

# NOBANIS – Invasive Alien Species Fact Sheet

## *Anthriscus sylvestris*

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### Species description

**Scientific names:** *Anthriscus sylvestris* (L.) Hoffm., Apiaceae

**Synonyms:** *Chaerofolium sylvestre* (L.) Sch. et Thell., *Chaerophyllum sylvestre* L., *Chaerofolium sylvestre* (L.) Thell., *Cerofolium sylvestre* Besser.

The species can be subdivided into three subspecies: 1) *Anthriscus sylvestris* subsp. *sylvestris*; 2) *Anthriscus sylvestris* subsp. *alpina* (Vill.) Greml. (= *Chaerophyllum alpinum* Vill. = *Chaerofolium sylvestre* var. *alpinum* (Vill.) Thell. = *Anthriscus sylvestris* var. *tenuifolia* DC. = *Anthriscus sylvestris* var. *torquata* W. D. J. Koch p.p.); 3) *Anthriscus sylvestris* subsp. *stenophylla* (Rouy & Camus) Briq. (= *Anthriscus stenophylla* Rouy & Camus = *Chaerofolium sylvestre* var. *stenophyllum* (Rouy & Camus) Thell. = *Anthriscus sylvestris* var. *torquata* W. D. J. Koch p.p. = *Anthriscus torquata* Thomas)

Very similar, closely related and sometimes regarded as a subspecies is *Anthriscus nitida* (Wahlenb.) Hazsl. (= *Chaerophyllum nitidum* Wahlenb. = *Anthriscus sylvestris* subsp. *nitida* (Wahlenb.) Briq. = *Anthriscus alpestris* Wimm. & Grab. = *Anthriscus sylvestris* subsp. *alpestris* (Wimm. & Graeb.) Greml. = *Chaerofolium sylvestre* subsp. *alpestris* (Wimm. & Grab.) Thell. = *Anthriscus torquata* DC. = *Anthriscus alpestris* subsp. *torquata* (DC.) Nyman).

**Common names:** Cow parsley (GB), Wiesen-Kerbel, Wilder Kerbel (DE), Vild Kørvel (DK), Mets-harakputk (EE), Koiranputki (FI), Skógarkerfill (IS), Meza sunburkškis (LV), Krūminis builis (LT), Hundekjeks (NO), Trybula lesna (PL), Hundkex (SE).



**Fig. 1 .** *Anthriscus sylvestris* in its native range in Germany, photo by T. Muer.



**Fig. 2.** *Anthriscus sylvestris* invading Nootka lupin (*Lupinus nootkatensis*) areas in Southwestern Iceland, photo by S.H. Magnusson, June 2003.



**Fig. 3.** *Anthriscus sylvestris* invading abandoned grass fields in Southwestern Iceland, photo by S.H. Magnusson, June 2003.

### **Species identification**

*A. sylvestris* is a perennial 0.3–1.5 m tall rosette plant with a thick tap root up to 2 m long (Grime *et al.* 1988, Spalik and Woodell 1994, Darbyshire *et al.* 1999). The species has alternately arranged, fern-like leaves, and each segment of the leaf is 1.5–5 cm in length. The inflorescence is a compound umbel 20–60 cm in diameter and the flowers are white, 3–6 mm in diameter. The fruits are smooth, lanceolate in shape and around 6 mm long. The fruits are green at the beginning but turn brown when they ripen (Darbyshire *et al.* 1999).

### **Native range**

*A. sylvestris* is native to Europe and temperate Asia. In Europe it is common in most countries, but rare in the Mediterranean region. It is, however, not native to Iceland, the Faroe Islands nor Greenland (Tutin *et al.* 1968, Hultén and Fries 1986, Clapman *et al.* 1987, Baskin *et al.* 2000, Rutkowski 2004, Latvian database on plants – [Anthriscus sylvestris](#)).

### **Alien distribution**

#### **History of introduction and geographical spread.**

*A. sylvestris* has been introduced to several parts of the world. In North America the species is now widely distributed. It is found in eastern and western Canada, in the north-eastern, mid-Atlantic and mid-western USA and in the state of Washington (Darbyshire *et al.* 1999). The species is also found in several countries in the southern hemisphere. *e.g.* in South Georgia, New Zealand and central and southern Africa (Webb *et al.* 1989, Hultén and Fries 1986).

In Europe *A. sylvestris* has also been introduced to the west of its native range. In Iceland the first record is from Akureyri 1927 (Óskarsson 1932).

#### **Pathways of introduction**

*A. sylvestris* may have been spread from its native range with wildflower mixtures or for ornamental purposes.

#### **Alien status in region**

During the last decades, *A. sylvestris* has increased in abundance in many biotopes within its native range in Europe such as hay meadows, roadside verges and on abandoned habitats formerly used for hay production (van Mierlo and van Groenendael 1991, Hansson 1994, Hansson and Persson 1994, Oberdorfer 2001, Zarzycki *et al.* 2002, Rutkowski 2004). The species is widely distributed in Scandinavia, especially in southern Scandinavia (Hultén 1971). In Sweden, it appears to be increasing in species rich nature reserves (Hansson and Persson 1994). In Poland the species has increased its number of stands on the country scale in the last decades and also expanded into new habitats (Zarzycki *et al.* 2002).

Following its introduction, the species has also increased considerably outside its native range (see table 1). In Iceland, the species became widely established during World War II especially around army camps and gardens in Reykjavík south west Iceland. Between 1940 and 1965 it spread very rapidly, reached most parts of the country and became naturalised at several sites (Davidsson 1967). However, it did not become invasive until quite recently (Fig. 1 and 2).

In the Faroe Islands *A. sylvestris* is found in gardens in Thorshavn (Jóhansen 2000) and has naturalised at several sites on the islands (Anna Maria Fosaa, pers. comm.). The species is found

with scattered distribution in SW Greenland (Kenneth Høegh, pers. comm.) but it is not found in Svalbard (Cecilie von Quillfeldt, pers. comm).

Country	Not found	Not established	Rare	Local	Common	Very common	Not known
Denmark					Native		
Estonia					Native		
European part of Russia							
Finland					Native		
Faroe Islands				X			
Germany						Native	
Greenland			X				
Iceland					X		
Latvia					Native		
Lithuania					Native		
Norway						Native	
Poland					Native		
Sweden					Native		

**Table 1.** The frequency and establishment of *Anthriscus sylvestris*, please refer also to the information provided for this species at [www.nobanis.org/search.asp](http://www.nobanis.org/search.asp). Legend for this table: **Not found** –The species is not found in the country; **Not established** - The species has not formed self-reproducing populations (but is found as a casual or incidental species); **Rare** - Few sites where it is found in the country; **Local** - Locally abundant, many individuals in some areas of the country; **Common** - Many sites in the country; **Very common** - Many sites and many individuals; **Not known** – No information was available; **Native** – when a species is native in a country this is indicated in the table under the relevant frequency category.

## Ecology

### Habitat description

In its native range, *A. sylvestris* is found in nutrient rich (Ellenberg value 8) moderately disturbed grassland habitats, such as hay meadows, roadside verges and abandoned hayfields (Grime *et al.* 1988, Parr and Way 1988, Silvertown and Tremlett 1989, van Mierlo and van Groenendael 1991, Hansson and Göransson 1993, Hansson and Persson 1994, Rutkowski 2004). The species grows along hedgerows, woodland- and forest edges and in waste places (Clapman *et al.* 1987) and is commonly recorded in field margins (Marshall 1989).

The species prefers a moist or mesic soil; according to the Ellenberg scale the moisture value is 5, indicating fresh soils of average dampness (Ellenberg 1979). The species is rather shade tolerant and grows under light conditions from semi-shade to fully open sites (Ellenberg values 5–7). These ecological requirements are confirmed by 5-degree Zarzycki's scale used in Poland (Zarzycki *et al.* 2002).

Outside its native range, the species also grows under a range of conditions but thrives best in wet to moist disturbed sites, especially where soils are rich (Darbyshire *et al.* 1999). In Iceland it also invades old patches of *Lupinus nootkatensis* on eroded gravel soils where the lupin has increased the nitrogen status of the soil (Magnússon *et al.* 2004).

### Reproduction and life cycle

*A. sylvestris* reproduces both from seeds and from root buds at the top of the root. The species produces large numbers of small white flowers. Flowering is size dependent and usually takes place in the plant's third or fourth year (Hansson and Persson 1994). The species is andromonoecious, the male and hermaphrodite flowers are on the same plant. The species attracts a wide range of unspecialized insect pollinators (Darbyshire *et al.* 1999). The flower development is centripetal with the outer flowers in the umbellula developing first. The seeds ripen in late June through July and disperse slowly. Seed production of single plants is in the range of 800 – 10,000 (Keller *et al.* 1934 cited in Darbyshire *et al.* 1999, Forurnier 1947 cited in Darbyshire *et al.* 1999). Seeds have no apparent dispersal mechanisms, most of them fall close to the parent plant (Rew *et al.* 1996).

The seeds of *A. sylvestris* are generally short lived. They need a chilling period to germinate (Baskin *et al.* 2000) and most of them survive only for one winter (Grime *et al.* 1988, Thompson *et al.* 1997, Berge and Hestmark 1997). The seeds germinate in early spring and a rosette plant is formed. According to van Mierlo and van Groenendael (1991) the life cycle is as follows: During the first season the rosettes remain in the vegetative phase and form a basal rosette with a taproot. When these rosettes reach a certain minimum size, vernalisation can lead to flowering during the next growing season. After pollination, seeds are produced and the life cycle is completed. After flowering and death of the parent rosette the side rosettes become independent. Sexual and asexual reproduction may thus occur simultaneously.

### **Dispersal and spread**

Once *A. sylvestris* is established in a new area, dispersal can take place by several methods. The seeds have no obvious dispersal mechanisms, and although they may be spread by birds, wind and water, dispersal is primarily mediated by human activities (Darbyshire *et al.* 1999). The spreading along roads, fence-lines and pastures seems to be very effective (Evans *et al.* 2003), but secondary dispersal mediated by agricultural practices, traffic and transport is today probably the most common method (Grime *et al.* 1988, Rew *et al.* 1996, Darbyshire *et al.* 1999). For the city of Prague, Kopecký (1984, cited in Wittig 2004) described how *A. sylvestris* may have spread from natural habitats (riparian margins, forests, forests edges) along rivers and streets which act as a corridor for population expansion into the nitrogen rich habitats of settlements.

## **Impact**

### **Affected habitats and indigenous organisms**

The increase in abundance of *A. sylvestris* within its native range in Europe during the last decades is commonly considered to be related to an increase in nitrogen compounds in the soil (Hansson and Persson 1994, Zigmantas Gudzinskas, pers. comm., Frank Klingenstein, pers. comm.). The effects on diversity seem to vary considerably. In Germany *A. sylvestris* only increases in intensively managed and fertilised meadows due to changes in land use practises. These habitats are already species poor and diversity is therefore little affected (Klingenstein, F. pers. comm.). For some regions it is, however, reported that the species may threaten the local flora worth preserving (Hansson and Persson 1994). The species competes with other plants for light, water, space, and nutrients and the rapid growth of the broad leaves in spring forms a canopy which shades and out competes lower growing species sometimes resulting in an open sward. Therefore, spread of *A. sylvestris* can increase susceptibility of soils to erosion on sloping ground (van Mierlo and van Groenendael 1991).

In Iceland *A. sylvestris* has invaded several nutrient rich habitats including abandoned hay fields, river banks and Nootka lupin patches (Figs.1 and 2) (Magnússon *et al.* 2003). With the present

climatic conditions and reduced livestock grazing intensity in Iceland, the spread and abundance of this plant is likely to increase considerably during the next decades, especially in areas where the Nootka lupin has increased soil fertility. *A. sylvestris* communities in Iceland are so recent that their succession is not known. However, experience from Central Europe shows that vegetation types containing the species are susceptible to invasion of alien species (Pysek and Pysek 1995, Godefroid and Koedam 2003). Therefore, sites grown with *A. sylvestris* can be future spots for invasion of non-native species, especially those with high demand for nutrient rich soils.

### **Genetic effects**

No genetic effects have been reported.

### **Human health effects**

The species has been reported to have been used in several ways as a medicine (see Darbyshire *et al.* 1999).

### **Economic and societal effects (positive/negative)**

Positive effects of *A. sylvestris* are reported both within and outside its native range. In Europe, it has been used for medical purposes (see above). In America, the Faroe Islands, Greenland and Iceland, the species has been cultivated in gardens (Darbyshire *et al.* 1999, Jóhansen 2000, Kenneth Høegh, pers. comm., Eyþór Einarsson, pers. comm.). The plant is palatable to livestock, especially the young foliage (Hansson and Persson 1994, Darbyshire *et al.* 1999). The beneficial effects of the species for grazing or for fodder production are, however, limited and may even be negative as the species may reduce other more valuable species (Darbyshire *et al.* 1999, [Weed alert](#), Nova Scotia Noxious Weeds) Stems of *A. sylvestris* have also been reported to dry slowly, which interrupts hay making

Other negative economic and societal effects of *A. sylvestris* are related to its competitive ability in meadows and pastures where it increases at the expense of other species. This has been reported both within (Hansson and Persson 1994, see also Parr and Way 1988) and outside its native range (Darbyshire *et al.* 1999, Guide to weeds in British Columbia).

The species is susceptible to several viruses and can act as a host for viral diseases that infect other plants in the same family; including carrots, parsnips, and celery (see Plant viruses online, [VIDE database](#)).

## **Management approaches**

### **Prevention methods**

Within its native range in Europe, no prevention methods have been described for the species. In Iceland, there are at present no regulations or official guidelines in place with respect to *A. sylvestris*. In general, care should be taken in disposal of garden waste infested with the species, as this may facilitate spreading of the species into new areas. Care should also be taken with regards to all transport of soil and plant material from sites with *A. sylvestris* to uncolonized areas. As a prevention measure for the spread of the disease sheep scrapie in Iceland, all transport of hay, manure and soil is prohibited between farms in infested versus healthy areas (see Icelandic Ministry of Agriculture on [sheep scrapie](#) (in Icelandic)). This may delay the spread of *A. sylvestris* within the country.

In several US states and in Canada, *A. sylvestris* is regarded as a weed (Darbyshire *et al.* 1999). Therefore, general information of the species together with description of prevention methods have been published on the Internet (see links below).

### **Eradication, control and monitoring efforts**

Mechanical control of the species is possible but it is very labour and cost-intensive. Newly infested sites can be controlled by pulling out small plants or by cutting the plants before they set seeds. If seeds are developed, it is effective to burn the growing area or kill seeds and plants in other ways.

In Europe, cutting has been an important control practice for *A. sylvestris* (see Darbyshire *et al.*). However, studies show that the effects of cutting are variable and can range from causing an increase in the population (Hansson 1994), having little significant effect (Hansson 1994, Hansson and Persson 1994) to causing a decrease in the population (Grime *et al.* 1988, Parr and Way 1988, van Mierlo and van Groenendael 1991). The frequency and timing of cutting seem to be very important for the results (Hansson 1994, Darbyshire *et al.* 1999). Cutting early in the season, particularly on nutrient rich and disturbed soils, may increase the population through inducing side rosette development and enhanced survival of seedlings (Hansson 1994). In contrast, repeated cutting (three or more times per year) will reduce the abundance of *A. sylvestris*, at least in the short term (Parr and Way 1988, Hansson and Persson 1994, Darbyshire *et al.* 1999). The competitiveness of the species increases with nutrient status of the soil. Therefore, application of artificial fertilizers or other nutrient inputs should be avoided.

*A. sylvestris* is palatable, especially in the rosette stage (Wagner 1967 cited in Hansson and Persson 1994), and is eaten by cattle and rabbits. It has been reported to be intolerant to heavy trampling (Grime *et al.* 1988), and cattle grazing has been found to suppress it (Hansson 1994, Darbyshire *et al.* 1999). The effects of sheep grazing, as a means of control, are unclear. In a study in northern Finland, sheep grazing in semi-natural meadows did not have significant effect on the abundance of the species (Hellström *et al.* 2003). In Iceland the species does generally not colonize sheep grazing areas but has on the other hand been actively spreading into areas where sheep and other livestock grazing is no longer practised.

In Europe and in North America experiments have been carried out to control *A. sylvestris* with herbicide application. Although the results vary, the species seems to be resistant to many types of herbicides (Darbyshire *et al.* 1999). However, good results have been obtained with *dichloroprop*, applied during early flowering, or *chlorfurecol-methyl* together with *maelic hydrazide*, applied in the spring (Williams 1984 cited in Darbyshire *et al.* 1999). Also *picloram* and *2,4-DP* have been found effective (see Darbyshire *et al.* 1999). In addition, effective control has been reported by applying *dicamba* (3,6-dichloro-2-methoxybenzoic acid) when plants are in the vegetative stage (see: Crofts and Jefferson 1999, see also [Article on wild Chervil](#) – prepared by Sid Bosworth, University of Vermont).

### **Information and awareness**

In Iceland the general public has been informed and warned about the species in published papers (Einarsson 1997, Kristinsson 1997) see also Icelandic Institute of Natural History, [homepage on \*A. sylvestris\*](#) There are however, no other information reports available or awareness campaigns in place regarding this species in Iceland.

### **Knowledge and research**

None reported.

## Recommendations or comments from experts and local communities

None reported.

## References and other resources

### Contact persons

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### Links

Latvian database on plants – [Anthriscus sylvestris](#)

[Guide to Weeds in British Columbia](#)

Nova Scotia Noxious Weeds - [Wild Chervil Anthriscus sylvestris \(L.\) hoffm.](#)

[Article on wild Chervil](#) – prepared by Sid Bosworth, University of Vermont

Icelandic Institute of Natural History, [homepage on A. sylvestris](#) (in Icelandic)

Weed alert from the government of British Columbia [on A. sylvestris](#)

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