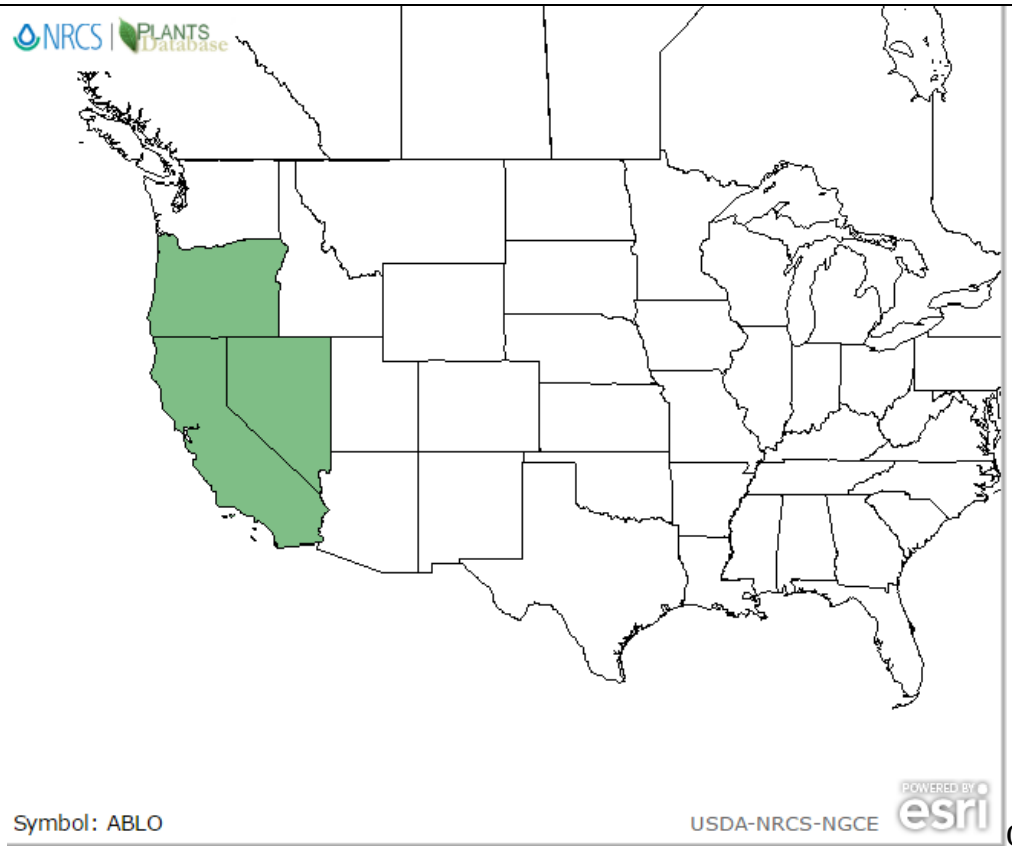
TAXONOMY	
Plant Family	Pinaceae
Scientific Name	Abies *lowiana*
Common Name	White Fir
Species Scientific Name	
Scientific Name	Abies *lowiana* (Gordon & Glend.) A. Murray bis [1]
Varieties	No other Varieties [1]
Sub-species	None [1]
Cultivar	
Common Synonym(s)	Abies *concolor* var. lowiana (Gordon & Glend.) Lemmon[2] Picea lowiana [2]
Common Name(s)	California White Fir, Low's Fir, Pacific White Fir, Sierra White Fir, White Fir[2]
Species Code (as per USDA Plants database)	ABLO
GENERAL INFORMATION	
Geographical range	 Oregon, Nevada, Colorado, Oregon [1]
Ecological distribution	This tree is most often found in conifer forests.
Climate and elevation range	Varies widely.
Local habitat and abundance	The White Fir grows mainly alongside other conifers in its geographical range. It grows in a wide range of elevations. [4]
Plant strategy type / successional stage	A. *lowania* seedlings thrive in partial shade and tolerate full shade. They are often climax components of the forests in which they are found. [7]
Plant characteristics	A. lowiana is a tree that grows as tall as 60 meters and can achieve a diameter of 1.9 meters. The bark is smooth and gray on young plants, but turns brown and develops deep

	furrows as the tree ages. Branches grow perpendicular to the trunk or with a slight droop. It's needle-like leaves are 2-6cm long and 2-3mm wide. The leaves are usually two-ranked, flexible and have very sharp points; they have a strong piney citrus scent. The branches all grow to a similar length, giving the tree a mostly cylindrical shape with a dome-shaped crown. The seed cones are cylindrical, 8-9cm long, and the scales are subtended by pubescent bracts. [3]
PROPAGATION DETAILS	
Ecotype	Collected from specimens located in conifer forests of varying elevations and precipitation.
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Soil Container Trays
Stock Type	
Time to Grow	60-75 days
Target Specifications	Plants should be 6-12 inches and have vigorous root growth at time of transplant.
Propagule Collection Instructions	Seeds can be collected from the ground in the fall. Cones shatter upon maturity.
Propagule Processing/Propagule Characteristics	Seeds should be cleaned and sanitized. Seeds are viable for up to 5 years after collection if kept in a cool, dry environment. Cones produce 185-295 seeds each and shatter when they are mature. The cones are mature by fall [4], which is when collection should take place.
Pre-Planting Propagule Treatments	Seeds should be cleaned and treated in sterilization solution. After a 24-hour areated imbibition, they should be cold stratified at 1 C [6] for 28 days [5] at high humidity.
Growing Area Preparation / Annual Practices for Perennial Crops	Abies *lowiana* grows fastest and healthiest in wet mineral soil [4]. Natural germination occurs in early spring [7]. Seedlings will root well in long, narrow cone containers. Seedlings germinate best when placed on the surface of bare mineral soil.
Establishment Phase Details	Cold weather treatments (1 C) for a short period of time can cause rapid stem growth and bud development in young seedlings. [6]
Length of Establishment Phase	5-15 days
Active Growth Phase	Plants grow actively in warm and moderate weather until dormancy in winter.
Length of Active Growth Phase	Varies by region and elevation, plants become dormant in cold temperatures, but grow actively in warm and moderate weather.
Hardening Phase	Evergreens such as Abies *lowiana* generally have a naturally high tolerance to low temperatures and harden naturally over the course of the year.
Length of Hardening Phase	Plants should be transplanted in mid to late spring, giving them 6-7 months to acclimate and harden.
Harvesting, Storage and Shipping	Seedlings can be stored at 1C for a maximum of 15 days. Any longer and the survival rate for outplants will fall significantly. [6]
Length of Storage	Maximum of 15 days cold storage. [6]
Guidelines for Outplanting / Performance on Typical	This tree begins bearing cones at around 40 years of age. It will grow slowly and eventually reach up to 60m in height and up to 2m. [4]
Other Comments	None.

INFORMATION SOURCES	
References	[1] "Plants Profile for Abies Lowiana (Sierra White Fir)." Plants Profile for Abies Lowiana (Sierra White Fir). USDA NRCS, n.d. Web. 23 Apr. 2016. [2] "ITIS Standard Report Page: Abies Lowiana." ITIS Standard Report Page: Abies Lowiana. ITIS, n.d. Web. 24 Apr. 2016. [3] "Abies Lowiana in Flora of North America" Abies Lowiana in Flora of North America @ Efloras.org. EFloras, n.d. Web. 25 Apr. 2016. [4] Wennerberg, Sarah, and Mark Skinner. "Plant Guide - White Fir." (n.d.): White Fir. USDA, 4 Aug. 2004. Web. 25 Apr. 2016. [5] Kildisheva, Olga A., Donald J. Regan, and Anthony S. Davis. "Seed Treatments for Container Seedling Production at the University of Idaho." *Forest Nursery Notes (Online)* 32.1 (2012): 13. Web. 25 April 2016. [6] Jenkinson, James L.; Nelson, James A.; Huddleston, May E. "Asessing Planting Stock Quality." USDA Forest Service Gen. Tech. Rep. 143 (1993): 23-34. USDA Pacific Southwest Research Station. USDA Pacific Southwest Research Station. Web. 26 Apr. 2016. [7] Zouhar, Kris. 2001. Abies concolor. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2016, April 26].
Other Sources Consulted	None
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