Watsonia, **11**, 247–251 (1977).

The past and present status and distribution of Sea Pea, *Lathyrus japonicus* Willd., in the British Isles

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ABSTRACT

Lathyrus japonicus Willd. is a rare and declining species in the British Isles. From 1973 to 1975 beaches on which the species had been recorded in the past were visited and the present status recorded. There has been a marked reduction in the number of *Lathyrus japonicus* colonies and under half of those sites where it had once been recorded now contain the species. However, in E. Sussex, v.c. 14, and E. Suffolk, v.c. 25, the populations are expanding and at Chesil Beach, Dorset, v.c. 9, Rye, E. Sussex and Orford, E. Suffolk its continued existence seems assured. Elsewhere, human pressure or a change in physical conditions could rapidly eliminate the species.

The range of a plant species and its distribution within that range are frequently dynamic. This may be the result of physical or climatic changes, successional sequence or, above all, human interference. The Sea Pea, *Lathyrus japonicus* Willd., is an example of a species easily disturbed by man and it illustrates the care with which he must monitor his effects on the flora even in non-agricultural landscapes.

L. japonicus is a creeping or climbing perennial most commonly found on shingle beaches but occasionally recorded from dunes and other coastal habitats. It is fairly long-lived and once established it is not likely to disappear except where coastal changes or human pressure cause this to occur. Where beaches are accreting seawards and more closed vegetation enters as humus builds up, it disappears on older shingle but persists nearer the shore where the vegetation is open. This is particularly clear at Shingle Street, Suffolk, v.c. 25. A description of this species is given by Brightmore & White (1963), who consider that the British plant is *L. japonicus* var. *glaber* (Sér.) Fernald. However, a narrow-leaved variant, *L. japonicus* var. *acutiformis* Bab., is present in north-eastern Britain. This may well be a northern ecotype with distinct habitat preferences, since all the Scottish sites for the species are on sand-dunes and the dune plants in northern Jutland, Denmark, are similarly narrow-leaved. Conversely, the Danish plants growing on shingle are broad-leaved like the shingle plants of southern Britain (F. Rose, pers. comm. 1976).

L. japonicus is a northern plant with a disjunct circumpolar distribution. It formerly extended south into northern France but it is now extinct there. It is common in Denmark, especially in north Jutland in the dunes of the Hanstholm Nature Reserve and on shingle beaches between Struer and Thisted. With the exception of southern and eastern England, it is rare over much of the rest of the European coast and this is probably explained by the lack of shingle beaches. In Britain it has been recorded most frequently on the southern and eastern coasts from Chesil Beach, Dorset, to Benacre, E. Suffolk, but isolated colonies occur elsewhere. Its seeds are avidly eaten by birds, and many animals, especially sheep, find the whole plant palatable. The plants cease flowering and soon die when heavily or frequently trampled.

For many years *L. japonicus* has been regarded as a rare and declining species in the British Isles as excerpts from county Floras show:

DORSET 'Native; pebbly beaches; rare.' (Mansel-Pleydell 1895)

HANTS 'On pebbly and sandy sea beaches; very rare; only found in I. of W., and has not been seen for many years.' (Townsend 1904)

SUSSEX 'Native. Shingly shores: very rare. Now very nearly extinct, the specimen at Rye in 1931 being the last seen since 1878. . . . Its shyness in flowering and therefore inability to reproduce itself, and the rapacity of collectors when it does appear, sufficiently account for its disappearance.' (Wolley-Dod 1937)

KENT 'Native. Shingly shores; very rare. In some stations it seems to be extinct; but it may still be found at Dungeness and Kingsdown, in small quantity.' (Hanbury & Marshall 1899)

SUFFOLK 'On shingly shore; rare.' (Hind 1889)

However, population resurgences do occur and currently all these counties except Hampshire have colonies of some quantity. From 1973 until 1975 the population at Shingle Street, E. Suffolk, was much larger than that recorded in 1962 and Brightmore & White (1963) suggest that an exceptional spread of *L. japonicus* at Rye Harbour from 1962 until 1964 resulted from dispersal of seeds by flocks of stock dove, *Columba oenas* L. This colony has remained large to the present day.

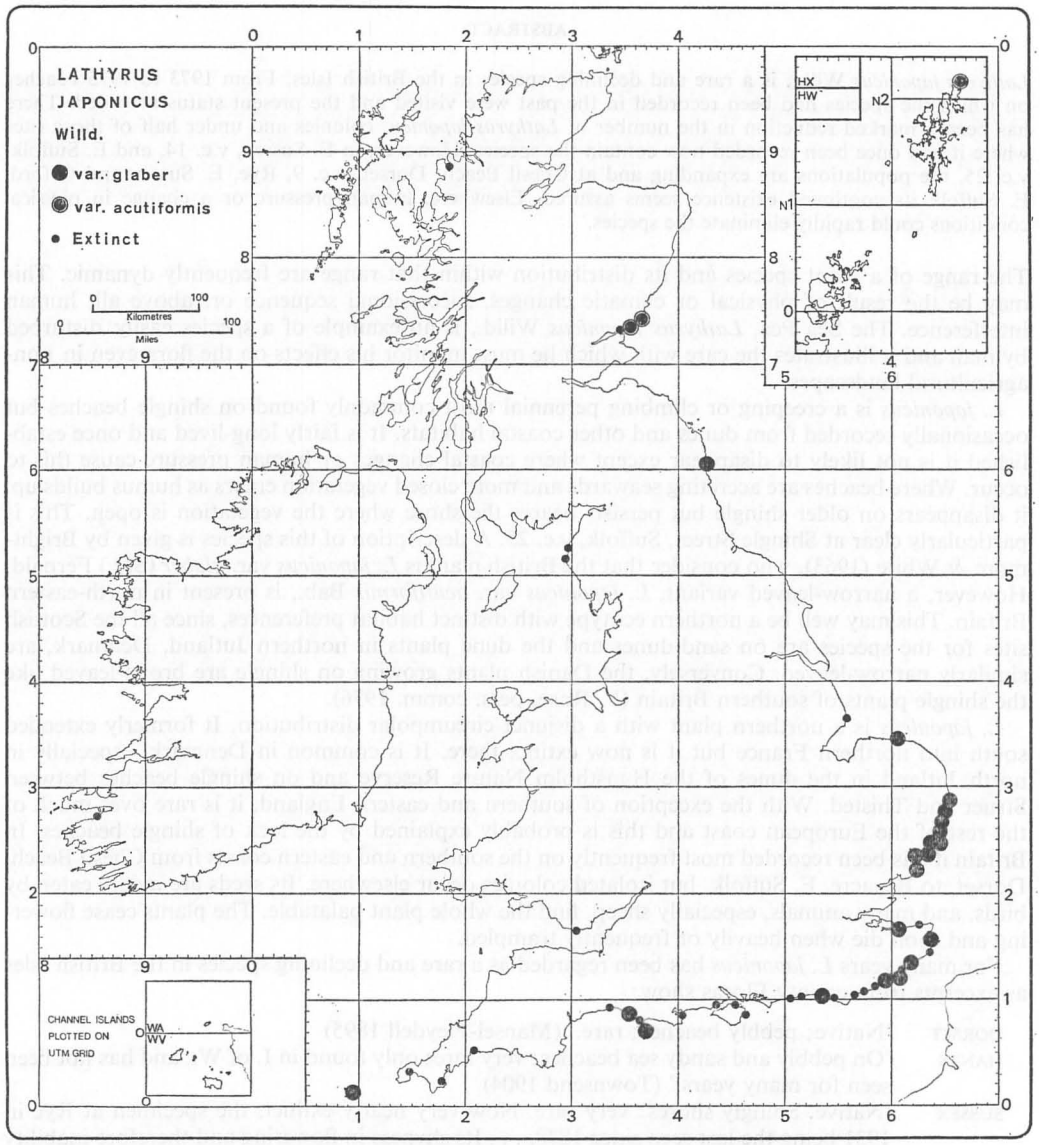

FIGURE 1. Distribution of *Lathyrus japonicus* in the British Isles. Map compiled by the Biological Records Centre, Monks Wood.

TABLE 1. PLANT SPECIES FREQUENTLY ASSOCIATED WITH *L. JAPONICUS* IN THE BRITISH ISLES

Based on data collected by the author and within 5m square quadrats

Agropyron junceiforme	*Lupinus arboreus*
Ammophila arenaria	*Medicago arabica*
Arrhenatherum elatius	*Medicago minima*
Atriplex sp.	*Montia perfoliata*
Bellis perennis	*Plantago lanceolata*
Beta vulgaris	*Plantago coronopus*
Bromus mollis	*Rumex crispus*
Cirsium arvense	*Sedum acre*
Crambe maritima	*Senecio jacobaea*
Echium vulgare	*S. viscosus*
Epilobium angustifolium	*Silene maritima*
Erodium cicutarium	*Solanum dulcamara*
Festuca rubra	*Tamarix anglica*
Geranium robertianum	*Trifolium pratense*
Glaucium flavum	*T. repens*
Hieracium pilosella	*T. suffocatum*
Honkenya peploides	*Tripleurospermum maritimum*
Lathyrus nissolia	*Vicia hirsuta*
Leontodon autumnalis	*V. lathyroides*
Lolium perenne	*V. lutea*

Because of the uncertainty of the present distribution of this species and the scant knowledge of the population size at any of the recorded sites, a study was undertaken from 1973 until 1975 to assess the distribution and status of *L. japonicus* on the coasts of the British Isles. Enquiries were also made of many shingle researchers to discover their knowledge of the species' present distribution. Full data from each site have been lodged with the Biological Records Centre, Monks Wood. The following records describe the current situation and trends. Fig. 1 illustrates the present distribution of *L. japonicus* in the British Isles and Table 1 shows the more important associated species.

With the exception of a new site first recorded in 1972 on St Mary's, Isles of Scilly, v.c. 1, *L. japonicus* is now absent from all four of its former sites west of Chesil Beach, Dorset; these are Penzance and St Keverne, W. Cornwall, v.c. 1, St Austell, E. Cornwall, v.c. 2, and Charmouth, Dorset, v.c. 9. This area of England has become one of the major tourist regions in the post-war period and a marked reduction has occurred in the quality and quantity of beach vegetation in general. The first record of *L. japonicus* from Chesil Beach, Dorset was in 1799. Mansel-Pleydell (1895) and Good (1948) mentioned that it grew only intermittently along the beach. In 1973 a zone of *L. japonicus* was found along much of Chesil Beach just landwards of the crest of the shingle ridge and extending for great distances along the beach. In places it disappeared for some distance only to reappear a few hundred metres further on. This is certainly the largest population of *L. japonicus* on the south coast of Britain and is rivalled only by the extensive recent spread at Rye Harbour. Chesil Beach has been scheduled as a Site of Special Scientific Interest but it is not within a nature reserve.

From Chesil eastward to Brighton, E. Sussex, v.c. 14, *L. japonicus* has been recorded in seven localities but in 1973 the only site found was within the fenced enclosure of Volk's Railway on Brighton beach. It is now absent from Poole, Dorset, Hurst Castle spit, S. Hants, v.c. 11, East Cowes and Sandown, Wight, v.c. 10, Kingston and Worthing, W. Sussex, v.c. 13. Again, this is an important holiday area but considerable stretches of the coast have also been altered for sea-defence purposes. A small patch, about 1 m^2, occurred at Pagham Harbour, W. Sussex, in 1972 but timber dumping had eliminated it in 1973. F. Rose (pers. comm. 1976) reports, however, that it has re-appeared in 1976. East of Brighton, it had been recorded at Seaford, Pevensey, Bulverhythe (until 1960s) and Hastings, all in E. Sussex, v.c. 14, but it is now extinct at each site.

In eastern E. Sussex, v.c. 14, and E. Kent, v.c. 15, *L. japonicus* is much more abundant. In the former it is present in great quantity for over 3 km of shingle from Winchelsea Beach to Rye Harbour

and on to Camber Sands, where it becomes a dune species. It is most abundant on new shingle ridges but persists locally as these become covered with blown sand east of the estuary of the River Rother. East of Dungeness power station, E. Kent, there is a colony which has increased considerably between 1946 and 1973, though two other colonies nearby known in the 1940s have now apparently disappeared. Along this stretch of coast, especially at Winchelsea and Dungeness, pressure from tourism and fishing have made some colonies poor or non-flowering, but at Palmarsh, west of Hythe, a colony first recorded in 1954 on the rifle-range is expanding.

Elsewhere in E. Kent, *L. japonicus* is now absent from its old sites at New Romney, Kingsdown and Reculver, although it still persists at Walmer and at Whitstable, where it was first recorded in the 1970s. Walmer beach is heavily used by holiday-makers but there is a wooden track across the shingle to which most visitors keep. This has reduced the pressure on the beach vegetation and the colony of *L. japonicus* is expanding. Perhaps this augers well for future conservation of the species and suggests a satisfactory means of reducing trampling on the species at other sites. F. Rose (pers. comm. 1975) saw *L. japonicus* 'in local plenty' about 2 km west of Minnis Bay, Reculver in the early 1960s but inroads by the sea and the erection of a new sea-wall have eliminated it.

The only two N. Essex, v.c. 19, sites are both recent ones. Jermyn (1975) mentioned that it occurred at Walton-on-the-Naze in 1964 and that it was still present in 1971; it was also recorded just north at Little Oakley in 1970. All eight sites from which *L. japonicus* has been recorded in E. Suffolk still contain the species and in several places, for example Orford Ness, Shingle Street and Benacre, it is increasing. At Landguard Point and Thorpeness the populations are dwindling rapidly because of human pressure. The other sites are Felixstowe Ferry, Minsmere, Dunwich and Walberswick. Records suggest that until about 1850 Aldeburgh was its northern limit in East Anglia but now it seems to be spreading very considerably north to Benacre. The Orford Ness/ Shingle Street area has vast mats of *L. japonicus* over the apposition banks (Randall 1973); this is the largest population in the British Isles and is only exceeded on the Continent by those along the west coast of Jutland. The Suffolk coast is much less used by tourists than the south coast of Britain, although pressure has increased markedly in recent years. Orford Ness is part of a National Nature Reserve and is virtually inaccessible except by boat, but Shingle Street is unprotected. Caius (1570) noted that between the towns of Orford and Aldeburgh, in the autumn of 1555, peas grew of their own accord in such great abundance as to be sufficient even for thousands of people. This is the earliest record for *L. japonicus* in the British Isles.

L. japonicus seems not to have been part of the indigenous flora of Norfolk in historic times and several attempts to establish it there this century have failed after a few years. At present a small patch about 2 m^2 still exists on Cley beach, Norfolk, v.c. 27, just west of the coastguard lookout. In Lincolnshire, it is now extinct but there are new records in the 1970s at Warkworth and Birling Links, Cheviot, v.c. 68.

Scotland has had three isolated populations of *L. japonicus*: one by the Firth of Tay, Forfar, v.c. 90, one on Unst, Shetland, v.c. 112, and one by Loch Ewe, W. Ross, v.c. 105. At the first of these populations it disappeared near Monifieth as a result of industrial activity but it still exists in two small areas, one near Carnoustie and the other near Arbroath. Both sites are on golf-links. In Shetland, the population has disappeared at one site through gravel extraction and recreation and at the other it has been reduced to under 2 m^2 by similar pressures. The Loch Ewe colony has also disappeared.

Hodgson (1899) recorded *L. japonicus* from Harrington and St Bees on the Cumberland coast, v.c. 70, but these colonies have now disappeared, as has also that at West Aberthaw, Glamorgan, v.c. 41, as a result of the construction of a power station and heavy use of the area for fishing. However, a single plant was reported at Seascale, 15 km south of St Bees, in 1975.

For many years *L. japonicus* was recorded at Rossbeigh, S. Kerry, v.c. H1, and also across the bay at Inch. It has not been seen at the latter site since before 1916 and although collections have been made from Rossbeigh in recent years, it was not found in 1973 (Scannell per. comm. 1975).

Thus it can be seen that there has been a drastic reduction in the number of *L. japonicus* sites although the species has certainly increased locally on the Sussex and Suffolk coasts. The disappearance of *L. japonicus* from many of the remaining areas can be attributed in part to shyness of flowering (Lousley & McClintock 1951) but above all to human use of the beaches concerned. It seems that the present climate in southern and eastern England would enable it to grow very vigorously were it allowed to do so, but this may not be the case further north or west. It seems

that shingle extraction is totally responsible for its elimination from its only French locality, on shingle south of the mouth of the River Somme. Lack of grazing in the twentieth century may well have helped the species considerably in southern and eastern England. Where trampling does not occur, such as at Walmer, even heavily-used beaches retain good populations. As it is a plant of the mobile foreshore, there are bound to be natural changes or fluctuations in its distribution, and some extinctions can be attributed to local land-erosion. However, the most stable sites physically are those where the vegetation is more closed and where there is greatest risk from human activity. Thus the long-term outlook for the species in many areas is bleak. The populations at Chesil Beach, Rye Harbour and Orford Ness/Shingle Street are by far the largest and are the only ones in which its continued existence seems assured, unless deliberate protective measures are taken elsewhere.

ACKNOWLEDGMENTS

This research was financed by the World Wildlife Fund. I should like to thank Dr F. Rose and Dr F. H. Perring for their criticism of this study and for help in obtaining data.

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(*Accepted June* 1976)