

Plant Propagation Protocol for *Betula nana*

ESRM 412 – Native Plant Production

Protocol URL: <https://courses.washington.edu/esrm412/protocols/BENA.pdf>



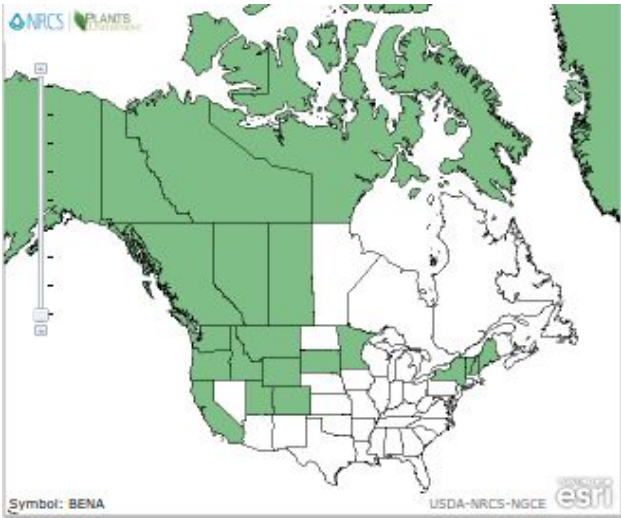
Source: https://plants.usda.gov/java/largeImage?imageID=bena_007_avp.tif

TAXONOMY	
Plant Family	
Scientific Name	Betulaceae ¹
Common Name	Birch ¹
Species Scientific Name	
Scientific Name	<i>Betula nana</i> L. ¹
Varieties	N/A
Sub-species	<i>Betula nana</i> L. ssp. <i>exilis</i> (Sukaczew) Hultén ¹ <i>Betula nana</i> L. ssp. <i>Nana</i> ¹ <i>Betula nana</i> L. ssp. <i>perfiljevii</i> (V.N. Vassil.) Á. Löve & D. Löve [excluded] ¹
Cultivar	N/A
Common Synonym(s)	N/A

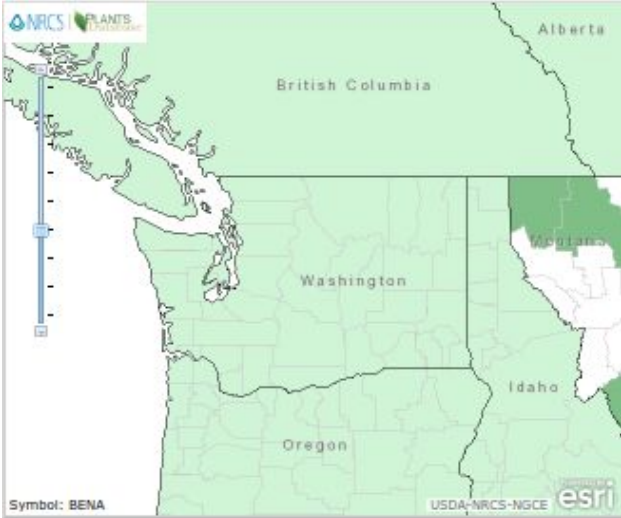
Common Name(s)	dwarf birch ¹ arctic dwarf birch ² dwarf alpine birch ² swamp birch ²
Species Code (as per USDA Plants database)	BENA

GENERAL INFORMATION

Geographical range



Source: <https://plants.usda.gov/core/profile?symbol=bena>



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Ecological distribution	<i>B. nana</i> is circumpolar in distribution. ² It is found throughout the arctic and subarctic regions of the Northern hemisphere, including North America, Europe and Asia. ³ In Alaska, <i>B. nana</i> grows along the coast and in interior mountains ranging from the northern part of southeastern Alaska to the Arctic coast. ²
Climate and elevation range	Specific information on the climate and elevation range of <i>B. nana</i> is unavailable.
Local habitat and abundance	<i>B. nana</i> grows in low, open, mixed-shrub and tussock tundra communities. ² It also occurs in black spruce (<i>Picea mariana</i>) and white spruce (<i>Picea glauca</i>) forests. ²
Plant strategy type / successional stage	N/A
Plant characteristics	<i>B. nana</i> is considered a shrub or sub-shrub. ¹ <i>B. nana</i> is short, ranging from 0.5 to 3 feet (.15-1 m) tall. ² Twigs are resinous and slightly pubescent. ² The thick and leathery leaves range from 0.2 to 0.5 inch (5-12 mm) long, and 0.2 to 0.6 inch (5-16 mm) wide. ² The inflorescences are in catkins. ²
PROPAGATION DETAILS	
Ecotype	N/A
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container (plug)
Stock Type	N/A
Time to Grow	There is no information for the specific time it takes to grow <i>B. nana</i> , though <i>B. nana</i> seedlings are noted to be slow growing. ² In general, <i>Betula</i> species take 12-24 months to grow to a size for outplanting. ⁴
Target Specifications	Specific information on target specifications of <i>B. nana</i> is unavailable.

<p>Propagule Collection Instructions</p>	<p>The seed of <i>Betula</i> species ripen and dry out in ‘cone like’ structures while still on the mother plant, and are dispersed by wind.⁵ This makes them sometimes difficult to harvest, as collection needs to be timed correctly.⁵ <i>B. nana</i> is a prolific seed producer, though plants at high altitudes and in cold climates produce fewer seeds.² While there is no information on the seed collection of <i>B. nana</i> specifically, seeds of <i>Betula</i> species in general should be harvested when the cone like fruits begin to fall apart in autumn, when cool moist weather sets in.⁵</p>
<p>Propagule Processing/Propagule Characteristics</p>	<p>Information for <i>B. nana</i> propagule processing and characteristics is unavailable.</p>
<p>Pre-Planting Propagule Treatments</p>	<p>For <i>Betula</i> species in general, if seed is collected while in cones, the scales/seeds should be rubbed by hand to break them apart.⁵ The seed and scales can be partially separated by fanning, though a fair amount of the cone material will most likely remain.⁵ With small quantities, the entire cone may be broken up and sown.⁵</p> <p>Most seed of <i>Betula</i> species exhibit physiological dormancy.⁵ Storing seeds outdoors in moist sand until the following spring will yield a higher germination rate.⁶ Alternatively, seeds can be placed in cold moist stratification for one to three months at 40° F (4.4° C).⁷</p>
<p>Growing Area Preparation / Annual Practices for Perennial Crops</p>	<p>Specific information on the growing area preparation for <i>B. nana</i> is unavailable. In general, the light, papery seeds of <i>Betula</i> species should be sown thinly on a mixture of sand, peat moss and soil in equal proportions.⁵ Seeds should be pressed into the medium to make full contact,⁵ and then lightly covered in a thin layer of soil and sand just thick enough to cover the seeds.⁶ The soil should not be allowed to dry out until germination.⁶ Germination will begin at a temperature of 75° F (24°C).³</p>

Establishment Phase Details	Successful establishment of <i>B. nana</i> from seed is rare. ² <i>Betula</i> species in general have early spring germination and should be protected from spring frosts. ⁵ Since seeds are small, light, and often hard to separate from their cones during cleaning, oversowing is common. ⁵ In the case of over sowing, seedlings should be thinned and transplanted into their own respective containers. ⁵ As seedlings grow, they should be exposed to more light and air. ⁵
Length of Establishment Phase	Information on the length of the establishment phase is unavailable.
Active Growth Phase	Information on the active growth phase is unavailable.
Length of Active Growth Phase	Seedlings should be left in the original pots for up to 12 months before being outplanted. ⁵
Hardening Phase	Information on the hardening phase is unavailable.
Length of Hardening Phase	Information on the length of the hardening phase is unavailable.
Harvesting, Storage and Shipping	Information on the harvesting, storage and shipping is unavailable.
Length of Storage	Information on the length of storage is unavailable.
Guidelines for Outplanting / Performance on Typical Sites	Information on guidelines for outplanting unavailable.
Other Comments	<i>B. nana</i> also reproduces vegetatively, through layering and by sprouting from their root crown and/or rhizomes. ² However, no information is available for propagating <i>B. nana</i> vegetatively. Some species of <i>Betula</i> , such as <i>B. pendula</i> , may be propagated by grafting, ⁷ but no information is available for the potential of grafting of <i>B. nana</i> .
INFORMATION SOURCES	
References	(1) USDA, Natural Resources Conservation Service. The PLANTS Database- <i>Betula nana</i> https://plants.usda.gov/core/profile?symbol=bena Accessed 2, May 2018.

	<p>(2) Tollefson, Jennifer E. <i>Betula nana</i>. In: Fire Effects Information System, U.S. Department of Agriculture, Forest Service. https://www.fs.fed.us/database/feis/plants/shrub/betnan/all.html Accessed 2, May 2018.</p> <p>(3) Baskin, J. Baskin, C. Propagation protocol for production of Container (plug) <i>Betula nana</i> L. https://npr.rngr.net/renderNPNProtocolDetails?selectedProtocolIds=betulaceae-betula-1431 Accessed 2, May 2018.</p> <p>(4) Arbury, J et al. <i>The Complete Book of Plant Propagation</i>. Reed International Books; 1997.</p> <p>(5) Browse, M. <i>Hardy Woody Plants From Seed</i>. Grower Books; 1979.</p> <p>(6) Gardiner, A. <i>Modern Plant Propagation</i>. Lothian Publishing.;1988.</p> <p>(7) Hartman, Kester. <i>Plant Propagation Principles and Practices</i>. Prentice Hall; 1959.</p>
Other Sources Consulted	<p>Bailey, L.H. <i>The Nursery Manual; A Complete Guide To The Multiplication of Plants</i>. The Macmillan Company; 1950.</p> <p>Beazley, M. <i>Propagation Techniques</i>. Octopus Publishing; 2012.</p> <p>Dirr, Mm Heusser C. <i>The Reference Manual of Woody Plant Propagation</i>. Varsity Press; 1987</p> <p>Greer, L. Dole, J. <i>Woody Cut Stems for Growers and Florists</i>. Timber Press, 2009.</p>

	Trees for Life- <i>Betula nana</i> (Dwarf Birch) https://treesforlife.org.uk/forest/dwarf-birch/ Accessed 7, May 2018.
Protocol Author	Jon Backus
Date Protocol Created or Updated	05/05/18