

Biscutelle de Neustrie (*Biscutella neustriaca*) – France



Photo: LIFE99/NAT/F/006332

Conservation status	IUCN Global: Vulnerable FR: U1 (+)
Protection status	HD: Annex II and IV Bern Convention: Appendix 1
Population (2007-12)	EU27: 3,000 – 3,500 individuals FR: 3,000 – 3,500 individuals
MS with genuine improvement	FR
Other MS	-

Summary: *Biscutella neustriaca* is a rare and endemic plant of the Atlantic biogeographical region, which inhabits open calcareous grasslands on steep slopes and cliff screes. The species now only exists in small localities in France, around Amfreville-sous-les-Monts and Les Andelys, and is highly endangered due to the abandonment of traditional agricultural practices that help to maintain the suitability of its calcareous grassland habitat.

Two LIFE projects, from 1993 – 2003 and 2006 – 2012, have stopped the species decline through a combination of research into the species' reproductive biology and genetics, habitat restoration and management (vegetation clearance and ongoing grazing) and the reinforcement of small populations and creation of new populations (through ex-situ measures and in-situ seeding and planting) to increase their viability and genetic diversity. As a result the population of *Biscutella neustriaca* increased from >1,580 individuals in 2002 to more than 4,798 in 2012.

Background

Status and EU occurrence

*Biscutella neustriaca*¹ is a middle-size (20 to 40 cm), sub-pioneer flowering plant species endemic to northern France, and thus only occurs in the Atlantic biogeographic region of the EU. It is found only in calcareous or sandy grasslands in the Seine valley in Normandie (Museum National d'Histoire Naturelle 2003-2010) between Les Andelys and Romilly-sur-Andelle. Although it has always been rare, it has declined. According to Article 17 reporting data for 2007-2012 its range was then 400 km², the extent of its suitable habitat only 0.6 km² and its population estimated to be 3,000 – 3,500 individuals (ETC-BD, 2018). Its entire global population now occurs completely within one Natura 2000 site "*Boucles de la Seine amont d'Amfreville à Gaillon*".

France assessed the species' overall conservation status in 2007-2012 as unfavourable-inadequate (Annex 1; ETC-BD, 2018). Although its range status was considered favourable, its habitat and population status components were both assessed as unfavourable-inadequate (no information was provided on future prospects). However, its short term (i.e. 2001-2013) population trend was positive.

Ecological requirements

Biscutella neustriaca is a xerophilous species (i.e. adapted to dry conditions) that mainly occurs on calcareous grasslands on steep slopes (30 to 40%), screes and cliffs. On rare occasions, the species can appear on underground alluvial sand of the Seine. As an heliophilous (i.e. requiring sunny conditions) and oligotrophic species, *Biscutella neustriaca* thrives in open grasslands with short vegetation. In particular, the species grows in the following habitats: rupicolous calcareous or basophilic grasslands of the *Alyso-Sedio albi*, semi-natural dry grasslands and scrubland facies on calcareous substrates and calcareous scree of hill and montane levels (Bensettiti *et al*, 2005).

Pressures and threats

According to the France Article 17 report, the most frequently reported highly important current pressures and future threats to *Biscutella neustriaca* are vegetation succession, interspecific floral relations and reduced

¹ Natura 2000 species code 1506

fecundity/genetic depression. In addition, the category ‘Roads, railroads and paths’ is listed as a highly important threat. More precisely, the main threats are habitat destruction - through eutrophication and mowing of roadside vegetation - as well as vegetation closure. The grasslands are open habitats, usually the result of ancient clearings and traditional grazing practices, which were carried out until the 1960s. Since then, the modernisation of agricultural practices have led to the exclusion of grasslands from the conventional systems of farming, to the point of their abandonment. This has enabled natural succession to take place, leading to the gradual enclosure of open areas by woody species and bracken (*Brachypodium*) (Douville, 2003). This has also coincided with urban development on dikes of the Seine, which the species also rarely occurs on.

The very low number of individuals and the increasing distance between them is further threatening the survival of the species. *Biscutella neustriaca* diverges genetically very quickly, as transportation of the seed by the wind or water is very rare. Furthermore, less than 30% of flowers produce seeds within certain populations (Bernet, 2012). Therefore, as the lifetime of its seed is only 2 to 3 years, the species’ ability to reproduce is endangered (E. Vochelet pers. comm., 2018).

Drivers of improvements: actors, actions and their implementation approaches

Organisers, partners, supporters and other stakeholders

The implementation of conservation measures have been enabled by a strong collaboration between different stakeholders. The Conservatoire d’espaces naturels de Haute-Normandie (CENHN) and the Conservatoire Botanique National de Bailleul (CBNBI) jointly led the two LIFE Projects that have targeted the species: ‘Priority species, chalk grasslands and screen in the lower Seine valley catchment area’ (1999-2003) and ‘Rescue of *Viola hispida* and *Biscutella neustriaca* on the Seine Valley’ (2006-2012) (Annex 2). CENHN was in charge of the general coordination of the project, conception and implementation of field actions (land prospecting, works, grazing, monitoring and communication). CBNBI developed the in-situ and ex-situ conservation plan.

The Laboratory of Genetic and Evolution of Vegetal Population (GEPV) of the Sciences and Technology University of Lille was a major scientific research partner, as they conducted ecological and genetic studies on *Biscutella neustriaca*. This collaboration resulted in the creation of a reinforcement protocol for the species and improved knowledge on its genetic diversity, local adaptation and reproduction pattern.

National and regional governments have also contributed to the conservation of the species through their financial support after the completion of the LIFE Projects (M.H. Petit, pers comm, 2018).

Contributions / relevance of strategic plans

The conservation measures that led to the improved trends reported here were primarily the result of the two LIFE Projects. However, these were followed by the publication of a Conservation Action Plan in 2013, which is playing an important role in initiating long-term conservation actions for the species and obtain funding for them.

Measures taken and their effectiveness

France reported that from 2007 to 2012 the following conservation measures were taken for *Biscutella neustriaca*

Application of conservation measures for *Biscutella neustriaca* for 2007-2012 in France

Measure	Type	Ranking	Inside / outside N2k	Broad evaluation
Establish protected areas/sites	Legal	High	Inside	Enhance
Maintaining grasslands and other open habitats	Contractual Recurrent	High	Inside	Enhance

Source: France Article 17 report 2013 at <https://bd.eionet.europa.eu/article17/reports2012/>

The two LIFE Projects mentioned above aimed at restoring and managing the current habitat of the species as well as establishing new locations by restoring potential sites. In addition, where necessary, individuals were introduced to reinforce sparse populations, or to create new populations. The first LIFE Project, from 1999 to 2003, sought to carry out urgent measures to conserve the calcareous grasslands and scree in the lower Seine basin. The main goal was to reintroduce the required agro-grazing practices in order to increase the suitable habitat for the two targeted endemic species of the area (*Viola hispida* and *Biscutella neustriaca*). Habitat inventories were carried out in the lower Seine and Eure valleys, which provided precise data that helped to guide conservation measures by managers and competent authorities. As a result, 800 ha of grassland was added

to the Natura 2000 network. Habitat restoration was also carried out through brush cutting and subsequent grazing. Monitoring and research was carried out to assess the impacts of the conservation measures, and this showed that the seeds of *Biscutella neustriaca* do not remain viable for long, therefore it is not possible to restore populations on old sites through the use of the remaining soil seed bank (Douville, 2003).

After this first LIFE project, experts realised there was a substantial lack of knowledge regarding the biology of the species as some conservation measures were unsuccessful. Therefore, CENHN cooperated with the laboratory of Lille University to carry out further research into the species' genetics in order to support effective conservation measures. This revealed that there were six populations of the species distributed in two geographical pools on hillsides and alluvium terraces; and indicated that reinforcement of them had to be made with individuals from the same geographic pool (E. Vochelet, pers. comm., 2018).

The second LIFE Project, from 2006 to 2012, aimed to ensure the long-term preservation of *Viola hispida* and *Biscutella neustriaca* in their natural environment. This was achieved through further brush cutting and grazing to enhance and maintain the habitat at the species' existing locations, as well as establishing new locations by restoring potential sites (E. Bernet, pers. comm., 2018). In addition, where necessary, the most vulnerable sparse populations were reinforced through planting, and some new populations were created. To connect isolated populations, scrub clearance and grazing was carried out to create 'ecologic corridors'.

During the LIFE projects, awareness-raising measures were carried out to inform both the general public and private owners of the conservation status of these species. A booklet and brochure were published to communicate the results, and information facilities were set up to ensure that visitors behave appropriately and are properly informed (Douville, 2003).

In 2018, an ex-post visit was carried out on the 2006 LIFE project by the LIFE external monitoring team, 5.5 years after the project's completion². This visit concluded that the project, and subsequent implementation of actions included in the After-LIFE Conservation Plan, had been very effective in bringing back favourable environmental conditions for *Viola hispida* and *Biscutella neustriaca*, thus directly helping to avoid their extinction. Information and awareness-raising among local stakeholders was also deemed successful, as was the collaboration established between scientists and managers.

Since the end of the LIFE Projects, conservation measures have continued to be implemented. From 2015 to 2017, land acquisition and plant location management was carried out to maintain the current populations. The populations in all existing sites have been closely monitored each year and their trends assessed. However, the monitoring protocols are not the same as those used during the LIFE projects and appear to be less precise (E. Vochelet, pers. Comm., 2018).

Funding sources (current and long-term) and costs (one-off and ongoing)

The main costs of achieving the improvement in the trends of *Biscutella neustriaca* have arisen from the two LIFE projects, although they were not solely focussed on the one species. The 1993-2003 project cost €2,332,532, whilst the budget for the 2006-2012 project was €451,678.

Since the end of the LIFE projects, funding has been provided by regional and national governments, through the Regional Directorate for Environment, Development and Housing (DREAL). The long-term management of the sites has also been financed by other sources (FEDER, credits Etat-Région, Ministry of the Environment).

Future actions

In 2018-19, CENHN hopes to update the Conservation Action Plan that was published at the end of the LIFE Project in 2013, with accurate monitoring data from each site, and specific next steps for each site, in line with available funding. The counting methodology for monitoring the plants will be reviewed in order to get comparable figures (for instance, counting plants at the vegetative stage) (M.H. Petit, pers. comm., 2018). It is considered important to further enhance knowledge about the species, to aid its conservation, as the biology of the species is highly specific regarding its reproduction, population dynamics and patterns of dispersion. Therefore, to aid adaptive management, research is to be carried on the individual plants by comparing their responses to differing specific grazing and mowing management regimes (INPN, Cahier d'Habitat Natura 2000).

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http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=313
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Achievements

Impacts on the target species

The two LIFE projects improved knowledge of the species' required conservation measures, improved and increased suitable habitat, and increased the size and genetic diversity of the species' populations through seeding and planting.

In total, there are now seven locations where the plants have viable numbers (more than 50 individuals) exceeding the initial objective of getting six such locations. The project enabled four new locations to be established through seeding and planting of young individuals on screes and grasslands, and four populations of *Biscutella neustriaca* were genetically reinforced. 36 ecological corridors of suitable habitat were created to help join up isolated locations holding the plants.

During the LIFE projects, the population of *Biscutella neustriaca* increased from >1,580 individuals in 2002 to 2,879 between 2007-2008 and more than 4,798 mature individuals in 2012.

Other impacts (e.g. other habitats and species, ecosystem services, economic and social)

As the conservation of *Biscutella neustriaca* (and similar measures for *Viola hispida*) required the restoration and ongoing maintenance of semi-natural grassland habitats in the region, it can be expected that the conservation measures taken benefited the whole ecosystem and many associated species.

Conclusions and lessons learnt

The key targeted conservation measures that led to the improvements

- Targeted scientific research on the species to develop knowledge of its biology.
- Recurring management practices, such as grazing and vegetation cutting and removal to maintain open sunlit areas.
- Acquisition of land to ensure ecological continuity through the creation of ecological corridors of suitable and homogenously managed habitat.
- Management agreements through partnerships with local land owners.
- Agreements with local stockbreeders for grazing to be introduced.
- Introduction of individual plants through ex-situ and in-situ measures.
- Close monitoring of the plant's populations.
- Communication to the general public through outreach materials and large public awareness activities.

Conservation measures that have not been sufficiently effective

- The simple actions of brush removal and grazing did not result in the return of the plants due to the absence of a viable seedbank.
- Some scientific research on the *Biscutella neustriaca* biology was not pursued due to a lack of funding.
- The plant counting protocols have varied, making it difficult to provide accurate comparable data.

Factors that supported the conservation measures

- Availability of funding that could be specifically targeted towards the species' conservation needs, in particular the LIFE Nature programme action grants.
- Collaboration of diverse stakeholders in order to develop scientific knowledge on the species.
- Support from all stakeholders: regional, national and European support.
- As endemic species of grasslands, LIFE Projects increased public awareness on the target species (*Viola hispida* and *Biscutella neustriaca*).

Factors that constrained conservation measures

- Difficulties with obtaining approval from certain land owners to implement conservation measures on their land (grazing, brush cutting or mowing).
- At first, insufficient knowledge of the complex biology of the species hampered conservation measures, but scientific research helped to overcome this.
- Adverse climatic conditions (e.g. a dry spring) partly constrained the success of direct seeding operations.

Quick wins that could be applied elsewhere for the species

- Ex-situ and in-situ introduction and population reinforcement measures.

Examples of good practice, which could be applied to other species

- Targeted expansion of protected areas to secure critical locations for an endangered species.

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Authorship

Prepared by Pauline Cristofini of Deloitte, as part of the European Commission study on identifying the drivers of successful implementation of the Birds and Habitats Directives (under contract ENV.F.1/FRA/2014/0063), carried out by the Institute for European Environmental Policy, BirdLife International, Deloitte, Denkstatt, Ecologic, ICF Consulting Services and PBL Netherlands Environmental Assessment Agency.

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Annex 1. Status of the Biscutelle de Neustrie (*Biscutella neustriaca*) at Member State and biogeographical levels

Favourable	FV	Unknown	XX	Unfavourable - inadequate	U1	Unfavourable - bad	U2
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	2001-06	2007-12				
	Overall	Range	Population	Habitat for the species	Future prospects	Overall
FR (ATL)	U2	FV	U1	U1	XX	U1 (+)
EU overall (ATL)	U2	FV	U1	U1	XX	U1 (+)

Source: Member State Article 17 reports as compiled by ETC-BD on EIONET <https://bd.eionet.europa.eu/article17/reports2012/species/summary/?period=3&group=Vascular+plants&subject=Biscutella+neustriaca®ion=>

Annex 2. LIFE Nature Projects in France that aimed to help conserve the Biscutelle de Neustrie (*Biscutella neustriaca*)

Project Title	Project N°	MS	Type Of Beneficiary
Rescue of <i>Viola hispida</i> and <i>Biscutella neustriaca</i> on the Seine Valley	LIFE06 NAT/F/000137	FR	Park-Reserve authority
Priority species, chalk grasslands and screen in the lower Seine valley catchment area	LIFE99 NAT/F/006332	FR	NGO-Foundation

Source: Life Programme database, projects with *Biscutella neustriaca* listed as a key word