

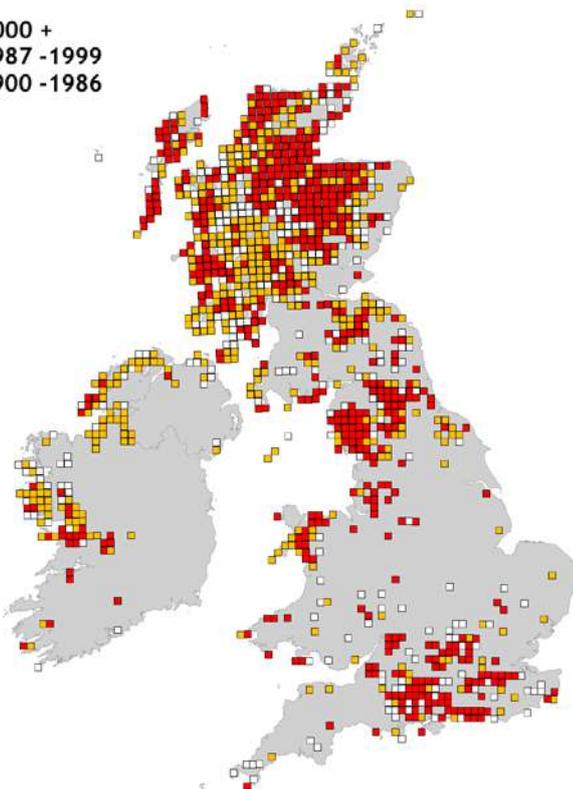
Juniper *Juniperus communis*

Juniper is an evergreen perennial coniferous shrub or small tree with narrow-linear tough leaves. There is a wide variety of growth forms from a horizontal creeping mat to tall columnar spikes. Plants are either male or female. It can live to well over 100 years and may form a distinctive scrub community (W19 of the National Vegetation Classification) or, in Scotland, it may be a frequent member of the understorey in open Scots pine woodland. It supports a characteristic native invertebrate fauna, including some species with specialised habitat requirements and restricted distributions. Its 'berries' (actually modified cones) and shoots provide a valuable food source for wild birds and mammals and over 40 species of fungi plus a range of epiphytic lichens and bryophytes are known to be associated with the plant.



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- 2000 +
- 1987 -1999
- 1900 -1986



Juniper distribution across Britain and Ireland

The data used to create these maps has been provided under licence from the Botanical Society of Britain and Ireland (BSBI) and accessed from the Society's online distribution database.



Lifecycle

Pollination occurs by wind in the spring: male bushes produce small pollen cones whilst the cones of female bushes carry receptive droplets of fluid. Fertilised cones develop into berry-like fruits (galbuli) which ripen two or three years after pollination. Dispersal is mainly via migrant thrushes in the autumn. Although its seed is deeply dormant, requiring two cold winters to germinate, it appears only to remain viable in the soil for a few years. Seedlings take 4-9 years to reach sexual maturity. Particularly in southern England regeneration of juniper bushes is reduced by the composition of the populations. Many consist of a cohort of similar or identically aged bushes that responded to suitable conditions for growth at the same time in the past and at some sites are either all male or all female reducing the opportunity for reproduction where populations are sparsely spread across a landscape.

Distribution

Juniper has a highly disjunct distribution across England, and is virtually absent in the Midlands. In the southern lowlands, it has severely contracted in range and abundance over the past 50 years and, without conservation effort, may become extinct in the next 50. Nearly a quarter of sites support only one bush and even stronghold areas have declined, namely the South Wessex Downs, Chilterns, South Downs, North Downs and Cotswolds. Only one population survives in each of the following: Sussex, Cambridgeshire, Herefordshire and the Isle of Wight. The prospects for northern English populations appear less bleak with good stands in the Lake District and North Pennines, but it has been eliminated from many moorland sites by burning.

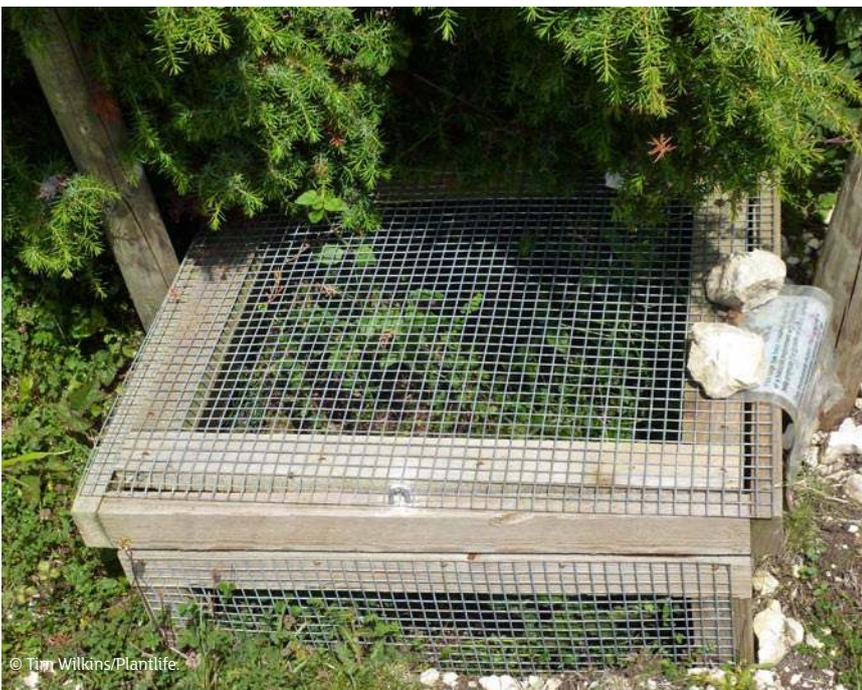
Habitat

Core populations of juniper mainly occur on chalk downland or limestone grassland in southern England but may also be found along ancient trackways, roadsides, disused quarries, sea cliffs and rarely heathland. In the uplands, it can be found on mountains, moorland, beside streams or in open woodland. Juniper is intolerant of heavy shade and in the absence of grazing is succeeded by broadleaved scrub and secondary woodland. Juniper can be considered a pioneer species; its seedlings need bare ground to establish and are readily outcompeted due to their slow growth. In Scotland it is frequent in open Scots pine woodland. Subspecies *nana* occurs on coastal and montane heaths often subject to severe wind-pruning in north Wales, The Lake District and north and west Scotland. The rare ssp. *hemisphaerica* is confined to species-rich coastal heath on the Lizard.

GB Status and rarity

Juniper is classified as 'Least Concern' in The Vascular Plant Red Data List for Great Britain 2005, primarily because northern populations are faring relatively well. The last UK survey of populations noted juniper's continued and accelerating decline, especially in southern England, and the gradual decline of large northern populations, particularly in Scotland. Both factors have affected the red-listing category. Juniper woodland is of particular significance at a European level for the invertebrate communities associated with this habitat.

Seed shelters which exclude small to large herbivores whilst allowing berries to reach the ground can encourage seedling establishment.



Reasons for decline

Historical losses of juniper have been attributed to the Enclosure Acts, post-war conversion of land to arable and the traditional burning of heathland. However, the key reasons today are lack of seedling habitat, exacerbated by small fragmented populations (susceptible to biased sex ratios), habitat neglect leading to woodland development, habitat management conflicts at grassland sites (generally under-grazing in the south and over-grazing in the north of England), excessive rabbit grazing, aerial nitrogen deposition, pollution causing increased competition and seed abortion, which together reduce the opportunities for successful regeneration. In 2010, seedlings were absent from 85% of sites sampled in southern England and three-quarters of bushes were either mature or old and producing fewer seeds. Worryingly, the pathogen *Phytophthora austrocedrae* could potentially kill entire populations of juniper. The disease is already prevalent in a juniper population at Upper Teesdale and a number of cases have been confirmed in Cumbria.

Protection under the law

This plant is included as a species "of principal importance for the purpose of conserving biodiversity" under Section 41 (England) of the Natural Environment and Rural Communities Act 2006. Juniper scrub is protected at a European level under Annex I of the EC Habitats Directive 1992 and seven English sites have been designated as Special Areas of Conservation for this feature.

Habitat management for juniper

Management trials at key sites across southern England have shown that it is possible to stimulate regeneration. A combination of site specific scrub clearance, creation of scrapes and the erection of seed shelters or enclosure fences will encourage seedling establishment. Following restoration, the recovery of populations should only be considered complete once natural regeneration is observed and sustained.

Where bushes are surrounded by scrub or young woodland, selective clearance will help reduce shading and prolong life span. However, where bushes have become weak through etiolation, clearance should be phased to avoid collapse.

Seedling habitat can be created by scraping away turf and topsoil, or by long-cycle rotational grazing. It can take up to ten years before seedlings are robust enough to withstand browsing. Seedlings and young bushes need protection measures where rabbits are abundant, possibly including rabbit control.

Bespoke seed shelters, which exclude herbivores whilst allowing berries to reach the ground, should be either sited under female bushes or installed in the open and sown with cleaned seed from the berries of nearby bushes. This approach has been very successful in southern England and in 2011, over 300 seedlings were reported from 10 sown scrape and shelter sites in five different counties.

To achieve regeneration from seed, populations need reasonable numbers of male and female bushes including productive females with plenty of viable seed. Where colonies fail to produce much viable seed, cuttings can be taken and propagated off-site. The optimum time to plant out cuttings is after at least two growing seasons when plants are established and these should be planted back at the parent sites. There is some evidence to suggest that cuttings kept in cultivation for longer periods of time may struggle when eventually planted. Shrub guards or enclosures may be necessary for the first five years depending on the intensity of browsing. Piles of spiny brushwood offer a less conspicuous alternative. Alternatively plants can be raised from seed, which will increase the genetic diversity of populations, but the process is difficult and time consuming. Pre-treatment is necessary to break seed dormancy, germination times can be sporadic, and five years or more may be needed before bushes are large enough to be planted out. Cuttings are quicker growing but can have high failure rates and result in clones of parent bushes. Supplementing populations from off-site stocks or on-site sowing of seed are no replacement for natural regeneration. For sustained recovery once a population has been restored, an appropriate grazing regime is vital.

Survey method

Individual bushes are identified and surveyed for a variety of factors including the status of the bush itself (age class, sex, berry quantity, seed viability), the presence / absence of *Phytophthora* and habitat management factors surrounding the trees such as grazing pressure and the amount of bare ground. Biosecurity precautions to reduce the spread of *Phytophthora* should be undertaken, cleaning all footwear of mud and vegetation and using a recommended fungicide to eliminate transference of spores.



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