

Tree Identification Tips  
For  
Envirothon Students  
By  
Martin Curran

OAKS

They have clustered end buds and their fruit are acorns. Only oaks produce acorns.  
Two major groups of oaks; red oak and white oak group

Distinguishing characteristics

Red Oaks

Leaf lobes have bristle tips  
Acorn shells (not caps) have hairy inner  
Surfaces

Acorns take two years to mature  
(1st and 2<sup>nd</sup> year acorns are present on  
mature trees)

White Oaks

Lack Bristle tips, leaves have rounded lobes  
Hairless inner acorn shell

Acorns mature in one year

ID Characteristics for individual species

Red Oak

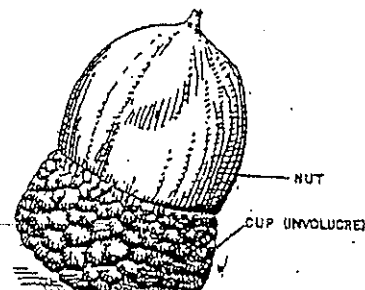
- Leaves are hairless
- End bud is hairless (and cross section is not angled)
- Inner bark is reddish
- Bark is dark and furrowed. Furrows often show reddish color and appear in broad strips

Black Oak

- It has hairy end buds, and the cross section of the end bud is angled
- Bark is blocky
- Orange inner bark
- Leaves are glossy above, and somewhat hairy beneath
- Normally grows in upland drier sites
- Tree normally has poor form and retains a large portion of dead limbs

White Oak

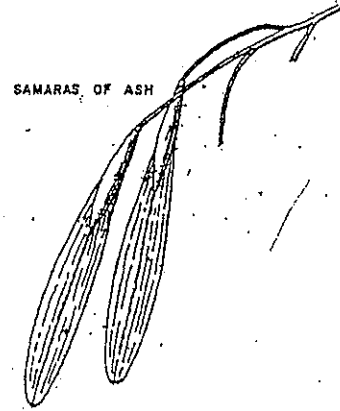
- Round evenly lobed hairless leaves
- Bark is whitish, slightly furrowed to scaly



## Ashes

The ashes and boxelder maple also known as ashleaf maple are our only native trees with opposite feather or pinnate compound leaves. Pinnate is a way of describing compound leaves with the leaflets arranged on opposite sides along a common rachis or axis. In winter ashes are the only opposite leaf scars that do not meet on twigs.

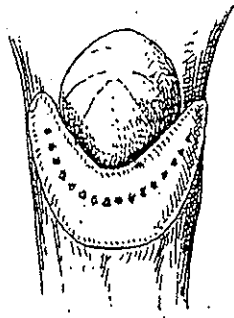
Samara is the fruit of ashes.



### ID Characteristics for Individual Species

#### White Ash

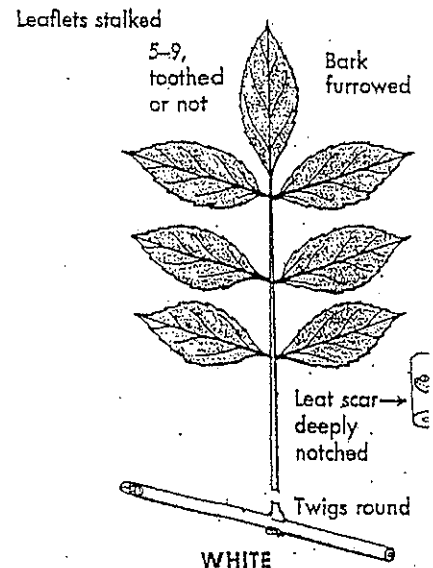
- Opposite branching with compound leaves
- Terminal bud is brownish in color with a granular surface texture. (Looks like a squeezed Hershey kiss chocolate) One of the most unique buds in the New Hampshire woods:
- Leaf scars are deeply notched with side buds set in the notch.
- Bark rigid interwoven pattern with shallow ridges and furrows.



LEAF SCAR OF ASH

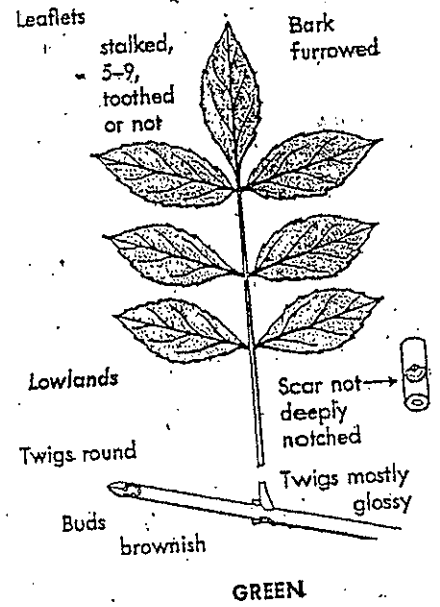
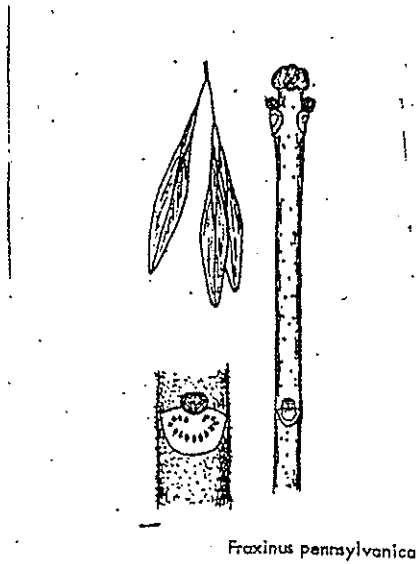


*Fraxinus americana*



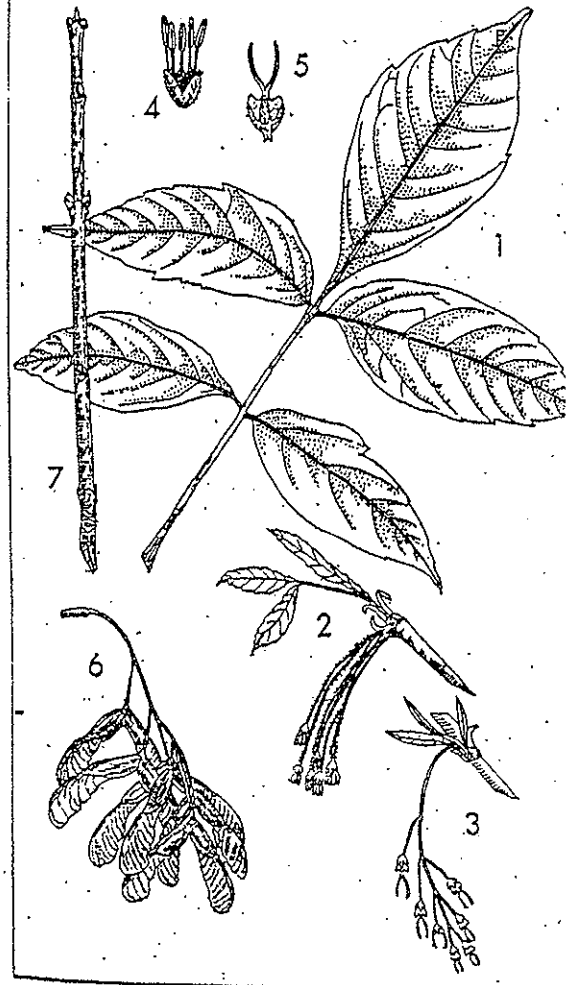
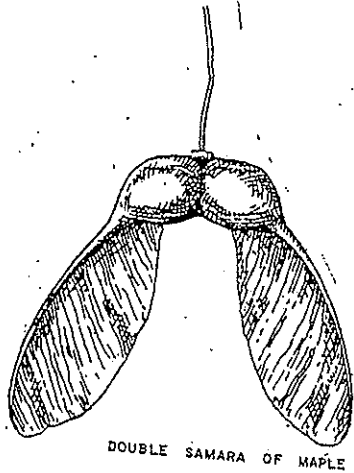
Green Ash

- Looks very much like white ash.
- It is a wetland species (very important)
- Leaf scars are not deeply notched, side buds set on top of notch or nearly so.
- Twigs are glossy.



## Maples

The maples are characterized by simple, opposite leaves and double winged fruit (samara). The exception is boxelder maple, which has opposite compound leaves.

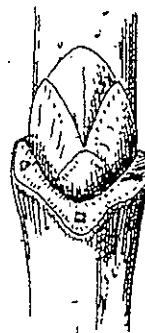


### ID Characteristics for Individual Species

#### Red Maple

- Twigs and buds are reddish.
- Buds are rounded and blunt.
- Smooth gray bark on young to medium sized trees, broken and darker bark on older trees.

PLATE 133.—BOXELDER  
 1. Leaf  $\times \frac{1}{3}$ . 2. Cluster of male flowers  $\times \frac{1}{2}$ . 3. Cluster of female flowers  $\times \frac{1}{4}$ . 4. Male flower  $\times 2$ . 5. Female flower  $\times 2$ . 6. Fruit cluster  $\times \frac{1}{2}$ . 7. Twig  $\times \frac{1}{2}$ .



LEAF SCAR OF MAPLE

Fig. 6  
TWIG OF BUTTERNUT

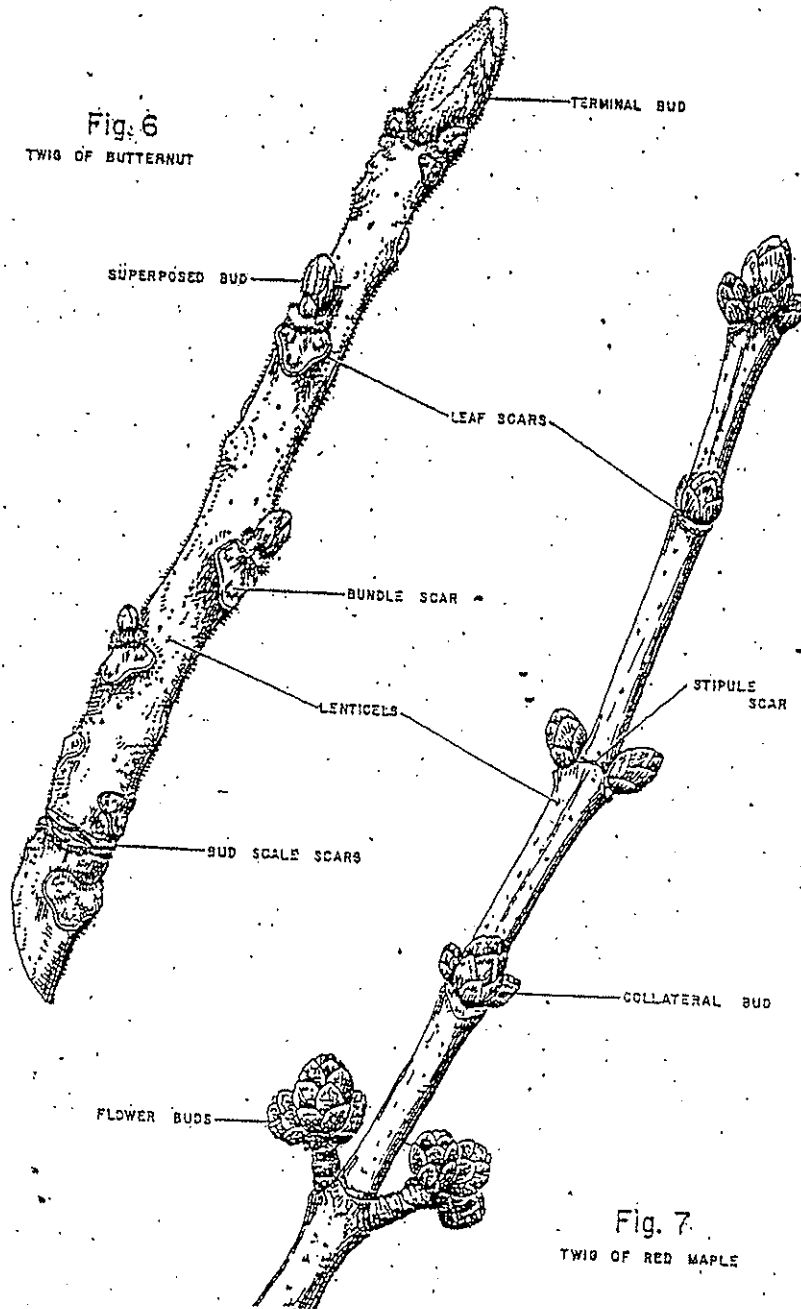


Fig. 7  
TWIG OF RED MAPLE

Sugar Maple

- Twigs are glossy and brown.
- Buds are pointed and brown.
- Bark is quite variable and can vary from light to dark brown and marked with rough, vertical grooves and ridges.

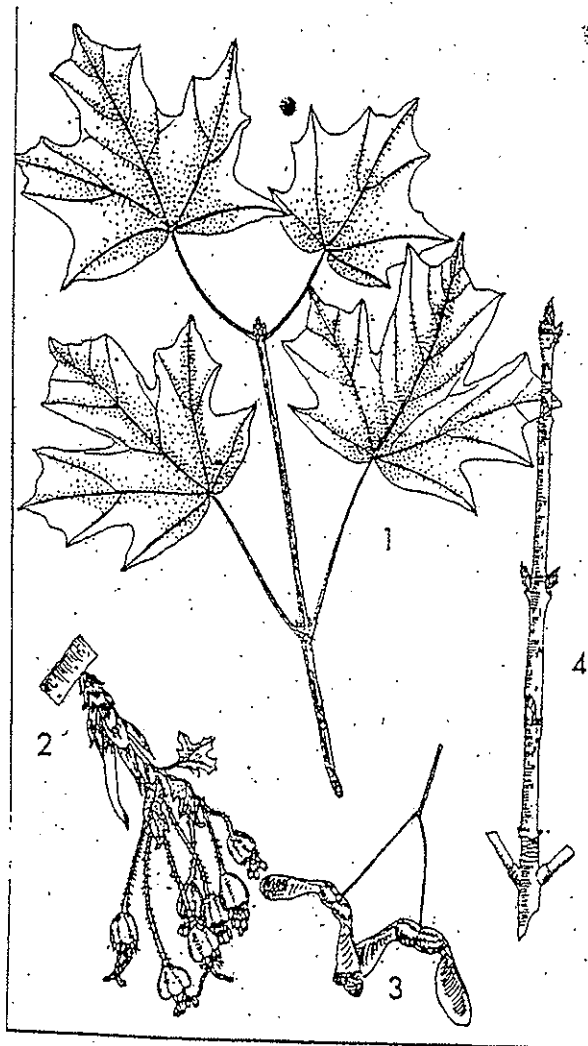


PLATE 136.—SUGAR MAPLE  
1. Foliage  $\times \frac{1}{2}$ . 2. Flower cluster  $\times 1$ . 3. Fruit  $\times \frac{1}{2}$ .  
4. Twig  $\times \frac{3}{4}$ .

## Birches

Birch leaves are mostly double toothed. Buds are 2 to 3 scaled and bundle scars are 3.

Native birches that possess dark bark might be confused with some cherries. Birches differ in that bud scales are fewer, leaf stacks do not have glands, broken twigs may have a strong wintergreen odor (Black Birch & Yellow Birch) rather than the sour smell of cherry twigs. The fruit of birches are catkins.

### ID Characteristics for Individual Species

#### Gray Birch

- Chalky white non-peeling bark marked by black dots and horizontal marks on older trees.
- Triangular long pointed leaves.
- Twigs are dark, hairless, with rough & warty appearance with whitish dots.
- Often found in clumps, rarely a straight tree.
- Early successional tree, populates abandoned fields.

#### Yellow Birch

- In Southern NH often grows in association with black birch and hemlock, often found near wetlands.
- In the White Mountains it is often found growing on rich soils in association with sugar maple and beech.
- Bark shiny yellow or silver-gray with narrow horizontal lines, and peeling in small curls.
- Broken twigs give off wintergreen odor (so does black birch).
- Buds are Hairy.
- Twigs not rough and warty.
- Leaves are egg shaped, double toothed, hairy beneath on the veins (leaves not as heart shaped as black birch).

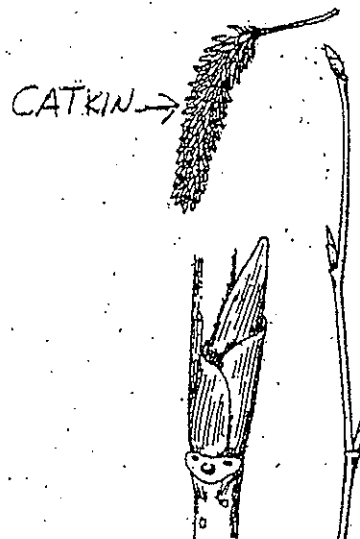
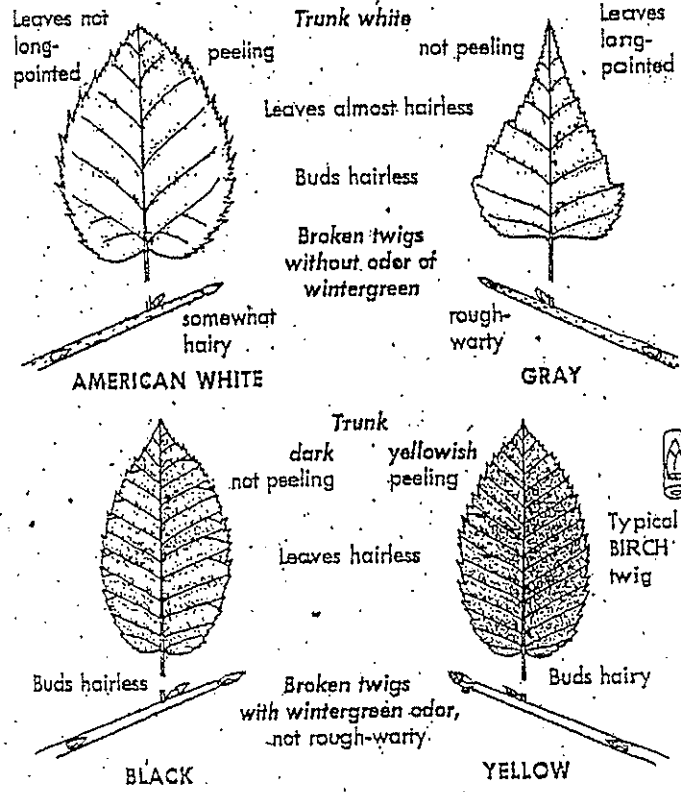
#### Black Birch

- Bark brown or black.
- Barks of young trees are marked with horizontal stripes.
- Buds are hairless.
- Leaf veins are mostly branched.

#### White Birch also called Paper Birch

- Saplings have brownish bark.
- Trees larger than sapling size have clear white peeling bark.
- Leaves are heart shaped, deep green, and sharply toothed.

- Twigs are hairy with yellowish dots.
- Buds are hairless.
- Without odor of wintergreen.



*Betula papyrifera*



DRY FRUITS

Fig. 27  
SAMARAS, OF ASH

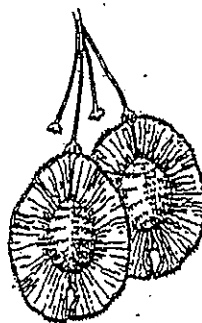
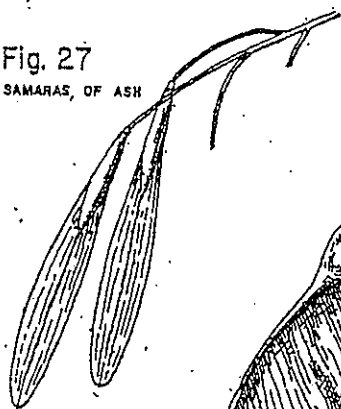


Fig. 28  
SAMARAS OF ELM

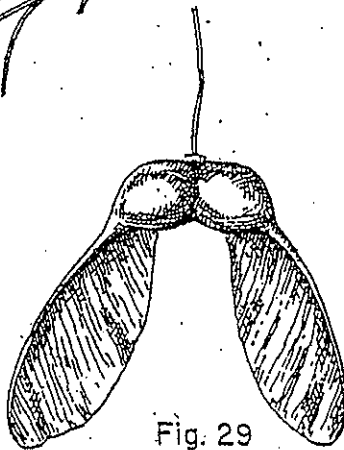


Fig. 29  
DOUBLE SAMARA OF MAPLE

Fig. 34  
CATKIN OF  
PUBBY WILLOW

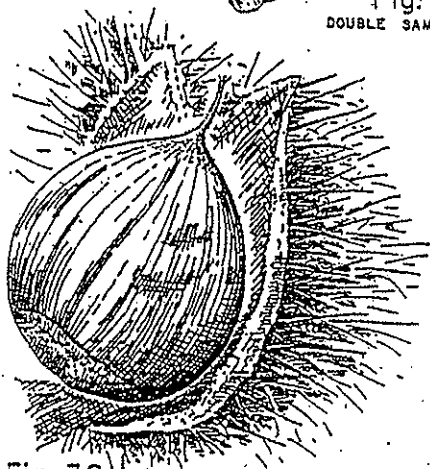
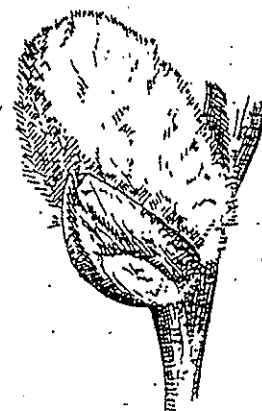


Fig. 30  
NUT OF  
CHESTNUT

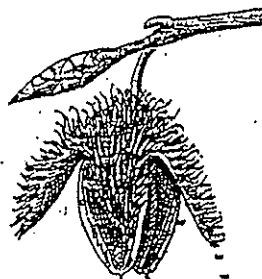


Fig. 31  
NUTS OF BEECH

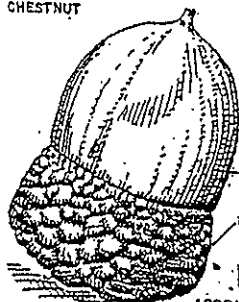


Fig. 32  
ACORN OF WHITE OAK

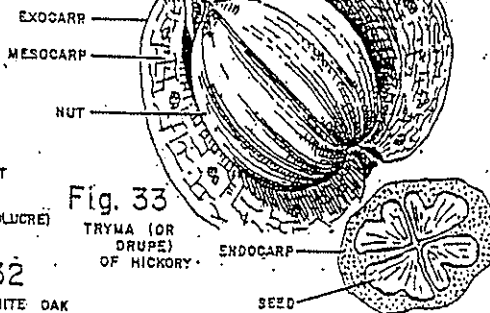


Fig. 33  
TRYMA (OR  
DRUPE)  
OF HICKORY

## Conifers

Conifers are cone bearing

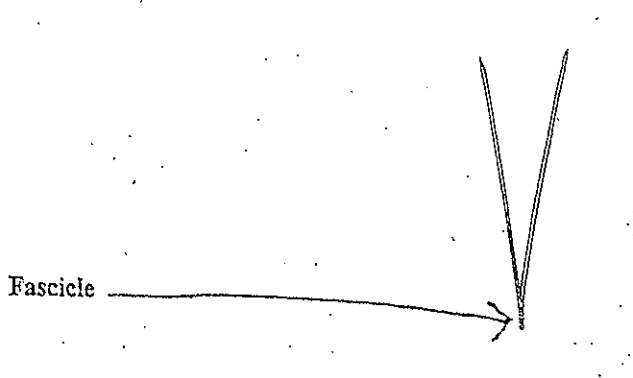
The are gymnosperms = naked seed which is commonly suspended by a scale.

## Pines

They are cone bearing evergreen trees with slender needles occurring in-groups of 2 to 5 along the twigs.

The needle groups are bound in bundles at the base by a fascicle.

Only pines have the needles bound together by fascicles.



Pine branches usually occur in whorls about the trunk; a whorl is added each year.

Only the white pine has 5 needles per cluster. All remaining species have 2 or 3.

Three pines found in New Hampshire are the white pine, red pine and the pitch pine.

White Pine=5 needles 2"-4" ; Cones 3"-10" , scales thornless

Red Pine= 2 needles 3"-8" ; Cones 1 1/2"-2 1/2" , scales thornless

Pitch Pine= 3 needles , coarse, stiff, mostly twisted 1 1/2"-5" , Cones 1"-3' , scales with thorns up to 1/8"



White



RED



PITCH

Pine cone scales are heavy or thorny

## Spruces

The trees are steeple shaped evergreen trees whose needles are somewhat 4 angled, short, stiff and sharp. The needles tend to grow all around the tree. When the needles are removed, the twigs and branchlets remain rough.

Cones hang pendently; brown and woody.  
Cone scales are thin, not heavy or thorny as in pines.

If you can roll the needles between your thumb and your forefinger it is a spruce.



BLACK

Under 1 1/4" long;  
scales stiff;  
old cones remain  
on tree for years.



RED

Over 1 1/4" long;  
scales stiff;  
mostly falling  
upon ripening.



WHITE

1"-2" long;  
scales flexible;  
mostly falling  
upon ripening.



NORWAY

4"-6" long;  
scales stiff;  
mostly falling  
upon ripening.

CONES OF SPRUCES

## Fir

Fir and Spruce are cold climate species. They are found both in uplands and in swamps. Fir often form pure stands in swamps.

### Balsam Fir

Balsam Fir needles are flattened, two sided, shiny green above and whitened or silvery beneath.

Twigs are smooth after the needles are removed.

Cones are 1'-3" long upright and fleshy, falling apart upon ripening and often leaving partially disintegrated cones.

The bark is smooth with resin pockets.

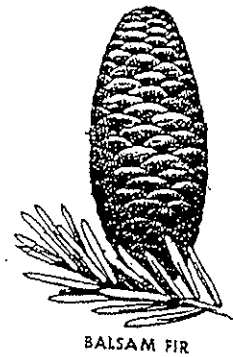
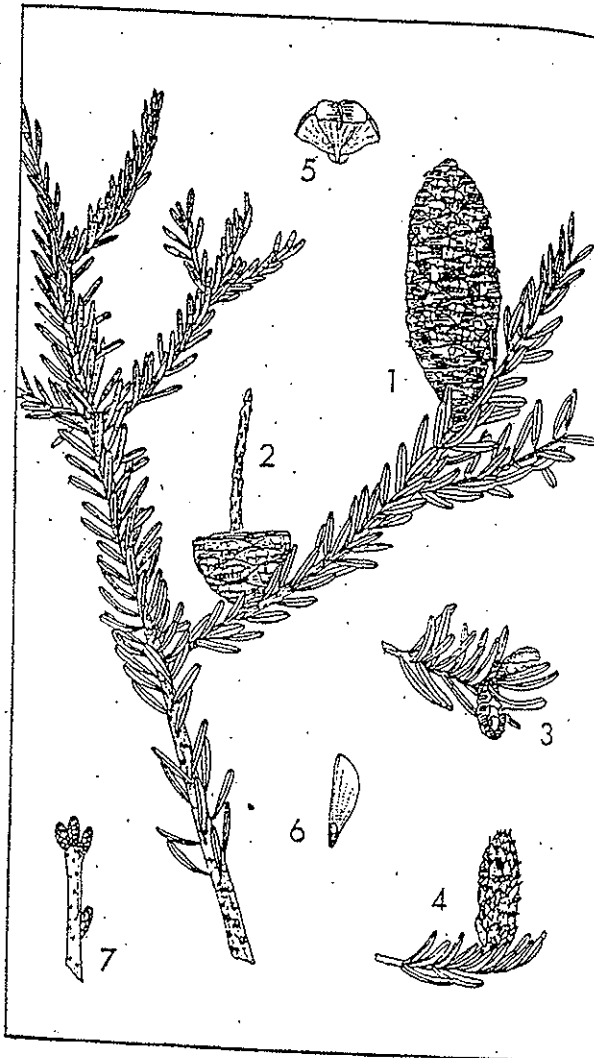


PLATE 11.—FRASER FIR.  
1. Foliage and cone  $\times \frac{1}{2}$ . 2. Partially disintegrated cone  $\times \frac{1}{2}$ .  
3. Male flowers  $\times 1$ . 4. Female flower  $\times 1$ . 5. Cone scale and  
bract  $\times 1$ . 6. Seed  $\times 1$ . 7. Buds  $\times 1$

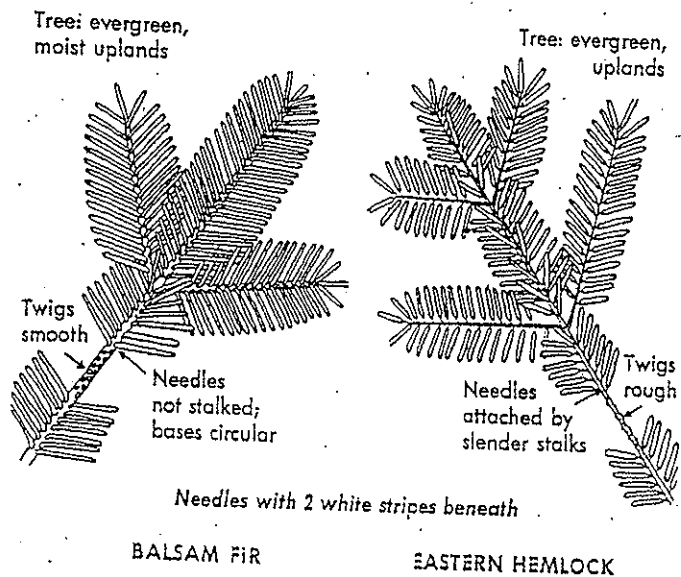
### Similar Species

The upright cones of the balsam fir are distinct when present. Hemlock has stalked needles while balsam fir needles connect directly to the stem.

The underside of hemlock needles are also lighter in color but they have two distinct lighter lines running parallel to the axis of the needles.

Hemlock has rough twigs while balsam fir has smooth twigs.

Balsam Fir has that distinct balsam fir aroma.



## References

I basically used three main references for preparing these ID Tips. The images that I used came from these texts. I would like to say that when purchasing a field guide, it is best to select one that shows drawings rather than photos because photos do not adequately show minute details. Drawings can accentuate those details and make identification much easier. The field guide that I recommend is "A field Guide to Trees and Shrubs" by George A. Petrides. This guide is easy to use and compact enough to take out in the field. This guide went out of print for a short time but it has recently been purchased by the Peterson series of nature books and is now the official Peterson Field Guide to Trees and Shrubs.

The unfortunate thing about tree ID is that it changes with the seasons. Because of this, you really also need a field guide that depicts winter characteristics. I recommend "Woody Plants in Winter" by Earle Core and Nelle P. Ammons.

I also used "Textbook of Dendrology" by William Harlow and Ellwood Harrar. This is an excellent reference book but it is too large to serve as a reference book. Also this is a very old text that has been revised many times over the years. This was the standard Dendrology textbook at most forestry schools throughout the country.

I also used "Trees and Shrubs of New Hampshire" by Frederic Steele. This is a compact little book that can easily be taken into the field. It contains pertinent information but the drawings are not of the quality found in Petrides.

I also used Michigan trees by Charles Herbert Otis in an other handout on "How to study Trees". This is an excellent book that contains a very useful key. However, it is out of print and can only be purchased in used bookstores. I also used Joseph S. Illick's book tree habits, How to Know the Hardwoods for the species comparative tables presented in another handout. This publication is also out of print.

## Selected References

Campbell Christopher S. and Hyland Fay. Winter Key to Woody Plants of Maine, University of Maine Press, Orono Maine, 1975.

Core Earle L. and Ammons Nelle P. Woody Plants in Winter. Boxwood Press. 1958

Foster John H, revised by Steele Frederic L. Trees and Shrubs of New Hampshire. Society for the Protection of New Hampshire Forests. 1962

Grimm William Carey. The Book of Trees. The Stackpole Company, Harrisburg, Pennsylvania, 1961

Grimm William Carey. How to recognize Shrubs, The Stackpole Company, 1966 (**Formerly published as Recognizing Native Shrubs. The best book that I have found on recognizing shrub: Really useful key**).