

## *Genista tinctoria* L.

### Dyer's Greenweed

A small, slender, spineless shrub with alternate shiny green leaves and racemes of solitary yellow flowers, found in unimproved grassland and heathland on calcareous or slightly acidic soils. It is a poor competitor and largely relies on seed production and dispersal to expand populations. *G. tinctoria* is an important foodplant for a wide range of rare and nationally scarce insect species. It is widespread and locally common in England and Wales, becoming rarer in southern Scotland and absent from central and northern Scotland and Ireland. It is assessed as of Least Concern in Great Britain, but is Vulnerable in England due to substantial declines.



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#### IDENTIFICATION

*Genista tinctoria* is a small deciduous shrub with ascending to erect spineless stems 20-60(-200) cm tall, weakly ribbed slender branches, and simple shiny-green oblong-lanceolate, ± sessile leaves that are mostly >4x as long as wide (Poland & Clement 2009; Stace 2010). Leaves are alternate and frequently held at an angle of 45° from the stem (Poland & Clement 2009).

The inflorescence comprises a long raceme of rich-yellow hermaphrodite flowers (10-15 mm) borne singly in the axil of each bract. Fruit pods are glabrous, flat, (15)20-30 × 4-5 mm and blunt at both ends (Sell & Murrell 2009; Stace 2010).

Two subspecies are recognised in Britain. Subsp. *littoralis* has a procumbent habit (retained in cultivation) and is restricted to coastal areas of north Devon, Cornwall, and Cardiganshire. It differs from subsp. *tinctoria* in habit, and also by the



Unimproved grassland with *Genista tinctoria* at Ancaster Valley, South Lincolnshire. ©Kevin Walker.

elliptic-oblong leaves mostly <4x as long as wide and fruits that can be hairy or glabrous (Stace 2010).

#### SIMILAR SPECIES

*G. anglica* shares similarities with *G. tinctoria* and is occasionally present in the same habitat, but *G. anglica* has a more slender appearance with smaller leaves (2-8 × 2-2.5 mm), flowers (7-10 mm) and fruits (12-20 mm). *G. anglica* usually has simple spines (1-2 cm) on the stem and branches (Polunin 1969), although the rare var. *subinermis* is spineless (Sell & Murrell 2009).

#### HABITATS

*G. tinctoria* is a species of heavy, nutrient-poor calcareous to slightly acidic soils, with habitats including unimproved grassland, cliff tops, grassy heaths, rhes pastures, road verges, stream banks, woodland rides and field edges (Pearman 2002; Hill et al. 2004; Crawley 2005; Chater 2010).

*G. tinctoria* subsp. *tinctoria* is associated with NVC CG5 *Bromus erectus-Brachypodium pinnatum* grassland and the *Lathyrus pratensis* sub-community of MG5 *Cynosurus cristatus-Centaurea nigra* grassland (Rodwell 1992). The maritime subsp. *littoralis* is found as a rare component of MC9 *Festuca rubra-Holcus lanatus* maritime grassland and H7 *Calluna-Scilla* heath characteristic of the tops or slopes of sea cliffs on the north Cornish coast (Rodwell 2000). It is also known further inland on H6 *Erica vagans-Ulex europaeus* maritime heath (Pearman 2002).

Across its European range, *G. tinctoria* has also been recorded at the edges of dry-mesic oak forests, in Atlantic de-calcified *Calluno-Ulicetea* fixed-dune systems with *Empetrum nigrum*,

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*Carex arenaria* and *Pyrola rotundifolia*, and within Mediterranean tall humid herb grasslands of the *Molinio-Holoschoenion*. In this latter habitat, *G. tinctoria* is usually an associate of dunal systems growing with species such as *Anacamptis laxiflora*, *Oenanthe pimpinelloides*, *Schoenus nigricans*, *Serratula tinctoria* and *Silaum silaus*.

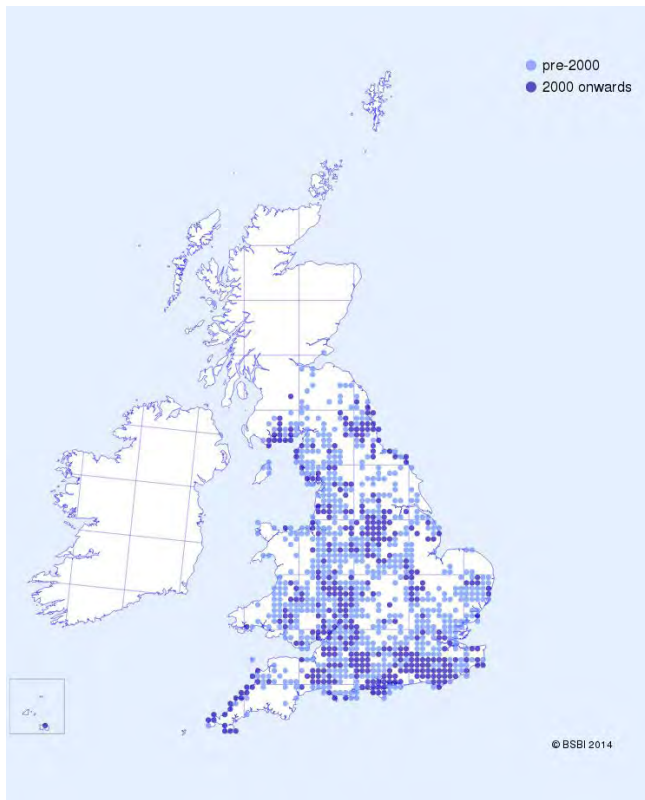
### BIOGEOGRAPHY

*G. tinctoria* is still considered to be widespread and locally common across England and Wales, although losses in central and eastern England have been particularly evident since 1930 (Stroh et al. 2014). It is a rare plant in much of southern Scotland, with the bulk of populations located in the south-west, centered on Dumfriesshires and Kirkcudbrightshire, and is absent from central and northern Scotland and Ireland.

The species belongs to the European Temperate element, with a native range extending from southern Scotland and Estonia southwards to the Mediterranean, east to the Urals, the Caucasus and western Asia (Tutin et al. 1968; Preston 2007). Its altitudinal limit in Britain is 330 m in meadows near Cae'r-Meirch (Cardiganshire) and in continental Europe *G. tinctoria* has been recorded at similar altitudes in sub-Mediterranean thermophilous oak woods (e.g. Drieň Nature Reserve, Slovakia).

### ECOLOGY

A small deciduous polycarpic chamaephyte or nanophanerophyte (Hill et al. 2004) flowering from June to September. Plants have little capacity for vegetative spread



Distribution of *Genista tinctoria* in Great Britain and Ireland.

(Fitter & Peat 1994), and so the expansion of a population largely relies upon seed production, dispersal, germination and subsequent establishment.

Plants produce sub-spherical seeds (4-10 × 2-2.5 mm) that are not long-lived in the soil seed bank (typically less than a year) and require moderately open conditions for germination in the autumn following flowering.

*G. tinctoria* is an important species for insect pollinators and in Britain is the sole foodplant for five rare or nationally scarce moths: Large Gold Case-bearer *Coleophora vibicella*, Greenweed Flat-body *Agonopterix atomella*, Greenweed Piercer *Grapholita lathyra*, Greenweed Groundling *Mirificarma lentiginosella* and Greenweed Pygmy *Trifurcula beirnei*. Several other insects are restricted to this foodplant, including leaf beetles and weevils, leaf mining and gall-causing flies, true bugs and sawflies (Davis et al. 2013).

Nagy et al. (2013) demonstrated that extreme climatic events such as drought or heavy rainfall can significantly alter the flowering phenology of *G. tinctoria*. This has the potential to induce a shift in the life cycles of pollinators, the number of flowers and seed set, and ultimately the reproductive fitness of *G. tinctoria* populations.

### THREATS

*G. tinctoria* requires open conditions and is a poor competitor of nutrient-poor soils. As such it is vulnerable to the cessation of grazing, mowing or ride management and the enrichment of grasslands via direct application or atmospheric deposition of nitrogen. Recent declines have mainly been attributed to the agricultural improvement of suitable habitats.

### MANAGEMENT

Extensive grazing with cattle will create a varied sward structure, remove biomass, prevent the encroachment of scrub, allow a proportion of plants to flower and set seed and create gaps for seed germination.

If livestock are not available, winter mowing is an acceptable alternative, but will eventually create a relatively uniform sward structure not conducive to the establishment of new plants. Sheep grazing should be avoided or numbers much reduced in the summer months to prevent the removal of flower heads and terminal shoots (Davis et al. 2013).

Where appropriate, management should account for the life cycle of rare host-specific invertebrates (see Davis et al. 2013).

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