

Dianthus deltoides L.

Maiden Pink

Dianthus deltoides is a striking plant of thin, basic to slightly acid soils on open and sunny slopes in unimproved grasslands and heaths. The deep-pink, scentless flowers have spotted petals with a dark bar or zigzag at the base, and the calyx is soft to the touch due to the presence of downy hairs. In Britain its native range is obscured by garden escapes but covers much of England, Wales and eastern and central Scotland. It is probably not native in south-west England and Ireland. The species was assessed as Near Threatened in both Wales and Great Britain, but as Vulnerable in England due to substantial declines in distribution and range.



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IDENTIFICATION

Dianthus deltoides is a loosely tufted perennial producing few-flowered (often solitary) inflorescences held on rounded, shortly pubescent stems (5-)15-30(-45) cm tall with ±swollen nodes (Jonsell 2001). The striking rose-red (-pink or white), scentless flowers (12-20 mm) have petals that are usually spotted with a dark bar or zigzag at the base of the petal-lob, which itself is divided <1/4 way to the base into narrow or triangular teeth (Jonsell 2001; Stace 2010). The calyx (12-18 mm long) and epicalyx scales (about half as long as the calyx) are soft to the touch due to the presence of downy hairs. Epicalyx scales are abruptly pointed and have a wide papery margin (Jonsell 2001). Leaves of vegetative shoots are linear-oblongate, subacute or obtuse, 8-20 (-30) × 1-4 mm, whereas the leaves of flowering stems are linear-lanceolate, acute and up to 40 mm (Jonsell 2001; Poland & Clement

2009). All leaves have a prominent mid-rib, stomata on both sides, and rough margins fringed with short hairs (Poland & Clement 2009).

SIMILAR SPECIES

D. armeria flowers are surrounded by an involucre of leaf-like bracts (Stace 2010). This character is absent in *D. deltoides*. *D. gratianopolitanus* has glabrous stems, scented flowers and unspotted petal-lobes that do not carry a dark bar. Cultivars of *D. deltoides* usually have a more robust and compact appearance and larger flowers (Jonsell 2001).

HABITATS

Dianthus deltoides is found in dry and open habitats on basic to mildly acid soils derived from Silurian sandstones, basalt, mica-schist, Carboniferous limestone, chalk, and thin soils associated with past quarrying or lead mining activities (e.g. metalliferous spoil in Bradford Dale, Derbyshire) (Braithwaite 1994; Lusby 2002).

Plants are often confined to steep slopes or banks with a sunny aspect within unimproved sandy grassland, heaths, dune slacks, dry calcareous grassland, and road verges as cliff ledges amongst rocky outcrops (e.g. **Arthur's Seat in Edinburgh**). In parts of Europe and Russia, *D. deltoides* is also associated with *Molinia*-meadows on calcareous peat soils where it grows with *Cirsium dissectum*, *Succisa pratensis* and *Viola persicifolia*.



Dianthus deltoides growing in acid grassland on volcanic rock outcrops at Banc Hirllwyn SSSI, Radnorshire. ©John Crellin, June 2009.

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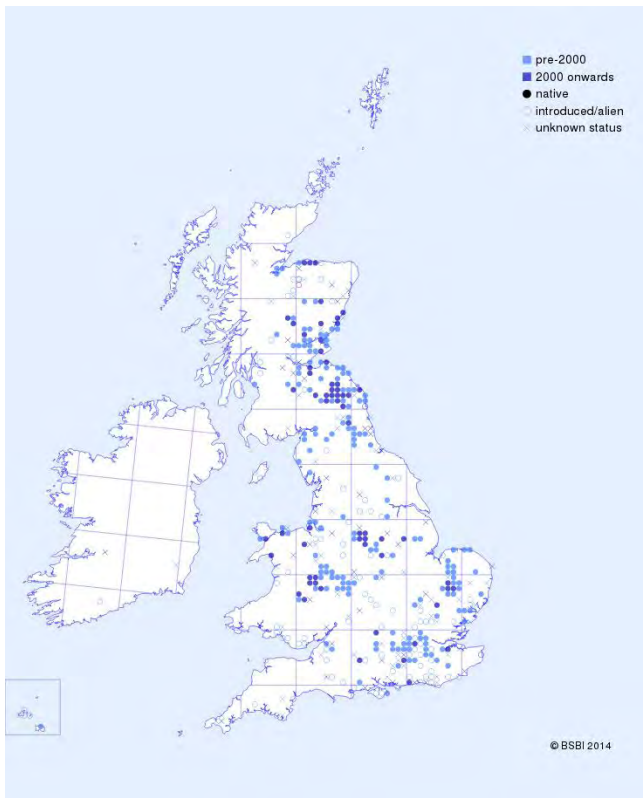
BIOGEOGRAPHY

In Great Britain *D. deltoides* is scattered throughout England, Wales, central and eastern Scotland and the Scottish borders, but is absent from south-west England, western and northern Scotland and Ireland. It is a mainly lowland but is found up to 355 m at Parsley Hay, Derbyshire. Its distribution has become severely fragmented in recent times, with for example England experiencing a decline of 39% since 1930 (Stroh et al. 2014), and as such populations are now largely confined to small refugia (Braithwaite 1994). Cultivars of *D. deltoides* are found as naturalised garden escapes across Scotland, Wales, England and Ireland, with the range of native plants and alien cultivars occasionally overlapping (Lusby 2002).

Dianthus deltoides is widespread throughout much of central, eastern and northern Europe but becomes increasingly uncommon towards the south and west (Jalas & Suominen 1985). Its eastern range extends through Russia as far as Lake Baikal, with its most northerly native limits extending to Tromsø and Sør-Varanger in Norway (Jonsell 2001). *D. deltoides* is present as a non-native in North America, New Zealand and Australia.

ECOLOGY

An over-wintering perennial chamaephyte of sunny, dry habitats on basic to mildly acid soils (Hill et al. 2004), flowering from June to September, reproducing by seed and also via creeping vegetative shoots.



Distribution of *Dianthus deltoides* in Great Britain and Ireland.

The flowers are protandrous, with pollen-bearing anthers presented two days before a pistil of two styles protrudes from the flower for an additional 1.5 days (Jennersten 1988). Flowers close each night and so can only be pollinated by diurnal insects. The relatively long, narrow and tough calyx tube and pink petal-limbs are characteristic of butterfly-pollinated flowers adapted to exclude short-tongued insects (Faegri & van der Pijl 1979). Studies in southwest Sweden have shown that butterflies are important pollinators (Jennersten 1984) and synchrony between the phenology of *D. deltoides* and *Thymelicus lineola* (Essex Skipper) and *Ochiodes venata* (Large Skipper).

Dianthus deltoides can produce over 60 obovate seeds (2 mm long) per capsule, although Jennersten (1988) demonstrated a significant relationship between visitation rates by pollinators and seed set, with fragmented populations of *D. deltoides* having much lower seed set due to a lower diversity and abundance of both flowering plants and flower-visiting insects. Upon maturity, dry capsules are shaken by the wind and eventually release seeds close to the parent plant, with germination and the subsequent establishment of young plants dependent on the availability of suitable safe sites in open areas. Seedlings and young plants in particular require open, warm conditions.

THREATS

Cessation of grazing can lead to a rank sward and the eventual loss of *D. deltoides*. However, over-grazing leading to a closed, short sward is also undesirable and in the long-term can result in the loss of populations. Habitat loss via conversion of sites to other uses such as intensive pasture or forestry has substantially reduced the number and connectivity of sites. Fragmentation and subsequent reduced seed set should also be considered as future threats to extant populations.

MANAGEMENT

Ideal management involves either a late-summer cut, removal of arisings, and aftermath grazing, or livestock grazing, preferably with cattle, throughout the spring and summer but with reduced levels in the summer months. However, meadow restoration trials conducted by Hellström et al. (2007) in northern Finland found that a mowing/disturbance regime in late summer led to the establishment of *D. deltoides* into a sown sward by providing bare soil and open 'micro-sites' for germination. This management regime created similar conditions to traditional practices of late mowing and aftermath cattle grazing, and can be viewed as a suitable alternative if cattle are not available in the locality.

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