In recent years, an ancient crop called Sea Buckthorn has proven very useful in landscape management. In addition, it tastes good and is good for you.

THE PLANT AND ITS DISTRIBUTION

Sea Buckthorn (Hippophae rhamnoides) is native to Eurasia, and is mainly known in North America as an attractive ornamental shrub. It has silvery deciduous leaves and colourful orange berries that persist most of the winter. The name is from its habit of growing near the sea, and from the possession of many spines or thorns that are reminiscent of some buckthorn species (of the genus Rhamnus). Plants typically grow 2-4 m (6½-13 feet) in height, although some in China have reached 18 m (59 feet), and others grow no higher than 50 cm (20 inches). There are both male and female plants; the latter develop berries that are round to almost egg-shaped, and up to 1 cm (3/8 inch) long. The fruit is usually orange, but yellow and red fruits also occur. Unlike the majority of fruits that fall away from the maternal plant at maturity, the Sea Buckthorn berries remain on the bushes all winter until eaten by birds. The fruits have a distinctive sourish taste and a unique aroma reminiscent of pineapple. Indeed, in Belarus the fruit juice is known as Russian pineapple.

All of the species of the genus Hippophae are native to Eurasia and are called sea buckthorns. Exactly how many species there are is unclear. The most widespread, H. rhamnoides, has been divided into approximately eight geographically separated subspecies, but some specialists think that some of these deserve the rank of species. Whether species or subspecies, some are restricted to relatively small geographic areas. For example, the unusually hairy H. gyantsensis occurs only in a restricted portion of Tibet adjacent to Sikkim.

ECOLOGY

Sea Buckthorn is a colonizer of open habitats. The European plants are typically found on slopes, riverbanks, and seashores. Over most of their natural distribution, the plants receive 30-40 cm of precipitation annually. The three European subspecies of H. rhamnoides are widespread, generally in low altitude areas under 2,000 m (about 6,500 feet). In contrast, most Asian representatives of the genus are montane and rarely found below 3,000 m (about 10,000 feet).

Sea Buckthorn has a highly efficient relationship with a bacterium of the genus Frankia, which belongs to a primitive class of bacteria called the Actinomycetes. This relationship (similar to that of the Pea family and the relatively advanced bacteria of the genus Rhizobium) allows it to convert atmospheric nitrogen to a form that can be used for nutrition. Only about two dozen other plant genera have developed such nitrogen-fixing relationships with the long, thread-like Actinomycetes. The resulting improved root growth enhances the entire soil ecosystem: there is more organic matter, more oxygen, and more soil organisms, which means more soil biodiversity.
For promoting wildlife, Sea Buckthorn may be very valuable, especially in its native range. Many animals use it for food and shelter. In the Canadian prairies, the shrubs provide valuable habitats for the native Sharptail Grouse. Various birds have been shown to be effective at distributing the seeds of Sea Buckthorn. Germination of the seeds is six times greater when they have passed through a bird’s gut.

While Sea Buckthorn is useful for promoting ecosystem welfare there is concern about its invasiveness, particularly in the British Isles. Here it is dominating some dune systems at the expense of a variety of native species. The dominance is apparently tied to the decline of rabbits that used to eat the young plants and shoots. The decline of rabbits was in turn, due to myxomatosis.

**ECONOMIC VALUE**

**As nutritious food:** The genus name *Hippophae* is classical Latin for “shining horse,” a name that was coined in ancient times after it was noted that feeding the leaves to horses improved their health and made their hair shiny. Sea buckthorn leaves contain considerable protein (averaging 15%), and can be used as livestock and pet food, and the fruits are among the most nutritious of all berries. They are rich in a variety of antioxidant chemicals (vitamins C and E; several carotenoids, including beta-carotene (pro-vitamin A); flavonoids; certain enzymes, and other substances). The berries are too acidic to eat fresh for most palates, but make excellent juice, jellies, marmalades, sauces, and liqueurs. The juice may be used by itself, or blended with other juices. The flavour has been likened to passionfruit.

In Eurasia, where Sea Buckthorn is one of the hardiest and most widely grown of northern fruits, the berries have been used as food for centuries, and possibly long before then. However, selection of improved fruit varieties has only been carried out for the past 60 or so years. Cultivated varieties have been released from the former U.S.S.R., Mongolia, the former East Germany, and Finland, and today breeding work is being conducted in Russia, China, Scandinavia, Canada, and other countries. In China, fruit is harvested from over one million ha (2.5 million acres) of wild Sea Buckthorn and almost 300,000 ha (750,000 acres) of cultivated plants.

Sea Buckthorn has attracted international attention as a new crop opportunity. It is said to have “momentous economic potential” and is predicted by some as the “next major health food fad.” In Canada, where 182 hectares have been planted, researchers have recently published a grower’s guide and developed a mechanical harvester. In addition, cultivars adapted to Canadian conditions have recently been released.

**As medicine:** Sea Buckthorn has been used medicinally in China for at least 12 centuries, and Sea Buckthorn oil (from the pulp and seeds) is currently used clinically in hospitals in Russia and China. Bioactive oil has also been obtained from the young branches and leaves and has been incorporated into an ointment for treating a wide variety of skin damage, including burns, bedsores, eczema, and radiation injury. For example, in 1986, many of the Chernobyl nuclear disaster victims were treated with Sea Buckthorn. The oil is also taken internally for diseases of the stomach and intestine.

Such strictly medicinal usage has not yet developed significantly in North America. There is, however, interest in the healthful cosmetic properties in North America. The berries are relatively high in essential fatty acids, which are important for the maintenance of a healthy skin. Sea Buckthorn oil absorbs ultraviolet light, and since the oil is also known to be useful for promoting skin health, it is particularly suitable for sun-care cosmetics. The Body Shop chain of stores, well known for its biodiversity-friendly cosmetics, has marketed Sea Buckthorn sunscreen products, both for sun blocking and tan enhancement. The potential of Sea Buckthorn oils for dermatological applications is extremely promising.

**As soil enhancer:** Sea Buckthorn is useful in reclaiming and conserving soil, especially on fragile slopes, due to its extensive root system. Because it is resistant to drought and tolerates soil salinity and low temperatures (to -43°C or -45°F), it is suitable for many situations that are simply too demanding for most plants. Riverbanks, lakeshores, steep slopes, and other susceptible terrain can benefit from the establishment of Sea Buckthorn. Windbreaks made up of Sea Buckthorn are effective at preventing wind erosion in open areas. The spiny shrub has even proven to be beneficial in acting as a barrier to pedestrian traffic, preventing sensitive vegetation from being trampled. Not only does Sea Buckthorn prevent the
loss of soil, but it also improves degraded soils due to its nitrogen-fixing capabilities. Thus, there is reduced need to add fertilizers, which results in less input costs as well as fewer ecological problems.

As pollution reducer: Sea Buckthorn is useful in lessening pollution resulting from erosion of contaminated mine waste, since it can be used to re-vegetate a variety of mine spoils. Because Sea Buckthorn is naturally resistant to pests, it has limited need of pesticides that are potentially damaging to the environment. In parts of North America it has been planted as cover along highways where de-icing salt prevents growth of many other woody plants. Thus Sea Buckthorn helps to prevent erosion and release of pollutants from roadsides.

As a source of firewood: The introduction of Sea Buckthorn in Nepal for firewood has also produced environmental benefits. The Nepalese used to cut tree branches from forest trees for firewood, demolishing the forest and causing severe soil erosion. The quickly re-growing Sea Buckthorn has reduced harvesting pressure on native woody plants. It tolerates cutting while providing erosion control.

As a landscape management tool: China is confronted with grave problems of soil erosion, with 2 million sq km (770,000 square miles) of eroding land. China has estimated its annual soil losses to be around 5 billion tons and the annual loss of cultivated land about 70,000 ha (173,000 acres). The most promising tool to control land degradation in China is re-vegetation, and Sea Buckthorn is one of the species successfully used on a large scale. In northern China it is helping to control desertification, conserve land and water resources, and integrate economic exploitation with ecological rehabilitation. About 1 million ha (2.5 million acres) of Sea Buckthorn have been planted in China, most of it for soil and water conservation.

A living windbreak is a linear arrangement of plants, primarily trees and shrubs, established to reduce harmful effects of strong winds, such as soil erosion. It also helps protect crops, manage snow accumulation, and create wildlife habitat. Plants that serve as windbreaks must be resistant to the drying effects and physical injuries caused by wind, and Sea Buckthorn is well suited to this task. It has been grown on the Canadian prairies since the late 1970s as a shelterbelt. Over 1 million seedlings of Sea Buckthorn have been distributed through the “Shelterbelt Program” of Canada’s Prairie Farm Rehabilitation Administration since 1982.

CONSERVATION

Sea Buckthorn, despite being a common and widespread species, is deserving of conservation measures. Its distribution pattern has been described as “highly fragmented,” i.e. it tends to occur as isolated patches, and these are often genetically distinctive. A recent analysis of Sea Buckthorn genetic resources noted, “The high nutrient and medicinal values of the fruit have led to uncontrolled exploitation and even destruction of Sea Buckthorn resources in some parts of its natural distribution. Thus, protection and preservation of the valuable germplasm have become urgent.” In Hungary, wild Sea Buckthorn is rarely observed, and the plant is protected as an endangered species. Such protection needs to be extended, especially to the Asian Sea Buckthorns, which occupy small distinct ranges. As a fruit crop, Sea Buckthorn requires considerable development, and the wild plants constitute an invaluable resource for selecting superior agricultural plants.

![China, Russia, and Mongolia are the largest producers of Sea Buckthorn commodities. The main product is oil for medical and cosmetic purposes, but 50 different foods are also available. The range of items in Eurasia includes: juice, jellies, liquors, candy, vitamin C tablets, ice cream, tea, biscuits, food colourants, cosmetics, shampoos, and medicines.](http://www.icrts.org/china.htm)

**BELIEVE IT OR NOT**

- It has been estimated that there is enough vitamin C in the berries of the Sea Buckthorn plants of the world to meet the dietary requirements of the entire human population.
- China designated its Sea Buckthorn sports drinks “Shawikang” and “Jianibao” as the official beverages for its athletes at the Seoul Olympic games in 1988, and Russian cosmonauts also were supplied with Sea Buckthorn beverages, to enhance their health and resistance to stress. It has been claimed that Sea Buckthorn was the first fruit juice in space!
- Sea Buckthorn is reputed to have been the favored food of Pegasus, the winged, flying horse of Greek Mythology, commemorated by a large constellation in the Northern Hemisphere.
- “Look around you, Gabrielle. Lush prairie. And those bushes with orange berries? See them, on those dunes? Sea Buckthorn. It grows wild here, and the oil works wonders on horses.” —Xena (television’s Warrior Princess)

**KEY INFORMATION**


International Centre for Research and Training on Sea Buckthorn, http://www.icrts.org/china.htm