

European alder

Alnus glutinosa (L.) Gaerth.

Synonyms: *Alnus alnus* (L.) Britt., *Betula alnus* Linnaeus var. *glutinosa* Linnaeus, *Betula glutinosa* Linnaeus

Other common names: black alder, European black alder

Family: Betulaceae

Invasiveness Rank: 61 The invasiveness rank is calculated based on a species' ecological impacts, biological attributes, distribution, and response to control measures. The ranks are scaled from 0 to 100, with 0 representing a plant that poses no threat to native ecosystems and 100 representing a plant that poses a major threat to native ecosystems.

Description

European alder is a rapidly growing shrub or tree. Trees have long trunks and narrow crowns that reach heights of 18 to 21 meters. Trees are typically mature at 60 years but can live for up to 150 years. Bark of young European alder is dark brown and smooth. It becomes darker, more fissured, and rougher with age. Young twigs are triangular in cross-section and green to reddish brown with prominent yellow-brown lenticels. Leaf buds are dark purple and stalked. Leaves are folded in bud and glutinous when young. Leaves are dark green, circular, and 7 to 12 cm long with toothed margins and notched apexes. Tufts of hair are present in the angles of the veins on the lower leaf surfaces. Long, drooping, green or purplish male catkins are found in clusters of two to five at the ends of branches. Erect, ovate female catkins enlarge to 2½ cm in length and are found in clusters of 2 to 12 on lateral shoots adjacent to the male catkins. Scales are persistent and blacken after the nutlets fall. Fruits are brown, compressed, and one-seeded with lateral corky outgrowths (McVean 1953, Gubanov et al. 2003, USDA 2006).



Foliage of *Alnus glutinosa* (L.) Gaerth. Photo by L. Mehrhoff.

Similar species: European alder is similar to the native shrub alders found along the streams in the Pacific Northwest. Unlike native alders, European alder has a notch at the apexes of its leaves (Gubanov et al. 2003).

Ecological Impact

Impact on community composition, structure, and interactions: European alder has been found to be associated with nitrogen-fixing actinomycetes and mycorrhizal fungi (Hall et al. 1979). A portion of this fixed nitrogen becomes available for other species. European alder provides food for deer, rabbits, hares, and several bird species. Dozens of insects and diseases have been observed in association with European alder, although few cause serious damage. European alder hybridizes readily with many other alders, and it improves the suitability of earthworm habitats (Funk 1953, McVean 1953).

Impact on ecosystem processes: European alder is a pioneer species capable of colonizing exposed soil. It produces copious litter and fixes nitrogen (Funk 2005, USDA 2006).

Biology and Invasive Potential

Reproductive potential: European alder reproduces almost entirely by seeds. The average number of seeds per tree is 240,000. Root suckers are rare. Fallen green branches have been observed beginning to take root in a soft swamp in Britain (McVean 1953).

Role of disturbance in establishment: European alder is a pioneer species that readily colonizes open ground.

Potential for long-distance dispersal: Wind dispersal occurs but is not very effective. Fruits float and are therefore efficiently dispersed by flowing water or by wind drift over standing water. Dispersal by birds is possible, although birds generally split seeds open and consume the embryos (McVean 1953).

Potential to be spread by human activity: European alder has been recommended for coal mine remediation (Funk 2005). It has escaped from reclaimed mine soils and now grows naturally in surrounding areas.

Germination requirements: Seeds can germinate immediately after they are shed, but stratification for six weeks enhances germination rates. Optimum germination occurs at 25°C and pH 4 and takes place in light or darkness. Newly germinated seedlings are sensitive to low soil oxygen and drought (McVean 1953). Germination of alder seeds is suppressed by the presence of tannins in alder litter (McVean 1955).

Growth requirements: European alder is adapted to all soil textures. It grows well on acidic and intermittently moist soils; growth is reduced under alkaline or neutral conditions. Optimum soil pH for nodulation appears to be between 5.5 and 7. The plant is hardy to winter temperatures of -33°C but requires 130 frost free days for successful growth and reproduction. European alder is intolerant of shade (Funk 2005, USDA 2006).

Congeneric weeds: No other *Alnus* species are known to occur as weeds in North America (USDA 2006, Invaders 2010).

Legal Listings

- Has not been declared noxious (but is considered invasive in TN and WI)
- Listed noxious in Alaska
- Listed noxious by other states
- Federal noxious weed
- Listed noxious in Canada or other countries

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Distribution and abundance

European alder grows in stream banks and lake shores in Europe (Gubanov et al. 2003, McVean 1953).

Native and current distribution: European alder has a broad native range that includes most of Europe, except the Arctic, and extends into North Africa and Asia. It is naturalized throughout the northeastern U.S. and maritime Canada (Funk 2005, McVean 1953). European alder has not been documented from Alaska (Hultén 1968, AKEPIC 2010, UAM 2010).

Management

Mechanical or chemical methods can be used to control European alder (USDA 2006).