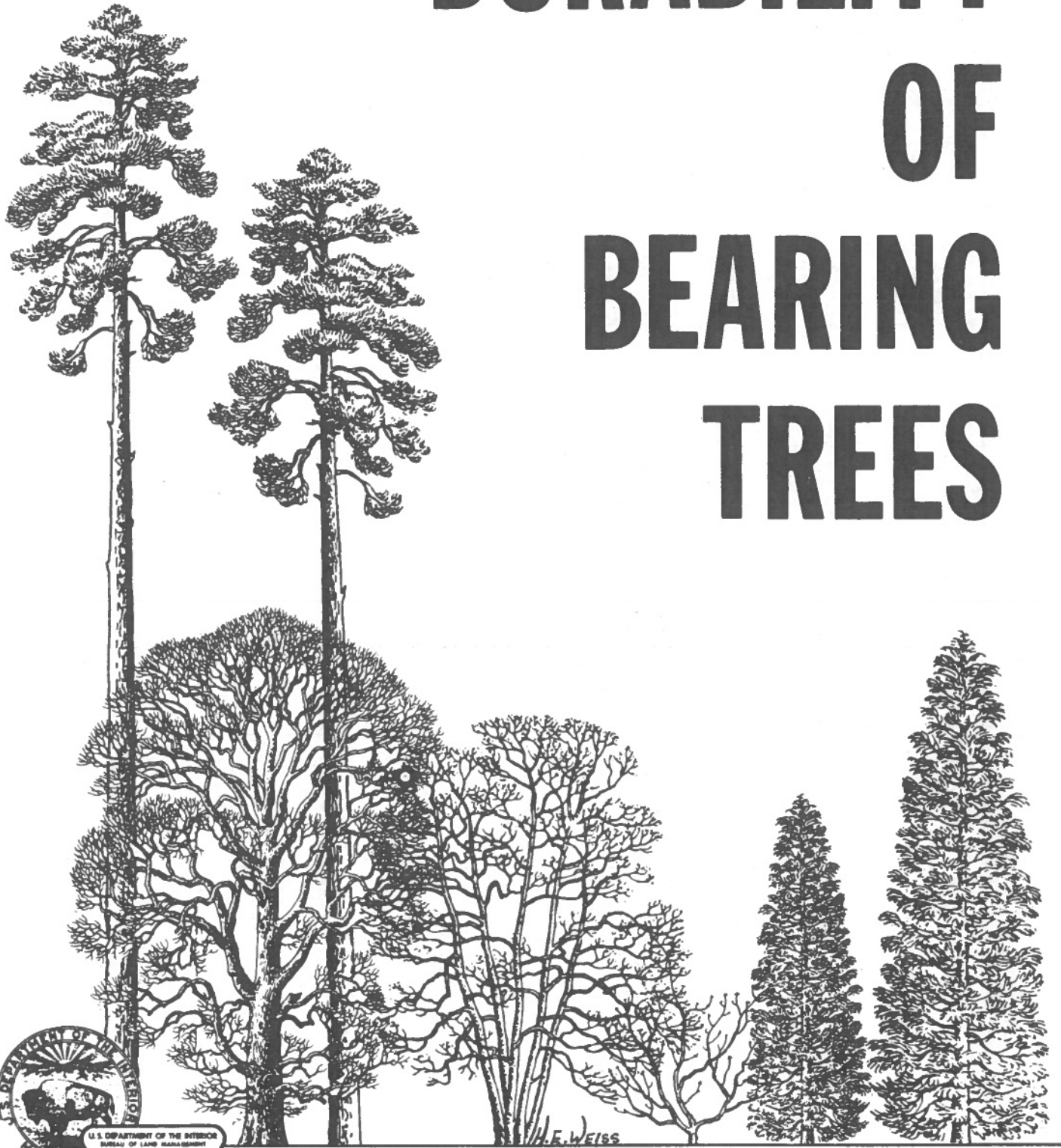


DURABILITY OF BEARING TREES



CADASTRAL SURVEY TRAINING STAFF

INTRODUCTION

This booklet is prepared as a guide, to aid in the search for old bearing trees as well as in marking new trees.

TREE SPECIES AND GENERAL DURABILITY

It is impossible to make a firm statement concerning the durability of trees by type or species. Generally speaking the most durable trees are the non-resinous conifers: yew, cedar and redwood. The hemlocks are non-resinous but are very inferior to the previous three. Next in order are the resinous conifers: pines, firs, spruce and tamarack or larch. But lodgepole pine is inferior in most cases to fir and white fir inferior to spruce. The deciduous hardwoods are the least desirable: maple, alder, birch, willow. Exceptions are some of the desert species, such as ironwood, and the white oak and live oak types.

The durability of a tree when marked for a bearing tree is of great importance to the Cadastral Surveyor. The original bearing trees are one of the primary methods used to determine the position of an original corner point. The surveyor must be able to identify the many tree species for which he is searching, not only by the proper common name but also by the common name used by the original surveyor. He should know what to expect in his search because of the widely divergent growth habits, growth rate, life span and resistance to decay of the many tree types. The methods of blazing and marking the trees by the original surveyor will play a large part in the search also. When marking new bearing trees judgement must be made in selecting the most durable species available and proper method of marking to prevent excessive injury, or even destruction of the tree.

When marking a bearing tree be sure of the identification and enter the correct common name in the field notes. Distinguish between the various species in the tree family. There is a world of difference between a Ponderosa pine and a Knob cone pine; or a California live oak and a California black oak!!

EFFECTS OF MATURITY

The normal life span of a tree is of primary importance. The black locust is highly resistant to decay but has a normal life span of only about 100 years, though some may attain a greater age. On the other hand the wood of Douglas-fir is considered only moderately resistant to decay but the tree may live over a thousand years (left unmolested) and is known to be an excellent bearing tree. Another contradictory example is the California black oak; this tree may live to over 300 years of age, yet is so susceptible to decay when injured that it is a poor choice for a bearing tree. Thus the life span is only an indication of what may be a good tree for witnessing a corner.

When searching for original bearing trees the size at maturity, expected life span, and growth rate are very important. If a tree which has an expected life span of 200 years and 24 inches diameter at maturity was marked when 20 inches diameter the tree was already near maturity. The blaze would be slow to heal, decay sets in and the tree soon dies, falls and disappears. If the field notes call for a mature tree the chances of recovery after 100 years or more are then greatly reduced.

In some cases the season of the year when marked is important. With deciduous hardwoods the dormant season is the most desirable time for blazing. The wound has a chance to heal and harden before insects and fungus are active and attack. In the northern states this will play a part in recovery possibilities. A tree marked in fall or winter would be more likely to survive than one marked in spring or summer. This will be especially true of trees with a high sugar content in the sap, such as maple and birch.

METHOD OF BLAZING

The methods of blazing and marking by the original surveyor are also very important. If the original surveyor made large blazes, cutting deeply into the tree, the loss is much greater from decay. If the blazes were made high on the tree logging will remove the entire blaze. Fortunately many of the original surveyors used a "double blaze"; the township, range and section on a blaze at breast height and a smaller "BT" blaze nearer the root crown. When logged the lower blaze frequently remains on the stump. The smooth barked trees and those with very thick bark were often bark scribed. The bark scribing expanded on the smooth barked trees as they grew and may be hard to detect though readily apparent to the experienced eye. On thick barked trees the bark was smoothed enough to scribe but no penetration made into the sapwood. This scribing may appear as disjointed lines or even be mistaken for worm or beetle "tracks". Sometimes the bark scribing is all but lost in the roughened and maturing bark.

The surveyor must keep an open mind at all times when searching for the original trees. He must consider not only the species of tree, time of year, size of tree, type of scribing, growth rate, life span and site location but also the characteristics of the original surveyor and the instructions which he had been given to govern his work.

When selecting new trees to mark for bearing trees at a corner several things must be considered. Is the tree young or near maturity, resistant to decay, long lived, well formed, suppressed by other (though inferior) trees, in a good location not subject to undercutting by a stream, large enough to receive all the marks and in good location in reference to the corner? Often there is very little choice, but when there is, all aspects should be considered. It is a well established fact that a large Douglas-fir stump, with the bark removed, is superior to poor trees such as dogwood or cascara, and in most cases young alder.

The blazes should also be kept as small and narrow as possible, consistent with the amount of scribing required. The blaze should be smooth at the edges and carefully done to avoid breaking the bark loose from the cambium layer. This is especially important when blazing trees such as birch, aspen and spruce. The bottom of the blaze should be smooth and well drained to avoid accumulation of sap, water, and dirt. This can frequently be done with an upward stroke of the axe at the bottom of the blaze. On many species of smooth barked young trees bark scribing is preferred. If the only suitable trees available are too small to accept all the marks making a small "BT" blaze at the root crown and marking the tree only "BT" is better than taking no tree at all. Manual requirements should always be fulfilled when possible but should never be used as an excuse to avoid marking bearing trees.

Much of the work performed by the Cadastral Surveyors today is dependent resurvey of intermingled ownership. An original bearing tree marked before the land was patented remains Federal property. But trees now standing on private lands are private property. Permission should always

be acquired before marking privately owned trees, particularly highly prized trees such as walnut or hickory. Never use an ornamental tree in someone's yard!! Painting is recommended. When injured by blazing and scribing the tree is opened to attack by insects, bacteria and fungus. If the wound is painted with a special tree wound paint, manufactured for this purpose and available in aerosol spray cans, the tree is protected until it can heal the injury. Painting is essential on many trees to prevent swift loss to decay.

Many trees, such as lodgepole pine, aspen and alder, grow in dense stands when young. They carry on a continuous battle of "survival of the fittest". When injured by blazing, the tree must attempt to heal the wound and is then less able to survive the battle. When marking such a tree it is recommended that the tree be freed from its close competition. This is done by cutting down, or "ringing" the close neighbors in a thinning process, called releasing. Releasing gives the bearing tree the advantage in the battle for sunlight, water, air and nutrients. Releasing is not always possible or prudent; on private lands the landowner may willingly give permission for cutting of survey lines or marking bearing trees, but would object to releasing. Dense thickets of hawthorn or vine maple make releasing nearly, if not totally, impossible at times. It should be done however, whenever ground conditions dictate or permit.

ARRANGEMENT OF LIST

This list is prepared by the common name of the tree. The common names are listed in capital letters. Many trees are very similar in appearance or durability and are listed together in the interest of simplicity and brevity. This should not be construed that the names are interchangeable. Following the common name is the scientific name, always the genus and in most cases the species. Next is given a list of other common names which may have been used by the original surveyor in his field notes. The original surveyor may have called for a redwood where none exist, the tree was actually an incense-cedar. Or he may have called for a hackmatack, the tamarack in Minnesota, when the tree was really a western larch. These other names are cross-referenced in the index.

Following the other names is a grading ranging from unsuitable or very poor up to excellent. A tree graded very poor should be used only as a last resort and probably be supplemented with a mound of stone or other accessory. These grades are given as an aid in making the decision about which tree(s) should be used to witness a corner. The scale is generally based on young, vigorous trees and not mature or old growth trees.

Following the grading is a written narrative of what is known of the particular species, both as an original bearing tree and recommendation for use as a new bearing tree.

EASTERN WHITE PINE (Pinus Strobus)

Other names: Pine, northern pine, soft pine; may appear as "black pine" or "conk pine"

EXCELLENT

In the Eastern States and Great Lakes Region "Paul Bunyan" logged the white pine. It was one of the more widely used bearing trees by the original surveyors in Minnesota, Michigan and Wisconsin. The blaze is usually completely healed but noticeable, and covered with a heavy pitch layer. Most trees were snow blazed as well. Fire hardened trees will last for many years. If dead the surrounding wood seems to decay readily but the pitch face will retain the scribing indefinitely. Logging and fire are the most probably causes of loss.

When marking the white pine keep the blaze narrow, low, and only deep enough to make a smooth blaze for scribing. Paint immediately.

RED (NORWAY) PINE (*Pinus resinosa*)

Other names: Hard pine, pitch pine, yellow pine, pine

EXCELLENT

The Norway is one of the "hard" pines and has a superficial resemblance to the Ponderosa Pine. The Norway is found only in the Great Lakes and Northeastern States. This tree is at least as durable as the eastern white pine. They are found intermixed, though the Norway will survive under more adverse conditions and is more resistant to fires. The dead and fallen tree, or the sawed stumps, decay slowly. The blaze face pitches over, heals rapidly and may have little or no discernible scar after 75 or more years. Even though the bearing tree may have been logged the pitch face and overgrowth with reverse scribing will remain until destroyed by means other than decay.

Since this tree is heavily logged the blaze should be kept low, with the "BT" close to the ground. Paint the blaze immediately before pitch begins to flow.

JACK PINE (*Pinus banksiana*)

Other names: Pine, scrub pine, black pine; maybe confused with lodgepole pine

VERY GOOD

The Jack pine looks somewhat like the lodgepole pine of the Western states but is found only in the Great Lakes Region. The wood is hard, resistant to decay when dead and fallen. The blaze is seldom found completely healed but the scribe marks may sometimes still be read after being burned and charred. Burned out stumps may still show the scribe marks, in reverse on the overgrowth of larger trees. When logged for pulp the stumps are usually cut very low to the ground. Slash burning may destroy all traces of scribing on the face. The burned stumps are like a "pine knot" and last indefinitely but are easily removed, like "pulling a plug", from the sandy soil.

The Jack pine grows in dense stands on sandy soils. When marking for a bearing tree keep the blaze low and narrow. Paint thoroughly. Release if necessary and possible.

EASTERN HEMLOCK (*Tsuga canadensis*)

Other names: hemlock, hemlock spruce, spruce pine.

EXCELLENT

A tree found in the Great Lakes and northeastern states, the eastern hemlock is a much more hardy tree than its western relative. The bark is much thicker and the tree is relatively free from loss by decay and fungus. It may reach 600 years of age and worst enemies are logging and fire. If the tree has died and fallen the dried blaze face may still remain. The rolled stump is reddish brown and discolors the soil. A stump hole may be 12" to 18" deep with a row of hard hemlock knots where the log has decayed. The wood decays quite rapidly but wet ground conditions will preserve the stump. The inner bark is a reddish cinnamon color which would aid in identification. The sound wood in a decaying tree is very hard and ill-smelling.

When marking for a bearing tree select the younger trees 6" to 12" diameter and avoid the knots with the blazing for they are very hard, like flint. Keep the blaze small, well drained, and paint thoroughly for there is no resin flow from the hemlocks. The sap is watery.

WESTERN LARCH (*Larix occidentalis*)

EASTERN LARCH or TAMARACK (*Larix laricina*)

Other names: larch, tamarack, hackmatack, juniper

FAIR TO VERY GOOD

The western larch occurs in eastern Washington and Oregon to Idaho and western Montana. The eastern larch or tamarack is native to the Great Lakes region from Minnesota to Maine and in interior Alaska. Both species shed their needles in winter and appear dead during the dormant season. The western larch prefers moist soil but grows on dry slopes. Tamarack is usually found in swampy lands. Both trees are cut for lumber but are used extensively for fence posts and even for shake roofs.

Western larch is usually found with the blaze only partially healed, but may be completely healed under ideal conditions, with no noticeable scar. It is a dependable bearing tree and is nearly always recovered, even if dead, fallen or stumped. The blaze may be decayed to some extent but with some scribing remaining. The wood decays quite slowly. The tamarack is more rot resistant than the western larch. Both trees grow in dense stands and many fallen trees may require examination. Because of the wet conditions that both trees prefer they are not lost to fire to any great extent, but fires will completely consume a dead tree.

Select young trees 8" or larger. Alaska reports problems with carpenter ants. Do not use trees that have a hollow sound when struck, or if there are ants in or near the larch. Keep the blaze narrow, well drained and through the sapwood. The larches are more long lasting if blazed when the sap is flowing, and more resistant to infection and attack by insects. Paint the wound thoroughly. Release if in a dense stand.

ENGELMANN SPRUCE (*Picea engelmanni*)

BLUE SPRUCE (*Picea pungens*)

Other names: spruce, silver spruce, white spruce; may have been confused with hemlock.

FAIR TO GOOD

Engelmann spruce occurs from eastern Oregon and Washington eastward through Idaho and Montana and Rocky Mountain region. Blue spruce is confined to the Central Rocky Mountain area. Though two distinct species they are very similar in durability as a bearing tree. The wood is soft and decays quite rapidly. They are usually found with the blazes decayed, only partially healed and little trace of scribe marks. These trees favor moist stream bank areas, are long lived (300 or more years) and grow slowly. They are subject to windthrow and the wood rots quickly once on the ground. Though resinous they do not produce a good pitch face to protect against decay of the blaze. Few are ever found with the blaze completely healed and protected.

Though not a "first choice" these spruces are better than aspen and birch with which they are usually found. Select young, healthy trees, 6" or larger. Use a narrow blaze, well drained and paint thoroughly. Release if necessary but these trees do tolerate considerable shade.

BLACK SPRUCE (*Picea mariana*)

WHITE SPRUCE (*Picea glauca*)

Other names: swamp spruce, bog spruce; skunk spruce,
Canadian spruce

POOR TO GOOD

These spruces are found in the Great Lakes region, through Canada, and are most prevalent in the interior regions of Alaska. Black spruce grows profusely in swamps, bogs and muskegs, and may be the only tree available in those locations. It is a slow growing tree and may be only 5" or 6" diameter when 400 years old. The white spruce favors wet conditions but does grow on higher lands and is usually larger than the black spruce and may be cut for lumber. It grows faster but has a shorter normal life span.

The original blazes on these spruces are seldom healed over. Fire may burn the open blazes with little trace of scribing remaining though it may be detected by side lighting. The bark is thin, the wood is soft and decays rapidly when on the usually wet ground. The root system is shallow and leaves no stump hole. Very few of these trees are recovered in the Great Lakes region, indicating they are not desirable bearing trees, if better species are available. Alaska finds them to be better than tamarack, birch or aspen.

Select trees at least 4" to 6" diameter. Keep the blaze small, just large enough to accommodate the required scribe marks. Blaze carefully to avoid separating the bark from the cambium layer, and smoothly drained at the bottom. Paint thoroughly but not excessively. Releasing may be necessary in dense stands. Prune off the lower limbs to a height of about 4 feet on the smaller trees.

NORTHERN WHITE-CEDAR (*Thuja occidentalis*)

EASTERN REDCEDAR (*Juniperus virginiana*)

Other names: arborvitae, swamp cedar, white cedar,
tree-of-life; red cedar, red juniper

VERY GOOD

The white cedar is found in the Great Lakes region and the redcedar from the Great Lakes throughout the eastern states. Both are slow growing, long lived trees, 300 years or more. The white cedar is subject to heart-rot in the older or dead trees. The bark is fibrous giving them a shaggy appearance. White cedar favors a wet or swampy growing condition and is less subject to loss by fire. Though usually hollow the white cedars are one of the most likely of the original bearing trees to be found in the Great Lakes region. If still standing the blaze may be nearly or completely healed. When fallen they decay very slowly and the wood has a distinctive "cedar smell". These trees leave little or no stump hole.

Select young trees, over 8" diameter. Do not use hollow old growth white cedars. Keep the blaze narrow and well drained. Paint thoroughly to retard weathering.

BALSAM FIR (*Abies balsamea*)

Other names: balsam, eastern fir.

POOR

The balsam fir is found from Minnesota to Maine in the Great Lakes region. It is short lived, seldom over 100 years of age. The bark is thin and usually covered with resin blisters. The wood decays rapidly when in contact with the ground. Any injury to the tree causes rapid infection and decay. The possibility of finding an original balsam fir bearing tree marked 100 years ago are very remote. The one tree reported as found had died and was lodged in an elevated position not in contact with the ground. The wood is coarse grained and soon disintegrates.

If no better tree is available select the healthiest looking young tree 6" or so in diameter. Do not use old growth trees. Bark scribing is recommended. The bark scribing rapidly fills with pitch which should afford protection.

WHITE OAK (*Quercus alba*)

BUR OAK (*Quercus macrocarpa*)

Other names: stave oak; blue oak, scrub oak, oak.

VERY GOOD

The white oak is found over most of the country east of the Mississippi. The bur oak is a central states tree, from North Dakota to Ohio and south to Texas. They are very similar in appearance, slow growing and live to ages of 400 to 600 years. The white oak is an upland tree. The bur oak prefers lowlands and stream banks. Both trees are desirable for lumber and fence posts.

The blaze tends to heal well and rapidly. The sapwood decays quickly but once turned to heartwood is much more resistant to decay than the black oak species. On trees marked 100 years ago, if still alive, the blaze will be completely healed over. Stumps will last for 20 years or more after cutting and may have sprouted new trees. Care should be exercised to avoid mistaking beetle "tracks" for scribe marks. The "whorly" grain is quite pronounced for 2 or 3 inches out from the blaze face.

When marking one of these trees blaze through the sapwood but no deeper. Keep the blaze as low as possible and well drained. Paint thoroughly.

NORTHERN RED OAK (*Quercus rubra*)

BLACK OAK (*Quercus velutina*)

Other names: oak, red oak, gray oak; yellow oak

GOOD

The red oak is found from Minnesota to Maine and throughout the eastern states. Black oak occurs from southern Wisconsin and Iowa throughout the east and south. They are both in the "black oak" group and are less desirable and durable as bearing trees than are the white oaks. The trees may live to 200 years if not cut for lumber. The red oak is more resistant to decay, is straight grained and very hard when dead and dry. The wood will burn like coal and leave very little ash.

Though slow growing trees the original blaze would be well healed on a live tree. The chance of finding a living tree after 100 years is very remote, because they were usually mature when marked. The stumps rot away leaving a large stump hole which may contain pieces of root and wood. Once begun, the decay rate is rapid. Look for second growth, or young trees to indicate the possible position of the original tree.

Keep the blaze as small as possible, just deep enough to penetrate the thin sapwood, well drained, and near the ground. Paint thoroughly.

SUGAR MAPLE (Acer saccharum)

BLACK MAPLE (Acer nigrum)

Other names: hard maple, rock maple, maple

VERY GOOD

These hard maples are found from Minnesota and Iowa to the New England states. They reach an age of up to 400 years. These are the "best" of the maple family in terms of bearing trees.

In ideal conditions the blaze will heal quickly, often before decay sets in. There are no reports at this time (1972) of the recovery rate or other information concerning these trees as live original bearing trees. A decaying stump usually has the bark gone and the wood turns black. The stumps do not decay uniformly but do leave a distinct stump hole.

Keep the blaze as short and narrow as possible, smooth at the edges and smoothly drained. Paint thoroughly.

RED MAPLE (*Acer rubrum*)

SILVER MAPLE (*Acer saccharinum*)

Other names: scarlet maple, soft maple, water maple,
white maple, maple.

POOR TO FAIR

These are the soft maple group found throughout the Great Lakes region, central and eastern states. They are rapid growing and short lived, seldom reaching more than 100 years of age.

There is little if any chance of finding a live original bearing tree. The original surveyors marked nearly mature trees which are now gone. The stump decays rapidly but usually leaves a distinct stump hole. New trees frequently sprout from the old stumps. A clump of maples may be a clue to the position of the original bearing tree.

The bark of the young red and silver maples is smooth. If better trees just aren't available it is suggested that young, smooth barked trees be selected and bark scribed. Use larger than normal letters and scribe deep enough to prevent disappearance of the scribing as the tree matures and bark roughens. Paint to prevent fungus infection.

BOX ELDER (*Acer negundo*)

Other names: Ash-leaf maple, maple

VERY POOR

This tree is found from the Rock Mountain Region and throughout the Eastern States. Though in the maple family it is much less desirable as a bearing tree. It grows very fast, does not live more than about 40-50 years and decays rapidly from any injury. The wood is pithy and soft, soon decaying to a mulch when dead.

Though the original surveyors undoubtedly marked this tree for a bearing tree none is known to have been recovered. The normal life span and rapid decay precludes the possibility of finding a box elder.

Not recommended. If nothing else available use a small (BT) blaze only and paint thoroughly.

WHITE ASH (*Fraxinus americana*)

BLACK ASH (*Fraxinus nigra*)

GREEN ASH (*Fraxinus pennsylvanica*)

Other names: Ash, red ash, swamp ash, water ash; may have been confused with basswood.

FAIR TO GOOD

The white and green ash are found throughout the eastern half of the adjacent states. The black ash is a northern tree of the Great Lakes Region and North-eastern states. White ash and green ash are very similar, often being called one for the other. They favor upland areas. Black ash is usually found in low or stream bottom terrains. All are rather fast growing but hardy hardwoods. The white and green ashes are the longer lived of the group and more resistant to decay. None have a life expectancy of more than 100 years.

There are no reports of recovered, life, ash bearing trees marked during the original surveys. The white and green ash stumps have thick and rough bark. The wood is brownish in color. Black ash retains a lighter color, has open pores and the bark turns powdery in fine scales. All ashes decay rapidly when cut. The stumps often sprout new clumps of trees which may be matched to locate a corner.

The ashes are relatively thin barked. Blaze carefully to avoid separating the bark from cambium layers, well drained and small as possible. Release if in dense stands. Paint thoroughly.

EASTERN COTTONWOOD (*Populus deltoides*)

PLAINS COTTONWOOD (*Populus sargentii*)

Other names: cottonwood, eastern poplar; plains poplar.

POOR TO FAIR

These cottonwoods are found throughout the eastern and plains states as the names indicate. They are separate species but very similar in appearance, and are generally just called cottonwood. These trees are rapid growing, reach sizes of up to 6 ft. diameter and have a life expectancy of about 125 years. Like all cottonwoods they thrive only along stream banks and river bottoms. The wood is soft and watery, very heavy when green but usually punky when dead or dying. The wood decays rapidly once on the ground.

These cottonwoods grow so rapidly that they will heal over almost any injury within a few years when young and vigorous. The blaze face will often be rotted out behind the overgrowth but scribing may be found in reverse. If a 10" or 12" tree was originally marked the face may be behind 2 ft. or more of overgrowth with no evidence of the blaze in the rough bark. Once mature, death and decay set in rapidly, the tree soon disappears but if windthrown leaves a large stump hole. The principle objections to these trees is the short life and rapid decay of dead wood or injuries.

Select young trees, up to 10" diameter. Keep the blaze as small as possible and smoothly drained at the bottom. Release if in dense stand. Paint the blaze thoroughly.

QUAKING ASPEN (*Populus tremuloides*)

BIGTOOTH ASPEN (*Populus grandidentata*)

WHITE POPLAR (*Populus alba*)

Other names: aspen, popple, poplar, quaker.

POOR

Quaking aspen is found throughout the western states, Great Lakes region, northeastern states and interior Alaska. It is the most wide-spread of the populus genera. Bigtooth aspen is a tree of the Great Lakes and northeastern states. White poplar is an imported tree that has "gone wild" in many parts of the country and, when young, looks very similar to the aspens. All of these trees are short lived, soft, and decay rapidly when dead. The normal life span does not exceed 100 years. Aspen usually grows in dense stands and often reproduces as "suckers" from the roots of the parent tree. The bark on all but the largest trees is smooth. The aspen are used for pulpwood in the Great Lakes region.

When bark scribed the original bearing trees have been found in good condition. When blazed decay soon destroys the tree. In dry conditions the blaze may harden before disease attacks. Dead trees are often held up by the densely growing neighbors and thus be well preserved for considerable time. Once in contact with the ground the wood rapidly decays and there is little chance of recovery. The aspen often leaves a distinct stump hole. Stool growth may also be a clue to the original tree position.

If aspen must be used for a bearing tree select the healthiest, more dominant tree, 6" to 8" diameter, bark scribe with larger than normal letters, to avoid tearing the bark. Bark scribing may be done with the sharp point of a pocket knife, cut into the bark without removing any of the bark as with the normal scribe. This leaves a thin line and when healed does not flake off. Release from dense stands. Do not use large aspen as they are usually near maturity. Paint the scribing.

WILLOWS, including BLACK, RED, PACIFIC, PEACHLEAF,
CRACK, SCOULER (Salix species)

Other names: None other than willow

POOR

Of the willow family these species sometimes reach tree size, up to 20" or 24" diameter. All willows look pretty much alike to most surveyors. The original surveyors merely called them all willow so they are grouped here. The willows named here are thought to be the most hardy. Some may live up to 150 years of age. The Black Willow of the Eastern States grows to tree size and is logged for lumber. It rarely exceeds 70 years of age. The wood of willows is soft and fibrous, decaying rapidly once dead. The willows require a moist stream bank type environment.

Very few original willow bearing trees have been found. If blazed, the scribing is rotted away and the tree may have a decayed hole completely through the trunk. This writer has seen only one willow that was bark scribed. The letters BT were in the bark near the base and a large decayed hole above. Willow clumps will frequently be found at the record position of a willow bearing tree when the corner has been positively located by other evidence. It can be assumed that the clumps were stools of the bearing tree.

Do not mark willows for bearing trees except as a last resort. A sound Douglas-fir stump with the bark removed would be preferred. If willow must be used try bark scribing if the bark is smooth enough. If not, keep the blaze as small as possible; "BT" only might be best. Paint thoroughly.

HAWTHORN (Crataegus, many species)

Other names: thornapple, haw

POOR

There are too many species of hawthorn (or thornapple) to list here. All are scrubby trees, usually no more than 6" in diameter. They usually grow in dense thickets mixed with vine maple and crabapple on the Pacific slope. In the Great Lakes and eastern portion of the country they occur as single trees in open pastures and borders of woodlands. They are thorny, have hard wood, are short lived and decay quickly when dead.

The original surveyors may have called hawthorn "crabapple", or vice versa. The sapwood is thick under a rough bark. The wood is hard to cut but decays quickly when dead and on the ground. Original hawthorn bearing trees are seldom found and when they are the blaze is badly decayed, with little or no scribing remaining. Identification of the bearing tree is had by reference to another before it can be certain the particular hawthorn is the bearing tree searched for.

Avoid marking hawthorn for a bearing tree. If nothing better is available bark scribe if possible, or keep the blaze small, (a "BT" blaze size is recommended over a full compliment of markings) and paint the wound thoroughly. Release if possible, but this is usually difficult in the dense entanglements.

PIN (FIRE) CHERRY (*Prunus pensylvanica*)

BLACK CHERRY (*Prunus serotina*)

BITTER CHERRY (*Prunus emarginata*)

HOLLYLEAF CHERRY (*Prunus ilicifolia*)

Other names: cherry, wild cherry

VERY POOR TO GOOD

The pin cherry is found in the northern part of the country from Wyoming and Idaho to Maine. Black cherry is a tree of the Great Lakes region and eastern half of the country. It reaches tree size of 24" or more and an age of up to 300 years. The black cherry is logged for commercial lumber and veneer. Bitter cherry is the cherry of the Pacific Northwest. Hollyleaf cherry is a tree of southern California, with holly like leaves but is usually a shrub. The fruits of the black cherry and pin cherry are used to make jelly, wine and brandy. Of this group, only the black cherry is believed to be a good bearing tree.

There is no report of a recovered original cherry bearing tree. Cherry rots quickly once dead and on the ground. Except for the black cherry it is doubtful that any one has ever recovered an original cherry bearing tree. The trees are thin barked, with thick sapwood, easily injured by fire, and injuries decay quickly.

If nothing else is available and cherry must be used bark scribe the tree. Do not snow blaze, and tag carefully. Paint the scribe marks. If blazing must be done use a "BT" blaze only.

PAPER BIRCH (*Betula papyrifera*)

YELLOW BIRCH (*Betula alleghaniensis*)

Other names: canoe birch, white birch, silver birch;
gray birch, swamp birch, birch.

FAIR

Paper birch is found throughout the Great Lakes region, and extreme northern portion of the adjacent states. It is one of the most common trees in interior Alaska. Yellow birch is a tree of the Great Lakes region and northeastern states. Both are considered short lived trees. Paper birch may reach 140 years of age and yellow birch up to 200 years. Both are rapid growing with a thin, "papery", bark, and reach 12" to 24" in diameter. Though the wood is hard it decays very rapidly when dead. The stumps decay to a mulch and leave little or no stump hole, though portions of the bark often remain. Both trees stool into clumps. The yellow birch often takes root in old hemlock stumps, forming a raised root system, similar in type to the western hemlock. Yellow birch is the more durable of the two. If windthrown there is usually a fair sized stump hole remaining.

The original bearing trees of these species are sometimes found. If still standing the blaze is badly decayed with little or no trace of scribe marks. In ideal site conditions the trees have been found alive but mature and in poor condition. Do not discount the possibility of finding an original birch because they have been recovered. Careful examination and search would be a must. Matching rotted stumps and clumps of birches could pay off with a recovered corner.

If using these birches select young trees, blaze very carefully to avoid separating the bark at the edges (they peel easily). Blaze to firm wood, use a sharp scribe and paint thoroughly. If a tree less than 6" is taken use bark scribing but the scribing would have to be deep into the bark and carefully done to avoid tearing. Larger than normal letters would probably be best.

AMERICAN ELM (*Ulmus americana*)

SLIPPERY ELM (*Ulmus rubra*)

ROCK ELM (*Ulmus thomasii*)

Other names: white elm, soft elm, water elm; gray elm
red elm; cork elm, elm.

GOOD TO VERY GOOD

The elms are trees of the Great Lakes region and eastern half of the adjacent states. They are medium to rapid growing trees, favor bottom lands, grow to 3 ft. or more in diameter and have a life expectancy of 150 to 300 years if not logged or killed by Dutch elm disease. Elms usually grow from seed but are known to grow up from root suckers of a dead or logged tree. These trees will completely heal an injury but a noticeable scar usually remains in the rough bark. Once cut or dead and fallen the wood decays quickly, both heart and sapwood. In low land conditions the growth rings are usually wide-spaced, curl and break off. The wood immediately under the bark is dark while the inner core is lighter in color.

There are no reports of recovered original elm bearing trees. They were used extensively by the original surveyors.

If an elm is used for a bearing tree, blaze through the bark just deep enough for a smooth face. Take care not to separate the bark from cambium layer. Smoothly drain with an upward axe stroke to prevent accumulation of the watery sap. Keep the bottom of the blaze high enough to prevent coverage by high water in swampy areas. Paint the blaze thoroughly.

SHAGBARK HICKORY (*Carya orata*)

BITTERNUT HICKORY (*Carya cordiformis*)

Other names: hickory, shagbark; bitternut, pignut,
pecan, swamp hickory

VERY GOOD

There are many species of hickory but the two listed here are found throughout the lower Great Lakes states and eastern half of the country. These hickories are moderate to fast growing trees, reach up to 3 ft. in diameter and an age of 200 years, if not cut or fire damaged. If fungus infection is not severe these trees will completely heal an injury in 25 or 30 years, with little trace of a scar in the rough bark. When dead and fallen the wood decays rapidly, and more so if in wet land conditions. There may be little or no trace of the rotted stump.

Hickories were a favorite bearing tree of the original surveyors. At this time (1972) there is no report of the characteristics of a recovered original hickory though many must have been by sheer weight of numbers. Since the trees are desirable as lumber, veneer, handles, etc., most large trees have undoubtedly been cut.

Select young vigorously growing trees, keep the blaze narrow, smoothly drained, and use a sharp scribe. Paint thoroughly.

AMERICAN BASSWOOD (*Tilia americana*)

Other names: basswood, linden

VERY GOOD

The American basswood or linden tree grows throughout the Great Lakes region, Minnesota to Maine. The tree prefers sandy glacial soil. Basswood is rapid growing, reaches as much as 3 ft. in diameter and up to 140 years of age. The tree is highly prized for lumber and is used as shade trees on city streets. The tree blooms in spring with white blossoms which bees turn into the most delicious honey. The Indians used the tough and stringy inner-bark to make rope. This tree sprouts profusely. Every old stump has a clump of new basswood trees which sprouted from it, forming a natural perpetuation of a trees' location. Young trees have a smooth green bark. Mature trees are protected by a rough and fibrous bark.

The original surveyors often bark scribed the young basswood. As the tree grew the bark scribing disappeared in the rough bark and would be very hard to detect. Dead and fallen trees decay quickly but the sprout clumps of new trees show where the original tree stood in most cases.

Select young and vigorous trees and release from a dense stand. Bark scribe through the bark. Avoid blazing but if necessary keep the blaze small, narrow and smooth at all edges. Paint thoroughly, whether bark or meat scribed.

BLACK WALNUT (*Juglans nigra*)

BUTTERNUT or WHITE WALNUT (*Juglans cinerea*)

Other names: walnut, American walnut; oilnut.

EXCELLENT

These trees are found in the midwest, eastern and lower Great Lakes portion of the country. They are very similar in appearance but the black walnut is the better bearing tree for it grows rapidly, reaches diameters of 3 to 5 ft. and an age of more than 200 years. The heartwood of black walnut is highly decay resistant and will remain for years buried in the ground. Butternut is a fast growing smaller tree, lives only about 75 years and decays quickly when dead and fallen. Both trees bear a very hard nut. The wood is highly valuable for lumber.

There are no reports of recovery of an original walnut bearing tree. Though both trees will heal a wound completely and would likely remain, any tree 100 years old would have been cut for lumber by this time.

Where the walnuts grow they are probably on private land and permission would be required before being used for bearing trees. The same caution would apply before cutting into a walnut suspected of being an original. These are highly prized trees.

SYCAMORE or PLANETREE (*Platanus occidentalis*)

Other names: buttonwood, buttonball

VERY GOOD

This sycamore is a tree of the eastern half of the adjacent states. It grows very rapidly, reaches 8 ft. or more in diameter and lives in excess of 200 years. The bark is a whitish brown, flakes in thin scales, is thin on young trees but thick and rough on old trees. This tree grows in bottomlands and along stream banks like the cottonwood but should not be confused with that species. Some species of sycamore are found in Arizona and California but ~~do~~ do not reach sizes nearly as large as the planetree discussed here.

There are no reports of recovery of an original sycamore bearing tree. Undoubtedly many exist.

When marking a sycamore select young trees, for large ones are probably near maturity. Blaze to firm wood, well drained and paint thoroughly. Do not bark scribe.

AMERICAN BEECH (*Fagus grandifolia*)

Other names: beech, beechnut, white beech, red beech

FAIR

The beech is an eastern states tree, extending as far west as Wisconsin in the Great Lakes region. This tree is slow growing, reaches 2 or 3 ft. in diameter and up to 300 years of age. The bark is smooth, bluish-gray in color and thin. The beech heals slowly when injured. The tree does reproduce as suckers from the parent root system. The beech nut is formed in a bur which looks very much like the chinquapin bur of the Pacific coast.

There is no report of a recovered beech bearing tree. Many were marked by the original surveyors. The beech is the tree specifically mentioned as the tree type which should be bark scribed in the earlier instructions by surveyor's general. The beech is susceptible to many killing fungi. The wood decays quickly. Though original trees must still exist today the older and larger trees have probably disappeared.

The instruction to bark scribe beech bearing trees still applies. Select young trees however because larger trees are subject to butt-rot, etc. Paint the scribe marks.