

the  
species  
recovery  
trust

# SPECIES HANDBOOK

Starved Wood-sedge  
(*Carex depauperata*)

Ecology, conservation, survey  
and management



## Conservation Status

# ENDANGERED

- Facing a high risk of extinction in the wild
- Only two native sites remaining
- Population stood at just 1 plant in the mid 80's
- A further 4 re-introduced populations have now been created

Starved Wood-sedge (SWS) once had the dubious honour of being the rarest plant in the UK, when just a single plant existed in a site near Cheddar Gorge in Somerset. As testament to three decades of work by conservationists, in 2019 the UK population stood at over 200 plants, spread across 2 native sites and 4 re-introduced populations.

During this time, however, the species has been lost from Ireland and despite over two decades of work at the native Surrey site, the population there has fallen in recent years.

Both native sites are on the edge of bridleways and lie within unprotected sites, so remain extremely vulnerable to accidental damage.

The plant is named due to each panicle producing few seeds (thus depauperate, or starved). These utricles are however amongst the largest produced by any sedge species.

Germinating plants from seed has continued to prove elusive, and vegetative spread is likely to be the main way populations grow, explaining its poor ability to colonise or spread. It does however possess a long-lived seedbank, as demonstrated by its miraculous reappearance in Surrey at the end of the 20th century.



## Description

A rhizomatous tussock-forming perennial sedge, forming large tussocks in mature individuals. Superficially similar to Wood Sedge (*C. sylvatica*) but can be distinguished by shallower ridges in leaf cross-section and ochre-purple flush to sheaths (see 'Survey').

In fruit it is easily recognisable, with long (up to 1m) drooping inflorescences, bearing few but large shiny utricles (7-9mm). Plants can produce multiple inflorescences although each one typically has just 5 utricles upon ripening.

There appears to be little variation in plants across Europe.



## Lifecycle

SWS is perennial so over-winters as a tussock, remaining green but showing some dieback in harsher winters. It flowers in late April, and seeds start ripening into September. These can remain on the flower spikes until the following spring. Once the seeds develop the inflorescences tend to bow downwards, often depositing the seeds a short distance from the plant.

It appears that seeds can remain dormant in the soil for some time, evidenced by the Surrey site returning from local extinction following the great storm of 1987.

Seed germination is however potentially uncommon, with attempts to grow plants from seed often unsuccessful. It is also hypothesised that seeds may be predated by voles and mice due to their large size. While this may act to disperse seeds it probably often results in the removal of seeds from the seedbank. The role of sunlight is crucial to the species, and rates of seed set have been much higher on sites once the canopy has been cleared. It is likely the warming of the soil is key in triggering germination. Seeds can take over 2 years to germinate, suggesting a need for after-ripening, which is common to many sedges.

Plants in captivity can live up to 25 years, although in the wild they appear to live for roughly 10 and sometimes shorter. Due to vegetative splitting it is hard to precisely monitor this.

## Habitat

The two native sites comprise banks on the edge of woodlands by the side of tracks. Originally we thought the low-level of dappled shade at these sites was the optimal conditions, but as management work has gradually reduced canopy size and populations have started to increase, we now believe that the plants favour higher levels of light, as long as corresponding development of ruderal plants is gradually eliminated.

All the sites occur on relatively free-draining neutral soil, with some underlying calcareous influence at Axbridge.

The woodlands show no strong affinity to any NVC type, with the plants growing amongst Lime, Ash and Oak/Hazel canopies. At Axbridge it copes well growing in amongst Ramsons (*Allium ursinum*) but struggles in all sites when denser Bramble starts to develop. Both sites do however have well-drained and often dry soils.





**NATIVE EXTINCT RE-INTRODUCED**

## Distribution

### UK

SWS has always been extremely rare in Britain, having been recorded from only twelve sites. These were located in Dorset, Kent, Surrey, Somerset and Anglesey. It was lost from Ireland in the late 1990s and is similarly rare in the rest of Europe.

It now only has two native populations, in Godalming in Surrey and near Axbridge in Somerset. In the 2010s plants were re-introduced to the grounds of Charterhouse and to Cranborne Chase in Dorset. Along with a previous re-introduction in Cheddar Woods this brings the total number of sites to 6.

### World

SWS has been recorded from Albania, Belgium, Bulgaria, Corsica, Croatia, England, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Romania, Scotland, Sicily, Spain, Switzerland and Wales. In addition, it has been recorded from Iran, Iraq, Turkey and Russia (Caucasus, Ukraine, Pamir, Tien-Shan) but the records are too fragmented and unlocalised to merit plotting. The records traced show it is widely scattered across Europe and near Asia, though these are likely to be biased towards western European sources. France and Spain appear to be its main strongholds, but no recent study has been done on its distribution.



## Reasons for decline

Historically the decline of this species is linked to the general loss of woodlands. More recently its disappearance has been due to the decline of woodland management, and this is well documented in the grounds of Charterhouse, where much of the woodland management ceased after WW2 and the species disappeared in the early 1930s. A similar picture was seen in Ireland, where during a visit in 2017 the site was found to be completely overgrown, with no chance of the plants surviving. When The Species Recovery Trust starting working on the species many of the native sites were on the edge of falling into neglect, and they will all need continued annual management to sustain populations.

## Protection under the law

Protected under Schedule 8 of the Wildlife and Countryside Act 1981 which makes it an offence to intentionally pick, uproot or destroy any plants.

Listed as a species of Principal Importance in England and Wales under the NERC Act 2006 and is a UK Biodiversity Action Plan priority species.



*Unmanaged and extinct site in County Cork, Ireland.*

# THE SITES



# CD1 - AXBRIDGE

Plants were first discovered at this site in 1860, although possibly in a different location to the current site, which is on the edge of a trackway leading up into Cheddar Woods. It has twice been documented as teetering on the edge of extinction, with a drop to 1 plant in the late 1950s and just 2 plants in 1977. Extensive conservation work was carried out in 1993, to remove trees and scrub, but by 2012 this stretch had once again closed over.

Extensive clearance work was once again carried out in 2012 to remove trees and scrub, at which point the population was only 30 plants. Since then The Species Recovery Trust have carried out annual management and monitoring, and in 2017 the population rose above 100 plants for the first time, and currently stands at 150 plants. Annual management consists of light work to remove any enclosing scrub and gradually enlarge the area of habitat available to the plants.

The site still faces threats by nature of being on a public bridleway. For a period there was an active stable at the top of the track and the plants were subject to continual browsing as the horses passed, and it is uncertain whether at some point access may be granted to motor vehicles to access this property.



# CD2 - CHARTERHOUSE

At the start of the 21st century plans were being hatched to try and re-introduce SWS to some of its historic sites. The driver behind this was the perilously low number of sites nationally (just two remaining) and the fact that both of these sites were on public bridleways and at some risk from the public. Plants were known to have grown in the grounds of Charterhouse School up until the late 1930s, at which point management of the woods appeared to cease (possibly linked to WW2) and despite extensive searches plants were never refound.

Three locations were chosen within the school grounds, and an initial collection of 28 plants, from the garden of Barry Phillips (former VC recorder for Surrey), bulked up from material taken from Ockford Wood were planted at two locations in September 2009.

A further 53 plants were then planted at a third location with plants from Kew Gardens at Wakehurst Place. The origin of these plants is somewhat of a mystery as they were logged as coming from Wiltshire, where no native populations have ever existed, so we cannot be certain if they originated from Surrey or Somerset.





## CHARTERHOUSE (CONT.)

All three sites have been closely monitored ever since. One of them was deemed unstable relatively quickly after aggressive regeneration of Bramble (which had been cleared before the site was first inspected). The third site (Devil's Drop) has proved the most successful, with currently over 100 plants present.

This site is much more open and lighter than the native sites, and the success of the plants here has persuaded us to carry out much more open canopy management at other sites.

An interesting issue in recent years has been the increase in levels of Wood Sedge (*Carex sylvatica*) in the same location. This has been partially removed each year as we are unsure whether it would eventually outcompete the SWS.



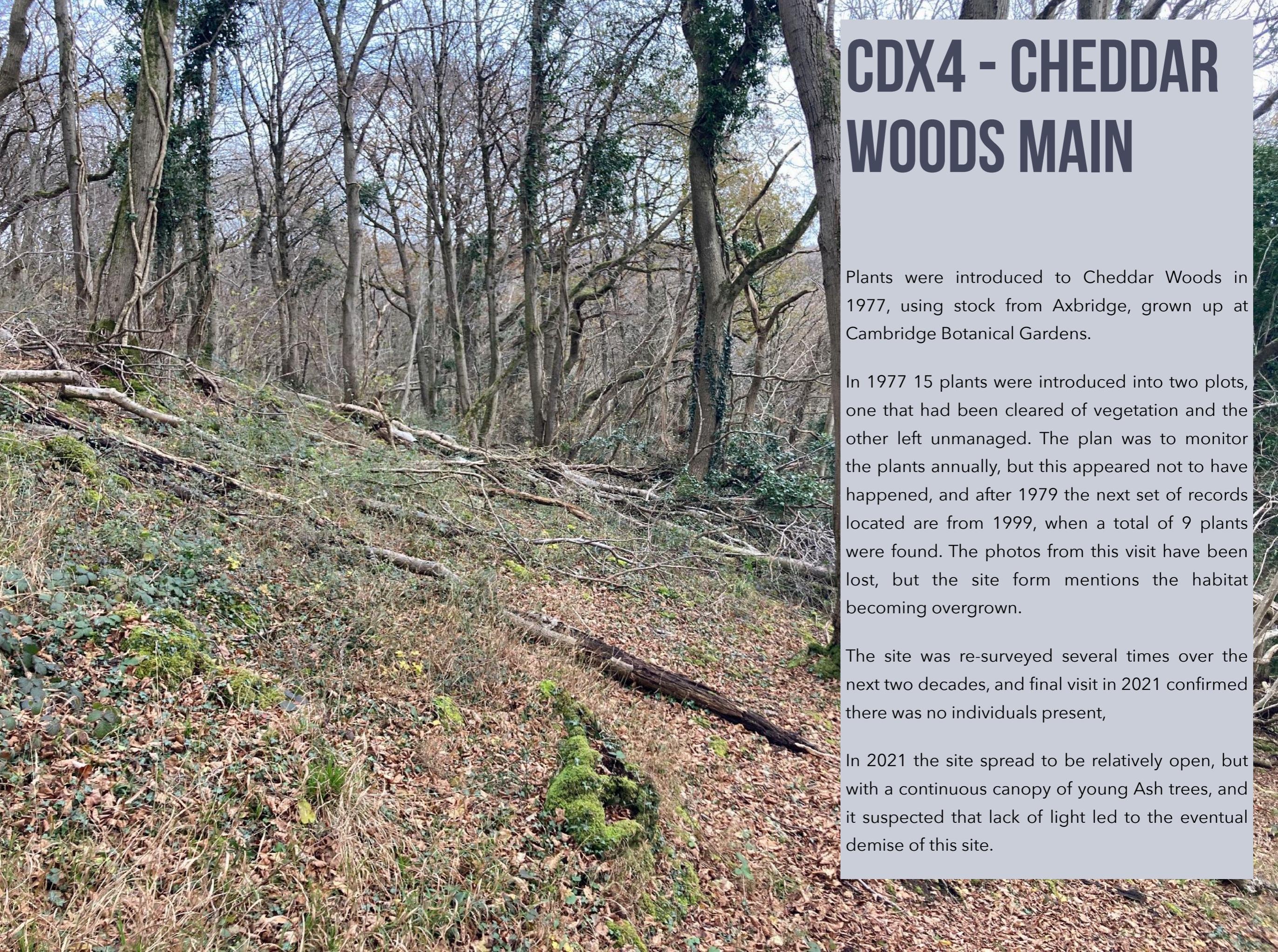
# CD3 - OCKFORD

This site has a similar smattering of historical records dating back to 1807, although perhaps not in the exact location of today's plants. What is known is that the population was lost in 1972, perhaps under a landslide. Extensive searches were carried out for two decades, and then remarkably, a single plant was found in 1992, under an area where a Lime tree had lost a large branch in the great storm of 1987.

Since this time the site has been continuously monitored and managed, although the population remains fairly constant at roughly 20 plants. One of the oddities here is that large mature plants seldom persist, and the population tends to comprise seedlings and juvenile plants.

Two large lime trees have recently started to shade out the site, although plans are in place to remove these.



A photograph of a woodland area. The foreground is a slope covered in fallen leaves, some green moss, and some low-lying plants. Several large, fallen tree trunks and branches are scattered across the slope. In the background, there are many tall, thin trees with bare branches, suggesting a late autumn or winter setting. The sky is visible through the canopy, appearing overcast.

# CDX4 - CHEDDAR WOODS MAIN

Plants were introduced to Cheddar Woods in 1977, using stock from Axbridge, grown up at Cambridge Botanical Gardens.

In 1977 15 plants were introduced into two plots, one that had been cleared of vegetation and the other left unmanaged. The plan was to monitor the plants annually, but this appeared not to have happened, and after 1979 the next set of records located are from 1999, when a total of 9 plants were found. The photos from this visit have been lost, but the site form mentions the habitat becoming overgrown.

The site was re-surveyed several times over the next two decades, and final visit in 2021 confirmed there was no individuals present,

In 2021 the site spread to be relatively open, but with a continuous canopy of young Ash trees, and it suspected that lack of light led to the eventual demise of this site.

# CDX4 - CHEDDAR WOODS EDGE

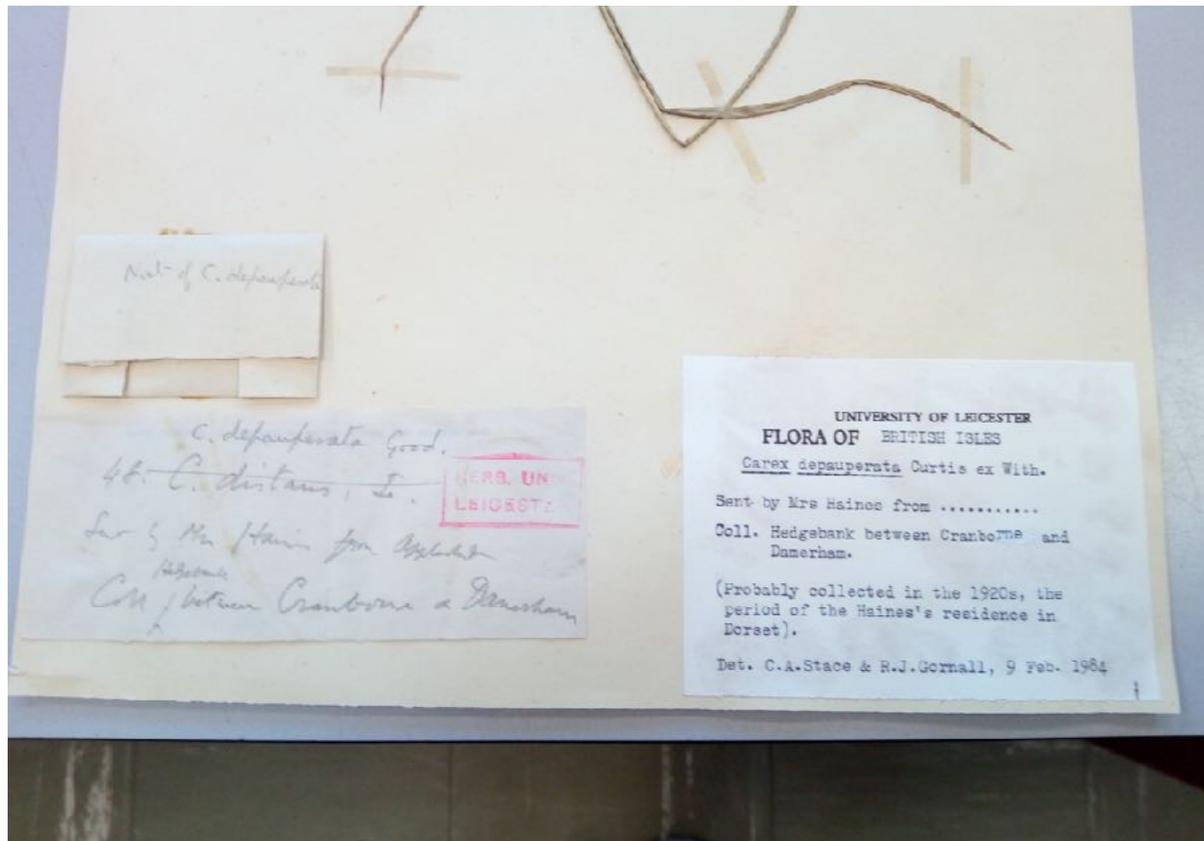
In 1988 a further introduction was made into the edge of the woods, which we believe was carried out as experimental work by Cambridge University, looking at how the plants would behave in more open conditions and what their response to grazing would be. 100 plants were introduced into a small area just below the woodland escarpment. During the experiment it was detected the grazed plants were less fecund, and that plants grown in disturbed soil, free from competitive stress, grew larger.

This site had been managed by Plantlife and was taken on by The Species Recovery Trust in 2012, with considerable help from Somerset Wildlife Trust.

After some years of absence the plants did respond to management work and several individuals did reappear in 2018. However, the amount of work needed to keep the dense competing vegetation down was considered unsustainable, and when it was discovered that the site had originally been intended as an experiment rather than an attempt to re-establish the species, in 2020 the decision was made to cease the management of this site.



# CD5 - CASTLE HILL



In 1984 a herbarium specimen collected 'from hedge banks between Cranborne and Damerham' was discovered at the University of Leicester. This led to many years of searching in this locality, before it was decided that this site had become extinct.

In 2018, 14 plants from Kew Gardens (from the same stock used at Charterhouse) were planted in a new location on the edge of Cranborne. This site was chosen due to the positive attitude of the landowner (the large estate refused permission) and the discovery of an open glade at the base a hill-fort, relatively free of the competing vegetation that had resulted in the time-consuming habitat management at other sites.

Shortly after planting the UK suffered one of the worst heatwaves and drought in modern times, and a decision was made to water the plants through this period.

As of Spring 2019 all 14 plants are still alive and slowly growing. The site will be closely monitored for the recruitment of new plants. In 2021 a further 14 plants were introduced into 3 further locations.





# SURVEY

## Habitat

Favours woodland edges and banks, but extremely unlikely now to be encountered outside its known sites.

## What to look for

The difficulties in surveying come with young and out of season specimens which are not in fruit. The plants are superficially similar to Wood Sedge (*C. sylvatica*) but can be distinguished by shallower ridges in leaf cross-section and ochre-purple flush to sheaths. At two of the sites it also grows with Grey Sedge (*C. divulsa*) plants, from which it can be separated due to the thinner and slightly glaucous leaves of this plant.

In fruit it is easily recognisable, with long (up to 1m) drooping inflorescences, bearing few larger shiny utricles (7-9mm).

## What to record

Numbers of plants, noting amount of fruiting and immature plants.

# Vegetative ID

Look for rufous reddy-brown flush on sheaths on young shoots (cf pale in Wood & Grey Sedge)

The leaf has a shallow 'bird-wing' shape in cross section, (cf. W-shape in Wood Sedge)

Leaves marginally wider than Grey Sedge.



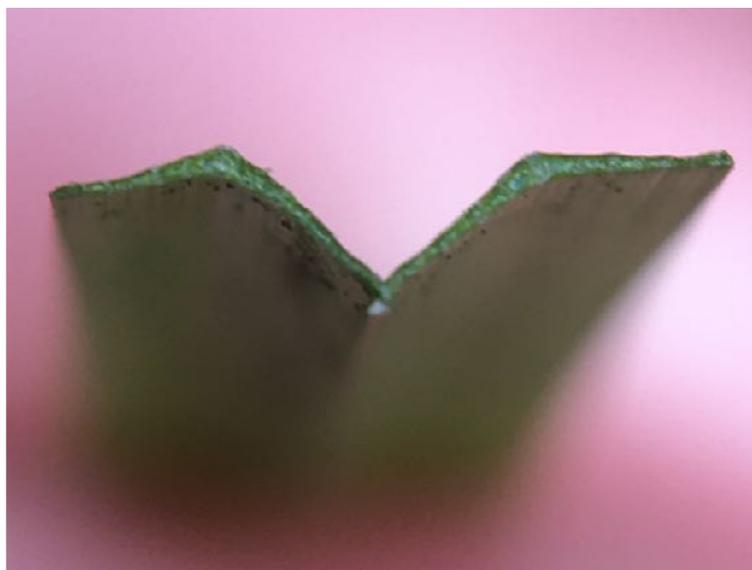
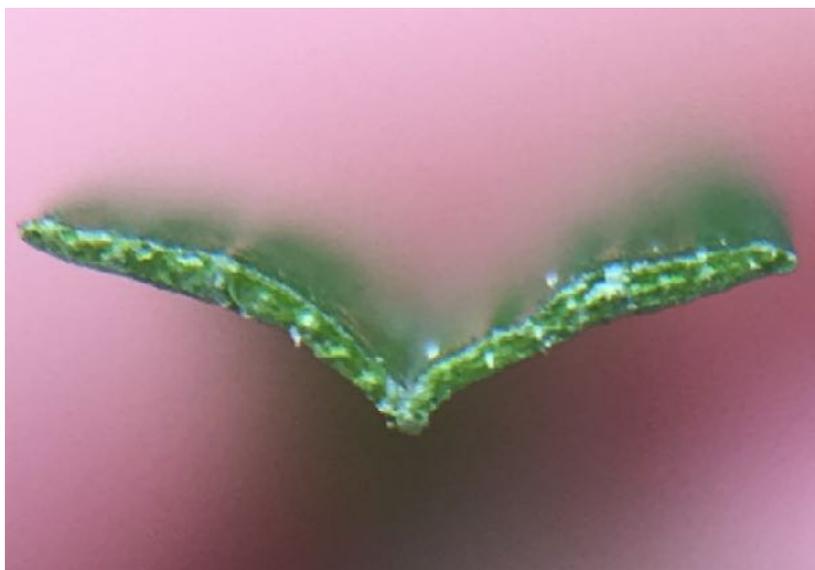
**Starved Wood-sedge**



**Wood-sedge (*Carex sylvatica*)**



**Grey Sedge (*Carex divulsa*)**



# MANAGEMENT

This is a species which appears to thrive in open glades and rides, and management should focus on maintaining openings in the canopy combined with cyclical coppicing work.

As is common with woodland management, especially in the Southeast with its corresponding elevated atmospheric nitrogen levels, the creation of such glades tends to result in an accompanied rise in the growth of ruderal plants including bramble, and annual work is usually required to keep this competing vegetation in check.

For any consideration of potential re-introduction sites it is well worth considering the weed burden of any site, which is a lesson learnt for the difficulties now faced on the 1990s Cheddar Wood intro site, which requires almost constant removal of Bramble and False Brome.

Two of the sites are also now showing an increase in the amount of other sedges species, and we are closely monitoring this to see how this may effect the native sites.



# OUR WORK

- Annual management and monitoring of all 6 extant sites
- Continuing work to establish plants in Cranborne Chase
- Research into seed ecology
- Constant surveillance and protection of all sites

# SUCCESS

- Axbridge population now over 100 plants
- Charterhouse introduction sustained for ten years and increased to over 100 plants

Starved Wood-sedge is likely to always remain conservation dependent, but through our work it has now come back from the brink of extinction.

The Somerset native population continues to thrive, and each year we maintain and expand its habitat.

At the native Surrey site we are still facing considerable challenges due to a shrinking population, and are working hard to save this population without resorting to bulking up with ex-situ grown plants.

We continue to manage and monitor the rapidly expanding re-introduced population in the grounds of Charterhouse, and the smaller introduction at Castle Hill in Dorset.



*Education work at  
Charterhouse*

References: Rich, TCG & Birkenshaw CR. Conservation of Britain's biodiversity: Carex depauperata With. (Cyperaceae), Starved Wood-Sedge. Watsonia 23: 401--411 (2001 )

The Species Recovery Trust is a charity set up to tackle the loss of some of the rarest species in the UK.

There are over nine hundred native species in the UK that are classed as under threat, with several hundreds more currently widespread but known to be in significant decline. The countryside is now bereft of many species that were a familiar sight a mere generation ago.

A small number of these species are on the absolute brink of existence, poised to become extinct in our lifetimes; our goal is to stop them vanishing.

Our aim is to remove 50 species from the edge of extinction in the UK by the year 2050. In addition we are reconnecting people with wildlife and the natural world through training programmes and awareness raising.



A photograph of a forest floor in spring. The ground is covered with a dense carpet of purple bluebells. In the foreground, a large, moss-covered tree stump lies on the ground. The background is filled with tall, slender trees with fresh green leaves, suggesting a young forest or woodland. Sunlight filters through the canopy, creating dappled light on the ground.

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