forests,

but also human structures (Maurer & Hänggi 1990, Roberts 1993); the species appears to prefer chalk or magnesian limestone grounds in Great Britain (Smith 1989).

Proposed Red List status: Declining, care demanding.

Conservation considerations: Generally rare in Britain (Roberts 1993), listed as Rare in the Finnish Red Lists (Rassi & Väisänen 1987, Rassi et al. 1992) and Data Deficient in Sweden (Gärdenfors 2000). The only Norwegian records are from a basiophilous mixed forest and two damp, undisturbed deciduous forests (Ellefsen & Hauge 1986). The species is probably sensitive to human disturbance of such biotopes.

• *Dictyna latens* (Fabricius, 1775)

Norwegian records: VE Tjøme (Hauge 1989) and Sande: Kommersøya (Hauge & Hansen 1991).

Distribution: North to Bohuslän in Sweden (Jonsson pers. comm.), only the extreme southwestern tip of Finland (Palmgren 1977a), southern parts of Great Britain and Ireland (Locket et al. 1974, van Helsdingen 1996), otherwise continental Europe including the Mediterranean region and Turkistan (Maurer & Hänggi 1990) and east to South Siberia (Mikhailov 1997).

Habitat: Extremely thermophilous; on vegetation in very sunny places (Maurer & Hänggi 1990).

Proposed Red List status: Declining, care demanding.

Conservation considerations: Probably reaches its northwestern limit of distribution in the Oslofjord region. Likely to be locally distributed due to its thermophilous requirements. Considered Threatened in Germany (Platen et al. 1996).

5.4 Gnaphosidae

• *Drassyllus pumilus* (C. L. Koch, 1839)

Norwegian records: AK Asker: Bjørkås, HES Hamar: Furuberget (Aakra unpub.).

Distribution: Known from Östergötland and Gotland in Sweden (Jonsson pers. comm.), southwestern parts of Finland (Palmgren 1943, Lethinen et al. 1979), not recorded from Great Britain or Ireland (Locket et al. 1974, van Helsdingen 1996), otherwise central and eastern parts of Europe (Grimm 1985).

Habitat: Warm sunny sites; fields and meadows (Grimm 1985).

Proposed Red List status: Indeterminate.

Conservation considerations: Probably restricted to eastern parts of South-Norway.

• *Echemus angustifrons* (Westring, 1861)

Norwegian records: VE Tjøme (Klausen & Andersen 1990).

Distribution: North to Bohuslän in Sweden (Jonsson pers. comm.), not recorded from Finland (Palmgren 1977a), rather widespread but scattered records from continental Europe (Grimm 1985), absent from Great Britain and Ireland (Locket et al. 1974, Grimm 1983, 1985, van Helsdingen 1996), rang-

es into Western Siberia (Mikhailov 1997).

Habitat: Thermophilous (Thaler 1981, 1997); open, grassy habitats (Grimm 1983).

Proposed Red List status: Declining, care demanding.

Conservation considerations: Obviously rare in Norway as the species was only recently discovered. It is probably at its northwestern limit of distribution. Generally rare in central Europe (Thaler 1981), Strongly Threatened by Extinction in Germany (Platen et al. 1996), Endangered in Slovakia (Gajdos et al. 1999).

• *Gnaphosa orites* (Chamberlin, 1922)

Norwegian records: **ON** Vågå: Sjordalen (Hauge & Refseth 1979), **OS** Sør-Aurdal: Vassfaret (Hauge & Wiger 1980) and **STI** Midtre Gauldal: Budal, Enabu (Paulsen Thingstad 1982).

Distribution: Mostly northern parts of Fennoscandia (Palmgren 1943, 1977a, b); northern Sweden (Jonsson pers. comm.), north but also southern Finland (Niemi et al. 1996 sub *G. holmii*), not recorded from Great Britain or Ireland (Locket et al. 1974, van Helsdingen 1996), nor continental Europe (Grimm 1985), otherwise east to the Far East as well as North-Amerika (Esyunin & Efimik 1996, Mikhailov 1997).

Habitat: Bogs (Hauge & Wiger 1980).

Proposed Red List status: Insufficiently Known.

Conservation considerations: The Norwegian record is the most western to date, thus our populations represents one extremity of its total range. Another possible member of the eastern taiga element, probably being more common in the north and east.

• *Haplodrassus minor* (O.P.-Cambridge, 1879)

Norwegian records: **VE** Tjøme: Hvasser (Andersen & Hauge 1995), the only known record from Fennoscandia.

Distribution: Five shingle beaches in southern parts of Great Britain, absent from Ireland (Locket et al. 1974, van Helsdingen 1996), southwestern parts of Switzerland (Maurer & Hänggi 1990), Italy (Di Franco 1997) and as far east as the Urals (Mikhailov 1997). Central European records are uncertain (Grimm 1985).

Habitat: Shingle beaches, preferably with a considerable amount of seaweed and litter (Bratton 1991, Andersen & Hauge 1995).

Proposed Red List status: Endangered.

Conservation considerations: Given the general rarity of the species, the scattered populations and the frequent disturbance of its main habitat due to human activities in Great Britain (Bratton 1991), sufficient evidence exist to give this species the status above. The site where this species have been found and similar habitats is in dire need of protection. In Great Britain the species is given the status Rare (Bratton 1991), it is Strongly Threatened in Germany (Platen et al. 1996) and Vulnerable in Slovakia (Gajdos et al. 1999). The species is also considered to be of conservation interest in other areas (e.g. Zulka & Milasowszky 1998).

• *Scotophaeus blackwalli* (Thorell, 1873)

Norwegian records: **VAY** Kristiansand, not reported since Strand (1904).

Distribution: Swedish records from Skåne and Gotland (Jonsson pers. comm.), not recorded from Finland (Palmgren 1977a), most parts of Great Britain and central Ireland (Locket et al. 1974, van Helsdingen 1996), continental Europe (Grimm 1985), North Amerika and Peru (Maurer & Hänggi 1990) and east to Caucasus (Mikhailov 1997).

Habitat: Usually on buildings (Maurer & Hänggi 1990, Roberts 1993).

Proposed Red List status: Extinct?

Conservation considerations: The current records are very old, real status unknown. Considered Vulnerable in Slovakia (Gajdos et al. 1999).

• *Scotophaeus quadripunctatus* (Linnaeus, 1758)

Norwegian records: **AK** Oslo: Esmark, not reported since Strand (1904).

Distribution: North to Uppland in Sweden (Jonsson pers. comm.), not taken in Finland (Palmgren 1977a), absent from Great Britain and Ireland (Locket et al. 1974, Roberts 1995, van Helsdingen 1996), Europa (Maurer & Hänggi 1990), central parts of continental Europe (Grimm 1985) and east to the Caucasus (Mikhailov 1997).

Habitat: Usually found on and near buildings (Thaler 1981, Maurer & Hänggi 1990, Roberts 1993).

Proposed Red List status: Extinct?

Conservation considerations: The current records are very old, real status unknown.

• *Zelotes electus* (C. L. Koch, 1839)

Norwegian records: **VAY** Farsund: Hanangermona (Klausen 1974).

Distribution: North to Gotland in Sweden (Jonsson pers. comm.), a single record from Finland (Palmgren 1943), coastal areas of Great Britain and Ireland (Locket et al. 1974, van Helsdingen 1996), most parts of continental Europe (Maurer & Hänggi 1990, Grimm 1985) and east to South Siberia (Mikhailov 1997).

Habitat: Thermophilous; below vegetation and rocks on coastal dunes (Roberts 1995), dry open sites (Bauchhenss 1990, Maurer & Hänggi 1990).

Proposed Red List status: Declining, care demanding.

Conservation considerations: Only a single specimen has ever been found in Norway (Klausen 1974) and the species is very rare. If this turns out to be a coastal species in Norway it is likely to be vulnerable to human activities. Considered Rare in Finland (Rassi et al. 1992).

• *Zelotes longipes* (L. Koch, 1866)

Norwegian records: **AK** Oslo: "V. Aker" (Strand 1904 sub *Prosthesima serotina* (L. Koch)).

Distribution: North to Värmland in Sweden (Jonsson pers. comm.), a few records from southern Finland (Palmgren 1943, Nimelä et al. 1996 sub *Z. serotinus*), widely distributed in Great Britain but rare, central part of Ireland (Locket et al. 1974, Roberts 1995, van Helsdingen 1996), continental Europe (Grimm 1985) and east to Central-Asia (Esyunin & Efimik 1996, Mikhailov 1997).

Habitat: Thermophilous; dry open sites (Bauchhenss 1990), dry heaths, coastal sites (Maurer & Hänggi 1990, Roberts 1995).

Proposed Red List status: Extinct?

Conservation considerations: The only known record is very old, real status unknown. Threatened in Germany (Platen et al. 1996), placed in Lower Risk (Least Concern) category in Slovakia (Gajdos et al. 1999).

• *Zelotes puritanus* Chamberlin, 1922

Norwegian Records: **HES** Hamar: Furuberget (Aakra unpub.).

Distribution: Known from Södermanland in Sweden (Jonsson pers. comm.), not reported from Finland (Palmgren 1977a), not found in Great Britain or Ireland (Locket et al. 1974, van Helsdingen 1996), recorded from central parts of continental Europe (Grimm 1985), otherwise Russia and east to northeastern Siberia (Mikhailov 1997), also western parts of USA (Grimm 1985).

Habitat: Warm sunny sites, also coniferous forests (Grimm 1985).

Proposed Red List status: Vulnerable.

Conservation considerations: This is the northeasternmost record in Europe and the species is unlikely to range much further north. Due to the general rarity and scattered distribution pattern of the species it is given the status above. *Z. puritanus* is Strongly Threatened in Germany (Platen et al. 1996) and Critically Endangered in Slovakia (Gajdos et al. 1999).

5.5 Linyphiidae

• *Agyneta fuscipalpus* (C. L. Koch, 1836)

Norwegian records: **BV** Hemsedal and **RY** Stavanger (Strand 1902a)

Distribution: Not recorded from Sweden (Jonsson pers. comm.), Finland (Palmgren 1977a) or Great Britain and Ireland (Locket et al. 1974, van Helsdingen 1996), known from central parts of continental Europe (Horak 1992), west and south-Siberia, central Asia, and east to Mongolia (Esyunin & Efimik 1996).

Habitat: Thermophilous (Horak 1992); cereal fields (Maurer & Hänggi 1990).

Proposed Red List status: Extinct?

Conservation considerations: The otherwise southern distribution of this species indicates that the Norwegian records are very doubtful.

• *Caviphantes saxetorum* (Hull, 1916)

Norwegian records: **STI** Midtre Gauldal: Mo (Aakra unpub.), the only Fennoscandian record.

Distribution: Known from a few scattered localities north to Scotland in Great Britain, not recorded from Ireland (Locket et al. 1974, van Helsdingen 1996), otherwise scattered records from central continental Europe (Wunderlich 1979, Thaler 1993, Steinberger 1996), Russia (Mikhailov 1997) and a single record from North-America (Crawford 1990).

Habitat: Restricted to fine grained sand banks along rivers (Locket et al. 1974, Steinberger 1996).

Proposed Red List status: Declining, care demanding.

Conservation considerations: Given its restriction to an uncommon and vulnerable biotope in Norway along with the general rarity of the species (Steinberger 1996) the proposed status is justified. An evaluation of riparian beetles also support this consideration (F. Ødegaard pers. comm.), see discussion of other riparian species.

• *Centromerus pabulator* (O. P.-Cambridge, 1875)

Norwegian Records: **BV** Hemsedal: Bjøberg (Strand 1902a).

Distribution: Scania in Sweden (Jonsson pers. comm., Almquist 1994), not recorded from Finland (Palmgren 1977a), nor Great Britain and Ireland (Locket et al. 1974, Almquist 1994, van Helsdingen 1996), known from Russia (Mikhailov 1997) and most parts of continental Europe (Almquist 1994).

Habitat: Various grassy habitats (Almquist 1994).

Proposed Red List status: Extinct?

Conservation considerations: In view of the otherwise southern distribution of this species the Norwegian record is very doubtful. Vulnerable in Sweden (Gårdenfors 2000).

• *Collinsia inerrans* (O. P.-Cambridge, 1885)

Norwegian records: **TEI** Heddal: Heståsen (Hauge & Kvamme 1983).

Distribution: Only known from Norrbotten in Sweden (Jonsson pers. comm.), not reported from Finland (Palmgren 1977a), most parts of Great Britain (Locket et al. 1974) but not Ireland (Locket et al. 1974, van Helsdingen 1996), otherwise continental Europe (Heimer & Nentwig 1991, Klapparek & Riecken 1995 sub *C. submissa* L. Koch) and throughout Asia east to the Kurile Islands (Mikhailov 1997).

Habitat: Bogs (Heimer & nentwig 1991), fields and forests (Maurer & Hänggi 1990), the Norwegian specimen was taken in a forest-fire area (Hauge & Kvamme 1983). Klapparek & Riecken (1995) indicated that *C. inerrans* is a pioneer species most often found in agroecosystems.

Proposed Red List status: Declining, care demanding.

Conservation considerations: A rarely found species (Heimer & Nentwig 1991, Klapparek & Riecken 1995), considered Critically Endangered in Slovakia (Gajdos et al. 1999).

Comments: Previously known as *Milleriana inerrans* (see Marusik et al. 1993), the older name *C. submissa* (L. Koch, 1879) has been suppressed for lack of usage (see Blick 1998, Platnick 1998, 2000).

• *Entelecara flavipes* (Blackwall, 1834)

Norwegian records: BV Sigdal (Aakra 2000).

Distribution: Known from the area between Västmanland and Hälsingland in Sweden (Jonsson pers. comm.), not reported from Finland (Palmgren 1977), comparatively widespread in southern and central parts of Great Britain, not recorded from Ireland (Locket et al. 1974, van Helsdingen 1996), otherwise continental Europe (Heimer & Nentwig 1991).

Habitat: Intensively used fields (Maurer & Hänggi 1990), bushes and grassland (Roberts 1993), low vegetation in forests (Heimer & Nentwig 1991), the Norwegian specimen were taken during a pine canopy fogging project.

Proposed Red List status: Insufficiently Known.

Conservation considerations: Probably a rare species (Heimer & Nentwig 1991), considered Vulnerable in Slovakia (Gajdos et al. 1999).

• *Gonatium paradoxum* (L. Koch, 1869)

Norwegian records: HES Elverum (Hauge & Kvamme 1983 sub *G. corallipes* (O. P.-Camb.)).

Distribution: South to Dalarna in Sweden (Jonsson pers. comm.), eastern parts of southern Finland (Palmgren 1976), a few sites in southeastern Great Britain, absent from Ireland (Locket et al. 1974, van Helsdingen 1996), continental Europe (Maurer & Hänggi 1990), east to Kazakhstan (Mikhailov 1997).

Habitat: Ground litter and moss, heaths and grasslands (Bratton 1990, Maurer & Hänggi 1990, Roberts 1993).

Proposed Red List status: Indeterminate.

Conservation considerations: Considered Vulnerable in Great Britain (Bratton 1991) and Threatened in Germany (Platen et al. 1996). Reaches its northwestern limit of distribution in Norway.

• *Hypomma cornutum* (Blackwall, 1833)

Norwegian records: BØ Hurum: Mølen (Hauge & Hansen 1991), Ø Sarpsborg: Vister (Waaler 1971), Moss: Jeløy and Råde: Tasken (Aakra unpub.).

Distribution: North to Uppland in Sweden (Jonsson pers. comm.), southwestern parts of Finland (Palmgren 1976), widespread and common in Great Britain and Ireland (Roberts 1993, van Helsdingen 1996), Europe and Turkistan (Maurer & Hänggi 1990) and east to South Siberia (Mikhailov 1997).

Habitat: On trees in moist forests (Maurer & Hänggi 1990).

Proposed Red List status: Insufficiently Known.

Conservation considerations: Another seemingly under-recorded species. Threat Situation is Unclear in Germany (Platen et al. 1996), a Lower Risk species (Least Concern) in Slovakia (Gajdos et al. 1999).

• *Lasiargus hirsutus* (Menge, 1869)

Norwegian records: HES Rendalen: Kværnesmoen (Hauge & Kvamme 1983).

Distribution: Only known from Scania in Sweden (Tullgren

1955, Jonsson pers. comm.), southern and central Finland (Palmgren 1976), mostly coastal sites in northern Europe including Denmark (Larsen & Bøggli 1970, Fründ et al. 1994), central Europe (Noflatcher 1988), absent from Great Britain and Ireland (Locket et al. 1974, van Helsdingen 1996), most parts of Northern Asia (Esyunin & Efimik 1996, Mikhailov 1997).

Habitat: Vegetation in sandy shores (Palmgren 1976), the Norwegian specimen was found on a forest-fire area with sandy soil (Hauge & Kvamme 1983).

Proposed Red List status: Declining, care demanding.

Conservation considerations: The most northwestern record of this rare and local species to date. Threatened in Germany (Platen et al. 1996), Critically Endangered in Slovakia (Gajdos et al. 1999).

• *Macrargus boreus* Holm, 1968

Norwegian records: OS Vågå: Vassfaret (Hauge & Wiger 1983), STI Midtre Gauldal: Budal, Enabu (Paulsen Thingstad 1982).

Distribution: Northern parts of Sweden (Jonsson pers. comm.), most parts of Finland except the northernmost provinces (Palmgren 1975), absent from Great Britain and Ireland (Locket et al. 1974, van Helsdingen 1996), otherwise areas of the former USSR (Mikhailov 1997).

Habitat: High-mountain habitats, including spruce forests (Hauge & Wiger 1980).

Proposed Red List status: Insufficiently Known.

Conservation considerations: Probably under-recorded.

Comments: Closely related to the more common *M. multesimus* (O. P. -Cambridge, 1875), considered a subspecies of the latter by Palmgren (1975), also see Hutha & Viramo (1979).

• *Maro lepidus* Casimir, 1961

Norwegian Records: HOI Kvam: Geitaknottane Nature Reserve (Pommeresche 1999)

Distribution: Widespread in Sweden (Jonsson pers. comm.), most parts of Finland (Palmgren 1975), a few sites in Great Britain, not recorded from Ireland (Locket et al. 1974, van Helsdingen 1996), otherwise central-Europe (Holm 1968) and the Russian plain (Mikhailov 1997).

Habitat: Strongly sphagnophilous (Holm 1968), occasionally in other wet habitats (Palmgren 1975).

Proposed Red List status: Insufficiently Known.

Conservation considerations: Probably under-recorded, but stenotopic and sensitive to drainage.

• *Pelecopsis parallela* (Wider, 1834)

Norwegian records: AAY Risør (Hauge 1989), BØ Hurum: Verksøya (Aakra unpub.) and VE Tjøme (Andersen & Hauge 1995).

Distribution: North to Uppland in Sweden (Jonsson pers. comm.), a few localities in southern Finland (Palmgren 1976), most parts of Great Britain, central parts of Ireland (Locket et al. 1974, van Helsdingen 1996) and central and southern Europe (Maurer & Hänggi 1990) and east to the Far East

(Mikhailov 1997).

Habitat: Moist fields, close to free water and in cultural landscapes (Maurer & Hänggi 1990).

Proposed Red List status: Insufficiently Known.

Conservation considerations: Probably restricted to the southeastern corner of Norway. Considered a Lower Risk species (Near Threatened) in Slovakia (Gajdos et al. 1999).

• Saaristoa firma (O.P.-Cambridge, 1905)

Norwegian records: **HOY** Askøy (Aakra 1998, 2000), Os (Hauge unpub.) and Bømlo (Aakra 2000), the only Fennoscandian records.

Distribution: Widespread in all of Europe (except the southern parts) including Great Britain and Ireland, but generally uncommon (Blick & Aakra unpub.).

Habitat: Damp and shaded habitats, primarily forests, but also cave entrances and open coastal sites (Blick & Aakra unpub.).

Proposed Red List status: Indeterminate.

Conservation considerations: The Norwegian records are the northernmost of this species. As such the Norwegian population is of particular conservation interest as genetic exchange with other known populations is highly unlikely. The species is given the status Threatened in Germany (Platen et al. 1996) and Critically Endangered in Slovakia (Gajdos et al. 1999).

• Satilatlas britteni (Jackson, 1912)

Norwegian records: **NSI** Saltdal: Kvitbergvatnet (Hauge & Tingstad 1999)

Distribution: Only known from Öland in Sweden (Jonsson pers. comm.), a few localities in southern Finland (Palmgren 1976, Lethinen et al. 1979), a few widely scattered sites in Great Britain, (Locket et al. 1974), two counties in Ireland (van Helsdingen 1996), otherwise central continental Europe (Maurer & Hänggi 1990) and the Russian plain (Mikhailov 1997).

Habitat: Wetlands, including shore habitats (Holm 1968) and marshes (Roberts 1993). The Norwegian specimen was taken in a mire (Hauge & Tingstad 1999).

Proposed Red List status: Declining, care demanding.

Conservation considerations: Of considerable interest as the northernmost record of this species. Considered Vulnerable in Finland (Rassi & Väisänen 1987, Rassi et al. 1992) and Threatened by Extinction in Germany (Platen et al. 1996).

• Scotinotylus clavatus (Schenkel, 1927) [= S. sacer (Crosby, 1929)]

Norwegian records: **BV** Nore og Uvdal (Hauge 1989).

Distribution: Holarctic (includes distribution data for *S. sacer*, see below); eastern Alps, Russia, Middle Siberia, the Far East, Alaska, Canada, Rocky Mountains and Western

Greenland (Thaler 1970, Eskov & Marusik 1993, Mikhailov 1997). Not recorded from Sweden (Jonsson pers. comm.), Finland (Palmgren 1977), Great Britain (Locket et al. 1974) nor Ireland (van Helsdingen 1996).

Habitat: Litter in high alpine habitats (Holm 1967).

Proposed Red List status: Indeterminate.

Conservation considerations: Of considerable interest as the first record in Europe outside the Alps.

Comments: *S. sacer* (Crosby, 1929) is in all probability a junior synonym of *S. clavatus* (Thaler 1970). Although the synonymy has not been published, we feel it is best to assign the Norwegian specimen (a male) to *S. clavatus* since the specimens fit the description of both *S. sacer* (in Holm 1967, Eskov & Marusik 1993) and *S. clavatus* (in Thaler 1970) and the latter name has priority.

• Silometopus ambiguus (O. P.-Cambridge, 1905)

Norwegian records: **HOY** Askøy: Herdla (Hauge 1989), Øygarden: Herdlavær (Hauge et al. 1991) and **RY** Jæren (Folvik 1992).

Distribution: Not recorded from Sweden (Jonsson pers. comm.), nor Finland (Palmgren 1976, 1977a), coastal sites in Great Britain and Ireland (Locket et al. 1974, van Helsdingen 1996), records from coastal parts of North Germany (Fründ et al. 1994) refer to *S. curtus* (Simon, 1881) according to Blick (1998).

Habitat: Various coastal habitats (Roberts 1993).

Proposed Red List status: Indeterminate.

Conservation considerations: Probably under-recorded but has a Restricted (coastal) Distribution in Germany (Platen et al. 1996), although this may refer to *S. curtus* (Simon, 1881) (Blick 1998).

• Silometopus incurvatus (O. P. -Cambridge, 1873)

Norwegian records: **HES** Elverum: Starmoen (Hauge 1989).

Distribution: Only known from Öland in Sweden (Jonsson pers. comm., Kronstedt 1983), not recorded from Finland (see Comments below), some scattered records from Northern England, not found in Ireland (Locket et al. 1974, van Helsdingen 1996), otherwise continental Europe, south Siberia and Middle Asia (Esyunin & Efimik 1996).

Habitat: Dry sites, including heaths and dunes (Kronstedt 1983).

Proposed Red List status: Indeterminate.

Conservation considerations: Probably extinct in Northern Germany (Platen et al. 1991) and has a Restricted Distribution in Germany (Platen et al. 1996).

Comments: Palmgren (1976) reported *S. incurvatus* from southern Finland, but these records were later assigned to *S. acutus* Holm, 1977 by Holm (1977).

• *Syedra gracilis* (Menge, 1866)

Norwegian records: **AK** Vestby: Son (Waalder 1967) and **BØ** Hurum: Ramvikholmen (Hauge & Hansen 2000), the only Fennoscandian records.

Distribution: Known from about 20 scattered sites in Great Britain, not recorded from Ireland (Locket et al. 1974, Roberts 1993, van Helsdingen 1996), otherwise central parts of continental Europe (Thaler 1983), the Mediterranean region (Mauere & Hänggi 1990) and east to Russia and Ukraine (Mikhailov 1997).

Habitat: Thermophilous; heaths (Thaler 1983), calcaerous grasslands (Roberts 1993).

Proposed Red List status: Declining, care demanding.

Conservation considerations: Considered rare in Britain (Roberts 1993), status in Germany Unclear (Platen et al. 1996).

• *Tapinocyboides pygmaeus* (Menge, 1869)

Norwegian records: **AAY** Hisøy (Hauge 1989), **BØ** Hurum: Mølen (Aakra unpub.) and **VE** Tjøme (Andersen & Hauge 1995).

Distribution: Widespread in Sweden (Jonsson pers. comm.), southern parts of Finland (Palmgren 1976), only known from four sites in Great Britain, absent from Ireland (Locket et al. 1974, Roberts 1993, van Helsdingen 1996), the Far East (Esyunin & Efimik 1996, Mikhailov 1997).

Habitat: Thermophilous (Kronstedt 1983, Bauchhens 1990); calcaerous, dry grasslands (Maurer & Hänggi 1990, Roberts 1993),

Proposed Red List status: Insufficiently Known.

Conservation considerations: Probably more widespread than current records appear to suggest, but rather local.

• *Tmeticus affinis* (Blackwall, 1856)

Norwegian records: **FØ**: Pasvik (Simon 1887), **NSI** Hattfjell-dal (Strand 1902b).

Distribution: Throughout Sweden (Jonsson pers. comm.) and most parts of Finland (Palmgren 1976), southern England and Ireland (Locket et al. 1974, van Helsdingen 1996), northern parts of central continental Europe (Heimer & Nentwig 1991) and eastwards to the Far East (Mikhailov 1997).

Habitat: Predominantly wet habitats (Roberts 1993), possibly strongly bound to freshwater reed habitats (Huhta & Viramo 1979, Hendrickx et al. 1998).

Proposed Red List status: Extinct?

Conservation considerations: Distribution in Germany Restricted (Platen et al. 1996), status Indeterminate in Slovakia (Gajdos et al. 1999) and generally uncommon (Heimer & Nentwig 1991). Almost certainly under-recorded in Norway in view of the distribution in the rest of Fennoscandia. Still, the apparent absence of *T. affinis* from bogs and wetlands investigated in southern Norway is noteworthy and could be caused by a specialised habitat.

• *Trichoncus vasconicus* Denis, 1944

Norwegian records: **VE** Tjøme: Grimestad (Hauge 1987).

Distribution: Probably only known from Gotland (Jonsson pers. comm.), southern and western parts of Finland (Palmgren 1976), not recorded from Great Britain or Ireland (Locket et al. 1974, Roberts 1993, van Helsdingen 1996), otherwise parts of Northern Europe and east to Middle Siberia (Heimer & Nentwig 1991, Esyunin & Efimik 1996, Mikhailov 1997).

Habitat: Very dry, warm grassy habitats (Hauge 1987).

Proposed Red List status: Indeterminate.

Conservation considerations: A generally rare species which is unlikely to have a wide range in Norway.

Comments: *T. vasconicus* has been considered a subspecies of *T. hackmani*, but is currently recognized as a separate species (Roberts 1993, Platnick 1998, Tanasevitch 2000).

• *Troxochrota scabra* Kulczynski, 1894

Norwegian records: **TEY** Kragerø (Hauge 1989).

Distribution: Småland and Uppsala in Sweden (Jonsson pers. comm.), southern and western Finland (Palmgren 1976), not recorded from Great Britain or Ireland (Locket et al. 1974, van Helsdingen 1996), otherwise known from the Russian plain and Estonia (Mikhailov 1997).

Habitat: Moss in dry, open forests (Palmgren 1976).

Proposed Red List status: Indeterminate.

Conservation considerations: An eastern species (Lethinen et al. 1979), having its western limit of distribution in Norway.

Comments: Listed as *Ceratinopsis pectinata* (Tullgren, 1955) in Hauge (1989).

• *Troxochrus nasutus* Schenkel, 1925

Norwegian records: **HES** Elverum: Starmoen (Hauge 1989) and **NTI** Mosvik (Tømmerås et al. 2000).

Distribution: North to Uppland in Sweden (Jonsson pers. comm.), southern Finland (Palmgren 1976), absent from Great Britain and Ireland (Locket et al. 1974, van Helsdingen 1996), mountainous areas of central continental Europe (Maurer & Hänggi 1990) and the Russian plain (Mikhailov 1997).

Habitat: Closed canopy forests with little or no ground-cover (Gudik-Sørensen 1997), probably preferring moist localities, also on trees (Holm 1968, Maurer & Hänggi 1990). The species is noteworthy in that it apparently constructs communal webs (Heer 1997).

Proposed Red List status: Indeterminate.

Conservation considerations: Considered rare in most of its range (Heimer & Nentwig 1991), Critically Endangered in Slovakia (Gajdos et al. 1999). May be abundant locally (Gudik-Sørensen 1997), also see Gunnarson (1983). The record from Trøndelag is the northernmost in Europe.

• *Typhocrestus sylviae* Hauge, 1968

Norwegian records: NNØ Narvik: Ankenes, Skjomenfjord (Hauge 1968), the type locality.

Distribution: Only known from the type locality.

Habitat: Litter and moss of birch forest (Hauge 1968)

Proposed Red List status: Indeterminate.

Conservation considerations: The only known endemic Norwegian spider species of which a single specimen (a female) is known to science.

5.6 Liocranidae

• *Apostenus fuscus* Westring, 1851

Norwegian records: AK Bærum: Kolsås (Hauge 1986b), Osterøya (Strand 1904), and Asker: Bjørkås and Konglungen (Aakra unpub.), BØ Hurum: Mølen (Aakra unpub.), TEY Porsgrunn (Ellefsen & Hauge 1986).

Distribution: North to Upland in Sweden (Jonsson pers. comm.), only the southwestern corner of Finland (Palmgren 1977), only known from Kent in Great Britain, not reported from Ireland (Roberts 1995, van Helsdingen 1996), otherwise central continental Europe (Grimm 1986, Maurer & Hänggi 1990).

Habitat: Detritus and moss in woodland, on vegetation-covered shingle in coastal sites in Great Britain (Williams & Locket 1982).

Proposed Red List status: Indeterminate.

Conservation considerations: Rare in Norway (Hauge 1989). Poorly known in Finland (Rassi & Väisänen 1987, Rassi et al. 1992).

• *Phrurolithus minimus* C. L. Koch, 1839

Norwegian records: BØ Kongsberg (Strand 1904).

Distribution: North to Bohuslän in Sweden (Jonsson pers. comm.), absent from Finland (Palmgren 1977a), a few records from southern Great Britain, not recorded from Ireland (Locket et al. 1974, Roberts 1995, van Helsdingen 1996), otherwise western and central continental Europe (Grimm 1986, Maurer & Hänggi 1990) and the Russian plain (Mikhailov 1997).

Habitat: Varied; under rocks, in litter in both dry and wet situations (Bauchhenss 1990, Maurer & Hänggi 1990, Roberts 1995), most common in grasslands and wood margins (Hänggi et al. 1995).

Proposed Red List status: Extinct?

Conservation considerations: The current record is very old, real status unknown.

Close to its northern limit in South Norway.

5.7 Lycosidae

• *Alopecosa fabrilis* (Clerck, 1757)

Norwegian records: AAY Tvedestrand and AK Oslo (Hauge 1989).

Distribution: North to Norrbotten in Sweden (Jonsson pers. comm.), mainly coastal regions in southern and western parts of Finland (Palmgren 1939), two small areas in Great Britain, absent from Ireland (Locket et al. 1974, Bratton 1991, van Helsdingen 1996), continental Europe and east to the Far east (Esyunin & Efimik 1996, Mikhailov 1997).

Habitat: Thermophilous (Palmgren 1939); prefers dry sandy heathland with open stony areas (Bratton 1991, Roberts 1993).

Proposed Red List status: Indeterminate.

Conservation considerations: Listed as Endangered in Great Britain (Bratton 1991), Threatened in Germany (Platen et al. 1996) and Indeterminate in Slovakia (Gajdos et al. 1999). *A. fabrilis* is probably restricted to the southeastern coast in Norway and is likely to be sensitive to human disturbance in view of its habitat.

• *Arctosa cinerea* (Fabricius, 1777)

Norwegian records: MRI Surnadal: Surna (Storm 1898, see Tambs-Lyche 1941, also S. Einum and O. M. Aasen pers. comm.). NTI Stjørdal: Langøra (Andersen & Hanssen 1994), Levanger: Rinnleiret (F. Ødegaard pers. comm.). STI Melhus: Gaula, Orkdal: Orkla, Selbu: Selbusjøen. Collett (1876) reported the species from "Surenal – Romsdalen" which in all probability refers to the rivers Rauma and Surna in MRI Romsdalen and Surnadalen, respectively, and possibly appropriate rivers in between.

Distribution: North to Norrbotten in Sweden but local (Jonsson pers. comm., Framenau 1995), mostly coastal parts of southern and central Finland (Palmgren 1939), central and northern parts of Great Britain, southern Ireland (Locket et al. 1974, van Helsdingen 1996), North-Africa and continental Europe and east to the Far east, North-America and Cuba (Esyunin & Efimik 1996).

Habitat: Very stenotopic; vegetation-free biotopes like sand and shingle-covered riverbeds and lakeshores are preferred (Buchar & Thaler 1995, Framenau 1995).

Proposed Red List status: Declining, care demanding.

Conservation considerations: This species appear to be declining on a regional basis due to habitat deterioration and has probably disappeared from several localities in Germany where it is Threatened by Extinction (Framenau 1995, Platen et al. 1996). It is very sensitive to changes in habitat quality (Framenau 1995) and based on an evaluation of Coleoptera living in similar habitats *A. cinerea* should have the status given above (F. Ødegaard pers. comm.). Considered a Lower Risk (Least Concern) species in Slovakia (Gajdos et al. 1999).

• *Arctosa leopardus* (Sundevall, 1833)

Norwegian records: AK Oslo (Hauge 1989).

Distribution: North to Uppland in Sweden (Jonsson pers. comm.), relatively rare in Finland where it has been found in southern parts (Palmgren 1939, Lethinen et al. 1979), most parts of Great Britain and Ireland (Locket et al. 1974, van Helsdingen 1996), Europe and east to the Far East (Esyunin & Efimik 1996, Mikhailov 1997).

Habitat: Litter and detritus in marshy sites, river and lakeshores (Roberts 1993, Buchar & Thaler 1995).

Proposed Red List status: Indeterminate.

Conservation considerations: May have been over-looked, but is probably restricted to river-deltas, lake shores and similar habitats in southeastern Norway.

• *Arctosa lutetiana* (Simon, 1876)

Norwegian records: RY vicinity of Egersund (P. Grimsby pers. comm.), TEY Drangedal: Rønno mdalen (Aakra unpub.).

Distribution: North to Östergötland in Sweden (Jonsson pers. comm.), absent from Finland (Palmgren 1977a), absent from Great Britain and Ireland (Locket et al. 1974, van Helsdingen 1996), central continental Europe, and at least as far east as the Urals (Esyunin & Efimik 1996, Mikhailov 1997).

Habitat: Detritus and vegetation in sandy biotopes (Roberts 1995), in continental Europe also warm meadow and forests margins (Buchar & Thaler 1995).

Proposed Red List status: Declining, care demanding.

Conservation considerations: Apparently rare, possibly restricted to open, warm habitats in southern parts of Norway.

• *Arctosa perita* (Latreille, 1799)

Norwegian records: RY Jæren (Collett 1876 sub *Trochosa picta* Hahn, Folvik 1992).

Distribution: North to Närke in Sweden (Jonsson pers. comm.), southeastern coastal areas of Finland (Palmgren 1939), most parts of Great Britain and Ireland (Locket et al. 1974, van Helsdingen 1996), east to the Caucasus (Mikhailov 1997).

Habitat: Open sandy localities, including coastal dunes and dry heatland (Maurer & Hänggi 1990, Roberts 1993, Bell & Haughton 1995).

Proposed Red List status: Insufficiently Known.

Conservation considerations: The preferred habitat of this species is rather rare in Norway, centre of occurrence is probably the Jæren district. Considered Threatened in Germany (Platen et al. 1996) and Vulnerable in Slovakia (Gajdos et al. 1999).

• *Arctosa stigmosa* (Thorell, 1875)

Norwegian records: STI Melhus: Melhus and Gravråk, Midtre Gauldal: Follstad, Frøsetøya and Mo. Orkdal: Elnvang by Orkla (Aakra unpub.), the only known Fennoscandian records.

Distribution: Absent from Great Britain and Ireland (Locket et al. 1974, van Helsdingen 1996), otherwise central parts of continental Europe (Denis 1937), the Baltic states and as far east as South Siberia (Esyunin & Efimik 1996, Mikhailov 1997).

Habitat: Very similar to *A. cinerea*; sandy sites near running water (Heimer & Nentwig 1991).

Proposed Red List status: Declining, care demanding.

Conservation considerations: The same argument as for *A. cinerea* and other riparian species apply. The discovery of this species in Norway came as a great surprise and is very interesting from a zoogeographical point of view. It is unlikely to have a wide distribution in Norway and is in any case restricted to a particularly vulnerable biotope. The species is considered Strongly Endangered in Germany (Platen et al. 1996) and Vulnerable in Slovakia (Gajdos et al. 1999).

• *Hygrolycosa rubrofasciata* (Ohlert, 1865)

Norwegian records: Ø Hvaler: Kirkøy (Hauge 1986b).

Distribution: North to Uppland in Sweden (Jonsson pers. comm.), southern parts of Finland (Palmgren 1939), southeastern parts of Great Britain, not recorded from Ireland (Locket et al. 1974, van Helsdingen 1996), southern and central Europe, east to South Siberia (Esyunin & Efimik 1996, Mikhailov 1997).

Habitat: In fens and damp parts of forests (Roberts 1993).

Proposed Red List status: Extinct?

Conservation considerations: Generally rare throughout its range, Threatened in Germany (Platen et al. 1996), Endangered in Slovakia (Gajdos et al. 1999). The sole Norwegian record date from 1936 (Hauge 1986b).

• *Pardosa lasciva* L. Koch, 1879

Norwegian records: FN Vadsø (Palmgren 1939, see below).

Distribution: South to Jämtland in Sweden (Jonsson pers. comm.), two records from northern Finland (Palmgren 1939 sub *Lycosa guernei* Simon, 1887), absent from Great Britain and Ireland (Locket et al. 1974, van Helsdingen 1996), otherwise east to southern Siberia (Mikhailov 1997).

Habitat: Coniferous and other forests (Holm 1947, Gustafson & Holm 1980).

Proposed Red List status: Extinct?

Conservation considerations: Rarely reported, probably rather local.

Comments: Simon (1887) described *Lycosa guernei* from Vadsø (Palmgren 1939) which was later synonymised with *L. lasciva* by Palmgren (1939), also see Tambs-Lyche (1955) and Holm (1973). The species was inadvertently omitted from the Norwegian checklist (Hauge 1989). Probably more widespread in northern Norway which represents the northwestern limit of distribution of this species.

• *Pardosa trailli* (O.P.-Cambridge, 1873)

Norwegian records: HOI Eidfjord: Finse (Hauge et al. 1978, 1989).

Distribution: Only known from high mountain areas in Torne Lappmark in Sweden (Jonsson pers. comm.) and northern Great Britain (Locket et al. 1974), possibly also on the Faroes (Holm 1980).

Habitat: Screes (Locket & Millidge 1953).

Proposed Red List status: Insufficiently Known.

Conservation considerations: The limited distribution of the species is worthy of note.

Comments: Closely related to *P. eiseni*, but considered a separate species by Kronstedt (1986). Some of the records of *P. eiseni* may actually refer to *P. trailli*, the former has been found in both southern and northern Norway (Hauge 1989).

• *Pardosa schenkeli* (De Lessert, 1904)

Norwegian records: HEN Rendalen: Kværnesmoen and HES Eleverum: Starmoen (Hauge & Kvamme 1983).

Distribution: Only known from Dalarna in Sweden (Jonsson pers. comm.), southern coastal sites in Finland (Palmgren 1939 sub *P. calida*), absent from Great Britain and Ireland (Locket et al. 1974, van Helsdingen 1996), otherwise the Alps and eastern Europe and as far east as Mongolia and the Far East region (Esyunin & Efimik 1996, Mikhailov 1997).

Habitat: Open, sunny and sandy situations in coniferous forests (Palmgren 1939), meadows and fields in the Alps (Maurer & Hänggi 1990).

Proposed Red List status: Insufficiently Known.

Conservation considerations: Probably a member of the eastern «taiga» element, and unlikely to be widely distributed in Norway.

• *Pirata insularis* Emerton, 1885

Norwegian records: OS Sør-Aurdal: Vassfaret (Hauge & Wiger 1983).

Distribution: North to Lule Lappmark in Sweden (Jonsson pers. comm.), a few sites in Finland (Palmgren 1939), absent from Great Britain and Ireland (Locket et al. 1974, van Helsdingen 1996), known from northern parts of continental Europe (Heimer & Nentwig 1991), western and central Siberia and USA (Esyunin & Efimik 1996, Mikhailov 1997).

Habitat: Bogs and wetlands (Platen et al 1991).

Proposed Red List status: Indeterminate.

Conservation considerations: Threatened by Extinction in Germany (Platen et al. 1996).

Comments: Listed as *Pirata piccolo* Dahl, 1908 in Hauge (1989).

• *Pirata piscatorius* (Clerck, 1757)

Norwegian records: Known from AAY Arendal and AK Oslo (Hauge 1989).

Distribution: North to Uppland in Sweden (Jonsson pers. comm.), several localities in Finland (Palmgren 1939), southern and central parts of Great Britain, eastern Ireland (Locket et al. 1974, van Helsdingen 1996), other parts of continental Europe as well as Middle Siberia (Mikhailov 1997)

Habitat: Bogs and wetlands.

Proposed Red List status: Indeterminate.

Conservation considerations: Considered rare by Hauge (1989), Threatened in Germany (Platen et al. 1996).

• *Pirata uliginosus* (Thorell, 1856)

Norwegian records: BØ Hvaler (Collett 1876), VE Tjøme: Mostranda and Moutmarka (Andersen & Hauge 1995).

Distribution: North to Hälsingland in Sweden (Jonsson pers. comm.), not recorded from Finland (Palmgren 1939, 1977a), most parts of Great Britain, central Ireland (Locket et al 1974, van Helsdingen 1996), central Europe and east to the Volga and Caucasus (Esyunin & Efimik 1996, Mikhailov 1997).

Habitat: Wetlands with dense vegetation (Maurer & Hänggi 1990).

Proposed Red List status: Indeterminate.

Conservation considerations: Considered rare by Hauge (1989), Endangered in Slovakia (Gajdos et al. 1999).

5.8 Oxyopidae

• *Oxyopes ramosus* (Panzer, 1804)

Norwegian records: AK vicinity of Oslo and BØ Drammen (Collett 1876).

Distribution: Ranges north to Lappmark in Sweden (Holm 1947, Jonsson pers. comm.), also rather far to the north in Finland but uncommon (Palmgren 1943), absent from Great Britain and Ireland (Locket et al. 1974, van Helsdingen 1996), continental Europe and east to South Siberia (Esyunin & Efimik 1996).

Habitat: Heath vegetation, bushes and conifers (Holm 1947, Roberts 1995), Collett (1876) collected it on bushes and higher vegetation.

Proposed Red List status: Extinct?

Conservation considerations: Probably overlooked due to its rather wide distribution in our neighbouring countries, but possibly confined to southeastern parts of Norway. Considered Threatened in Germany (Platen et al. 1996). Thaler (1991) indicated that the species has become rare in recent times.

Comments: The species was not included in Hauge (1989).

5.9 Philodromidae

• *Philodromus rufus* Walckenaer, 1825

Norwegian records: **BØ** Hurum: Mølen (Hauge & Hansen 1991).

Distribution: Only known from Skåne and Öland in Sweden (Jonsson pers. comm.), not recorded from Finland (Palmgren 1977a), reported from parts of southern Great Britain by (Locket et al 1974), but apparently confused with *P. albidus* Kulczynski, 1911 (Nellist 1998), not known from Ireland (van Helsdingen 1996), southern and central Europe, east to Japan and north America (Esyunin & Efimik 1996).

Habitat: Low vegetation and bushes in sunny forests (Maurer & Hänggi 1990).

Proposed Red List status: Declining, care demanding.

Conservation considerations: The Norwegian record is noteworthy as the northwesternmost in Fennoscandia. Status in Germany Unclear (Platen et al. 1996), Indeterminate in Slovakia (Gajdos et al. 1999) and Data Deficient in Sweden (Gårdenfors 2000).

Comments: The single known Norwegian specimen (a male) has been examined and did not belong to the very similar and somewhat more common species *P. albidus* Kulczynski, 1911 (see Segers 1989).

• *Thanatus arcticus* Thorell, 1872

Norwegian records: **FV** Alta (Holm 1967, Hauge 1989).

Distribution: Only known from Torne lappmark in Sweden (Jonsson pers. comm.), not recorded from Finland (Palmgren 1950, 1977a), nor Great Britain or Ireland (Locket et al. 1974, van Helsdingen 1996), otherwise eastwards through Northern Asia, Alaska, Canada to Greenland (Esyunin & Efimik 1996).

Habitat: Probably on vegetation and trees.

Proposed Red List status: Insufficiently Known.

Conservation considerations: Quite possibly another taiga species having its westernmost limit of distribution in Norway.

Comments: *T. arcticus* as reported in Hauge (1976) is *T. atratus* Simon (see below).

• *Thanatus arenarius* Thorell, 1872

Norwegian records: **AK** Asker, **BØ** Drammen, **FØ** Sør-Varanger: Elvenes and **ON** Dombås, Valdres, **Ø** Hvaler (Collett 1877) also reported by (Strand 1901) who gave no locality.

Distribution: North to Uppland in Sweden (Jonsson pers. comm.), southeastern parts of Finland (Palmgren 1950), absent from Great Britain and Ireland (Locket et al. 1974, Roberts 1995, van Helsdingen 1996), other parts of Northern Europe, Caucasus, Kazaksthan, the Himalayas and east to the Far East (Esyunin & Efimik 1996, Mikhailov 1997).

Habitat: Thermophilous species; associated with coastal dunes (Kronstedt 1983).

Proposed Red List status: Extinct?

Conservation considerations: The only known records are old and doubtful. Strongly Threatened in Germany (Platen et al. 1996).

• *Thanatus atratus* Simon, 1875

Norwegian records: **FN** Porsanger: Kistrand (Hauge 1976), **ON** Vågå: Sjudalen (? – see Hauge & Refseth 1979).

Distribution: Öland and Gotland in Sweden (Jonsson pers. comm.), not recorded from Finland (Palmgren 1972, 1977a reported *T. vulgaris borealis* = *T. atratus* from Southern Finland but this was based on a subadult female (Kronstedt 1983)), absent from Great Britain and Ireland (Locket et al 1974, van Helsdingen 1996), otherwise central Europe, the Alps and the Pyrenees (Kronstedt 1983) and east to South Siberia (Mikhailov 1997).

Habitat: Probably a thermophilous species preferring open, sunny sites (Kronstedt 1983).

Proposed Red List status: Insufficiently Known.

Conservation considerations: Two disjunct populations seem to exist, one in southern Europe, the other in Fennoscandia (Kronstedt 1983).

Comments: Reported as *T. arcticus* by Hauge (1976).

5.10 Salticidae

• *Ballus chalybeius* (Walckenaer, 1802)

Norwegian records: **AK** «Oslo» (Collett 1876) and Asker: Bjørkås (Aakra unpub.), **BØ** Hurum: Tofteholmen (Hauge & Hansen 2000), **VAY** Farsund: Straumen (Aakra unpub.), **VE** Våle: Langøya (Hauge & Hansen 1991, Hauge & Hansen 2000).

Distribution: North to Uppland in Sweden (Jonsson pers. comm.), not known from Finland (Palmgren 1977a), mostly southern parts of Great Britain, absent from Ireland (Locket et al. 1974, Roberts 1993, van Helsdingen 1996), continental Europe and North Afrika (Maurer & Hänggi 1990), Caucasus and Middle Asia (Esyunin & Efimik 1996, Mikhailov 1997).

Habitat: On vegetation, bushes and trees (Maurer & Hänggi 1990, Roberts 1993).

Proposed Red List status: Insufficiently Known.

Conservation considerations: Most probably restricted to southern coastal parts of Norway.

Comments: Listed as *B. depressus* in Hauge (1989).

• *Marpissa muscosa* (Clerck, 1757)

Norwegian records: **TEY** Kragerø and **VAY** Mandal (Hauge 1989).

Distribution: North to Uppland in Sweden (Jonsson pers. comm.), southern Finland (Palmgren 1943), southern Great Britain, not recorded from Ireland (Locket et al. 1974, van Helsdingen 1996), central Europe, east to Middle Siberia and Japan (Esyunin & Efimik 1996, Mikhailov 1997).

Habitat: On vegetation in dry and sunny sites (Kropf & Horak 1996), bark and lichen on trees (Roberts 1993).

Proposed Red List status: Insufficiently Known.

Conservation considerations: Considered rare by Hauge (1989).

• *Pellenes tripunctatus* (Walckenaer, 1802)

Norwegian records: **BV** Hallingdal (Strand 1899) and **Ø** Hvaler: Kirkøy (Hauge 1986b).

Distribution: North to Uppland in Sweden (Jonsson pers. comm.), a single record from Åland in Finland (Lehtinen et al. 1979), restricted to two sites in southeastern Great Britain, absent from Ireland (Locket et al. 1974, van Helsdingen 1996), central and northern continental Europe, and at least as far east as Middle-Siberia (Esyunin & Efimik 1996, Mikhailov 1997).

Habitat: Sparsely vegetated shingle-covered localities (Bratton 1991), in continental Europe usually in grassy sites, low vegetation and also other biotopes (Roberts 1995).

Proposed Red List status: Extinct?

Conservation considerations: Considered Endangered in Great Britain (Bratton 1991), Threatened in Germany (Platen et al. 1996) and Rare in Finland (Rassi & Väisänen 1987, Rassi et al. 1987). Both Norwegian records are old (see Hauge 1986b).

• *Phlegra fasciata* (Hahn, 1826)

Norwegian records: **BØ** Drammen (Collett 1877), Hole: Røysethalvøya, Søhol (Aakra unpub.), Hurum, Verksøya (Aakra unpub.) and **VE** Tjøme (Andersen & Hauge 1995).

Distribution: North to Uppland in Sweden (Jonsson pers. comm.), southern Finland (Palmgren 1943), the extreme southeastern coast of Great Britain, absent from Ireland (Locket et al. 1974, van Helsdingen 1996), otherwise continental Europe and east to the Far East, Japan and North America (Esyunin & Efimik 1996).

Habitat: Thermophilous (Palmgren 1943), on low vegetation in sandy areas and on shingle (Roberts 1995), also recorded from both moist and dry fields (Maureer & Hänggi 1990).

Proposed Red List status: Indeterminate.

Conservation considerations: Red Listed as Rare in Great Britain (Bratton 1991).

• *Salticus zebraneus* (C. L. Koch, 1837)

Norwegian records: **AK** Vestby: Son (Waalder 1967), **BØ** Hurum: Tofteholmen (Hauge & Hansen 2000) and Hurum, Mølen (Aakra unpub.), **VE** Tjøme (Hauge 1989) and Våle: Langøya (Hauge & Hansen 2000),

Distribution: North to Södermanland in Sweden (Jonsson pers. comm.), doubtful records from southern Finland (see Palmgren 1977a), a few scattered records from southern Great Britain, not recorded from Ireland (Locket et al. 1974, van Helsdingen 1996), South and Central Europe, Moldavia, Russia (Esyunin & Efimik 1996, Mikhailov 1997).

Habitat: Low vegetation, bushes and coniferous trees (Roberts 1995).

Proposed Red List status: Insufficiently Known.

Conservation considerations: Generally rare in Great Britain (Roberts 1993).

• *Sitticus distinguendus* (Simon, 1868)

Norwegian records: **VAY** Farsund; Hanangermona and Nordhasselbukta (Klausen 1974 sub *Attulus cinereus* (Westring)) and **VE** Tjøme: Sandøy (Hauge 1986a).

Distribution: North to Östergötland in Sweden (Jonsson pers. comm.), southern and central parts of Finland, mainly coastal (Palmgren 1943), not recorded from Great Britain or Ireland (Locket et al. 1974, van Helsdingen 1996), otherwise continental Europe (Maurer & Hänggi 1990).

Habitat: Dry, open sites; predominantly sandy coastal sites (Tullgren 1944, Maurer & Hänggi 1990, Klausen 1974).

Proposed Red List status: Declining, care demanding.

Conservation considerations: Possibly restricted to sandy beaches in Norway. Considered Vulnerable in Slovakia (Gajdos et al. 1999).

Comments: Listed as *Attulus cinereus* (Westring, 1862) in Hauge (1989).

• *Sitticus saltator* (O. P.-Cambridge, 1868)

Norwegian records: **VE** Tjøme (Hauge 1989) and **Ø** Onsøy (Klausen 1974).

Distribution: Known from Scania, Öland and Gotland in Sweden (Tullgren 1944), a few records from Finland (Palmgren 1943), coastal sites of southern and central Great Britain, not reported from Ireland (Locket et al. 1974, van Helsdingen 1996), central and southern Europe and east to south Siberia (Esyunin & Efimik 1996, Mikhailov 1997).

Habitat: Sandy localities (Felton 1993, Roberts 1995)

Proposed Red List status: Declining, care demanding.

Conservation considerations: Probably restricted to the warmer sandy habitats of the south-southeastern coastline. Listed as Threatened in Germany (Platen et al. 1996) and as Lower Risk (Near Threatened) in Slovakia. (Gajdos et al. 1999).

Comments: Listed as *Attulus saltator* in Hauge (1989).

• *Talavera aequipes* (O. P.-Cambridge, 1871)

Norwegian records: **HOI** Kvam: Geitaknottane Nature Reserve (Pommeresche 1999) and **RY** Sola: Vigdel (Alvseike 1991).

Distribution: North to Uppland in Sweden (Jonsson pers. comm.), a few records from southern Finland (Palmgren 1943), north to Scotland in Great Britain, but commoner in the south, absent from Ireland (Locket et al. 1974, van Helsdingen 1996), otherwise Europe and east to China (Esyunin & Efimik 1991).

Habitat: Dry open sites, usually in connection with sandy areas (Maurer & Hänggi 1990, Roberts 1995).

Proposed Red List status: Insufficiently Known.

Conservation considerations: Probably restricted to sandy or very warm biotopes in southern Norway.

5.11 Tetragnathidae

• *Tetragnatha striata* L. Koch, 1862

Norwegian records: **AK** vicinity of Oslo (Collett 1877) and **BØ** Lier (Strand 1900a).

Distribution: North to Hälsingland in Sweden (Jonsson pers. comm.), not recorded from Finland (Palmgren 1974a), scattered records from south and central Great Britain and Ireland (Lockett et al. 1974, van Helsdingen 1996), otherwise central and northern continental Europe, the European part of Russia and east to south Siberia (Esyunin & Efimik 1996, Mikhailov 1997).

Habitat: Reeds and other vegetation in close proximity to water (Roberts 1993).

Proposed Red List status: Extinct?

Conservation considerations: May be vulnerable to removal of vegetation and drainage of water bodies. Strongly Threatened in Germany (Platen et al. 1996), Vulnerable in Slovakia (Gajdos et al. 1999) and very rare in Switzerland (Maurer 1980). Possibly overlooked, although it is rare throughout its known range.

5.12 Theridiidae

• *Anelosimus vittatus* (C. L. Koch, 1836)

Norwegian records: **AK** Vestby and Frogn (Hauge 1989), **BØ** Hurum: Mølen (Hauge & Hansen 1991) and **VE** Tjøme (Hauge 1989).

Distribution: North to Uppland in Sweden (Jonsson pers. comm.), not recorded from Finland (Palmgren 1977a), south and central parts of Great Britain and Ireland (Lockett et al. 1974, van Helsdingen 1996), east to Azerbaijan (Mikhailov 1997).

Habitat: Tall vegetation, bushes and branches of trees (Roberts 1993).

Proposed Red List status: Indeterminate.

Conservation considerations: Probably reaches the the northwestern limit of distribution in southeast Norway (Hauge & Midtgaard 1986). Considered Vulnerable in Slovakia (Gajdos et al. 1999).

• *Dipoena inornata* (O. P. - Cambridge, 1861)

Norwegian records: **AK** Vestby:Son (Waalder 1967), **RI** Suldal (Strand 1902a) and **VE** Tjøme (Hauge 1989).

Distribution: North to Södermanland in Sweden (Jonsson pers. comm.), extreme southern tip of Finland (Palmgren 1974b), southern and central Great Britain and Ireland (Lockett et al 1974, van Helsdingen 1996), continental Europe (Maurer & Hänggi 1990) and the Russian plain (Mikhailov 1997).

Habitat: Dry open sites (Maurer & Hänggi 1990).

Proposed Red List status: Insufficiently Known.

Conservation considerations: Considered rare by Hauge (1989), uncommon in Great Britain by Roberts (1995),

Strongly Threatened in Germany (Platen et al. 1996) and Endangered in Slovakia (Gajdos et al. 1999). Apparently widespread in southern Norway, but rare and local.

• *Dipoena melanogaster* (C. L. Koch, 1837)

Norwegian records: **AK** Frogn: Håøya (Hauge & Midtgaard 1986).

Distribution: Scania and Öland in Sweden (Jonsson pers. comm.), not known from Finland (Palmgren 1974b), single specimens in four sites in Great Britain, one record from Ireland (Lockett et al. 1974, Bratton, 1990) and a single record in Ireland (Lockett et al 1974, van Helsdingen 1996), otherwise Europe and North Afrika (Maurer & Hänggi 1990) and east to the Caucasus (Mikhailov 1997).

Habitat: Low vegetation and bushes of dry sites (Maurer & Hänggi 1990).

Proposed Red List status: Declining, care demanding.

Conservation considerations: Probably close to its north-western limit of distribution. Red Listed as Vulnerable in Great Britain (Bratton 1991), Data Deficient in Sweden (Gärdenfors 2000). Generally very rare in the rest of Europe (Roberts 1995).

• *Dipoena torva* (Thorell, 1875)

Norwegian records: **BV** Sigdal (Aakra 2000), **NTI** Mosvik (Tømmerås et al. 2000), **VE** Stokke: Melsomvik (Aakra unpub.).

Distribution: Södermanland, Östergötland and Uppland in Sweden (Jonsson pers. comm.), southern Finland (Palmgren 1974b), a few sites in northern Great Britain, absent from Ireland (Lockett & Millidge 1974, Roberts 1993, van Helsdingen 1996), central Europe east to Middle-Siberia (Esyunin & Efimik 1996, Mikhailov 1997),

Habitat: Restricted to old pines with deeply fissured bark where the spider spins a small web used to catch wood ants (Bratton 1991, Roberts 1995), also on old oaks in Germany (R. Platen pers. comm., Simon 1997).

Proposed Red List status: Declining, care demanding.

Conservation considerations: Given the general rarity of this species (Miller 1967), its dependence upon both mature trees and wood ants (Simon 1997) and the late discovery of the species in Norway, we feel the status proposed above is justified. Modern forestry practices where trees are not allowed to develop a rough and richly textured bark cover is a threat to the species (Palmgren 1974b). *D. torva* has the status Vulnerable in Great Britain (Bratton 1991) and Endangered in Slovakia (Gajdos et al. 1999).

Note on the genus *Dipoena*: All members of *Dipoena* are considered rare throughout the world. This may be due to the small size and specialized ecology of the genus and a lack of suitable sampling methods, but available evidence still indicate that rarity is a real feature of the genus (Roberts 1993), also see Miller (1967) and Levi (1963).

• *Enoplognatha thoracica* (Hahn, 1833)

Norwegian records: **VE** Tjøme: Tjøme and Hvasser (Andersen & Hauge 1995).

Distribution: North to Uppland in Sweden (Jonsson pers. comm.), southern Finland (Koponen 1999), most parts of Great Britain and Ireland (Locket et al. 1974, van Helsdingen 1996), otherwise continental Europe (Maurer & Hänggi 1990) and east to the Kopetdagh Mountains (Mikhailov 1997).

Habitat: Under stones and litter in various types of habitats, including forests and heaths (Maurer & Hänggi 1990, Roberts 1993), possibly a photophilous species (Jonsson pers. comm.).

Proposed Red List status: Indeterminate.

Conservation considerations: Probably restricted to the southeastern coastal region.

• *Simitidion simile* (C. L. Koch, 1836)

Norwegian records: **BØ** Hurum: Mølen and **VE** Våle: Langøya (Andersen & Hauge 1995).

Distribution: North to Uppland in Sweden (Jonsson pers. comm.), the southwestern part of Finland (Palmgren 1974b), throughout Great Britain, one doubtful record from Ireland (Locket et al. 1974, van Helsdingen 1996) and continental Europe (Knoflach 1996), also North Africa, Asia and North America (Esyunin & Efimik 1996).

Habitat: *Calluna*-heaths (Palmgren 1974b), low vegetation and bushes (Maurer & Hänggi 1990).

Proposed Red List status: Indeterminate.

Conservation considerations: Likely to be restricted to the southeastern region of Norway.

Comments: Previously placed in *Theridion*.

• *Theridion montanum* Emerton, 1882

Norwegian records: **HES** vicinity of Hamar (Wunderlich 1973).

Distribution: Not recorded from Sweden (Jonsson pers. comm.), eastern parts of southern Finland (Palmgren 1974b), absent from Great Britain and Ireland (Locket et al. 1974, van Helsdingen 1996), otherwise east to Shakalin and Northern America (Esyunin & Efimik 1996, Mikhailov 1997).

Habitat: On coniferous trees (Palmgren 1974b).

Proposed Red List status: Declining, care demanding.

Conservation considerations: Populations were found to fluctuate considerably in Finland (Palmgren 1977b), and the species seem to have a very localised distribution.

• *Theridion tinctum* (Walckenaer, 1802)

Norwegian records: **AK** inner parts of Oslofjord (Waalder 1967), **BØ** Hurum: Tofteholmen (Hauge & Hansen 1999) and Østnestangen (Aakra unpub.), **VE** Tjøme (Hauge & Midtgaard 1986), Våle: Langøya and Sande: Kommersøya (Hauge & Hansen 2000).

Distribution: North to Hälsingeland in Sweden (Jonsson

pers. comm.), coastal parts of southern Finland (Palmgren 1974b), southern and central parts of Great Britain and central Ireland (Locket et al. 1974, van Helsdingen 1996), east to South Siberia and Japan and North America (Esyunin & Efimik 1996, Mikhailov 1997).

Habitat: Coniferous trees, bushes and low vegetation (Roberts 1993, Palmgren 1974b).

Proposed Red List status: Insufficiently Known.

Conservation considerations: Probably close to its north-western limit of distribution (Hauge & Midtgaard 1986).

5.13 Thomisidae

• *Xysticus kochi* Thorell, 1872

Norwegian records: **AAY** Flostad (Hauge 1986b, 1989) and **VE** Våle: Langøya (Hauge & Hansen 1991).

Distribution: North to Uppland in Sweden (Jonsson pers. comm.), southeastern parts of Finland (Palmgren 1950), most parts of Great Britain, not taken in Ireland (Locket et al. 1974, van Helsdingen 1996), other parts of Europe including the Mediterranean region, North Africa, and east to South Siberia (Maurer & Hänggi 1990, Esyunin & Efimik 1996, Mikhailov 1997).

Habitat: On bushes, low vegetation and occasionally on the ground (Maurer & Hänggi 1990, Roberts 1990).

Proposed Red List status: Indeterminate.

Conservation considerations: Rare in Finland according to Palmgren (1950), probably close to its northwestern limit of distribution (Hauge 1986b).

5.14 Uloboridae

• *Hyptiotes paradoxus* (C. L. Koch, 1834)

Norwegian records: **AK** Asker (Waalder 1970), Bjørkås (Bretten pers. comm.) and Bærum: Borøya (Aakra unpub.) and **HOI** Kvinnherad: Ånuglo (Hauge 1971).

Distribution: North to Uppland in Sweden (Jonsson pers. comm.), not recorded from Finland (Palmgren 1977a), a few scattered sites in southern Great Britain and Ireland (Locket et al. 1974, van Helsdingen 1996), otherwise Europe and Madeira (Maurer & Hänggi 1990) and east to the Caucasus (Mikhailov 1997).

Habitat: Evergreen trees, particularly yew, box and holly (Bratton 1991, Roberts 1993), on conifers in Norway.

Proposed Red List status: Insufficiently Known.

Conservation considerations: Populations are apparently localized and vulnerable to removal of trees (Roberts 1993, Bratton 1991). Red Listed in Great Britain (Bratton 1991) where it is Rare.

5.15 Summary of species data

The most important information given in the boxes above is summarised in **table 1** below. See section 7 for definition of threat factors.

Table 1. Summary of species and their habitat, distribution, threat factors and proposed red list status.

Species	Habitat	Distribution	Threat factors	Proposed Red List status
ARANEIDAE				
<i>Aculepeira ceropegia</i> (Walckenaer, 1802)	Bushes, vegetation, trees	HES, HEN	Forestry, agri.	Ex?
<i>Agelenatea redii</i> (Scopoli, 1763)	Bushes, vegetation, trees	RY	Forestry, agri.	Ex?
<i>Araneus alsine</i> (Walckenaer, 1802)	Clearings in forests	ON, BV, STI	Forestry, agri.	Ex?
<i>Araneus angulatus</i> Clerck, 1757	Coniferous forests	Ø, OS, NTY	Forestry, agri.	Ex?
<i>Araneus nordmanni</i> (Thorell, 1870)	Coniferous forests	AK, ON, OS, NTI, NSI	Forestry	DC
<i>Araneus saevus</i> (L. Koch, 1872)	Coniferous/deciduous forests	BØ, AK, HES, HEN NTI	Forestry	DC
<i>Araniella alpica</i> (L. Koch, 1869)	Coniferous forests	AK, HES, NTI, STI	Forestry	K
<i>Gibbaranea bituberculata</i> (Walckenaer, 1802)	Bushes, vegetation, trees	STI	Forestry, agri.	Ex?
<i>Gibbaranea omoeda</i> (Thorell, 1870)	Coniferous forests	AK, BØ, NTI, VE	Forestry	I
<i>Larinioides scolopetarius</i> (Clerck, 1757)	Synanthropic?	AK, RY	?	Ex?
<i>Mangora acalypha</i> (Walckenaer, 1802)	Bushes, vegetation, trees	AAY, BØ, TEY, VAY, VE	Forestry, agri.	K
<i>Nuctenea silvicultrix</i> (C. L. Koch, 1844)	Coniferous forests	AK, HES, ON, OS	Forestry	Ex?
<i>Singa nitidula</i> C. L. Koch, 1844	Vegetation by streams	STI	Agri., dev.	DC
CLUBIONIDAE				
<i>Cheiracanthium oncognathum</i> Thorell, 1871	Moss, litter and detritus	AAY, AK, BØ, TEY, VAY, VE	Forestry, dev., pollution	I
<i>Clubiona diversa</i> O. P.-Cambridge, 1862	Moss, litter and detritus	VE	Dev., agri.	K
<i>Clubiona kulczynskii</i> De Lessert, 1905	Coniferous forests	BV	Forestry, dev.	K
DICTYNIDAE				
<i>Archaeodictyna consecuta</i> O. P.-Cambr. 1872	Dry and sunny sites	FØ	Agri., regrowth	I
<i>Argenna subnigra</i> (O.P.-Cambridge, 1861)	Dry and sunny sites	VE	Agri., regrowth	I
<i>Cicurina cicur</i> (Fabricius, 1793)	Moist, shaded forests	TEY	Forestry, drainage	DC
<i>Dictyna latens</i> (Fabricius, 1775)	Dry and sunny sites	VE	Agri., regrowth	DC
GNAPHOSIDAE				
<i>Drassyllus pumilus</i> (C. L. Koch, 1839)	Dry and sunny sites	AK, HES	Agri., regrowth	I
<i>Echemus angustifrons</i> (Westring, 1861)	Moist, grassy fields	VE	Agri., regrowth	DC
<i>Gnaphosa orites</i> (Chamberlin, 1922)	Bogs	ON, OS, STI	Drainage	K
<i>Haplodrassus minor</i> (O.P. - Cambridge, 1879)	Shingle covered beaches	VE	Dev., recr., pollution	E
<i>Scotophaeus blackwalli</i> (Thorell, 1873)	Synanthropic?	VAY	?	Ex?
<i>Scotophaeus quadripunctatus</i> (Linnaeus, 1758)	Synanthropic?	AK	?	Ex?
<i>Zelotes electus</i> (C. L. Koch, 1839)	Coastal dunes	VAY	Dev., recr., pollution	DC
<i>Zelotes longipes</i> (L. Koch, 1866)	Dry and sunny sites	AK	Dev., agri., regrowth	Ex?
<i>Zelotes puritanus</i> Chamberlin, 1922	Dry and sunny sites	HES	Agri., regrowth	V
LINYPHIIDAE				
<i>Agyneta fuscipalpus</i> (C. L. Koch, 1836)	Dry and sunny sites	BV, RY	Agri., regrowth	Ex?
<i>Caviphantes saxetorum</i> (Hull, 1916)	Sandy river banks	STI	Dev., regrowth	DC
<i>Centromerus pabulator</i> (O. P. - Cambr., 1875)	Moist, grassy fields	BV	Agri., regrowth	Ex?
<i>Collinsia inerrans</i> (O. P.-Cambridge, 1885)	Coniferous forests	TEI	Forestry, agri., regrowth	DC
<i>Entelecara flavipes</i> (Blackwall, 1834)	Coniferous forests	BV	Forestry	K
<i>Gonatium paradoxum</i> (L. Koch, 1869)	Moss, litter and detritus	HES	Agri., dev., regrowth	I
<i>Hypomma cornutum</i> (Blackwall, 1833)	Moist, shaded forests	BØ, Ø	Forestry	K
<i>Lasiargus hirsutus</i> (Menge, 1869)	Clearings in forests (sandy)	HES	Forestry	DC
<i>Macrargus boreus</i> Holm, 1968	High-altitude sites, incl. forests	OS, STI	Forestry, dev.	K
<i>Maro lepidus</i> Casemir, 1961	Bogs/fens	HOI	Drainage, agri.	K
<i>Pelecopsis parallela</i> (Wider, 1834)	Moist, grassy fields	AAY, BØ, VE	Agri., regrowth	K
<i>Saaristoia firma</i> (O.P.-Cambridge, 1905)	Moist, shaded forests	HOY	Forestry, drainage	I

Species	Habitat	Distribution	Threat factors	Proposed Red List status
<i>Satilatlas britteni</i> (Jackson, 1912)	Bogs/fens	NSI	Drainage, agri.	DC
<i>Scotinotylus clavatus</i> (Schenkel, 1927)	High-altitude sites, litter	BV	Dev.	I
<i>Silometopus ambiguus</i> (O. P. – Cambr., 1905)	Coastal habitats	HOY, RY	Dev., recr., agri.	I
<i>Silometopus incurvatus</i> (O. P. – Cambr., 1873)	Heaths	HES	Agri., forestry	I
<i>Syedra gracilis</i> (Menge, 1866)	Calcaerous grasslands	AK, BØ	Agri., regrowth	DC
<i>Tapinocyboides pygmaeus</i> (Menge, 1869)	Calcaerous grasslands	AAY, BØ, VE	Agri., regrowth	K
<i>Tmeticus affinis</i> (Blackwall, 1856)	Bogs/fens, on reeds	FØ, NSI	Drainage	Ex?
<i>Trichoncus vasconicus</i> Denis, 1944	Dry and sunny sites	VE	Agri, regrowth	I
<i>Troxochrota scabra</i> Kulczynski, 1894	Moss, litter and detritus	TEY	Forestry	I
<i>Troxochrus nasutus</i> Schenkel, 1925	Coniferous forests	HES, NTI	Forestry	I
<i>Typhocrestus sylviae</i> Hauge, 1968	Moss, litter and detritus	NNØ	Forestry	I
LIOCRANIDAE				
<i>Apostenus fuscus</i> Westring, 1851	Moss, litter and detritus	AK, BØ, TEY	Forestry, recr., dev.	I
<i>Phrurolithus minimus</i> C. L. Koch, 1839	Moss, litter and detritus	BØ	Agri., dev.?	Ex?
LYCOSIDAE				
<i>Alopecosa fabrilis</i> (Clerck, 1757)	Heaths	AAY, AK	Agri., dev.	I
<i>Arctosa cinerea</i> (Fabricius, 1777)	Sand/shingle dunes by rivers	MRI, STI, NTI	Recr., dev., pollution	DC
<i>Arctosa leopardus</i> (Sundevall, 1833)	Wet sites, river, lake shores	AK	Drainage, recr., dev.,	I
<i>Arctosa lutetiana</i> (Simon, 1876)	Sandy dunes (incl. rivers)	RY, TEY	Agri., dev., regrowth	DC
<i>Arctosa perita</i> (Latreille, 1799)	Sandy dunes, heatlands	RY	Agri., dev., regrowth	K
<i>Arctosa stigmosa</i> (Thorell, 1875)	Sand/shingle dunes by rivers	STI	Agri., dev.	DC
<i>Hygrolycosa rubrofasciata</i> (Ohlert, 1865)	Moist, shaded forests, fens	Ø	Drainage, agri.	Ex?
<i>Pardosa lasciva</i> L. Koch, 1879	Coniferous/deciduous forests	FN	Forestry	Ex?
<i>Pardosa trailli</i> (O.P. - Cambridge, 1873)	High-altitude sites, screens	HOI	Dev.	K
<i>Pardosa schenkeli</i> (De Lessert, 1904)	Clearings in forests	HES, HEN	Forestry	K
<i>Pirata insularis</i> Emerton, 1885	Bogs/fens	OS	Drainage	I
<i>Pirata piscatorius</i> (Clerck, 1757)	Bogs/fens	AK, AAY	Drainage	I
<i>Pirata uliginosus</i> (Thorell, 1856)	Bogs/fens	BØ, VE	Drainage	I
OXYOPIDAE				
<i>Oxyopes ramosus</i> (Panzer, 1804)	Vegetation, bushes	AK, BØ	Agri., forestry	Ex?
PHILODROMIDAE				
<i>Philodromus rufus</i> Walckenaer, 1825	Bushes, vegetation, trees	BØ	Forestry, agri.	DC
<i>Thanatus arcticus</i> Thorell, 1872	Bushes, vegetation, trees	FV	Forestry, agri.	K
<i>Thanatus arenarius</i> Thorell, 1872	Bushes, vegetation, trees	AK, BØ, FØ (?), ON, Ø	Forestry, agri.	Ex?
<i>Thanatus atratus</i> Simon, 1875	Dry and sunny sites	FN, ON (?)	Agri.	K
SALTICIDAE				
<i>Ballus chalybeius</i> (Walckenaer, 1802)	Low vegetation, bushes and trees	AK, BØ, VAY, VE	Agri, forestry	K
<i>Marpissa muscosa</i> (Clerck, 1757)	Dry and sunny sites	TEY, VAY	Agri., recr.	K
<i>Pellenes tripunctatus</i> (Walckenaer, 1802)	Shingle-covered and grassy sites	BV, Ø	Agri., recr.	Ex?
<i>Phlegra fasciata</i> (Hahn, 1826)	Vegetation in sandy and grassy sites	BØ, VE	Agri., recr.	I
<i>Salticus zebraneus</i> (C. L. Koch, 1837)	Low vegetation, bushes, trees	AK, BØ, VE	Forestry, agri.	K
<i>Sitticus distinguendus</i> (Simon, 1868)	Dry and sunny sites	VAY, VE	Agri., recr.	DC
<i>Sitticus saltator</i> (O. P.-Cambridge, 1868)	Sandy sites	VE, Ø	Dev., recr.	DC
<i>Talavera aequipes</i> (O. P.-Cambridge, 1871)	Dry and sunny sites	HOI, RY	Agri., forestry	K
TETRAGNATHIDAE				
<i>Tetragnatha striata</i> L. Koch, 1862	Bogs/fens, on reeds and other vegetation	AK, BØ	Drainage, agri., pollution	Ex?

Table 1, continued. Summary of species and their habitat, distribution, threat factors and proposed red list status.

Species	Habitat	Distribution	Threat factors	Proposed Red List status
THERIDIIDAE				
<i>Anelosimus vittatus</i> (C. L. Koch, 1863)	Low vegetation, bushes, trees	AK, BØ, VE	Forestry, agri.	I
<i>Diploena inornata</i> (O. P. - Cambridge, 1861)	Dry and sunny sites	AK, RI, VE	Agri., recr.	K
<i>Diploena melanogaster</i> (C. L. Koch, 1845)	Low vegetation, bushes, trees	AK	Agri., recr.	DC
<i>Diploena torva</i> (Thorell, 1875)	Coniferous forests, older trees	BV, NTI, VE	Forestry	DC
<i>Enoplognatha thoracica</i> (Hahn, 1833)	Low vegetation, bushes, trees	VE	Forestry, agri.	I
<i>Simitidion simile</i> (C. L. Koch, 1836)	Low vegetation, bushes, trees	BØ, VE	Forestry, regrowth, agri.	I
<i>Theridion montanum</i> Emerton, 1882	Coniferous forests	HES	Forestry	DC
<i>Theridion tinctum</i> (Walckenaer, 1802)	Coniferous forests, bushes and low veg.	AK, BØ, VE	Forestry, agri.	K
THOMISIDAE				
<i>Xysticus kochi</i> Thorell, 1872	Low vegetation, bushes, trees	AAY, VE	Agri.	I
ULOBORIDAE				
<i>Hyptiotes paradoxus</i> (C. L. Koch, 1834)	Coniferous forests	AK, HOI, RY	Forestry	K

Table 1, continued. Summary of species and their habitat, distribution, threat factors and proposed red list status.

6 Discussion

6.1 General statistics

The 91 species included in the present list represent 16.4 % of the 555 species known to occur in Norway at the time of writing [unpublished manuscript by the first author based on Hauge (1989) with subsequent published and unpublished additions and taxonomic amendments]. This figure is considerably less than the corresponding figure for Germany (53 % - Platen et al. 1996, 1998) and Slovakia (about 47 % - Gajdos et al. 1999) and is more comparable to that for Great Britain (13.5 % - Bratton 1991). Even fewer spiders are redlisted in Finland (about 6 % - Rassi & Väisänen 1987, Rassi et al. 1992) and Sweden (about 8.8 % - Gärdenfors 2000). The difference among the Fennoscandian countries may be explained by a relatively large number of Norwegian species being restricted to the small coastal region of south-eastern Norway. Comparable regions with similar climatic conditions are in other words larger in Sweden and Finland. Some of these species are absent from Finland, or if present, have not been included in the Finnish red lists.

Although it is very likely that at least some of the 20 species here considered extinct have been overlooked, many occurred in the parts of Norway which are best known with respect to spiders. Furthermore, 7 are large and conspicuous araneids and most of the others are likely to be captured by pitfall traps. New records are therefore needed to confirm their existence in Norway. One species is considered endangered, one is vulnerable and 21 are believed to be care demanding. A large proportion of the species are either indeterminate or insufficiently known which is a reflection of the incomplete knowledge on the distribution and rarity of many species.

6.2 Zoogeographical considerations

Table 2 shows the number of species in each Red List category in different zoogeographical regions of Norway (following the division of Ødegaard and Coulianos 1998; table 1).

Table 2 bears considerable resemblance to the corresponding table for true bugs (Ødegaard and Coulianos 1998: table 4). The number of beetles in the DC category is much higher than for

true bugs and spiders, however (57 % - Hanssen et al. 1998: table 2). Several species here included in the categories «Indeterminate» or «Insufficiently Known» are probably restricted to the southeastern corner of Norway and could just as well have been assigned to the category «Declining, care demanding», but given their relatively extensive distribution in Sweden and Finland we feel more information on their range in Norway must surface before their status is changed.

Of the 91 species included in this survey 40 are southeastern and 29 are eastern. Only 5 species are only known from the western parts of Norway, 8 are exclusively northern (including two alpine species known only from the high altitude plateau in south Norway), 4 are recorded from south Norway, 3 are recorded from south Norway north to about NT and 2 have been found in widely separated localities (scored as "Whole country").

The species fall into several zoogeographically distinct groups. The largest group consists of species which have only been found in the southeastern parts of Norway and follow a comparable northern limit in Sweden and Finland. This limit includes the southeastern coast of Norway (the faunal provinces of AAY, TEY, VAY, VE, BØ, AK and Ø) and possibly inner regions as well (VAI, AAI, TEI, BV and OS), runs across Central Sweden from Värmland to Uppland and embraces the southern parts of Finland (particularly Alandia but also the southernmost provinces of the mainland). Based on the distribution of other organisms (e.g. plant associations, true bugs and beetles) these species are likely to be restricted to this narrow strip of the southeastern coast and possibly the southern parts of the large eastern valleys, although they could possibly be able to maintain viable populations in warmer regions of western Norway. We agree with Ødegaard & Coulianos (1998) in that the protection of potentially vulnerable terrestrial invertebrate species would be most effective if the effort was concentrated in the southeastern region.

A second group consists of holarctic and palearctic species reaching the southwestern or western limit of their total distribution in Norway, possibly belonging to the «taiga element» of Hippa & Mannila (1975). This smaller group is represented by *Gnaphosa orites*, *Scotinotylus clavatus*, *Gibbaranea omoeda*, *Thanatus articus* and *Pardosa lasciva*. It must again be stressed that the spider fauna of northern Norway is poorly known compared to the rest of the country and future research may alter the current picture considerably. It is beyond doubt however,

Table 2. Distribution of species within each proposed Red List category. «Northern» includes two alpine species recorded from southern Norway (*Pardosa trailli* and *Scotinotylus clavatus*).

Distribution	Ex	E	V	DC	I	K	Total
Whole country	-	-	-	1	-	1	2
Eastern parts	7	-	1	8	6	7	29
Southeastern parts	7	1	-	9	14	9	40
Southern Norway	2	-	-	-	-	2	4
Southern, including central parts	1	-	-	2	-	-	3
Western parts	1	-	-	-	2	2	5
Northern parts	2	-	-	1	3	2	8
Total	20	1	1	21	25	23	91

that these species are generally uncommon and infrequent throughout their known range.

Another group is made up of species which appear to be generally rare or uncommon throughout their known range but do not exhibit the same northern limit of distribution as the first group. Examples are *Pardosa trailli*, *Typhocrestus sylviae*, *Euoyphrys frontalis*, *Maro lepidus*, *Satilatlas britteni* and *Dipoena* spp. The first two are Fennoscandian or Northern endemics.

A small number of generally rare or uncommon spiders have so far not been recorded from other Fennoscandian countries and most appear to be coastal species. They include *Saaristoa firma*, *Silometopus ambiguus*, *Syedra gracilis*, and *Haplodrassus minor*, all of which are found in Great Britain and continental Europe. These may be relatively recent immigrants from Great Britain and/or northern continental Europe. Two riparian spiders are also only known from Norwegian sites in Fennoscandia (*Arctosa stigmosa* and *Caviphantes saxetorum*). We expect all or most of these species to be eventually found in the appropriate habitat in at least southern and/or central parts of Sweden.

6.3 Ecological considerations

Table 3 illustrates the relationship between Red List category and habitat preferences. The habitat types differ from those used by Hanssen et al. (1998:table 2) and Ødegaard & Coulianos (1998: table 5) because more concise information regarding the habitats preferences of spiders have been used. Each species have been assigned to only one habitat type, if more than one habitat is listed in the literature the most frequently cited habitat has been used or, if different, the one applicable to Norwegian re-

conds. The habitats descriptions used in table 2 are approximate only, and the reader should refer to the species boxes above for more precise habitat characterisations.

Despite the difficulty in assigning some of the species to the various habitat types some relevant points should be stressed. No less than 20 species (22 %) are associated with open habitats. Of these 14 are bound to very warm, sunny biotopes, including two extinct, one vulnerable and three care demanding species. Much the same pattern was exhibited by true bugs (Ødegaard & Coulianos 1998: table 5). A large part the of rare and potentially threatened spiders in Norway are in other words thermophilous species, another indication of the biodiversity value of the warmer southeastern region. An even larger group (29 %) are forest species (some species usually found on vegetation, bushes and branches are also found in forests). Many of the forest species live in litter and detritus. Others show a preference for moist and shaded forest habitats, including one extinct and one care demanding species. Species usually found on herbaceous vegetation, bushes and low branches also constitute a sizeable group (19 %), which include six extinct and three care demanding species. Relatively fewer species are bound to peatlands and other wetlands (10 %), high-altitude/alpine habitats (3 %) and coastal/river habitats (12 %), but some of the faunistically most interesting species in Norway are either alpine or coastal so their importance is not in proportion to their numbers in the present list. The relatively high number of species bound to sandy or shingle-covered coastal habitats is noteworthy and includes two lycosids, one salticid and two gnaphosids, one of which is endangered and six which are care demanding. Of the strictly riparian species the two lycosids and one linyphiid are all deemed care demanding. Three synanthropic species are listed as extinct, but this could be caused by a lack of sampling in the appropriate habitat!

Table 3. Relation between Red List category and habitat preferences. Each species have been assigned to one category only.

Habitat type	Ex	E	V	DC	I	K	Tot.
<i>Forests habitats</i>							
Coniferous forests	2	-	-	5	2	5	14
Moist, shaded forests	1	-	-	1	1	1	4
Moss, litter and detritus	1	-	-	-	5	1	7
Clearings in forests	1	-	-	1	-	1	3
Bushes, vegetation, trees	6	-	-	3	4	4	17
<i>Open habitats</i>							
Dry and sunny sites	2	-	1	3	4	4	14
Moist, grassy fields	1	-	-	-	-	1	2
Calcareous grasslands	-	-	-	1	-	1	2
Heaths	-	-	-	-	2	-	2
<i>Wetlands</i>							
Bogs/fens/wetlands	2	-	-	1	4	2	9
High altitude/alpine habitats	-	-	-	-	1	2	3
Synanthropic conditions	3	-	-	-	-	-	3
<i>Coastal and river habitats</i>							
Shingle beaches (incl. rivers)	1	1	-	2	-	-	4
Sandy dunes (incl. rivers)	-	-	-	4	1	1	6
Other coastal habitats	-	-	-	-	1	-	1
Total	20	1	1	21	25	23	91

6.4 Taxonomic considerations

In most cases the number of species of each family appears to be represented in the list more or less in proportion to their contribution to the Norwegian spider fauna (table 4), although bias caused by different ecology, activity pattern, size, appearance, «catchability», and habitat preferences must be taken into the account. One family is worthy of further comment however.

Araneidae are represented by a disproportionately large number of presumably extinct species (table 3). Most of these are large, conspicuous spiders making equally conspicuous webs so their apparent disappearance or decline may be a real one. Since modern forestry reduce the abundance and diversity of spiders (see below), including araneids, and at least three of the araneids li-

sted as extinct are usually found in coniferous forests, this hypothesis may have some merit. On the other hand, the large and visually pleasing araneids were the favourites of early arachnologists, a bias which shifted toward the epigeic and cryptic spider fauna in the latter half of this century. These «extinct» araneids could therefore simply have been overlooked. Circumstantial evidence however, suggest that araneids were much more abundant in forests before large-scale forestry and industrial atmospheric pollution became common (Hauge unpub.). Similar observations were made by Palmgren (1972, 1974a, 1977b, 1979) who remarked that the large araneids apparently showed a decline in numbers in western Finland. He proposed several possible reasons for the apparent decline, from bias caused by increased interest in the epigeic fauna to the use of pesticides and SO₂ pollution (Palmgren 1979).

Table 4. Relation between taxa and Red List status. Last column is the approximate contribution of each family to the Norwegian spider fauna (based on the updated and revised unpublished check - list).

Family	Ex	E	V	DC	I	K	Total	Prop. Norw.
Araneidae	7	-	-	3	1	2	13 (14.3 %)	6.0 %
Clubionidae	-	-	-	-	1	2	3 (3.3 %)	3.8 %
Dictynidae	-	-	-	2	2	-	4 (4.4 %)	1.4 %
Gnaphosidae	3	1	1	2	1	1	9 (9.9 %)	8.0 %
Linyphiidae	3	-	-	5	9	6	23 (25.3 %)	44.4 %
Liocranidae	1	-	-	-	1	-	2 (2.2 %)	1.8 %
Lycosidae	2	-	-	3	5	3	13 (14.3 %)	8.8 %
Oxyopidae	1	-	-	-	-	-	1 (1.1 %)	0.2 %
Philodromidae	1	-	-	1	-	2	4 (4.4 %)	3.1 %
Salticidae	1	-	-	2	1	4	8 (8.8 %)	5.2 %
Tetragnathidae	1	-	-	-	-	-	1 (1.1 %)	2.4 %
Theridiidae	-	-	-	3	3	2	8 (8.8 %)	6.5 %
Thomisidae	-	-	-	-	1	-	1 (1.1 %)	3.6 %
Uloboridae	-	-	-	-	-	1	1 (1.1 %)	0.2 %
Total	20	1	1	21	25	23	91	

7 Threat assessment

Species-specific threat factors are rather difficult to identify with certainty and only general threat factors are listed for each species. They are as follows:

Agriculture (agri.) - Includes all land uses pertaining to agriculture, such as mowing, use of pesticides and manure, conversion of natural landscapes to pastures, grazing and trampling by domesticated animals, etc.

Development (dev.) - Conversion or use of land for larger constructional purposes, like roads, hydroelectrical dams and installations, industrial sites, buildings, etc.

Drainage - Drainage of swamps, bogs and other wetlands, river systems, creeks and standing water bodies, including conversion to agricultural land, filling of ponds and small waters.

Forestry - Includes all aspects of modern forestry, such as felling of trees, thinning, planting, conversion to monocultural woods and removal of detritus, litter, dead trees and decaying matter.

Pollution - Includes household garbage, chemicals, heavy metals and air pollution.

Recreation (recre.) - Any human recreational activity embracing associated construction activities and trampling effects caused by walking, skiing or the use of motorized vehicles.

Regrowth - The regrowth of open sites, usually caused by cessation of agricultural practices such as mowing, etc.

? - In this paper only used on synanthropic species. Threat factor unknown, although use of electric heating which results in extremely low humidity may render modern houses unsuitable as habitats.

In general terms spiders are (often quite extremely) sensitive to any factors which alter the microclimatic conditions of their habitats. In practical terms this means changes in the tri-dimensional orientation and architecture of the vegetation (Uetz 1991).

The largest ecological group in this study, thermophilous species preferring open sites, would thus be sensitive to grazing and trampling by humans and domesticated animals (Delchev & Kajak 1974, Gibson et al. 1992), regrowth and other changes in vegetational structure as well as the changes in solar and moisture regimes caused by these and other factors. Grasslands and fields are usually maintained in their present state by human activities and the future of these habitats is dependent upon continued use and management (DN 1999a). Some open biotopes such as managed pastures exhibit a depauperate spider fauna, it has been shown that intensive manuring causes short-term decreases in spider diversity and a reduction in the number of large wandering forms (Delchev & Kajak 1974, Kajak 1978). Calcareous grasslands are vulnerable to removal of marine deposits and conversion to agricultural use (DN 1999a) and is a

habitat type in decline in Europe today (see Baur et al. 1996). Some spiders in the list are at least partly associated with this biotope (*Syedra gracilis*, *Tapinocyboides pygmaea*). Calcareous grasslands have been found to harbour a wide range of interesting and potentially threatened spider species in Switzerland and the most diverse invertebrates in the biotope are spiders and ground beetles (Baur et al. 1996). A most serious disturbance factor for open ecosystems are trampling effects caused by humans and domesticated animals (Duffey 1975). Both species diversity and abundance are affected, especially for species which are dependant upon a certain vegetational complexity (van der Ploeg & van Wingerden (1974).

Forest species are likewise sensitive to changes in the composition and characteristics of the ground vegetation, litter deposition, moisture levels, felling of trees, clearing of dead trees and detritus and changes in the epiphytic flora and reduction of the complexity of the canopy. In this regard modern forestry practices pose a threat to the diversity of spiders, both in terms of abundance and species diversity. For instance, there appears to be a positive correlation between abundance of lichens, branch size and needle density (all of which are reduced in managed forests) and spider diversity and abundance (Gunnarson 1988, 1990, Petterson et al. 1995, Petterson 1996). It is interesting to note that modern forestry has been blamed for the disappearance of *Araneus nordmanni* in the Uppsala area in Sweden (Ehnström & Walden 1986). Forest fires, an important regulatory process in boreal forests, open up new sites for colonization by pioneer species (see Hauge & Kvamme 1983 and Schaefer 1980), and is together with other natural disturbance factors (especially decomposition and decay of dead trees) an important factor in maintaining a certain degree of spatial heterogeneity which in turn sustains a high level of invertebrate biodiversity in boreal forests (Niemelä et al. 1996). Mature (i.e. undisturbed) coniferous forests are rare in Norway today (Berntsen & Hågvar 1991), yet they harbour many red listed and rare species (DN 1999a). Even if data is still scanty it is likely that some spider species prefer or are dependent upon mature forest types (see Petterson et al. 1995), including several in the present list (e.g. *Dipoena torva* and most *Araneus* species), although the effects of modern forestry probably is more severe for some other groups of invertebrates (Väisänen & Biström 1990).

Peatland, wetland and sphagnophilous species are sensitive to drainage of marshes and bogs, although the exact long-term effects are not clear (Koponen 1979, 1980, Schikora 1994), as well as to industrial pollution with attendant changes in vegetational structure (Deeleman-Reinhold 1990). Species with a preference for special water vegetation or wetland habitats (e.g. *Tmeticus affinis* and *Tetragnatha striata*) are particularly vulnerable (Decler 1990). Bog and wetland species are also vulnerable to factors which increase the fragmentation and isolation effects on their habitats (see Saunders et al. 1991 for a review of these effects). That the threat to wetland ecosystems is a real one becomes evident when looking at the Red Lists of other countries (e.g. Platen et al. 1991, also see Maurer 1980) which

contain a large number of hygrophilous and paludicole species. Since many types of bogs and wetlands are still relatively undisturbed in Norway several of these species are still common in Norway and we have a special European responsibility to conserve them and their habitats (see Responsibility Lists below).

Alpine species are probably not under immediate threat, because our high-altitude areas are still relatively intact (DN 1999a). But it must be emphasised that these cold-adapted species are also potentially vulnerable to habitat deterioration, including extensive trampling and construction activities leading to loss of surface vegetation and changes in moisture levels. For instance, it has been shown that permanent alpine skiing activities may lead to a serious reduction in diversity of spiders, particularly in stenotopic species, which results in an atypical fauna (Blick 1994). Preliminary findings further indicate that changes in vegetation structure with an attendant rise in microclimatic temperatures will favour opportunistic low-land species (Hauge unpub. data, also see Otto & Svensson 1982). No endemic species are known from mountains in Fennoscandia, probably because of the recent glaciation (Brinck 1974), but the record of *Scotinotylus clavatus* indicate that some rare and faunistically interesting species may be present and indeed restricted to the alpine plateau in Fennoscandia.

Coastal species represent a group in particular need of protection. As mentioned above, the critically vulnerable coastal species are confined to the most heavily populated region of Norway where pressure from human activities is severe, particularly through the construction of holiday resorts, other buildings and roads as well as pollution and littering of the shoreline. Several lycosids and salticids included in the list are strongly bound to

sandy habitats, which in Norway are rather rare and mostly limited to coastal areas (DN 1999a). As such they are already strongly influenced by human activities. Threat factors include conversion of habitats to agricultural land, trampling effects caused by humans and domesticated animals (see Framenau 1995) and factors which changes the dynamics of the sand and growth of sand-retaining vegetation (DN 1999a).

A few psammophilous/lithophilous species appear to be restricted to river banks in Norway. These include some of the more remarkable discoveries in Norway in recent times, such as *Arctosa stigmosa* and *Caviphantes saxetorum*. Along with *A. cinerea* these species have only been found along rivers in Central Norway and are unlikely to be present in coastal sand dunes. They probably occur in most major river systems of Central Norway but these are under heavy pressure from human interests and the sand/silt deposits along these rivers are in dire need of maintenance and continual monitoring (Andersen & Hanssen 1994).

Besides showing sensitivity to alterations of their physical environment spiders are also vulnerable, like most organisms, to chemical pollution. A few studies on the effect of industrial waste on spiders have been made. For instance, Deeleman-Reinhold (1990) found that wandering spiders (lycosids, gnaphosids and a few other groups) were highly sensitive to pollution of various kinds whereas the smaller linyphiids were seen to cope much better. Clausen (1984) found that SO₂-pollution may reduce the density of spiders. His studies also indicate that the use of agricultural pesticides may reduce the abundance of spiders and thereby their effectiveness as predators of crop pests (Clausen 1990).

8 Conservation issues

The only spider so far considered endangered in Norway (*Haplodrassus minor*) is bound to seaweed- and litter-covered shingle beaches in the high-pressure region of southeastern Norway and is unlikely to have a wide distribution. Almost all other species in the most critical Red List categories (see **table 1**) as well as the largest number of species are found in this region, most of them in or near coastal sites. This region is also very important for other groups of terrestrial arthropods (Andersen & Fjeldså 1984, Andersen & Sølvi 1988, Andersen & Hauge 1995, Ødegaard & Coulianos 1998). As has been mentioned before this is a clear indication of the urgent need to protect and monitor this biological «hotspot» of Norway.

A few habitat types are also in dire need of protection. Probably the most threatened are the rare sand/silt and gravel banks of large rivers in Central Norway which harbour one of our most remarkable invertebrate faunas (Andersen & Hanssen 1994). The largest and best preserved of these habitats should be designated as Nature Reserves and monitoring procedures should be implemented as soon as possible.

Mature forests should also be identified and preserved whenever possible. Although the effects of modern forestry on the spider fauna as a whole are not unambiguous, it is clear that several species, particularly large orb-weavers, are sensitive to modern forestry practises and mature forest stands may serve as refuges for these species.

Steps should also be taken to ensure that calcareous meadows and fens are maintained in their present state. Without such active management these habitats will eventually disappear along with their special fauna (see Moen et al. 1999).

Our knowledge of the spider fauna of peatlands in Norway is in general very poor, but data from other countries strongly suggests that several rare and potentially vulnerable species only occur in such habitats. Fortunately, a wide range of mire types have been preserved in the national plan for mire nature reserves (Moen 1995).

The proposed Red List status of the species presented here should be considered tentative only. With a greater sampling effort some are likely to change status in a positive direction while other species may be added to the list. On the other hand, some species are definitely very rare throughout their known range and potentially vulnerable to human influence, some being either recent discoveries or not having been found for the last 50 years or more. Yet other species are highly unlikely to be widespread in Norway as they live in rare and vulnerable biotopes. Part of our intention with this list is to provide a preliminary guide to rare and faunistically interesting spiders of the Norwegian fauna. Any new records of the species treated herein would be of considerable interest and should be reported and published as soon as possible. In fact, one of the conclusions to be drawn from the current investigation is that more research and greater sampling efforts are needed, particularly in the southeastern «hotspot» region, but also in the barely investigated areas around Trondheim, northwestern Norway and all of Northern Norway. The high alpine plateau of southern Norway is unique in European context. Despite being poorly known with respect to spiders it contains some very interesting species and is definitely worthy of extensive studies.

9 Norwegian Responsibility Lists

The current Norwegian bioconservation effort relies heavily on protection of natural landscape and nature types and in this regard it is important to identify the nature types which harbour species of international and general conservation interest (DN 1997, 1999a).

One type of natural landscape still common in Norway but under considerable threat and degradation in continental Europe (including Great Britain) is peatlands and comparable wetlands (Löfroth 1995, Maurer 1980, Platen et al. 1991). Another landscape type mostly absent from Great Britain and Continental Europe is the high alpine plateau as found in Southern Norway which also holds a unique position in Fennoscandia. Stenocious species typical of or restricted to these biotopes may therefore be widespread and common in Norway while they are rare and/or declining in continental Europe, particularly in heavily industrialised and populated areas. Cross-referencing the distribution and occurrence of Norwegian species with species included in the Red Lists of other European countries (particularly Great Britain and Germany, see Platen et al. 1996, Bratton 1991, Platen et al. 1991, also Blick & Scheidler 1992), it is clear that several species fall into this category. A number of species from other habitats, mainly forests, are also worthy of consideration in this regard. With this in mind, the following Responsibility Lists for Norway are proposed:

List 1 - Spiders of peatlands and other wetlands

1. *Antistea elegans* (Blackwall, 1841)
2. *Agyneta mossica* (Schikora, 1993)
3. *Bathyphantes setiger* (F. O. P.- Cambridge, 1894)
4. *Ceratinella brevipes* (Westring, 1851)
5. *Diplocephalus permixtus* (O. P.- Cambridge, 1871)
6. *Drepanotylus uncatus* (O. P.- Cambridge, 1873)
7. *Hypselistes jacksoni* (O. P.- Cambridge, 1902)
8. *Theonoe minutissima* (O. P. - Cambridge, 1879)
9. *Kaestneria dorsalis* (Wider, 1834)
10. *K. pullata* (O. P.- Cambridge, 1863)
11. *Leptothrix hardyi* (Blackwall, 1850)
12. *Maro minutus* O. P.- Cambridge, 1906
13. *M. sublestus* Falconer, 1915
14. *Micaria nivosa* L. Koch, 1866
15. *Pardosa sphagnicola* (Dahl, 1908)
16. *Notioscopus sarcinatus* (O. P.- Cambridge, 1872)
17. *Taranucnus setosus* (O. P.- Cambridge, 1863)
18. *Walckenaeria cuspidata* (Blackwall, 1833)

List 2 - Spiders of the high altitude alpine plateaus

1. *Arctosa alpigena* (Doleschall, 1852)
2. *Lepthyphantes antroniensis* Schenkel, 1933
3. *Mecynargus morulus* (O.P.-Cambridge, 1873)
4. *Micaria alpina* L. Koch, 1872
5. *Ozyptila rauda* Simon, 1875
6. *Pardosa hyperborea* (Thorell, 1872)
7. *Pelecopsis mengei* (Simon, 1884)

List 3 – Spiders of forests, grasslands, meadows and similar habitats

1. *Alopecosa aculeata* (Clerck, 1757)
2. *Bolyphantes luteolus* (Blackwall, 1833)
3. *B. crucifer* (Menge, 1866)
4. *Micaria silesiaca* L. Koch, 1875
5. *Minicia marginella* (Wider, 1834)
6. *Oreonetides vaginatus* (Thorell, 1872)
7. *Pardosa fulvipes* (Collett, 1876)
8. *P. nigriceps* (Thorell, 1856)
9. *Pelecopsis elongata* (Wider, 1834)
10. *Peponocranium ludicrum* (O.P.-Cambridge, 1861)
11. *Robertus scoticus* Jackson, 1914
12. *Scotina gracilipes* (Blackwall, 1859)
13. *S. palliardi* (L. Koch, 1881)
14. *Silometopus elegans* (O.P.-Cambridge, 1872)
15. *Thanatus formicinus* (Clerck, 1757)
16. *T. striatus* C. L. Koch, 1845
17. *Theonoe minutissima* (O. P.-Cambridge, 1879)
18. *Walckenaeria nodosa* O. P.-Cambridge, 1873
19. *Xysticus lineatus* (Westring, 1851)
20. *X. luctuosus* (Blackwall, 1836)
21. *X. sabulosus* (Hahn, 1832)

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