GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: ***Frangula alnus***

Frangula alnus 简体中文 正體中文

System: Terrestrial

Kingdom	Phylum	Class	Order	Family
Plantae	Magnoliophyta	Magnoliopsida	Rhamnales	Rhamnaceae

Common name aulne noir (English), nerprun bourdaine (English), glossy buckthorn (English), European alder buckthorn (English), black buckthorn (English), frangula (English), alder buckthorn (English)

Synonym *Rhamnus frangula* , L.
Rhamnus frangula var. angustifolia ,Loud.
Rhamnus frangula subsp. columnaris ,hort.

Similar species *Rhamnus cathartica*

Summary Frangula alnus, commonly known as glossy buckthorn, is a shrub that can grow to seven metres and is sometimes considered a tree. Frangula alnus typically inhabits wet, shaded and acidic soils. It can grow in soils of any texture. In North America, wetlands are invaded by Frangula alnus. Frangula alnus is also a typical woody pioneer during the succession of drained mires and conveyed wet meadows, being overgrown and substituted by forest vegetation. The invasion of Frangula alnus into forests and riparian areas in the North American region has alarmed foresters and conservationists. Frangula alnus attains high cover in the understorey and tree seedling density and diversity is known to be inversely related to buckthorn basal area. Frangula alnus can also out-compete and exclude native woody species.

view this species on IUCN Red List

Species Description
Converse (1984) states that, \"*F. alnus* is a shrub or small tree growing to seven metres (Rosendahl 1970). Brown-green branches have elongate lenticels, and may be slightly pubescent (Soper and Heimburger 1982). Thin glossy leaves are obovate or elliptic with entire or obscurely crenulate margins. They are glabrous or slightly pubescent beneath and are usually alternate. Yellowish-green five parted perfect flowers are born in sessile umbels.\"
The Virginia Tech Forestry Department (2004) states that, \"the leaves of *F. alnus* are alternate, simple, elliptical to oblong or obovate, entire, veins are parallel but near edges of leaf turn and follow the edge, shiny green above, may be pale pubescent beneath, petiole short and pubescent. The flower is very small and inconspicuous, pale yellow green, bell-shaped, appearing in leaf axils in late spring after the leaves. The fruit is a small round drupe at first red but later turning black, juicy flesh, ripens in late summer. The twig of *F. alnus* is slender, reddish brown with gray pubescence; buds naked and tan-fuzzy brown; 3 bundle scars, lacking thorns. The bark of this species is smooth gray-brown with a few obvious slightly raised lenticels, may become shallowly fissured on larger stems.\"

Notes
Hampe and Bairlein (2000) state that, \"Pollen records show that the alder buckthorn *F. alnus* (Miller) was one of the first bird-dispersed woody plants that recovered much of temperate Europe from Mediterranean refugia in the early Holocene (Moe 1984).\"

Lifecycle Stages
(North American region): Converse (1984) states that, \"*F. alnus* flowers can blossom on current season's growth (Gleason and Cronquist 1963). The subglobose drupes of *F. alnus* are red turning to black. They ripen in July through August and have two or three ungrooved seeds (Fernald 1950). Fruit of this species are efficiently dispersed usually by starlings, blackbirds, woodducks, elk, mice (Ridley 1930), cedar waxwings, robins and blue jays. Mice are also seed predators (Godwin 1936). Apparently, few bird species readily tolerate the anthranquinones (emodin) present especially in the immature fruit, preventing premature dispersal (Trail and Dimond 1979). Fresh fruit of *F. alnus* floats 19 days, and dry seed floats one week (Ridley 1930). This dispersal could be significant in areas of frequent and extensive fall and winter flooding. Although seedlings invade apparently stable habitats, recruitment is most successful where there is ample light (Leitner 1984, Kowlaski 1968) and exposed soil (Andreas 1983). *F. alnus* has a long growing seasons, rapid growth rate, and resprout vigorously following top removal. *F. alnus* rapidly form dense, even-aged thickets. In an open site, buckthorn establishment is followed by lateral crown spread.\"

Uses
Gutiérrez and Thomas (2000) state that, \"The British distribution of the butterfly *Gonepteryx rhamni* (L.) follows closely the range of its natural host plants, *Rhamnus catharticus* L. and *F. alnus* Miller, suggesting that it is one of the few British butterflies that has a host-limited distribution. *F. alnus* bushes were planted in the area in about 1986, allowing the hypothesis that *G. rhamni* would expand its range following increased host plant availability to be tested.\"
Catling and Porebski (1994) state that, \"Berries of *F. alnus* are eaten by American Robins, Bohemian Waxwings, Cedar Waxwings, Rose-breasted Grosbeaks and Starlings. The shrub probably has a number of different avian and mammalian dispersal agents.\" Converse (1984) states that, \"*F. alnus* is recommended for reforestation of degraded European sites having water-logged, podzolized clay soils low in available nutrient and humus (Ziani 1957). In North America they are cultivated for hedges (Wyman 1971), forestry uses, and wildlife habitat.\"

Habitat Description
Hampe and Bairlein (2000) state that, \"In temperate Europe *F. alnus* preferably grows on acid, moist soils and can build up plentyful populations in the understorey of light forests, at forest edges or on fens (Godwin 1936, 1943, Ellenberg 1996). The species is a typical woody pioneer during the succession of drained mires and conveyed wet meadows, being overgrown and substituted by forest vegetation. The south Iberian *F. alnus baetica* is restricted to locations with weak summer drought (Valde´s *et al.* 1987). Its major populations grow in the understory of gallery forests along virtually year round active creeks in the coastal mountain ranges of southern Andalusia.\" Converse (1984) states that, \"*F. alnus* typically inhabits wetter, less shaded, and more acidic soils than its similar relative *R. cathartica* (Tansley 1968). It grows in soils of any texture (Sukachev 1928). Habitats include alder thickets (Eldin 1968, Tansley 1968) and calcareous wetlands (Godwin and Bharucha 1932, Tansley 1968). Heath-oak woods (Tansley 1968), pine (Kornev 1952) and spruce (Sukachev 1928) woods frequently have *F. alnus* in the understory. Naturalized habitats include pastures, fencerows, roadsides, and slopes of ravines. North American wetlands invaded by *F. alnus* include wet prairies, marshes, calcareous fens (Bacone 1983), sedge meadows (McClain 1983, Packard 1983), sphagnum bogs (Howell and Blackwell 1977, Swink 1974) and tamarack swamps (Hasselkus 1983, Swink 1974).\"

Reproduction
Medan (1994) states that, \"Various aspects of the reproductive biology of the perennial hermaphrodite *F. alnus* MILL. were studied in two populations located in the province of Cadiz, southern Spain. Flowering extends from the second week of May to early July. The small, white-greenish, entomophilous flowers are incompletely protandrous and last 8-10 days, but pollen transfer takes place only on days 1-3. A very weak, pleasant odour along with nectar and pollen attract over 45 insect species, of which 21 are probable pollinators. These are mainly Diptera but also include Hymenoptera and the unusual (as flower visitors) Mecoptera. Reproduction is exclusively sexual and strictly xenogamous, with pollen transfer depending solely on insect vectors. Although flower morphology and individual flower phenology do not fully prevent self-pollination, and geitonogamy can easily take place, the level of autogamy was negligible. Therefore, some self-incompatibility mechanism is operative in this species. Only 2.8% of open-pollinated flowers set fruit. At the flower level, fruit initiation was apparently limited by availability of cross-pollen, which in turn seemed influenced by the structure of the population. The seed/ovule ratio in ripe fruits was ca. 50%. Predispersal (maternal) reproductive success (percent ovules becoming filled seeds) was 1.42%. For mature individuals this corresponded to ca. 430 to 1560 potential offspring per year.\"

General Impacts
Fagan and Peart (2004) state that, \"The invasion of *F. alnus* into forests and riparian areas in the Northeast has alarmed foresters and conservationists (Reinartz, 1997; Post *et al.* 1989 and Converse, 1984). Buckthorn attains high cover in the understory of closed white pine (*Pinus strobus* L.) forests, especially in gaps. Tree seedling density and diversity are known to be inversely related to buckthorn basal area, implying that buckthorn lowers the survival or germination rates of tree seedlings (Frappier *et al.* 2002). Fagan and Peart (2004) state that, \"Forests dominated by white pine are common throughout New England and are economically important sources of timber. Because *F. alnus* has frequent seed crops in sunny areas and can form seed banks in nearby forests (Frappier *et al.* 2002), it is likely to continue increasing in pine forests in the northeastern US for the foreseeable future. White pine does not regenerate under a closed canopy.\"
In the study conducted by Fagan and Peart (2004), they state that, \"*F. alnus* in the forest understory clearly reduced the extension and radial growth of saplings of all species. *F. alnus* has an extensive shallow root system (M.E. Fagan, pers. obs.) and may be a strong below-ground competitor. *F. alnus* altered the relative abundance of seedlings towards a shade-tolerant species (sugar maple). *F. alnus* reduced the performance (growth and/or survival) of all tree seedlings, except for sugar maple. The survival of the most shade-intolerant species, white pine, was so reduced by *F. alnus* cover that pine survival to sapling size beneath buckthorn is highly unlikely. Removal experiments and surveys by Frappier *et al.* (2002) also indicate that glossy buckthorn reduces the diversity and density of tree seedlings.\"
Converse (1984) states that, \"*F. alnus* affects the survival of co-occurring species. Other woody plants such as *Viburnum opulus* L. (in Europe) and *Betula pumula* L. may be replaced by *F. alnus*, or are unable to invade *F. alnus* thickets (Godwin 1936, Lovely 1982).\" Catling and Porebski (1994) state that, \"Currently in some areas of Ontario, *F. alnus* comprises more than 90% of the green biomass over areas of several acres and it has become a major component of regionally and provincially significant plant communities.\"
Converse (1984) states that, \"In addition to naturalized habitats, these species are problems in parts of some natural areas. *F. alnus* sometimes invades similar woodland habitats (Brue 1980), but more often invades wetlands that are comparable to its European wetland habitats.\" The author states 3 other possible reasons why *F. alnus* may have an easier time invading wetland habitats. These include, \"Acidification of surface peat of calcareous fens (Godwin 1974); Exposed mineral soil providing a seed bed (Andreas 1983); and Fire supression and cessation of routine mowing (Godwin 1936, Curtis 1946, Vogl 1969, Godwin et al. 1974, White 1965, Zimmerman 1978, Moran 1981, Gawler 1983).\"

Management Info
For details on physical, chemical and biological control of this species please read our pdf file on *management information*.

Principal source: Converse, 1984 Element Stewardship Abstract for *Rhamnus cathartica*, *Rhamnus frangula* (syn. *Frangula alnus*)

Compiler: National Biological Information Infrastructure (NBII) & IUCN/SSC Invasive Species Specialist Group (ISSG)

Review: Liam Heneghan Associate Professor of Environmental Science Co-Director, Insititute for Nature and Culture DePaul University Chicago USA

Pubblication date: 2005-08-29

ALIEN RANGE

[4] CANADA

[23] UNITED STATES

BIBLIOGRAPHY

14 references found for **Frangula alnus**

Managment information

Canadian Wildlife Services. 2003. Glossy buckthorn (*Rhamnus frangula* L.). Species Fact Sheet.
Summary: Information on description, economic importance, distribution, habitat, history, growth, and impacts and management of species.
Available from: http://www.cws-scf.ec.gc.ca/publications/inv/p4_e.cfm [Accessed 24 August 2004]

Catling, P. M., and Z. S. Porebski. 1994. The history of invasion and current status of glossy Buckthorn, *Rhamnus frangula*, in southern Ontario. Canadian Field Naturalist 108 (3): 305-310 [Accessed 24 August 2004]
Summary: Information on description, economic importance, distribution, habitat, history, growth, and impacts and management of species.

Converse, C. K. 1984. Element Stewardship Abstract for *Rhamnus cathartica*, *Rhamnus frangula* (syn. *Frangula alnus*). The Nature Conservancy.
Summary: Information on description, economic importance, distribution, habitat, history, growth, and impacts and management of species.
Available from: http://tncweeds.ucdavis.edu/esadocs/documnts/franaln.html [Accessed 27 July 2004]

Fagan, M. E., and D. R. Peart. 2004. Impact of the invasive shrub glossy buckthorn (*Rhamnus frangula* L.) on juvenile recruitment by canopy trees. Forest Ecology and Management 194: 95-107.
Summary: Information on description, economic importance, distribution, habitat, history, growth, and impacts and management of species.

Gutierrez, D., and C. D. Thomas. 2000. Marginal range expansion in a hose-limited butterfly species *Gonepteryx rhamni*. Ecological Entomology 25: 165-170
Summary: Information on description, economic importance, distribution, habitat, history, growth, and impacts and management of species.

Haber, E. 2001. Invasive Plant Data Summary and Control Options: Glossy Buckthorn. National Botanical Services, Ottawa, Canada. ehaber@magi.com.
Summary: Information on description, economic importance, distribution, habitat, history, growth, and impacts and management of species.
Available from: http://24.114.142.233/nbs/ipcan/glo_buck.html [Accessed 24 August 2004]

Hampe, A., and F. Bairlein. 2000. Modified dispersal-related traits in disjunct populations of bird-dispersed *Frangula alnus* (Rhamnaceae): a result of its Quaternary distribution shifts?. Ecography 23: 603-613
Summary: Information on description, economic importance, distribution, habitat, history, growth, and impacts and management of species.

Hampe, A., J. Arroyo, P. Jordano, and R. J. Petit. 2003. Rangewide phylogeography of a bird-dispersed Eurasian shrub: contrasting Mediterranean and temperate glacial refugia. Molecular Ecology 12: 3415-3426
Summary: Information on description, economic importance, distribution, habitat, history, growth, and impacts and management of species.

IPANE (Invasive Plant Atlas of New England). 2001. *Frangula alnus* (Glossy buckthorn, European alder buckthorn). University of Connecticut.
Summary: Information on description, economic importance, distribution, habitat, history, growth, and impacts and management of species.
Available from: http://webapps.lib.uconn.edu/ipane/browsing.cfm?descriptionid=21 [Accessed 24 August 2004]

General information

ITIS (Integrated Taxonomic Information System). 2004. Online Database *Frangula alnus*
Summary: An online database that provides taxonomic information, common names, synonyms and geographical jurisdiction of a species. In addition links are provided to retrieve biological records and collection information from the Global Biodiversity Information Facility (GBIF) Data Portal and bioscience articles from BioOne journals.
Available from: http://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=504744 [Accessed March 2005]
Medan, D. 1994. Reproductive biology of *Frangula alnus* (Rhamnaceae) in southern Spain. Plant Systematics and Evolution 193(1-4): 173-186
Summary: Information on description, economic importance, distribution, habitat, history, growth, and impacts and management of species.
USDA-GRIN (Germplasm Resources Information Network). 2004. *Frangula alnus*. National Genetic Resources Program [Online Database] National Germplasm Resources Laboratory, Beltsville, Maryland.
Summary: Information on common names, synonyms, and the distributional range of species.
Available from: http://www.ars-grin.gov/cgi-bin/npgs/html/tax_search.pl?Frangula+alnus [Accessed 24 August 2004]
USDA-NRCS (Natural Resource Conservation Service). 2004. *Frangula alnus*. The PLANTS Database Version 3.5 [Online Database] National Plant Data Center, Baton Rouge, LA.
Summary: Available from: http://plants.usda.gov/java/nameSearch?mode=Scientific+Name&keywordquery=Frangula+alnus&go.x=9&go.y=12 [Accessed 24 March 2006]
Virginia Tech Forestry Department. 2004. Glossy buckthorn Rhamnaceae Frangula (*Rhamnus alnus*. Virginia Tech Dendrology Homepage.
Summary: Information on description, economic importance, distribution, habitat, history, growth, and impacts and management of species.
Available from: http://www.cnr.vt.edu/dendro/dendrology/Syllabus2/falnus.htm [Accessed 24 August 2004]