



Wyre Forest Study Group

THE STATUS AND DISTRIBUTION OF *CEPHALANTHERA LONGIFOLIA* (L.) FRITSCH - NARROW-LEAVED HELLEBORINE IN THE WYRE FOREST

Excerpts from Reports produced by Rosemary Winnall in 1999 and 2000

Introduction

The Narrow-leaved Helleborine (also called Long-leaved or Sword-leaved Helleborine) *Cephalanthera longifolia* (L.) Fritsch is a member of the *Orchidaceae* or Orchid Family. It is native in Japan, western Asia to Kashmir, North Africa and Europe to about 63 degrees north in Norway (Clapham, Tutin and Moore 1987). In Britain it is a nationally scarce (present in between 16-100 10km squares) and decreasing plant at the north western edge of its range. Hampshire is the stronghold, and it occurs in other scattered pockets in England, Wales, Ireland and Scotland north to Sutherland. A National Review of the species was carried out in 1993 jointly between Hampshire Wildlife Trust and British Wildlife (Byfield 1993). The results showed a serious decline in Britain from 79 10km squares sites pre 1970 to 42 in 1993. Only 3 of these remaining squares had over 100 plants and 33 of the recorded 48 sites had less than 10 plants. 40% of the total were in Western Scotland, and 23% in Hampshire.

The *Cephalanthera longifolia* sites in Wyre are on the Old Hill Marl which is made up of sandstones, conglomerates, shales and marls. The species is normally recorded as being a plant of basic soils, although in Britain there are a few sites, like Wyre Forest, which have more acidic soils. It has been noted that *Cephalanthera longifolia* only grows in association with woodland, or where there has been woodland in the past (Summerhayes 1951). The presence of *Cephalanthera longifolia* in Wyre Forest is well documented by past botanists, although it was often referred to as either *Epipactis ensifolia* or *Cephalanthera ensifolia*. Edwin Lees wrote in 1867 "The appearance of orchideous plants is much influenced by the light and temperature that breaks in upon the coverts where they grow, for in some seasons it is difficult to find the Sword-leaved Helleborine (*Epipactis ensifolia*) in the Wyre Forest, while when I once visited it in the company with my friend the Rev. Andrew Bloxam, whole glades of the exposed portion of the greenwood were perfectly white with its elegant flowers."

Although *Cephalanthera longifolia* has been noted as a coppice species (Marran and Rich 1993), Andrew Byfield (1993) refers to it as a glade species, requiring more permanent open area in order to flourish due to the length of time it takes for new flowering plants to develop. "*Cephalanthera ensifolia* would perish but for forest where it is stubbed up." (Lees 1867) The exact meaning of this term 'stubbed up' might be sought to clarify management procedures from 130 years ago! This helleborine is perennial and relies on fungal mycorrhizal associations in order to

grow, at least for part of its life history. It has short underground rhizomes, which apparently do not necessarily produce flowering spikes every year. Thus periods of dormancy may be observed with some mature plants. *Cephalanthera longifolia* has flowering spikes containing usually between 3 and 20 individual flowers. The fruiting capsules ripen on the plant, and the tiny seeds are released as fine dust through longitudinal slits. Each plant has the potential of being fairly long lived, and records of 13 year olds have been noted (Richard Fitter, reported by Byfield 1993). 'In vitro' germination and growth takes about 3 years from germination of seed to emergence of the neonatant (young non-flowering plant) (Prendergast 1996). It is thought that *Cephalanthera longifolia* may spend several years as a neonatant before flowering even in ideal conditions.

Wyre Forest plants are atypical by having a slightly different flower lip shape and broader leaves (pers. comms: Peter Hunt BSBI 1982 to John Bingham). This variation may be a result of ecological isolation. The flowers, as in all orchids, do not produce nectar and *Cephalanthera* species have no detectable scent. They may be reliant on mimicry to attract pollinators. Although research in Israel has indicated a rockrose model *Cistus salviifolius* (Dafni and Irvi 1981), this species does not occur in Britain and work here has not identified a specific flower model (Hedley 1999). It is suggested that the presence of pseudo pollen (yellow colouring) on the epichile (tongue-like section of the lower lip of the flower) might be sufficient to encourage insects to visit as long as there are other yellow-coloured flowers nearby (Dafni and Irvi 1981). The pollen is produced in each flower within a stalkless pollinia (waxy sac), and an insect pollinator is required for the transfer of this from one flower to another. (The pollinia adheres to the top of the thorax of the pollinator).

Recent research in Hampshire has shown that the solitary bee *Lasioglossum fulvicorne* (a member of the family *Halictinae*) is the pollinator in that area (Hedley 1998). In the same report it is also noted that there were many more active bees visiting flowers in open sunshine than those in shaded woodland. Other insects than solitary bees were observed visiting the flowers, but they were never seen with pollinia attached (Nilsson 1983; Dafni and Irvi 1981). It has been noted that self-pollination cannot occur between flowers on the same plant (Dafni and Irvi 1981). This has implications for a colony in decline which may only have one flowering spike during the season. Solitary bees, which are thought to be the pollinators, must have a sunny area in which to fly, and nectar-producing flowers from which to collect nectar and pollen for food and to store in their

burrows for their larvae to feed on. In an open sunny glade situation there will be potentially more bees and therefore greater chances of pollination of *Cephalanthera* flowers, although there is more to be discovered about local pollinators and their habits in Wyre Forest.

Declining colonies in East Hampshire showed that although some of the plants flowered from time to time, they failed to fruit and there were no neonatants present (Hedley 1998). As the species does not reproduce vegetatively (Byfield 1993), plans to maintain the plant must rely on efforts to increase flowering and fruiting (Hedley 1998). The management of the ground flora of woodland sites is usually achieved by managing the light regime by felling the canopy and/or clearing the understorey of scrub by coppicing (Hedley 1998). This often has the effect of increasing the flowering of herbs in the ground flora (Rackham 1975), (Mitchell 1992). Leighton (1841) quotes Edwin Lees as reporting that *Cephalanthera longifolia* in Wyre Forest was "most abundant where a recent fall of wood has taken place or on borders of old rides".

Hedley (1998) has shown that in a declining population the flowering plants lessen in number, and many of the plants, which had previously flowered, produce leaves only. In addition the size of the plants decline. If the emerging spike is eaten off as it is growing, the plant appears not to be able to produce another aerial stem in that growing season (Hedley 1998). Richard Hedley (1998) has shown that in Hampshire there was no difference in the ability of plants to flower in an open glade situation and under high tree canopy as long as the light intensity is appropriate. He says that "management by glade creation increases the total number of flowering plants very dramatically by increasing the rate of transition to flowering of large vegetative plants and subterranean plants." Hedley (1998) also states that in Hampshire the highest rates of fruiting were either in or close to open glades.

Cephalanthera longifolia



Neville Wilde

Plantlife has adopted *Cephalanthera longifolia* as one of the species on its 'Back from the Brink' species recovery programme (supported by English Nature and World Wide Fund for Nature). Dr. Belinda Wheeler is working on this species nationally in connection with the project. In 1997 Wyre Forest was chosen as one of 3 sites in Britain for Plantlife to consider in depth and to give special advice regarding management. A monitoring programme was set up in that year by Phil Rudlin, and Rosemary Winnall collected data from 1998 onwards.

Methods of Data Collection

During May each year, a search is made in Wyre of all the current and historical sites. Individual plants are mapped, measured and identified on the ground wherever possible. Throughout the season the plants are monitored to record the presence of flowering plants, neonatants, vegetative individuals, seed capsules, and fruiting capsules. The accompanying table indicates results to date.

Site meetings and consultation between Dr. Belinda Wheeler of Plantlife, John Bingham of English Nature, Phil Rudlin of the Forestry Commission and the other landowners result in a management plan for the following winter.

Conclusions

Most of the Wyre *Cephalanthera* colonies are in unusual sites. 3 are growing up through the edges of forest roads, 1 is on an old charcoal hearth, 1 is in a private garden in a flower bed, 1 is along the edge of a field that is grazed by horses and annually sprayed with fertiliser and herbicide, 1 is along the edge of a deer lawn that was ploughed, limed and reseeded in the past, and only 1 site is within a natural forest setting. (It must be noted, however, that some of the historical sites are also within the main forest block, but that plants at these sites have not been recorded for some years and may be extinct).

The diverse and inconsistent nature of the sites and the complex nature of the life history of the species make it very difficult to understand the habitat requirements and appropriate management necessary.

Although the increased numbers of plants found in Wyre during 2000 is encouraging, as is the increase in flowering heads and neonatants, numbers are still much lower than 20 years ago. There should be no complacency about the longterm future of the Wyre sites. Monitoring and management should aim to increase flowering and fruiting at all sites as soon as possible.



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Acknowledgments

Historical records were kindly supplied by John Bingham, Bill Thompson, Phil Rudlin, John Meiklejohn, John Robinson and Mike Taylor. The numbers of flowering spikes recorded by John Bingham in the 1970s and 1980s are of particular value in assessing the current status of *Cephalanthera longifolia* in Wyre. Dr. Belinda Wheeler, working for Plantlife, visited Wyre in 1997, 1998 and 2000 and shared her concern for the species and suggested methods of data collection and management policy. Her encouragement stimulated the project throughout. The Forestry

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Year	Main site			Sec. site			Glade site			St. John's Lane			Loon site			Rest route site			Missive's site			Victor Centre			TOTAL					
	Fls	spikes	plants	Fls	spikes	plants	Fls	spikes	plants	Fls	spikes	plants	Fls	spikes	plants	Fls	spikes	plants	Fls	spikes	plants	Fls	spikes	plants	Fls	spikes	plants			
1978	80			7			7																					80		
1979	46			3			15																					64		
1980	26			6			10																					42		
1981	126			7			21																					154		
1982	44			6			12																					62		
1983	24			3			19																					46		
1984	24			1			13																					38		
	Data from 1978 to 1984 sourced from John Bingham																													
	Data from 1987 sourced from Phil Rudlin																													
1997	13	13	2	2	2	?																						15	15	2
1998	15	12	3	4	4	1	3	3	(1)																			22	18	3+1
1999	16	2	0	3	2	0	4	3	0	12	6	2	2	2	0	16	1	0										53	16	2
2000	27	11	3	14	5	0	4	3	0	13	13	3	6	5	0	60	14	0	4	3	0	3	1	0	131	55	6			

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