A summary of the past and present status of *Spiranthes aestivalis* (Poir.) Rich. (Orchidaceae) (Summer Lady's-tresses) in north-west Europe

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ABSTRACT

The past and present distribution of *Spiranthes aestivalis* (Poir.) Rich. in north-west Europe is described. A species at the edge of its geographical range, it has been readily susceptible to changes in its damp habitat. This is especially so where the latter has dried out, either directly due to drainage or by other means, so that the plant is now lost from many of its former sites. Gross over-collecting will also have contributed to the plant's demise, especially where populations were small. *S. aestivalis* appears to be extinct in the British Isles, Belgium and the Netherlands, whilst in north and north-west France, where it was formerly quite widespread, it is now very scarce and reduced to about eighteen populations.

KEYWORDS: Orchids, distribution, extinction, ecology, extant populations.

INTRODUCTION

Spiranthes aestivalis, which at one time occurred extremely locally in southern England, the Channel Islands, Belgium and the Netherlands is now considered to be extinct in these regions. It is a close relative of *S. spiralis* from which it is most readily distinguished by the fact that its flower spike arises directly from the centre of the current season's basal rosette rather than adjacent to the developing one of the following season as is the case in *S. spiralis*. Its habitat is also very different, *S. aestivalis* being a plant of damp, often rather acidic, ground whereas *S. spiralis* is largely restricted to dry, short-grazed calcareous turf.

Within the British Isles, all confirmed records of *Spiranthes aestivalis* were from the New Forest in Hampshire and from the Channel Islands, in both of which areas it is now thought to be extinct. In much of Europe it is rare and decreasing as its damp, boggy, or heathland habitat is threatened by drainage, coastal development, or by agricultural improvement. Populations on the Dutch-Belgian border and in northern Germany, all now also thought extinct, together with those in the New Forest, were at the northern limit of the plant's range. Even just across the Channel in north-west France, where formerly there were many populations, the majority have now been lost. There is concern for its survival throughout most of central Europe, although further south, especially in Mediterranean areas such as Spain, there are still good populations, so that its survival chances there should be better. It has been widely recorded across central and southern Europe as far east as the Balkans and also, doubtfully, in Turkey (Renz & Taubenheim 1984); it is also found in North Africa. In north-west Europe it is a lowland plant but in the Alps is recorded to altitudes of 1200 metres.

This account outlines the result of an investigation (carried out over a period of more than ten years) of the past and present occurrence of *S. aestivalis* in north-west Europe. This area is defined here as that lying to the north and west of the River Loire (France) upstream as far as Orleans, and then of a line running approximately east-north-east passing just south of Luxembourg, along the Nahe valley, until reaching an arbitrary limit at longitude 8° East at the Rhine just west of Mainz (Germany). Within this area there are records from Belgium, the Channel Islands, England, France

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and The Netherlands. Information relating to the plant's former and current status has been obtained from the literature, from herbarium specimens, from field observations, and through personal communication with local botanists who know their area well. Inevitably, small populations may have been overlooked and even some existing ones lost during the survey period. Nevertheless, a fairly accurate picture of the plant's current status should be apparent.

In north-west Europe *S. aestivalis* occupies at least three types of fairly closely related habitat: open moist heathland (as at one of its most important extant sites near Lessay, France); wetter, rather acidic, boggy, peaty ground with *Sphagnum* spp. (as formerly in the New Forest) and damp, perhaps rather more alkaline, depressions in dunes (as on the Atlantic coast of north-west France). In southern Europe it is also found in base-rich ground, which however is still usually moist. Like many orchids the number of flowering plants can fluctuate appreciably from year to year.

THE PAST AND PRESENT DISTRIBUTION OF *SPIRANTHES AESTIVALIS* WITHIN THE REGION

GERMANY (EXTREME WEST ONLY)

It is not recorded in the area under consideration but was present prior to 1945 just outside the eastern limit in the area to the south of the mouth of the River Weser, west of Bremen, and also further south in the Rhine valley near Mannheim (Haeupler & Schönfelder 1989).

THE NETHERLANDS

In the past, *S. aestivalis* was recorded from the Limburg area. Localities there were close to those on the Belgian side of the border (see below). According to Adema (1980) and Kreutz (1987), prior to 1950 the plant was known from twelve separate 5 × 5 km squares in the border region of Noord-Brabant. It was first recorded in 1873 on marshy heathland at Stramproij near Weert, this being the first of three localities on the Swartbroeker Peel (peatland); however these sites were later lost through land reclamation. It was also known at Geuven and Aalst-Geldrop and appears to have been last recorded with certainty there in 1936. A record for *S. aestivalis* from the Dutch province of Zeeland in the vicinity of the "Braakman" was an error for *S. spiralis* (L. Vanhecke pers. comm.; cf. Vander Meersch, 1874).

There have been claims of further records from the Netherlands during the period 1968–1981. Kreutz (1987) relates that there have been reports that in 1968 the plant was re-found in dry heathland in the Stamproij-Weert area and at the Groote Peel (nature reserve) and that in the early 1970s up to 150 plants were found near Budel in a damp area, growing with *Calluna vulgaris*, *Drosera* sp., *Gentiana pneumonanthe*, *Narthecium ossifragum* and other typical associates. In 1981 it was thought there were still seven plants present but these were dug up, although it was claimed to still occur at de Hoort near Budel post-1980. In more recent years these areas have been searched without success (C. A. J. Kreutz pers. comm., 1991). Although the habitat was still good and the typical associated species present in abundance, there have been no further records of *S. aestivalis*. Due to this, and to the lack of absolute confirmation from the Rijksherbarium, Leiden, all these records are best treated as doubtful; this is also the opinion of local botanists (e.g. J. Willems, C. A. J. Kreutz, pers. comm.).

Losses in the Netherlands have been mainly attributed to habitat change caused by drying out, agricultural upgrading, and encroaching industrial development. However, the later claimed sites are still apparently intact and so the plant may yet be re-found there. The typical habitat in The Netherlands is, or was, damp heathland, usually over calcareous substrates.

BELGIUM

S. aestivalis formerly occurred at several localities in the Limburg region close to the Dutch border but it is now considered to be extinct there. It was mentioned for the first time as occurring in Belgium by Lejeuene & Courtois (1828) "*in pratis paludosis* Prov. Limburg" but subsequently was not recorded for many years; this resulted in some botanists questioning the validity of the original record. However, new localities were found at Genk in 1870 by Ch. Baguet and A. de Prins (Baguet 1871), where it was stated to be fairly common in a complex of heathland and *étangs*, preferring compacted soils, but not too wet conditions. Other localities were recorded in 1889 by Th. Thurand, and in 1913 by H. Van den Broeck and J. J. Hardy (L. Vanhecke pers.

comm., 1991). Eventually, eight localities were known, all in the Campine (Kempenland) region near Genk. By 1940, though, only one locality remained (Lawalrée & Delvosalle 1969), with less than ten plants; drying out of its habitat was given as the cause of loss. Since 1955 it has not been found at this last surviving locality, at which date the Ford Motor Company built a factory on the site; nor has it been refound elsewhere. In Belgium its habitat was damp heathland similar to that which it occupied in the Netherlands.

LUXEMBOURG

Not recorded from Luxembourg (van Rompaey & Delvosalle 1972).

ENGLAND

NEW FOREST, HAMPSHIRE: The only locality in the British Isles, other than the Channel Islands, was in the New Forest, Hampshire, where it is now thought to be extinct and where the date of the last record is uncertain. It was stated to be formerly present here in three or four valley bogs amongst *Sphagnum* sp. (Brewis *et al*. 1996). Popular belief is that it was last seen in about 1959, but it may have gone before then, although Lang (1980) suggests a possible sighting near one of the old localities that year, whilst McClintock (1968) considered it to be present until 1961. J. E. Lousley knew the plant in its latter days, noting two plants north of New Forest Gate in 1937 and that it was just hanging on there "about 1940" when the habitat was drying out and so becoming unsuitable. Another relatively late sighting was by D. McClintock in the New Forest on July 31, 1937 (D. McClintock pers. comm., 1991) when he found just two plants – possibly the same as Lousley's.

Babington, writing in Sowerby's "English Botany" (Sowerby 1838) after his first discovery of the species in Jersey (see below) expressed the hope that it would soon be discovered in the south of England, and this was fulfilled when it was found by Joseph Janson near Lyndhurst in August 1840 (Watson 1847–59), (see also a collection of Janson, 1840, **BM**!).

There were probably at least five localities in the area immediately to the south-west of Lyndhurst. Firstly, there was the site mentioned above, just north of New Forest Gate and east of Highland Water, where extensive *Sphagnum* bog still occurs but where the bordering carr woodland has now probably encroached onto the original site and natural succession taken its effect. A second site was at Gritnam Bank, a small area of *Sphagnum* bog bordered by deciduous woodland. This area was partly drained in the 1960s. Another site was west of Brick Kiln Inclosure, about ¾ mile south of Lyndhurst. This was also known to J. E. Lousley, who was of the opinion that its *Sphagnum* bog habitat was destroyed by both drainage and tree planting a few years after its discovery. At one time he had seen as many as 55 plants at this site, but his last visit was about 1940 when it was becoming overgrown with trees and he never returned. A fourth site was "about one and a half miles to the west of the road between Lyndhurst and Brockenhurst" as given on a herbarium label for nine specimens collected by F. J. Hanbury in 1893 (**BM**!). Yet a further locality was near a pond at Brockenhurst as evidenced by a herbarium specimen from there in 1880 "pond at Brockenhurst, 7/1880 leg. E. H. Melvill" (**MANCH**!). There is also another specimen "E. H. Melvill 8.1879, Brockenhurst, in boggy ground (**MANCH**!)". As Brockenhurst is six kilometres south of Lyndhurst, it is unlikely that any of the former sites are being referred to. Other than referring to a small *Sphagnum* bog close to the Lyndhurst to Christchurch road, the Floras of the period (Townsend 1883, Rayner 1929) are not specific about localities, although Townsend (1904) mentions that it was known from three separate localities near Lyndhurst.

The number of plants occurring at these sites seems to have been variable. It was "in abundance at the old locality in 1879" according to Bolton King (Townsend 1904), but later Rayner (1929) stated that it had all but gone from the site indicated by Townsend (1883) (see above). However, he referred to another one discovered by J. Cross prior to 1900, where for some years 200 flowering plants occurred annually but had subsequently diminished, with only seven being seen in 1927; nevertheless he concluded with an optimistic observation of 20 plants in 1928 (Rayner 1929). There is also the record quoted by Lang (1980) for nearly 200 flowering plants at a New Forest site in 1900. Despite this, several herbarium labels comment on its scarcity at the New Forest sites, and very many collections from there are now held in most major British herbaria – some with more than ten plants on a sheet, many with their tubers attached. It would seem to be very probable that over-collecting, allied to drainage, afforestation and the effects of natural

succession, has led to its extinction. There is apparently still some suitable habitat surviving close to the classic sites so there is always the chance that it may yet be re-found. Its New Forest habitat was wet *Sphagnum* valley bog where the conditions were slightly less acidic than elsewhere within the immediate area. [Some of the above historical information has been provided by R. P. Bowman (pers. comms.)].

An interesting and significant comment in relation to its former abundance and variable flowering performance was made by Marquand (1901) when noting the plant's occurrence in the Channel Islands. He reported that in the New Forest he "once saw half an acre of bog perfectly white with these flowers, but the following year only a few spikes of bloom appeared".

Recently *S. aestivalis* has been illegally re-introduced to one of its old New Forest sites where plants are flowering and fruiting freely. However, any irresponsible undocumented introduction, made without the full approval of the appropriate conservation body, is most inappropriate.

CHANNEL ISLANDS

JERSEY: *S. aestivalis* appears to have become extinct here in about 1925 (although stated to be in 1926 by Attenborough (1934) and 1928 by McClintock (1968)). It was first recorded for the British Isles by C. C. Babington on the banks of St. Ouen's Pond on 24 July 1837. A specimen, collected the following day, was sent to J. Sowerby, who reproduced a drawing of it in his supplement to *English Botany* (Sowerby 1838). It was stated to be "far from plentiful" even then and was not discovered elsewhere on Jersey. In the ensuing years it was subject to gross over-collection, again evidenced by the large number of specimens in many herbaria, so that well before the turn of the century it had become very rare. In its last years T. W. Attenborough took a great interest in the plant after collecting it on an early visit to the island in 1906. He recorded it for several years up to 1917 but, due to its scarcity, he was not collecting it at this stage. From then onwards he found none until 1926 when he discovered a single plant, but did not make a record of it in his Société Jersiaise Botanical Report until 1934 – possibly as a conservation measure (F. Le Sueur pers. comm., 1991). This appears to be the last reasonably reliable sighting. There is in fact a specimen of Frère Louis-Arsène's in **BM** purporting to come from St Ouen's Pond in 1926, and four further plants from the same locality in 1928 in his own herbarium (now with the Société Jersiaise). Unfortunately, since appreciable doubts have been shown to exist as to the validity of many rarities in Louis-Arsène's collections (Le Sueur 1982), both these herbarium sheets are of doubtful provenance and are probably not genuine Jersey plants. However, it is just possible that the 1926 specimen might have been the plant recorded by Attenborough (Le Sueur 1984).

The precise spot where the plant grew was wet sandy ground at the margin of St Ouen's Pond. The site is still natural and undeveloped but a reed bed has developed around the pond with *Juncus communis*, *Lythrum salicaria*, *Carex riparia* and other Carices dominant. This vegetation was formerly cut back hard by the farmers, but now grows unchecked. However, it is unlikely that this, rather than over-collecting, has been the cause of loss (F. Le Sueur pers. comm., 1991).

GUERNSEY: Extinct, not recorded since 1914. The date of its first discovery is not clear. Haslam in 1855 has been suggested, although there is an older undated record from Newbould c.1841 (McClintock 1975). Other early records include those of Beevor in c. 1858, and Wolsey and Hanbury, and also H. Trimen, in 1862, as well as a series of herbarium specimens also collected about this time. Although fairly abundant in the early days (Marquand 1901) it was considered to be quite rare by 1906 (McClintock 1975), presumably due to over-collecting and, in part, to drainage. Its Grand Mare locality appears on labels in numerous herbaria although Marquand (1901) reported that it flowered very sparsely in some years. The original site, where it occurred in *Sphagnum* bog, is apparently now much reduced although a small suitable area remains which has frequently been searched, but without success.

FRANCE (NORTH/NORTH-WEST)

In the part of France under consideration in this paper (i.e. north of the Loire, etc), *S. aestivalis* was formerly widespread but is now extant in only a relatively few localities. These lie in two main areas: (i) western Brittany (Départements of Finistère, Morbihan and Loire-Atlantique) and (ii) the Cotentin peninsula south of Cherbourg (Dép. Manche); there is also an isolated site further south in Dép. Ille et Vilaine and one in Sarthe. An examination of the published literature (de Vicq & de Brutelette 1865; De Vicq 1883; Masclef 1886; Lloyd 1897; Bonnier & Layens 1921; Riomet

& Bournérias 1952–1961; Wattez 1967; des Abbayes *et al*. 1971) reveals how frequent it once was in much of northern France. Many of these localities are indicated below under the relevant Département or area. Although perhaps not an exhaustive list, this shows that *S. aestivalis* formerly had a wide distribution.

FINISTÈRE: Des Abbayes *et al*. (1971) considered it to have formerly been fairly common in coastal slacks and inland marshes in the Département whilst Lloyd (1897) listed localities at Herbot; Quimper; Brest; Kerloc'h; Plougastel; S-Renan; Plouarzel; Goulven; Plobannalec; Edern; Plomodiern; Menezc'hom; Clohars. Many of these are now lost but some still survive (see below). MORBIHAN: The same authors Des Abbayes *et al*. (1971) and Lloyd (1897) give localities near Guer; at St-Dolav; Auray; Quiberon; Lorient; Theix; Ploërmel. LOIRE-ATLANTIQUE: Localities recorded in the Departement include St Gildas-des-Bois; Grande-Briere; le Pont-Mahé; près de Assérac; between Pornichet and Pouliguen; les Renardieres; lac de Grand-Lieu; la Seilleraie près de Mauves; Mazerolles et la Popinière near Sucé; Herbignac. CÔTES DU NORD: grand étang de Jugon; marais de Languenan; Planguenoual; Brusvily; Trébédan; in a depression in the dunes at Plévenon; in the landes of Kervezo in Tréglamus. ILLE ET VILAINE: Rennes; Broons-s-Nilaine; étang de Bazouges-sous-Hédé; St-Rémi; St-Pierre-de-Plesguen; landes de l'Ouée near Gosné. MANCHE: Mesnil-au-Val; Donville; Doville; landes de Lessay; dunes de Surville and Bréville; marsh at Gorges, 10 km west of Carentan, recently lost through drying out; Cherbourg "*in arena maritima*", 1886, herb. L Corbière (M!). MAYENNE: localities recorded by Des Abbayes *et al*. (1971) or supplied by D. Landemaine (pers. comm.), include the Signal des Avaloirs; near the source of the stream of "Buisson de malheur"; Boulay and Pré-en-Pail; south of mont Souprat; étang du Frêne at Champéon; on the firing range at Glaintin in St-Fraimbault; marsh of Cerisiers and of Randonnières in Aron; la Berlinchetterie en St-Germain-le-Guillaume; les Caves-de-Gérennes en Deux-Evailles; les Epinais and chateau of Cumont in Laval and a second site also at Laval. MAINE ET LOIRE: Pouancé; Angrie; Combrée; la Chapelle-s-Oudon; la Chapelle Rousselin; Rablay (all Des Abbayes *et al*. (1971)). CALVADOS: Falaise. ORNE: Gandelain. SARTHE: stated to be only slightly frequent (Des Abbayes *et al*. 1971); at Savigne sous le Lude, 1983 in moist alkaline meadows at stream margin at Cartes (D. Landemaine pers. comm., 1991). SEINE INFÈRIEURE, EURE, and EURE ET LOIRE: no records traced; PARIS BASIN: Rambouillet; Compiegne; Morlefontaine; Anet; Nogent-le-Rotrou; le Marais Vernier. PAS DE CALAIS: marsh between Beuvry and Cuinchy; St-Omer; Merlimont; Villers sur Authine; Villers-Cucq, seen there in 1966 but apparently not since (Wattez 1967); Tourbière de Villers (E of Cucq) in a rich alkaline *Schoenus* fen with *Liparis*, an unusual habitat (F. Rose pers. comm.). SOMME: St-Quentin-en-Tourmont; Mautourt; Cambron; Quend. AISNE: Chivres; Lierval; Parfondru; La Férte-Milon; Silly-la-Poterie; Montrgu Saint-Hilaire; Maucreux; Montchevillon. BOURGOGNE: Semur; Vielverge. ARDENNES: Sedan. [NORD: not known (Wattez 1967)].

French populations variously occupy acidic peat, *Sphagnum* bog, damp heathland, depressions in coastal dunes, or sometimes the more alkaline marshy areas.

CONCLUSIONS

The past and present distribution of *S. aestivalis* is indicated on the accompanying map (Fig. 1) where records are plotted on a 50 × 50 km squares basis of the UTM grid. In addition, the location and a brief description of the extant populations within the geographical area under consideration is summarised in Tables 1 and 2. Only readily detectable when in flower and in itself of very variable flowering, it is possible that the plant may be re-found at some of the old sites or that new populations will be discovered – or even that existing small ones have been overlooked.

Formerly very rare, *S. aestivalis* is considered to be extinct in the British Isles, Belgium, and the Netherlands. Within the area of north and north-west France under consideration, it was at one time quite a frequent plant but now only eighteen populations have been found to survive there (Fig. 1; Tables 1 & 2). Of these, six are in dune depressions on the Atlantic coast, eight in rather acidic bogs, two in acidic heathland and two in alkaline marshes.

Here, at the very edge of its geographical range, it has been susceptible to slight changes in habitat, especially to drying out caused as a direct or indirect result of drainage or through

TABLE 1: STATUS OF *SPIRANTHES AESTIVALIS* WITHIN THE AREA OF NORTH-WEST EUROPE UNDER CONSIDERATION

Country	Status	Region/Département	No of extant populations
Belgium	Not recorded since 1955	Limburg (near to Dutch border)	Considered to be extinct
Channel Islands	Not recorded since 1914 (Guernsey), c. 1925 (Jersey)	Guernsey, Jersey	Considered to be extinct
England	Not recorded since 1959	Hampshire (New Forest)	Considered to be extinct
France (north & north-west only)	Extant (now in only 6 Départements)	Finistère Morbihan Ille et Vilaine Loire-Atlantique Sarthe Manche	6 populations 4 populations 1 population 1 population 1 population 5 populations
		[Cotes du Nord, Mayenne, Maine et Loire, Calvados, Paris Basin, Pas de Calais, Somme, Aisne, Bourgogne and Ardennes]	All considered to be extinct
The Netherlands	Not recorded since c.1981?	Limburg (near to Belgium border)	Considered to be extinct
Luxembourg	No records	-	-
Germany (extreme north-west)	No records	-	-

agricultural upgrading. Industrial development has also resulted in losses and anthropogenic activities in coastal areas has caused, and may further cause, a reduction in the number of extant populations. Encroachment of its habitat by scrub or other coarse vegetation in the course of natural succession, especially in the absence of grazing, will also have contributed to losses.

An examination of the contents of major herbaria show the plant to have been grossly over-collected, sometimes with ten or more plants on a single sheet, often with the tubers attached. Such depradation is to be deplored. Small isolated populations cannot withstand such avid collecting for very long and in consequence will have soon been lost. In some circumstances however, the plant may tolerate or even benefit from slight disturbance. At one population, robust plants of *S. aestivalis* flowered freely on the raised ruts of vehicular tracks! Nevertheless, the few remaining populations should be monitored and protected. The large colony to the south of Cherbourg is of international importance and is the largest in north-west Europe. At some extinct sites, well-documented introductions might be worthy of consideration.

ACKNOWLEDGMENTS

I am very grateful to the many people who have supplied information regarding this plant. These include B. Bargain (France), V. Boullet (France), R. P. Bowman, C. A. J. Kreutz (Netherlands), D. Landemaine (France), D. C. Lang, B. Ozanne, F. Le Sueur, D. McClintock, M. Provost (France), F. Rose, L. Vanhecke (Belgium) and J. H. Willems (Belgium). I also offer thanks to M. S. Porter for accompanying me in the field, to the curators of the various herbaria where specimens have been studied, especially those of **BM**, **CGE**, **E**, **LIV** and **MANCH**, and to the Library staff of the Royal Botanic Gardens, Edinburgh.

TABLE 2: EXTANT (FRENCH) POPULATIONS OF *SPIRANTHES AESTIVALIS* WITHIN THE AREA OF NORTH-WEST EUROPE UNDER CONSIDERATION

Département	Population	UTM 50 km square
Finistère	Plounéour-Menez; bog west of road from Morlaix to Playben, to the south of Plounéour-Menez.	VU1
	St Rivoal; source of l'Elorn, *Sphagnum* peat bog, altitude 300 m, less than 10 flowering plants.	VU2
	Penmarc'h-Guilvinec; Le Steir, coastal dune depression, more than 100 flowering plants.	VT1
	Penmarc'h-Guilvinec; Toull Gwin, coastal dune depression, more than 500 flowering plants.	VT1
	Penmarc'h-Guilvinec; Poulguen, coastal dune depression, more than 100 flowering plants.	VT1
	Plomodiern; Menez Hom, peat bog, altitude 225 m, less than 10 flowering plants.	VU2
Morbihan	Ploemeur; Fort Bloqué, alkaline marsh, altitude 5 m, more than 50 flowering plants.	VT3
	Plouhinec; Kerzine, coastal dune depression, more than 50 flowering plants.	VT3
	Plouhinec; Moténo, coastal dune depression, more than 10 flowering plants.	VT3
	Guiscriff; inland marsh, discovered in 1990, c.200 flowering plants.	VU4
Ille et Vilaine	St Jean; inland peat bog. Population size not known.	XU2
Loire-Atlantique	La Turballe; coastal dune depression, altitude 5 m, more than 10 flowering plants.	WT2
Sarthe	Savigne sous le Lude; moist alkaline meadow and stream margin. Population size not known.	YT1
Manche	Lessay; approx 5 km to the south, heathland where associates include *Gentiana pneumonanthe, Lobelia urens* and *Carum verticillatum*, growing amongst *Pinus*, 600+ flowering plants counted in 1990 (estimated at 1000+).	XV2
	Lessay, a second small scattered population in heathland c.500 m to the south, where there are more than 25 flowering plants.	XV2
	Lessay, Tourbière de Mathon nature reserve, valley bog to the east of the town, small population.	XV2
	Marais de Doville, between St Sauveur-de-Pierrepont and the route national N800, small population in a large area of peat bog dominated by *Cladium mariscus* and *Myrica gale*.	XV2/WV3
	St Michel-des-Loups, SSE of Granville, small peat bog with a few flowering plants.	XU1

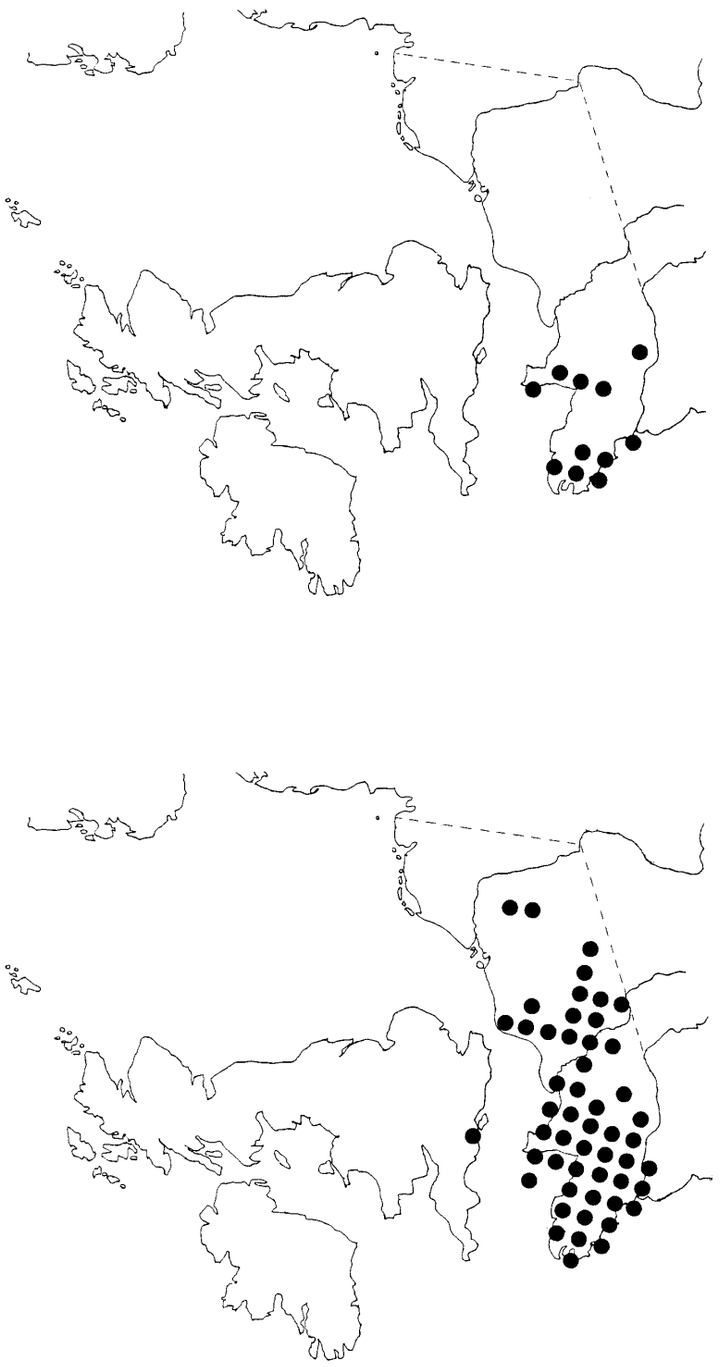

FIGURE 1. Map showing the provisional distribution of *Spiranthes aestivalis* in north-west Europe when plotted as 50 × 50 km squares of the UTM grid; (a) all records, (b) extant localites

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(*Accepted May 2004*)