

Pacific Northwest Noble Fir

***The king of wreaths, charms, and
other Christmas ornaments***



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This publication is intended for forest land managers that wish to manage the noble fir resources on the land they manage. Foremost in managing this resource is understanding the products that are desired by the Christmas ornamentals producers, and then manipulating forest stand conditions over time to encourage these bough traits.

Noble fir (*Abies procera* Rehder) is a native tree species in the Pacific Northwest states of Washington and Oregon, growing primarily at higher elevations of the Cascade Range. Characterized by a densely packed deep green to blue needle coloration, arranged flatly on the bottom of branches with all needles cupped upward, this bough product is highly prized by the Christmas ornamentals segment of the special forest products (nontimber forest products) industry. For many forestland managers noble fir is less well known for its value as a timber species than it is as a Christmas tree species and supplier of boughs (Schlosser et al. 1991, Schlosser et al. 1995).

Part of this industry's preference for noble fir comes from the needle retention of these boughs after the product has been manufactured into wreaths and other Christmas ornamentals. In its native range, noble fir occupies high elevation sites above 3,000 feet. These sites are characterized by steep slopes prone to erosion with pronounced summer to winter variation in environmental conditions (Franklin 1983). At these high elevations autumn frosts occur each year as early as October. By the middle of October these frosts have put the tree into dormancy and the needles are "held in place" after harvest. Trees at lower elevations cannot boast this early-in-the-year "needle set" and, therefore, cannot be harvested until well into

November. However, noble fir trees have been successfully planted at lower elevations. Since the mid-20th century, noble fir has been cultivated in regions of western Washington and Oregon at lower elevations (Murray et al. 1991), to areas north of its natural range in Canada (Xie and Ying 1994), and even in northern European plantations (Bang 1979).

In Denmark, noble fir has been cultivated for Christmas ornamentals since the middle of the 19th century (Christensen 1982). Although noble fir and Nordmann's fir (*Abies nordmanniana*) share the lead in that country's Christmas ornamentals segment of the industry (Christmas trees included), the Danes' preference for product characteristics has evolved along a different line than the optimal product characteristics in the U.S.A.'s Pacific Northwest.

In the Cascade Mountain range of the Pacific Northwest, Christmas ornamentals manufacturers favor both Christmas trees and evergreen boughs from their managed noble fir plantations. Typically, a Christmas tree of between 5 and 10 feet will bring the land manager more revenue than the boughs from that tree. However, not all trees can produce a marketable Christmas tree. For these trees, bough production is a viable economic alternative. When managed properly, a wild or planted noble fir stand can yield a commercial bough harvest every three to four years.

Methods

The authors collected information for this report during summer, fall, and winter 2001. A three-page, nine-question survey was mailed to 68 evergreen bough processors in September 2001. Eleven of the surveyed firms agreed to a follow-up interview during the bough harvest season. The lead author for this report met with and interviewed ten of these Christmas ornamentals processors during the end of the wreath-making season (November–December) of 2001 to determine product characteristics they sought. In addition, the lead author worked for approximately 13 years (1976–1989) harvesting various nontimber forest products, culturing Christmas trees, and as a noble fir bough cutter in western Washington. His knowledge of the industry and experiences were incorporated into this bulletin.

Interviews were conducted in Washington and Oregon and centered around determining (1) the characteristics of noble fir boughs desired in manufacturing Christmas ornament-



Figure 1. Smaller-diameter wreaths such as this one make up a large percentage of the noble fir wreaths made in the Pacific Northwest.

tal products, (2) characteristics of a managed noble fir stand, and (3) the specific products generated from year to year. Almost all of the producers interviewed provided sample noble fir boughs and finished products for this report. The photographs in this publication were taken at their facilities and professionally photographed.

A variety of industry representatives provided responses to earlier drafts of this publication. All of the producers interviewed were provided a draft copy, as were other companies that could not participate in the field interviews during November and December 2001. A sampling of forest landowners were also provided with the opportunity to provide feedback to the content of this publication.

Results

The respondents to the survey purchased approximately 2.90 million pounds of all boughs (all species) in 2000, of which 2.25 million pounds were noble fir (79% by weight). The survey respondents paid approximately \$887,000 for all bough products (lease, harvest, and transportation fees included) delivered during 2000 resulting in an average bough cost to the processor of \$0.31 per pound. Of this total, the respondents paid approximately \$825,000 for their noble fir boughs alone, representing an average cost of \$0.37 per pound, delivered during 2000. Schlosser et al. (1991) determined that nearly 20 million pounds of noble fir boughs with a raw material value of \$6.7 million (\$0.335 per pound) were harvested in 1989 in the northwestern U.S. and southern British Columbia. Indications from knowledgeable persons involved with the industry were that the industry is substantially larger today than the 1989 survey would suggest for 2000.

The respondents to the survey indicated that their noble fir bough use during 2000 was down by 4% from 1999 and down 8% from

1998 levels. The harvest of noble fir boughs by these firms was also down 4% between 1999 and 2000. The noble fir harvest for these firms dropped sharply (by 13%) between 1998 and 2000. Respondents indicated a slight increase for 2001 over year 2000 harvest levels.

While individual processors of Christmas ornaments do not apply a grading system to their purchases of noble fir boughs, they do apply a certain amount of discrimination based on bough characteristics. The ultimate use of the bough determines what is important in terms of color, shoot length, and branching density. Their evaluation of the bough products from a stand influence their willingness to purchase harvest rights to a parcel or to purchase boughs already harvested by cutters.

According to the processors interviewed, the vast majority of noble fir boughs are used in the manufacture of circular wreaths. These



Figure 2. Large-diameter wreaths, such as this one, are not uncommon in the industry. Many are produced for special orders at shopping malls, professional buildings, and other locations desirous of large diameter Christmas wreaths.

wreaths range in size from a 10-inch frame (Fig. 1) to frames well in excess of 4 feet in diameter (Fig. 2). A much smaller proportion of the bough materials are made into centerpiece arrangements and ornate swags (Fig. 3).

Noble fir is rarely used as the only material in a wreath or other product. Very often, it is accompanied by small amounts of incense cedar (*Calocedrus decurrens* [Torr.] Florin), western juniper (*Juniperus occidentalis* Hook), western red cedar (*Thuja plicata*), evergreen holly (*Ilex aquifolium* L.), and two or three ponderosa pine (*Pinus ponderosa*) cones. Ribbons may also be added to the arrangement when it is sold to the customer.

Bough Quality Characteristics

Trees grow at various rates depending on the amount and timing of sunlight, water, and nutrients they receive. When foresters consider timber production, they typically look at ways that more growth can be concentrated on the optimal number of trees per acre to maximize financial returns for the landowner. Logs are harvested from the site and sold, allowing the tree growth cycle to start over.

However, the procedure is a little different when the stand is managed for bough production. Typically, bough processors cannot use large quantities of the long annual growth shoots characteristic of fast-growing timber stands. These “spiky” growth traits are not attractive for the circular wreaths marketed by the U.S. industry, but a small amount of this material can be used in the manufacture of table ornaments (notice differences in the products included in Fig. 3, the swags and charms, and contrast that with the wreath material in Fig. 1 and 2). Processors have reported that while they can use the spiky material in charms, this volume is less than 1% of total production.

Competing vegetation, such as hardwoods and certain shade tolerant tree species (e.g. western red cedar, western hemlock), are not a hindrance to timber quality in noble fir, but

do degrade the bough quality significantly. Basic noble fir appearance characteristics that Pacific Northwest bough processors prefer are:



A.



B.



C.

Figure 3. A wide variety of noble fir Christmas ornamentals compliment wreaths. Charms, A, and swags, B, are common ornamental products made from noble fir boughs. Another charm variation, C, can be placed on tables or hung on walls.

Grade 1 (Preferred)—GR1

- deep green or blue color
- history of short annual growth nodes
- retention of at least 4 years of needles on each branch
- symmetrical shape to the bough (see photos)
- dense coverage of non-overlapping shoots
- characteristic needle cupping, consistent across all boughs
- harvested from area that has already experienced a series of hard frosts



Sample 1: GR1—full and well branched. This sample has a lot of usable material.



Sample 2: GR1—good color and good, wide branching with ample usable material.



Sample 3: GR1—full and even growth with good color. This bough has usable material.



Sample 4: GR1—good form and color with ample usable material. A small amount of twisting is present on the right side which is undesirable (circled), but a very minor problem on this sample.



Sample 5: GR1—good color and form with lots of branching and good tip length; very full.



Sample 6 (viewed from back-side): GR1—very even and full with good color. This sample has many usable tips with little waste.

Grade 2 (Acceptable)—GR2

- green needle color (yellow not acceptable)
- short annual growth nodes, can allow slightly longer internode length
- retention of at least 4 years of needles on each branch
- uniform coverage of shoots, bough not perfectly uniform
- nonsymmetrical shape allowed
- characteristic needle cupping consistent across all boughs
- harvested from area that has already experienced a series of hard frosts



Sample 7: GR2—the end of the bough is full and has good color, but the lower branches are thin, not full, and do not have preferred material.



Sample 8: GR2—lacks evenness and longer branching.



Sample 9: GR2—the end growth is spikey and there is uneven growth, but there is some usable material in this sample.



Sample 10: GR2—lacks uniformity and has spikey end growth. One good cut can be made from each tip, but not a second one.



Sample 11: GR2—uneven and spikey growth from the last year, but there is some usable material in this sample.



Sample 12: GR2—very sparse growth but there is some usable material in this sample.



Sample 13: GR2—full and good color, but there is some curling of the branches making this a mix of both desirable and undesirable material.



Sample 16: GR2—not a lot of branching but there is good color and needle form.



Sample 14: GR2—tips are usable but not the inner branching, and there is some twisting of the usable material.



Sample 17: GR2—the tips are usable but there is some browning of the lower needles.



Sample 15: GR2—good color and tip length, but there is twisting of the material. In addition, there seems to be some drying of the needles.



Sample 18: GR2—very thin branches, some dry and brown needles with long branches.

Unacceptable Traits—GRU

- yellow needle coloration
- long annual growth nodes
- needle disease or needle loss within last 4 years
- non-uniform coverage of shoots
- needles “flat,” not in cupping formation; some of this is allowed, but only a slight amount
- lack of fullness or usable material
- harvested from area that has not experienced a series of hard frosts



Sample 19: GRU—lacks usable bough material.



Sample 20: GRU—this sample lacks usable bough material.



Sample 21: GRU—very little usable material in this sample.



Sample 22: GRU—the color of the older needles is pale green to yellow and the growth is uneven.



Sample 23: GRU—spikey growth with very heavy branches; very little usable material in this sample.

Cut boughs are typically 24 to 30 inches long, but can be longer if the bough is uniform in shape (triangle shape), and the fine growth shoots are distributed evenly across the bough. Excessively woody boughs should be avoided.

Christmas ornamental processors can integrate some of the so-called “flat” material into high quality wreaths by using it as filler and backing to preferred material. However, the quantity of the inferior material must be limited relative to the preferred bough products. Additionally, some amount of the “spiky” material (fast growing) can be integrated in swags and table ornaments, as well as larger diameter wreaths (e.g., 4-foot diameter and larger). Again, the quantity of inferior material must be minimal relative to the amount of preferred material.

Photographs and descriptions on the previous pages provide examples of these grades applied to noble fir boughs harvested from a variety of sites in Oregon and Washington during 2001.

Implications to Forest Management

Forestland managers have a strong economic incentive to manage high elevation noble fir stands for combined bough production and timber production. The harvest of noble fir boughs is not known to reduce the production of noble fir timber, however, if stands are fertilized to increase bough quality, timber production could be increased. The periodic revenues generated from a managed bough harvest is sufficient to offset the costs of administering bough harvest leases, while providing a financial return to the landowner. The challenge is for forestland managers to develop methods of forest management that increase the value and quantity of noble fir boughs, thereby increasing periodic revenues from bough harvest leases, while maintaining timber growth.



Sample 24: GRU—sparse branching and heavy branches (woody); too much waste.



Sample 25: GRU—poor branching and spikey tips; only about 40% usable material in this sample.

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