
SD13

Sagina nodosa-*Bryum pseudotriquetrum* dune-slack community

Synonymy

Calliergon cuspidatum-*Salix repens* nodum Jones 1992
p.p.; Young dry slack nodum Jones 1992

Constant species

Carex arenaria, *Juncus articulatus*, *Leontodon hispidus*, *Sagina nodosa*, *Salix repens*, *Aneura pinguis*, *Bryum pseudotriquetrum*.

Rare species

Equisetum variegatum, *Pyrola rotundifolia*, *Moerckia hibernica*, *Petalophyllum ralfsii*.

Physiognomy

The *Sagina nodosa*-*Bryum pseudotriquetrum* dune-slack community comprises short and often rather open swards dominated by a low and patchy cover of *Salix repens*, a patchy turf of grasses and diminutive herbs and a sometimes extensive contingent of mosses and thalloid liverworts. The vegetation is typically submerged briefly and to shallow depths in the winter and it is on the bare damp patches of sand and shell debris exposed as the water level falls that the various ephemerals and less competitive bryophytes of the community can gain a hold.

Apart from *S. repens*, the commonest vascular perennials are *Carex arenaria*, *Juncus articulatus* and *Agrostis stolonifera*, all typically represented by sparse shoots, with small scattered rosettes of *Leontodon hispidus*. Among these, by late spring, there are often numerous tiny plants of *Sagina nodosa* with the more prominent *Centaureum eythraea*. Seedlings of *Rubus caesius* occasionally figure and there are sparse plants of *Samolus valerandi*, *Mentha aquatica*, *Carex serotina*, *Equisetum palustre* and *Taraxacum officinale* agg. *Ammophila arenaria* is typically very scarce in this vegetation and of insignificant cover.

Among the bryophytes, *Bryum pseudotriquetrum* is usually the most prominent, its robust dark green shoots, often choked with sand, occurring patchily in the

turf, but small thalli of *Aneura pinguis* are also very common with *Pellia endiviifolium* a distinctive occasional. In one sub-community, this cryptogam contingent shows a distinctive enrichment.

Sub-communities

***Poa annua*-*Moerckia hibernica* sub-community:** *Centaureo-Saginetum moniliformis* Diemont, Sissingh & Westhoff 1940 *p.p.* In this kind of *Sagina*-*Bryum* vegetation, the cover is usually more open, with *Salix repens* more patchy, and less grassy, though *Poa annua* is a distinctive preferential at low abundance. Also frequent are *Hydrocotyle vulgaris* and *Blackstonia perfoliata* with *Prunella vulgaris*, *Leontodon autumnalis*, *Epilobium palustre* and *Senecio jacobaea* occasional. Striking cryptogam associates are *Moerckia hibernica* and, less commonly, *Petalophyllum ralfsii*.

***Holcus lanatus*-*Festuca rubra* sub-community.** Here, *S. repens* is more extensive and the sward grassier with *Agrostis stolonifera*, *Holcus lanatus*, *Festuca rubra* and *Poa pratensis* all very frequent, though each usually of only moderate cover. Common vascular associates are *Lotus corniculatus*, *Anthyllis vulneraria*, *Euphrasia officinalis* agg. with *Carex flacca* and *Hieracium pilosella* occasional and this kind of *Sagina*-*Bryum* vegetation also provides a locus for the nationally rare *Equisetum variegatum* and *Pyrola rotundifolia*.

Habitat

The *Sagina*-*Bryum* community includes pioneer and early stages of vegetation in slacks that are damp in winter but dry on the surface in summer among stabilised dunes of calcareous shell-sand. It is a very local community kept immature by periodic, brief and shallow submergence but probably also dependent for its open character on grazing, trampling and scuffing by stock and rabbits.

Studies in The Netherlands (Westhoff 1947, Schat

1982) where similar vegetation to that included here as the *Poa-Moerckia* sub-community has been described in the *Centaurio-Saginetum moniliformis* Diemont, Sissingh & Westhoff 1940 suggest that this assemblage is characteristic of dune slacks with quite marked seasonal fluctuations in the water-table, flooded perhaps briefly and to only shallow depth in the winter and with a summer water-table 20–50 cm below the surface. Hydrological studies at Newborough (Ranwell 1959) showed that, between 1950 and 1953, the more open dune-slack vegetation with *Sagina nodosa* and *Centaurium littorale* had a water-table between about 60 and 160 cm down and winter flooding of less than 2 cm depth. In the Voorne dunes in The Netherlands, too, van der Laan (1979) found that neither of these two distinctive species of the *Sagina-Bryum* community occurred in slacks where the summer water was less than 52 cm below the surface. In fact, Schat (1982) and co-workers showed that both the germination and growth of these plants are reduced or actually prevented by flooding. At Braunton, most of the young slacks of this general kind studied by Willis *et al.* (1959b) and Hope-Simpson & Yemm (1979) had a flood duration of much less than 160 days.

The other type of *Sagina-Bryum* vegetation, in the *Holcus-Festuca* sub-community, seems characteristic of even drier situations but in slacks that have been stabilised for just a short time – perhaps only 20 years or so at Kenfig on the South Wales coast, for example (Jones 1992). The less open grassy sward with more abundant *Salix repens* marks such a shift in the hydrological regime though the biomass of the vascular perennials is not such as to totally exclude ephemerals or the distinctive bryophytes of the community.

Though relatively young and often seasonally wet, the ground waters beneath this kind of vegetation do not seem to have much or any lingering saline influence. In contrast to some Dutch stands of the *Centaurio-Saginetum*, for example, species like *Glaux maritima* and *Juncus gerardi* are very scarce in the *Sagina-Bryum* community. Typically, however, the superficial pH is high, maintained by a combination of the calcium carbonate of the shell sand substrate and periodic flooding with base-rich ground waters.

Fluctuating ground water-tables are clearly a key factor in maintaining the open, immature character of this vegetation, particularly in the *Poa-Moerckia* sub-community. Redeposition of modest amounts of sand, blown about in the drier conditions of summer, may also create new barer places. Interestingly, *Petalophyllum ralfsii* can withstand some degree of burial by producing new thalli from the sub-surface tissues and some surface mobility may help its survival. Disturbance and cropping of the herbage by rabbits and stock could be

important, too. Jones (1992) also suggested that the prominence of *Poa annua* in this kind of *Sagina-Bryum* vegetation might be due to import of seed by trekking ponies.

Zonation and succession

The *Sagina-Bryum* community is a very local vegetation type representing early or repeatedly-renewed stages in the colonisation of young, only briefly-wetted slacks among stabilised dune ridges. It can be found in systems with more mature and drier slacks and with more summer-damp slacks according to the pattern of ground-water fluctuation and gives way on drier dune ridges to a range of fixed grasslands. A combination of drying and freedom from grazing can facilitate eventual development of wet scrubby woodland.

Damper slacks on similar base-rich dunes to those with the *Sagina-Bryum* community can have stands of the *Salix-Campyllum* community or, where older slacks are kept very wet and have a more vigorous shading canopy of *Salix repens*, stretches of *Salix-Calliergon* vegetation. Generally speaking, such slacks are separated by ridges carrying *Festuca-Galium* grassland or where there is still some measure of sand movement, the more stable types of *Ammophila-Festuca* grassland. To these, the *Sagina-Bryum* vegetation can grade through the *Holcus-Festuca* sub-community, the grass cover thickening up, *Ammophila* becoming somewhat more vigorous and ephemerals and less competitive bryophytes being crowded out. Drier slack vegetation of the *Salix-Holcus* type may occur as a transitional zone in such sequences.

As slacks with the *Sagina-Bryum* community age and dry, a process assisted by trapping of sand among the *Salix repens*, this vegetation is probably succeeded by the *Salix-Holcus* community which in turn may be invaded by shrubs and trees, as in its *Ononis* sub-community. *Hippophae rhamnoides* always has the potential to supervene in such seral progressions.

Distribution

Young drier slacks of the *Sagina-Bryum* type have been described from only very few sites around the British coast (Dargie 1993, 1995; Radley 1994), most notably from Kenfig in South Wales (Jones 1992) but also from Lindisfarne and Sefton in England and Torrs Warren in Scotland.

Affinities

The *Sagina-Bryum* community is very similar to the young dune-slack vegetation described from The Netherlands as the *Centaurio-Saginetum moniliformis* Diemont, Sissingh & Westhoff 1940, though that assemblage has a modest contingent of halophytes like *Glaux maritima*, *Juncus gerardi* and *Sagina maritima* which

reflects its occurrence in slacks that have a lingering saline influence. In our stands, too, *Centaurium littorale* and *C. pulchellum* are replaced by *C. erythraea*. Traditionally, such vegetation has been assigned to the Nano-

cyperion, though a recent review of this alliance in The Netherlands (Lemaire & Weeda 1994) suggests that the *Saginion maritimae* might provide a more sensible locus because of the halophytic character of the vegetation.

Floristic table SD13

	a	b	13
<i>Salix repens</i>	V (1–8)	V (2–9)	V (1–9)
<i>Bryum pseudotriquetrum</i>	V (1–4)	V (2–7)	V (1–7)
<i>Aneura pinguis</i>	V (1–5)	V (1–4)	V (1–5)
<i>Sagina nodosa</i>	V (1–4)	IV (1–4)	V (1–4)
<i>Leontodon hispidus</i>	IV (1–3)	V (1–4)	IV (1–4)
<i>Carex arenaria</i>	IV (1–8)	V (1–5)	IV (1–8)
<i>Juncus articulatus</i>	IV (3–4)	IV (1–4)	IV (1–4)
<i>Poa annua</i>	IV (1–3)		III (1–3)
<i>Hydrocotyle vulgaris</i>	III (1–4)	I (1)	II (1–4)
<i>Moerckia hibernica</i>	III (1–4)	I (1–3)	II (1–4)
<i>Blackstonia perfoliata</i>	III (1–3)	I (1)	II (1–3)
<i>Prunella vulgaris</i>	II (1–4)	I (1)	II (1–4)
<i>Leontodon autumnalis</i>	II (1–3)	I (1)	I (1–3)
<i>Campylium stellatum</i>	II (1–4)	I (3)	I (1–4)
<i>Epilobium palustre</i>	II (1–3)		I (1–3)
<i>Senecio jacobaea</i>	II (1–3)		I (1–3)
<i>Hippophae rhamnoides</i> seedling	II (1)		I (1)
<i>Petalophyllum ralfsii</i>	II (1–3)		I (1–3)
<i>Pulicaria dysenterica</i>	I (1–3)		I (1–3)
<i>Arenaria serpyllifolia</i>	I (1–3)		I (1–3)
<i>Agrostis stolonifera</i>	III (1–4)	IV (1–4)	III (1–4)
<i>Holcus lanatus</i>	II (1–3)	V (1–6)	III (1–6)
<i>Poa pratensis</i>	I (1)	V (1–3)	III (1–3)
<i>Lotus corniculatus</i>		IV (1–5)	II (1–5)
<i>Festuca rubra</i>		IV (3–5)	II (3–5)
<i>Anthyllis vulneraria</i>		IV (1–6)	II (1–6)
<i>Equisetum variegatum</i>	I (1–6)	III (2–5)	II (1–6)
<i>Euphrasia officinalis</i> agg.	I (1–2)	III (1–3)	II (1–3)
<i>Pyrola rotundifolia</i>	I (1–3)	III (1–4)	II (1–4)
<i>Carex flacca</i>	I (1–5)	II (3–7)	I (1–7)
<i>Hieracium pilosella</i>		II (1–2)	I (1–2)
<i>Epipactis palustris</i>		II (1–4)	I (1–4)
<i>Ononis repens</i>		I (1–4)	I (1–4)
<i>Polygala vulgaris</i>		I (1–2)	I (1–2)
<i>Galium verum</i>		I (1–2)	I (1–2)
<i>Dactylorhiza incarnata</i>		I (1)	I (1)
<i>Centaurium erythraea</i>	III (1–3)	III (1–3)	III (1–3)
<i>Rubus caesius</i>	II (1–3)	II (1)	II (1–3)
<i>Pellia endiviifolia</i>	I (3)	I (4)	I (3–4)
<i>Samolus valerandi</i>	I (2–3)	I (2–3)	I (2–3)

<i>Equisetum palustre</i>	I (2)	I (3–5)	I (2–5)
<i>Mentha aquatica</i>	I (1)	I (1)	I (1)
<i>Carex serotina</i>	I (1–4)	I (1–4)	I (1–4)
<i>Amblystegium serpens</i>	I (1)	I (1–3)	I (1–3)
<i>Taraxacum officinale</i> agg.	I (1)	I (1)	I (1)
<i>Sonchus arvensis</i>	I (1)	I (1)	I (1)
<i>Ammophila arenaria</i>	I (1)	I (1)	I (1)
<i>Cerastium fontanum</i>	I (1)	I (1–2)	I (1–2)
<i>Phragmites australis</i>	I (4)	I (3–4)	I (3–4)
<i>Barbula tophacea</i>	I (1)	I (1–3)	I (1–3)
Number of samples	28	20	48
Number of species/sample	15 (11–24)	18 (13–26)	16 (11–26)

a *Poa annua*-*Moerckia hibernica* sub-community

b *Holcus lanatus*-*Festuca rubra* sub-community

13 *Sagina nodosa*-*Bryum pseudotriquetrum* dune-slack (total)