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Norwegian Vegetation Types. A Preliminary Survey of Higher Syntaxa

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ZUSAMMENFASSUNG

In einer vorläufigen Übersicht werden die norwegischen Vegetationstypen dem BRAUN-BLANQUET-schen System zugeordnet. Die Zusammenstellung stützt sich auf norwegische Arbeiten, eigene Erfahrungen im Gelände, sowie auch auf mitteleuropäische Lehrbücher und Publikationen. Durch wertvolle Anregungen und Diskussionen mit Kollegen wurde die Liste ergänzt. Diese erste Fassung (noch z.T. hypothetisch) umfaßt 42 Klassen, 73 Ordnungen und etwa 140 Verbände.

SUMMARY

In a preliminary phytosociological survey the Norwegian vegetation types are placed into the floristic-sociological BRAUN-BLANQUET system. The list has been compiled on the basis of Norwegian publications, the author's field experience as well as the systems in foreign textbooks and publications. The survey has also been greatly influenced by discussions and advice from collegue phytosociologists. The present system (partly hypothetical) comprises 42 classes, 73 orders and approximately 140 alliances.

INTRODUCTION

During the last decade the Norwegian vegetation types have been comprehensively surveyed several times for practical purposes, i.e. for vegetation mapping in the scales 1: 5000 to 1: 20000 (WIELGOLASKI 1971, MARKER 1973, HESJEDAL 1973, 1975, Nordiska Ministerradet 1980). The mapping units are based on phytosociological units. Only a few phytosociological monographs have been published, e.g. Utsire, Sylene and Sikilsdalen (NORDHAGEN 1923, 1928, 1943), Rondane (DAHL 1956) and Langøya (MARKER 1969). Some groups of vegetation types have been studied in detail in more or less restricted areas, the classical works being those concerning the alpine and subalpine vegetation (NORDHAGEN 1936, 1943), the forests (AUNE 1973, BJØRNSTAD 1971, DAHL et al. 1967, KIELLAND-LUND 1962, 1967, 1973, 1981), the snowbed communities (GJAEREVOLL 1956), the seashore communities (DAHL & HADAČ 1941, HØYLAND 1978, NORDHAGEN 1940, TÜXEN 1967) and the termophilous dry meadows (SUNDING 1963, 1965). The mires have been treated in different works by NORDHAGEN (mentioned above) and recently in several papers by DIERSSEN (1980, 1982b).

The lack of overall phytosociological system seems to have been the reason for R. TÜXENs considerations "Wir sind davon überzeugt, daß das pflanzensoziologische System auch eine brauchbare Grundlage für die geographische Betrachtung der Vegetation Skandinaviens im vielseitigsten und umfassendsten Sinne schaffen wird" (TÜXEN 1951: 150). In my opinion too little emphasis has been laid upon the compilation of existing knowledge into an overall countrywide system. So TÜXENs considerations still seem to be valid. The present paper shows a very preliminary system where Norwegian vegetation types are placed in higher syntaxa.

AIMS

The syntaxonomical classification of vegetation types seems to be useful and valuable for several different reasons, so the aims of this paper may be linked to several keywords.
S y n t a x o n o m y . For biological sciences the BRAUN-BLANQUET system has been said to be of the same importance as the Linnean bionomial system for taxonomy.
T e a c h i n g . For the teaching of geobotany on different levels of education the systematical arrangement of knowledge, and the definition of terms on different levels have been found relevant and useful.
C o m m u n i c a t i o n . The survey has also been made for the benefit of international communication pertaining to international nature conservation where Norway is concerned.
M a p p i n g s y s t e m s . Phytosociological units have been - and will be - applied in large scale vegetation mapping. Standardization of code systems will facilitate the use of vegetation maps in planning. These lists (and the list of lower units (VEVLE 1983a)) intend to give some ideas to the standardization of the (Norwegian) system.

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"Zeigerwerte", species sociological behaviour. The survey or its 2nd ed. will be used as a basis for the evaluation of the Norwegian species sociological behaviour.
Nature conservation. This list and the list of associations in VEVLE 1983a is also intended to be the basis for the future investigations preparing "Red list of plant communities".

METHOD

The list has been compiled on the basis of literature and the author's field experience. Some Norwegian publications have been mentioned above, others have been referred in VEVLE 1983b. Field experience comprises large scale vegetation mapping (e.g. HOFSTEN & VEVLE 1982, HJELTNES & VEVLE 1982, VEVLE 1982), teaching phytosociology and mapping which have revealed the need of improved classification systems. Therefore a number of foreign textbooks and publications have been studied, e.g. BIRSE (1980), DIERSSEN (1982a), ELLENBERG (1978), HOLUB et al. (1967), MATUSZKIEWICS (1979), OBERDORFER (1977/1978, 1979), PASSARGE (1978), RUNGE (1980), TÜXEN (1937), WESTHOFF & DEN HELD (1969) and WILMANNS (1978). In addition other publications dealing with classes or minor groups of vegetation have given valuable information and ideas concerning the taxonomical position of orders and alliances. The arrangement of classes in classgroups (no more than 9 in each), and the decimal numbers of the syntaxa have been adopted from ELLENBERG (1978, 1979) in order to prepare electronic data processing (EDP) of the species "Zeigerwerte", including their sociological behaviour (ELLENBERG 1979: 42).

INCLUDED SYNTAXA

The lists include syntaxa which have been described or reported (in tables) from Norway, and some units which are supposed to comprise Norwegian vegetation types. Some S Scandinavian units are also included. The lists comprise some classes of which the Norwegian communities have been studied and classified in great detail (e.g. *Vaccinio-Piceetea*, *Querco-Fagetea*, *Oxycocco-Sphagnetea*, *Scheuchzerio-Caricetea*) as well as some syntaxa which are highly in the need of further investigations (e.g. *Charetea fragilis*, *Molinio-Arrhenatheretea*, *Artemisietea vulgaris* etc.), and some Southern syntaxa (on different levels) which are distributed at least to S Scandinavia (e.g. *Saginetea maritima*, *Centauretalia cyani*, *Onopordion*, *Dauco-Melilotion*, *Parietarietea*, *Stipetalia calamagrostis*, *Corynephoretalia* and *Festucetalia valesiacae*).

DISCUSSION AND COMMENTS

The above mentioned (C European) textbooks and publications show some disagreement concerning the number and the contents of the syntaxa, in classes as well as on lower levels. In most cases this list keeps a conservative - (and less controversial?) view. The hypothetical feature of this list implies the fact that in many Norwegian tables the alphabetical listing of species conceal the true species combination of the communities (TÜXEN 1951: 171). The characteristic, differential and additional species as well as the associations and lower units have been listed in separate papers (VEVLE 1983a, b). So if these hypothesis should be tested the Norwegian phytosociologists should take care to make (proper relevees and) tables according to the synthetic steps of the BRAUN-BLANQUET method (WILMANNS 1978: 27 ff). Because of the scarce or even lacking (proper) investigations some of the classes have been surveyed with great uncertainty, e.g. *Isoeto-Nanojuncetea*, *Stellarietea*, *Artemisietea*, *Asplenietea*, *Thlaspietea rotundifolii*, *Koelerio-Corynephoretea* (p.p.), *Molinio-Arrhenatheretea* and *Nardo-Callunetea* (p.p.).
In a recent survey on the most important Norwegian vegetation types SUNDING (1978) reports on 71 alliances and their most common associations. The present list shows a higher diversity approximately 140 alliances, including some S Scandinavian ones which do not reach Norway. However, the phytosociological knowledge of these alliances is still far from sufficient, so a lot of tasks are awaiting. For the benefit of some of the aims mentioned above the future investigations should be concentrated upon chorological aspects and the hitherto least known communities (see above).

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List 1: SURVEY ON CLASSGROUPS AND CLASSES

1. VEGETATION IN AND NEAR FRESHWATER	
1.1 Floating communities of lemnids and wolfiellids	*Lemnetea minoris*
1.2 Communities of dwarf plants, on wet soil	*Isoeto-Nanojuncetea*
1.3 Communities of nitrophilous, mainly annual species	*Bidentetea tripartiti*
1.4 Communities of charophytes	*Charetea fragilis*
1.5 Communities of bladderworts	*Utricularietea intermedio-minoris*
1.6 Communities nymphaeids and potamids	*Potametea pectinati*
1.7 Litoral communities of isoetids	*Littorelletea uniflorae*
1.8 Communities of helophytes	*Phragmitetea*
2. VEGETATION IN SPRINGS AND MIRES	
2.1 Communities of springs	*Montio-Cardaminetea*
2.2 Communities of fens	*Scheuchzerio-Caricetea fuscae*
2.3 Communities of bogs and wet heaths	*Oxycocco-Sphagnetea*
3. VEGETATION OF SEASHORES	
3.1 Sublitoral communities of seelgrass	*Zosteretea marinae*
3.2 Hydrolitoral communities of potamids and isoetids	*Ruppietea maritimae*
3.3 Communities of Salicornia spp.	*Thero-Salicornietea*
3.4 Comm.of perennial,nitroph. spec. on shingle beaches	*Honckenyo-Elymetea*
3.5 Comm.of annual,nitroph. spec. on sand and shingle	*Cakiletea maritimae*
3.6 Comm. of lowgrowing salt-tolerant spec.	*Saginetea maritimae*
3.7 Comm. of salt-tolerant helophytes	*Bolboschoenetea maritimae*
3.8 Meadows rich in graminids	*Asteretea tripoli*
4. COMMUNITIES OF DISTURBED PLACES	
4.1 Trampling comm., mainly annual spec.	*Polygono-Poetea annuae*
4.2 Agricultural comm., mainly annual spec.	*Stellarietea mediae*
4.3 Communities of nitrophilous, perennial weeds	*Artemisietea vulgaris*
5. COMM. OF WALLS, ROCK AND THE ALPINE ZONE	
5.1 Communities of wall crevices	*Parietarietea judaica*
5.2 Comm. on soils rich in heavy metals (Cu, Zn, Pb)	*Violetea calaminariae*
5.3 Comm. of small farns, in rock crevices	*Asplenietea trichomanis*
5.4 Comm. of unstable mineral soil	*Thlaspietea rotundifolii*
5.5 Windswept ericaceous and grass heaths, alpine zone	*Juncetea trifidii*
5.6 Comm. of calcareous heaths, alpine zone	*Carici rupestris-Kobresietea bellardii*
5.7 Comm. of the snowbeds	*Salicetea herbaceae*
5.8 Comm. of low alpine shrub- and ericaceous heath	*Vaccinio-Piceetea* p.p.
6. VEGETATION ON SAND, SHALLOW SOIL, MEADOWS AND HEATH	
6.1 Marram comm. on eolian sand	*Ammophiletea arenarii*
6.2 Comm. on stable sand and shallow soil	*Koelerio-Corynephoretea*
6.3 Thermoph. dry meadows of geo- and hemi-cryptophytes	*Festuco-Brometea*
6.4 Anthropogeneous meadows	*Molinio-Arrhenatheretea*
6.5 Lowland heaths and grassland	*Nardo-Callunetea*
7. FOREST RIMS, CLEARINGS AND SHRUBS	
7.1 Communities of forest rims	*Trifolio-Geranietea*
7.2 Communities of forest clearings	*Galeopsio-Senecionetea sylvatici*
7.3 Eutrophic subalpine comm. of forests and shrubs	*Betulo-Adenostyletea*
7.4 Shrubs, anthropogeneous or climatically influenced	*Rhamno-Prunetea*
8. FORESTS	
8.1 Coniferous forests	*Vaccinio-Piceetea* p.m.p.
8.2 Alluvial willow shrubs and forests	*Salicetea purpureae*
8.3 Alder swamp forests	*Alnetea glutinosae*
8.4 Thermophilous deciduous forests	*Querco-Fegatea*

List 2: SURVEY ON CLASSES, ORDERS AND ALLIANCES

1. COMMUNITIES IN AND NEAR FRESHWATER
1.1 *LEMNETEA MINORIS* Koch et Tx. ap. Tx. 1955
1.11 *L e m n e t a l i a m i n o r i s* Tx. 1955
1.111 *Lemnion minoris* Tx. 1955

1.2 *ISOETO-NANOJUNCETEA* Br.-Bl. et Tx. 1943
1.21 *C y p e r e t a l i a f u s c i* Pietsch 1963
1.211 *Elatino-Eleocharition ovatae* Pietsch 1965
1.212 *Radiolion linoides* Pietsch 1965
1.213 *Eu-Nanocyperion flavescentis* Koch 1926 em. R. God. 1961
1.214 Boreal alliance ???

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1.3 *BIDENTETEA TRIPARTITI* Lohm., Prsg. et Tx. ap. Tx. 1950
1.31 *Bidentetalia tripartiti* Br.-Bl. et Tx. 1943
1.311 *Bidention tripartiti* Nordh. 1940
1.312 *Chenopodion rubri* J. Tx. ap. Poli et J. Tx. 1960

1.4 *CHARETEA FRAGILIS* (Fukarek 1961) Krausch 1964
1.41 *Nitelletalia flexilis* Krause 1969
1.411 *Nitellion flexilis* (Corill. 1957) Krause 1969
1.42 *Charetalia hispidae* Sauer 1937
1.421 *Charion asperae* Krause 1969
1.422 *Charion canescentis* Krause 1968

1.5 *UTRICULARIETEA INT.-MIN.* DenHart et Seg. 1964 em. Pietsch 1965
1.51 *Utricularietalia intermedio-minoris* Pietsch 1965
1.511 *Utricularion intermedio-minoris* Pietsch 1977
1.512 *Sphagno-Utricularion* (Müller et Görs 1960) Pietsch 1977
1.513 *Scorpidio-Utricularion* Pietsch 1964

1.6 *POTAMETEA PECTINATI* Tx. et Prsg. 1942
1.61 *Potametalia pectinati* Koch 1926
1.611 *Nymphaeion albae* Oberd. 1967
1.612 *Potamion pectinati* Koch 1926 em. Oberd. 1967
1.613 *Hydrocharition* Rübel 1933 em. Pass. 1964
1.62 *Callitricho-Batrachietalia* (DenHart et Seg. 1964) Pass.1978
1.621 *Batrachion fluitantis* Neuhäusl 1959
(incl. *Callitricho-Batrachion* DenHart. et Seg. 1964 p.p.)

1.7 *LITTORELLETEA UNIFLORA* Br.-Bl. et Tx. 1943
1.71 *Littorelletalia* Koch 1926
1.711 *Subulario-Isoetion* (Nordh. 1936) Pietsch 1977
1.712 *Lobelio-Isoetion* Pietsch 1965
1.713 *Eu-Littorellion uniflorae* Koch 1926 s. str. Pietsch 1977
1.714 *Eleocharition multicaulis* Pietsch 1965

1.8 *PHRAGMITETEA AUSTRALIS* Tx. et Prsg. 1942
1.81 *Phragmitetalia* Koch 1926
1.811 *Phragmition* Koch 1926
1.812 *Magnocaricion elatae* Koch 1926
1.82 *Sparganio-Glycerietalia* Pign. 1953
1.821 *Glycerio-Sparganion* Br.-Bl. et Siss. ap. Boer 1942
1.822 Boreal alliance ???

2. COMMUNITIES IN SPRING AND MIRES
2.1 *MONTIO-CARDAMINETEA* Br.-Bl. et Tx. 1943
2.11 *Montio-Cardaminetalia* Pawl. 1928
2.111 *Cardamino-Montion* Br.-Bl. 1925
2.111.1 (incl. *Mniobryo-Epilobion hornemanni* Nordh. 1936)
2.112 *Cratoneurion commutati* Koch 1928
2.112.1 (incl. *Cratoneuro-Saxifragion aizoidis* Nordh. 1936)

2.2 *SCHEUCHZERIO-CARICETEA FUSCAE* (Nordh. 1936) Tx. 1937
2.21 *Scheuchzerietalia palustris* Nordh. 1936
2.211 *Rhynchosporion albae* Koch 1926
(incl. *Stygio-Caricion limosae* Nordh. 1936
2.212 *Caricion lasiocarpae* VandenBerghen ap. Lebrun et al. 1949
2.22 *Caricetalia nigrae* (Koch 1926) Nordh. 1936 em. Br.-Bl. 1949
2.221 *Caricion nigrae* Koch 1926 em. Klika 1944
(incl. *Caricion canescentis-fuscae* Nordh. 1936)
2.23 *Caricetalia davallianae* Br.-Bl. 1949
(incl. *Tofieldietalia* Prsg. ap. Oberd. (1949) 1950)
2.231 *Caricion davallianae* Klika 1934
(incl. *Schoenion nigricantis* Nordh. 1936, *Erioporion latifolii* Br.-Bl. et Tx. 1943, *Sphagno-Tomenthypnion* (Dahl 1956) Rybniček 1964)
2.232 *Caricion bicoloris-atrofuscae* Nordh. 1936
(incl. *Caricion atrofuscae-saxatilis* Nordh. 1943)

2.3 *OXYCOCCO-SPHAGNETEA* Br.-Bl. et Tx. 1943
2.31 *Sphagnetalia magellanici* Br.-Bl. et Tx. 1943
(incl. *Ledetalia palustris* Nordh. 1936 p.p.)

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2.311 *Oxycocco-Empetrion hermaphroditi* Nordh. 1936
(incl. *Sphagnion fusci* auct.)
2.32 *Erico-Sphagnetalia* Schwick. 1940 em. Br.-Bl. 1949
(incl. *Ericetalia tetralicis* Moore 1968, *Sphagnetalia compacti* Tx. et al. 1972)
2.321 *Oxycocco-Ericion tetralicis* Moore 1968
2.322 *Ericion tetralicis* Schwick. 1933

3. VEGETATION OF SEASHORES
3.1 *ZOSTERETEA MARINAE* Pign. 1953
3.11 *Zosteretalia marinae* Beguinot 1941 em. Tx. et Oberd. 1958
3.111 *Zosterion marinae* Br.-Bl. et Tx. 1943

3.2 *RUPPIETEA MARITIMAE* J. Tx. 1960
3.21 *Ruppietalia maritimae* J. Tx. 1960
3.211 *Ruppion maritimae* Br.-Bl. 1931 em. DenHart.et Seg. 1964
3.22 *Eleocharitetalia parvulae* Seg. 1965
3.221 *Eleocharition parvulae* (Libb. 1940) Seg. 1968

3.3 *THERO-SALICORNIETEA* Pign. 1953 em. Tx. 1955
3.31 *Thero-Salicornietalia* Pign. 1953 em. Tx. 1955
3.311 *Thero-Salicornion strictae* Br.-Bl. 1933
(incl. *Salicornion ramosissimae* Tx. 1974)

3.4 *HONCKENYO-ELYMETEA ARENARII* Tx. 1966
3.41 *Honckenyo-Elymetalia* Tx. 1966 em. Géhu et Tx. ap. Géhu 1975
3.411 *Honckenyo-Elymion* (Galiano 1959) Tx. 1966
3.412 *Honckenyo-Crambion* J.-M. et J. Géhu 1969

3.5 *CAKILETEA MARITIMAE* Tx. et Prsg. ap. Tx. 1950
3.51 *Thero-Suedetalia* Br.-Bl. et Bolós 1957
3.511 *Thero-Suaedion* Br.-Bl. 1931 em. Tx. 1950
3.52 *Cakiletalia maritimae* Tx. ap. Oberd. 1949
3.521 *Salsolo-Honckenyon peploidis* Tx. 1950
3.522 *Atriplicion litoralis* (Nordh. 1940) Tx. 1950

3.6 *SAGINETEA MARITIMAE* Westh. et al. 1962
3.61 *Saginetalia maritimae* Westh. et al. 1962
3.611 *Saginion maritimae* Westh. et al. 1962
Boreal alliance ???

3.7 *BOLBOSCHOENETEA MARITIMI* Tx. et Hülb. 1971
3.71 *Bolboschoenetalia* Hejny 1962
3.711 *Scirpion maritimi* Dahl et Hadač 1941
3.712 *Caricion paleaceae* Dahl et Hadač 1941 em. Tx. et Hülb. 1971

3.8 *ASTERETEA TRIPOLII* Westh. et al. 1962
3.81 *Carici-Puccinellietalia* Beeft. et Westh. ap. Beeft. 1965
3.811 *Puccinellion phryganodis* Hadač 1946
3.812 *Caricion glareosae* Nordh. 1954
3.82 *Glauco-Puccinellietalia* Beeft. et Westh. ap. Beeft. 1962
3.821 *Puccinellion maritimae* Christians. 1927
3.822 *Armerion maritimae* Br.-Bl. et De Leeuw 1936
3.823 *Eleocharition uniglumis* auct.

4. COMMUNITIES OF DISTURBED PLACES
4.1 *POLYGONO-POETEA ANNUAE* Riv.-Mart. ap. Géhu 1973
4.11 *Polygono-Poetalia annuae* Riv.-Mart. ap. Géhu 1973
4.111 *Polygonion avicularis* Br.-Bl. ex Aichinger 1933
(incl. *Matric.-Polygonion* (Br.-Bl. 1931) Riv.-Mart. 1975

4.2 *STELLARIETEA MEDIAE* Tx. et al. ap. Tx. 1950
4.21 *Chenopodietalia albi* Tx. et Lohm. ap. Tx. 1950
(*Polygono-Chenopodietalia* auct.)
4.211 *Polygono-Chenopodion polyspermi* Koch 1926 em. Siss. 1946
(incl. *Fumario-Euphorbion*)
4.22 *Sisymbrietalia* J. Tx. ap. Lohm. et al. 1962
4.221 *Sisymbrion officinale* Tx. et al. ap. Tx. 1950
4.23 *Centauretalia cyani* (Tx. 1937) Tx. et al. ap. Tx. 1950
4.231 *Aperion spicae-venti* Tx. 1950 em. J. et R. Tx. 1960

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4.3 *ARTEMISIETEA VULGARIS* Lohm. et al. ap. Tx. 1950
4.31 *Onopordetalia acanthii* Br.-Bl. et Tx. 1943
(incl. *Artemisietalia vulgaris* Lohm. et al ap. Tx. 1950)
4.311 *Onopordion acanthii* Br.-Bl. 1926
4.312 *Arction lappae* Tx. 1937 em. Siss. 1946
4.313 *Dauco-Melilotion* Görs 1966
4.32 *Convolvuletalia sepii* Tx. 1950 em. Oberd. et al. 1967
4.321 *Calystegion sepii* Tx. 1947
4.322 *Agropyro-Rumicion crispi* Nordh. 1940 p.p. ???
4.33 *Agropyro-Glechometalia* (Dierschke 1974) Tx. 1975
(*Calystegio-Alliarietalia*)
4.331 *Geo-Alliarion* Oberd. (1957) 1962
(incl. *Lapsano-Geranion robertiani* Siss. 1973)
4.332 *Aegopodion podagrariae* Tx. 1967

5. COMMUNITIES OF WALLS, ROCK AND OF THE ALPINE ZONE
5.1 *PARIETARIETEA JUDAICAE* Riv.-Mart. ap. Riv. God. 1955 em. Oberd. 1969
(syn. *Cymbalario-Parietarietea* Oberd. 1969)
5.11 *Parietarietalia judaicae* Riv.-Mart. 1960 em. Oberd. (1970) 1977
5.111 (*Centrantho-Parietarion* Riv.-Mart. 1960)

5.2 *VIOLETEA CALAMINARIAE* Tx. ap. Lohm. et al. 1962
5.21 *Violetalia calaminariae* Br.-Bl. et Tx. 1943
5.211 *Thlaspion alpestre* Ernst 1965

5.3 *ASPLENIETEA TRICHOMANIS* Br.-Bl. ap. Meier et Br.-Bl. 1934
5.31 *Potentilletalia caulescentis* Br.-Bl. ap. Br.-Bl. et Jenny 1926 (incl. *Asplenietalia ruta-murariae*)
5.311 *Potentillion caulescentis* Br.-Bl. ap. Br.-Bl. et Jenny 1926
(incl. *Asplenion ruta-murariae* Gams 1936)
5.312 *Cystopteridion* (Nordh. 1936) J.L. Rich. 1972
(incl. *Asplenion viride* Nordh. 1936 p.p.)
5.32 *Androsacetalia vandellii* Br.-Bl. ap. Meier et Br.-Bl. 1934
(incl. *Asplenietalia septentrionalis* Oberd. et al. 1967)
5.321 *Androsacion vandellii* Br.-Bl. ap. Br.-Bl. et Jenny 1926
(incl. *Asplenion septentrionalis* Gams 1927)
(incl. *Saxifragion cotyledonis* Nordh. 1943)
5.322 *Asplenion serpentini* Br.-Bl. et Tx. 1943
(incl. *Asplenion viride* Nordh. 1936 p.p. sensu Rune 1953)
5.323 *Asplenion marinae* Seg. 1969

5.4 *THLASPIETEA ROTUNDIFOLII* Br.-Bl. et Tx. 1943
5.41 *Androsacetalia alpinae* Br.-Bl. ap. Br.-Bl. et Jenny 1926
5.411 *Androsacion alpinae* Br.-Bl. ap. Br.-Bl. et Jenny 1926
5.412 *Saxifrago stellaris-Oxyrion digynae* Gjaerev. 1956 p.p.
(incl. *Oppositifolio-Oxyrion* Gjaerev. 1956)
5.413 Ass.-group on sedimentation planes, low/middle alpine zone
5.42 *Drabetalia hoppeanae* Zollitsch 1966
5.421 *Luzulion arcticae* (Nordh. 1936) Gjaerev. 1956 ?? here?
5.422 *Potentillo crantzii-Polygonion vivipari* Nordh. 1936 p.p.
5.423 Subalpine ass. group ???
5.43 *Thlaspietalia rotundifolii* Br.-Bl. et Jenny 1926 em.Seib.1977
5.431 *Thlaspion rotundifolii* Br.-Bl. et Jenny 1926 em. Zollitsch 1966
(incl. *Arenarion norvegici* Nordh. 1936 p.p.)
(incl. *Veronico fruticantis-Poion glaucae* Nordh. 1943 p.p.)
5.432 *Arabidion coeruleae* Br.-Bl. ap. Br.-Bl. et Jenny 1926
5.44 *Stipetalia calamagrostis* Oberd. et Seib. ap. Oberd. 1977
5.441 *Stipion calamagrostis* Jenny-Lips 1930
5.442 Boreal ass.-group ???
5.45 *Epilobietalia fleischeri* Moore 1958
(incl. *Myricarietalia germanicae* Br.-Bl. 1931)
5.451 *Epilobion fleischeri* Br.-Bl. ap. J. et G. Br.-Bl. 1951

5.5 *JUNCETEA TRIFIDII* Klika ap. Klika et Hadač 1944
5.51 *Loiseleurio-Cetrarietalia* Suzuki-Tokio et Umezu 1964
5.511 *Arctostaphylo alpinae-Cetrarion nivalis* Dahl 1956
(incl. *Loiseleurio proc.-Arctostaphylion alp.* Nordh. 1943 p.p.)
5.52 *Caricetalia curvulae* Br.-Bl. 1948
5.521 *Juncion trifidi* Nordh. 1936
5.522 Oceanic ass.-group ???

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5.6 *CARICI RUPESTRIS-KOBRESIETEA BELLARDII* Ohba 1974
5.61 *K o b r e s i o - D r y a d e t a l i a* Br.-Bl. 1948
5.611 *Kobresio-Dryadion* Nordh. 1936
(incl. *Kobresion myosuroides* Nordh. 1943, *Caricion nardinae* Nordh. 1943)
5.612 *Potentillo crantzii-Polygonion vivipari* Nordh. 1936 p.p.

5.7 *SALICETEA HERBACEAE* Br.-Bl. et al. 1947
5.71 *S a l i c e t a l i a h e r b a c e a e* Br.-Bl. ap. Br.-Bl. et Jenny 1926
5.711 *Cassiopo-Salicion herbaceae* Nordh. 1936
(incl. *Polytrichion norvegici* Gjaerev. 1956)
5.712 *Saxifrago-Ranunculion nivalis* Nordh. 1943 em. Dierßen (1982)1983
(incl. *Salicion polaris* Gjaerev. 1956, *Distichion capillacei* Gjaerev. 1956)

5.8 *VACCINIO-PICEETEA* Br.-Bl. et al. 1939 p.p.
5.81 *D e s c h a m p s i o - M y r t i l l e t a l i a* Dahl 1956
5.811 *Phyllodoco-Vaccinion* Nordh. 1936
5.8 ?
5.812 *Deschampsio-Anthoxanthion* (DuRietz 1942) Dahl 1956

6. VEGETATION ON SAND, SHALLOW SOIL, MEADOWS AND HEATH
6.1 *AMMOPHILETEA ARENARIAE* Br.-Bl. et Tx. 1943
6.11 *A m m o p h i l e t a l i a a r e n a r i a e* Br.-Bl. et Tx. 1943
6.111 *Agropyro-Honckenyon peploidis* Tx. ap. Br.-Bl. et Tx. 1952
6.112 *Ammophilion arenariae* Br.-Bl. (1921)1933

6.2 *KOELERIO-CORYNEPHORETEA* Klika ap. Klika et Nowak 1941
6.21 *T h e r o - A i r e t a l i a* Oberd. (1957)1967
6.211 *Thero-Airion* Tx. 1951
6.22 *C o r y n e p h o r e t a l i a c a n e s c e n t i s* Klika 1934
6.221 *Corynephorion canescentis* Klika 1931
6.222 *Koelerion albescentis* Tx. 1937
6.223 *Sileno conicae-Cerastion semidecandri* Korneck 1974
6.23 *F e s t u c o - S e d e t a l i a* Tx. 1951
6.231 *Armerion elongatae* Krausch 1959
(incl. *Helichrysion arenarii* Tx. 1951 p.p.)
6.232 *Koelerion glaucae* (Volk 1931) Klika 1935
6.24 *S e d o - S c l e r a n t h e t a l i a* Br.-Bl. 1955
6.241 *Alysso-Sedion* Oberd. et Müll. ap. Müll. 1961
(syn. *Sedo-Scleranthion* Norw. auct.)
??? *Phleo-Sedion* Sunding 1963
6.24? *Tortello-Sedion* Hallberg 1971

6.3 *FESTUCO-BROMETEA* Br.-Bl. et Tx. 1943
6.31 *F e s t u c e t a l i a v a l e s i a c a e* Br.-Bl. et Tx. 1943
6.311 *Festucion valesiacae* Klika 1931
6.32 *B r o m e t a l i a e r e c t i* Br.-Bl. et Moor 1938
6.321 (*Xero-Bromion* Br.-Bl. et Moor 1938)
6.322 *Mesobromion* (Br.-Bl. et Moor 1938) Oberd. 1957
6.323 *Anthyllido vulnerariae-Artemision campestris* Sunding 1963

6.4 *MOLINIO-ARRHENATHERETEA* Tx. 1937
6.41 *P l a n t a g i n e t a l i a m a i o r i s* Tx. (1937)1950
6.411 *Lolio-Plantaginion* Siss. 1969
6.442 *Cynosurion cristati* Tx. 1947
6.42 *A g r o s t i e t a l i a s t o l o n i f e r a e* Oberd. 1967
6.421 *Agrostion stoloniferae* (Soo 1933) Görs 1966
6.43 *M o l i n i e t a l i a* Koch 1926
6.431 *Juncion acutiflori* Br.-Bl. et al. 1947
6.432 *Molinion caeruleae* Koch 1926
6.433 *Calthion* Tx. 1937
6.434 *Filipendulion* (Duvign. 1946) Seg. 1966
6.44 *A r r h e n a t h e r e t a l i a e l a t i o r i s* Pawl. 1928
6.441 *Arrhenatherion elatioris* Koch 1926
6.443 *Poion alpinae* Oberd. 1950
6.444 *Equiseto pratensi-Galion borealis* Tx. et Böttcher 1969
6.445 *Nardo-Agrostion* Sillinger 1933

6.5 *NARDO-CALLUNETEA* Prsg. 1949
6.51 *N a r d e t a l i a s t r i c t a* Prsg. 1949
6.511 *Nardo-Caricion bigelowii* Nordh. 1936

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6.512 *Violion caninae* Schwick. 1944
(syn. *Nardo-Galion saxatile* Prsg. 1949)
6.513 *Juncion squarrosi* Oberd. (1957)1978
6.52 *Calluno-Ulicetalia* (Quantin 1935) Tx. 1937
6.521 *Ulicion nanae* Duvign. 1944
6.522 *Calluno-Genistion* Duvign. 1944
6.523 *Empetrion boreale* Bøcher 1943
(incl. *Calluno-Arctostaphylion*)

7. COMMUNITIES OF FOREST RIMS, CLEARINGS AND SHRUBS
7.1 *TRIFOLIO-GERANIETEA* Müll. 1961
7.11 *Origanetalia vulgaris* Müll. 1961
7.111 *Geranion sanguinei* Müll. 1961
7.112 *Trifolion medii* Müll. 1961
7.113 Boreal ass.-group. ???

7.2 *GALEOPSIO-SENECIONETEA SYLVATICI* Pass. 1981
(incl. *Epilobietea angustifolii* Tx. et Prsg. ap. Tx. 1950 em. Pass. 1981)
7.21 *Galeopsio-Senecionetalia sylvaticae* Pass. 1981
7.211 *Senecioni-Rumicion acetosellae* Pass. 1981
7.212 *Galeopsio-Senecionion* Pass. 1981
7.213 *Mycelido-Senecionion* Pass. 1981

7.3 *BETULO-ADENOSTYLETEA* (Br.-Bl. et Tx. 1943) Br.-Bl. 1948
7.31 *Adenostyletalia* Br.-Bl. 1931
7.311 *Lactucion alpinae* Nordh. 1936
7.311.1 *Dryoptero-Calamagrostenion* (Nordh. 1943) Sekse 1981
7.311.2 *Athyrienion distentifolium* Nordh. 1936 p.p.
7.312 Assgroup on rel. dry soil

7.4 *RHAMNO-PRUNETEA* Riv. God. et Borja Carbonel 1961
7.41 *Prunetalia spinosae* Tx. 1952
7.411 *Salicion arenariae* Tx. 1952
(incl. *Hippophaeion rhamnoides* VanDieren 1932)
7.412 *Sarothamnion* Tx. ap. Prsg. 1949
7.413 *Rubion subatlanticum* Tx. 1952
7.42 *Sambucetalia* Oberd. 1957
7.421 *Sambuco rubri-Salicion capreae* Tx. et Neum. 1950
7.422 (incl. *Lonicero-Rubion sylvatici* Tx. et Neum. 1950)
7.4?? *Veronico fruticantis-Poion glaucae* Nordh. 1943 p.p.

8. FOREST COMMUNITIES
8.1 *VACCINIO-PICEETEA* Br.-Bl. ap. Br.-Bl. et al. 1939
8.11 *Cladonio-Vaccinietalia* K.-Lund 1967
8.111 *Dicrano-Pinion* Libb. 1933
8.112 *Phyllodoco-Vaccinion* Nordh. 1936 p.p. (*Cladonio-Pinion* auct.)
8.12 *Vaccinio-Piceetalia* Br.-Bl. ap. Br.-Bl. et al. 1939 em.K.-Lund 1967
8.121 *Vaccinio-Piceion* Br.-Bl. ap. Br.-Bl. et al. 1939 em. K.-Lund 1967

8.2 *SALICETEA PURPUREAE* Moor 1958
8.21 *Salicetalia purpureae* Moor 1958
8.211 *Salicion albae* (Soo 1936) Tx. 1955
(incl. *Salicion triandrae* Müll. et Görs 1958)

8.3 *ALNETEA GLUTINOSAE* Br.-Bl. et Tx. 1943
8.31 *Alnetalia glutinosae* Tx. 1937
(incl. *Salicetalia auritae* Doing 1962 em. Westh. 1968)
8.311 *Lactucion alpinae* Nordh. (1936)1943 p.p.
8.312 *Salicion cinereae* Müll. et Görs 1958
(incl. *Frangulo-Salicion auritae* Doing 1962)
8.313 *Alno incanae-Salicion pentandrae* K.-Lund 1981
8.314 *Alnion glutinosae* (Malc. 29) Meijer Drees 1936

8.4 *QUERCO-FAGETEA* Br.-Bl. et Vlieg. ap. Vlieg. 1937
8.41 *Quercetalia robori-petraeae* Tx. 1937 em.DoingKraft et Westh. 1959
8.411 *Quercion robori-petraeae* (Malc. 1929) Br.-Bl. 1932
8.412 *Luzulo-Fagion* Lohm. et Tx. 1954
8.42 *Fagetalia sylvatica* Pawl. 1928
8.421 *Alno-Padion* Knapp 1942
(incl. *Alno-Ulmion* Br.-Bl. et Tx. 1943)

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8.421.1 *Alnenion glutinosae-incanae* Oberd. 1959
8.422 *Fagion sylvaticae* Tx. et Diem. 1936
8.422.1 *Asperulo-Fagenion* Tx. 1955 em. Müll. 1966
Tilio-Acerenion Klika 1955
8.422.2 *Acerenion pseudoplatani* Oberd. 1957

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