

Various Friction Fire Woods and Their Relative Usefulness By storm

Preferred Hand Drill Materials of the Central Coast Section of the California Floristic Province

Great

Achillea millefolium
Conyza canadensis
Acer negundo
Aesculus californica
Baccharis salicifolia
Sambucus mexicana
Sequoia sempervirens
Typha latifolia
Acer macrophyllum
Artemisia douglasiana
Cirsium vulgare
Cytisus scoparius
Pseudotsuga menziesii
Scrophularia californica
Sonchus oleraceus

Yarrow
Horseweed
Box Elder
CA Buckeye
Seep Willow
Blue Elderberry
Coast Redwood
Cattail
Big-leaf Maple
Mugwort
Bull Thistle
Scotch Broom
Douglas Fir
CA Figwort
Sow Thistle



Good

Erigeron sp.
Umbellularia californica
Verbascum thapsus
Helianthus sp.
Lonicera hispidula
Salix sp.
Solidago spathulata
Cornus sericera
Rubus parviflorus
Silybum marianum
Vitus californica
Alnus rhombifolia
Artemisia californica

Fleabane Daisy
CA Bay Laurel
Common Mullein
Garden Sunflower
Hairy Honeysuckle
Willow
Coast Goldenrod
American Dogwood
Thimbleberry
Milk Thistle
Wild Grape
White Alder
CA Sagebrush

Difficult

Ceanothus thyrsiflorus
Chlorogalum pomeridianum
Dipsacus fullonum
Eriophyllum staechadifolium
Euonymus occidentalis
Holodiscus discolor
Myrica californica
Rubus discolor
Thuja plicata
Prunus cerasifera
Rosa gymnocarpa

CA Lilac
Soaproot
Fuller's Teasel
Seaside Woolly Sunflower
W. Burning Bush
Ocean Spray
Pac. Wax Myrtle
Himalayan Blackberry
Western Red Cedar
Cherry Plum
Wood Rose

Escallonia macrantha
Mimulus aurantiacus
Rhododendron occidentale
Tamarix parviflora
Baccharis douglasii
Larix sp.
Lithocarpus densiflorus
Madia elegans
Symphoricarpos albus
Acacia sp.
Calocedrus decurrens
Corylus cornuta
Cydonia oblonga
Grindelia stricta
Phyllostachys sp.
Rhododendron macrophyllum
Salix lutea

Escallonia
Sticky Monkeyflower
Western Azalea
Smallflower Tamarisk
Marsh Baccharis
Tamarack
Tan Oak
Tarweed
Snowberry
Acacia
Incense Cedar
Hazelnut
Quince
Marsh Gum Plant
Bamboo
Pacific Rhododendron
Yellow Willow



Extremely Difficult (*embers attained)

Arbutus menziesii*	Madrone
Baccharis pilularis*	Coyote Brush
Conium maculatum	Poison Hemlock
Cupressus macrocarpa	Monterey Cypress
Eucalyptus globulus	Blue Gum Eucalyptus
Hedera helix	English Ivy
Heteromeles arbutifolia*	Toyon
Juniperus communis	Common Juniper
Lupinus arborus*	Tree Lupine
Malus sp.*	Apple
Pteridium aquilinum	Bracken Fern
Pyrus sp.*	Pear
Rhamnus californica*	Coffeeberry
Ribes menziesii	Canyon Gooseberry
Rumex crispus	Curly Dock
Ulmus minor*	Smooth-leaved Elm
Vaccinium ovatum	Evergreen Huckleberry

Preferred Hand Drill Materials of the Sierran Foothill Section of the California Floristic Province

(CA Buckeye, Quaking Aspen, Mtn. Red Elderberry, Mtn. Ash and Incense Cedar heartboards used with each spindle species)

Great

Clematis lasiantha	Chaparral Virgin's Bower
Cornus stolonifera	Red-osier Dogwood
Populus tremuloides	Quaking Aspen
Populus trichocarpa	Black Cottonwood
Sambucus microbotrys	Mountain Red Elderberry

Good

Alnus rhombifolia	White Alder
Artemisia tridentata	Great Basin Sagebrush
Baccharis pilularis var. consanguineum	Coyote Brush
Chrysothamnus nauseosus	Rabbit Brush
Pinus sabiniana	Grey Pine

Difficult

Arctostaphylos patula	Green-Leaf Manzanita
Arctostaphylos viscida	White-Leaf Manzanita
Ceanothus integerrimus	Deer Brush
Cercis occidentalis	Redbud
Corylus cornuta var. californica	Western Hazelnut
Pinus ponderosa	Ponderosa Pine
Quercus douglasii	Blue Oak
Rhamnus californica	Coffeeberry
Rhamnus purshiana	Cascara
Salix scouleriana	Scouler's Willow
Solidago occidentalis	Western Goldenrod
Sorbus californica	Mountain Ash

Extremely Difficult (no embers attained)

Apocynum androsaemifolium	Dogbane
Cornus nuttallii	Flowering Dogwood
Ledum glandulosum	Labrador Tea
Quercus kelloggii	CA Black Oak
Spiraea douglasii	Western Spiraea
Urtica dioica	Stinging Nettle

[some of the above woods were chucked into spindle shafts for use]



Successful Hand Drill Combinations of the Olympic Peninsula, WA

On Western Hemlock Root (*Tsuga heterophylla*)
Big-Leaf Maple (*Acer macrophyllum*)
Cattail (*Typha latifolia*)
Red Elderberry (*Sambucus racemosa*)

On Western Red Cedar heartwood (*Thuja plicata*)
Big-Leaf Maple (*Acer macrophyllum*)
Western Red Cedar (*Thuja plicata*)
Salmonberry (*Rubus spectabilis*)
Thimbleberry (*Rubus parviflorus*)
Canada Thistle (*Cirsium arvense*)

On Western Red Cedar sapwood (*Thuja plicata*)
Cattail (*Typha latifolia*)
Horseweed (*Conyza canadensis*)
Canada Thistle (*Cirsium arvense*)
Burdock (*Arctium lappa*)
Mullein (*Verbascum thapsus*)

On Sub-Alpine Fir (*Abies lasiocarpa*)
Spiraea (*Spiraea latifolia*)
Ocean Spray (*Holodiscus discolor*)
Western Red Cedar (*Thuja plicata*)

On Sitka Spruce (*Picea sitchensis*)
Bitter Cherry (*Prunus emarginata*)
Clematis (*Clematis lingustifolia*)

On Douglas Fir (*Pseudotsuga menziesii*)
Douglas Fir (*Pseudotsuga menziesii*)
Big-Leaf Maple (*Acer macrophyllum*)
Clematis (*Clematis lingustifolia*)
Cattail (*Typha latifolia*)
Western Red Cedar (*Thuja plicata*)
Red Elderberry (*Sambucus racemosa*)

On Big-Leaf Maple (*Acer macrophyllum*)
Big-Leaf Maple (*Acer macrophyllum*)
Cattail (*Typha latifolia*)
Ocean Spray (*Holodiscus discolor*)
Thimbleberry (*Rubus parviflorus*)
Salmonberry (*Rubus spectabilis*)

On Douglas Fir bark (*Pseudotsuga menziesii*)
Yarrow (*Achillea millefolium*)

On Scotch Broom (*Cytisus scoparius*)
Scotch Broom (*Cytisus scoparius*)

On Artist's Conk fungus (*Ganoderma applanatum*)
Big-Leaf Maple (*Acer macrophyllum*)
Mullein (*Verbascum thapsus*)

On Red-Belted Conk fungus (*Fomitopsis pinicola*)
Big-Leaf Maple (*Acer macrophyllum*)

Successful Hand Drill Combinations of Southern CA

- **On** CA Fan Palm (*Washingtonia filifera*)
Yarrow (*Achillea millefolium*)
Big-Leaf Maple (*Acer macrophyllum*)
Maple-Curry Escallonia (*Escallonia* sp.)—ornamental shrub
- Seep Willow (*Baccharis viminea*) **on** Cottonwood Root (*Populus balsamifera* ssp *trichocarpa*)
- Utah Serviceberry (*Amelanchier utahensis*) **on** itself
- Seep Willow (*Baccharis viminea*) **on** Joshua Tree outer "bark" (*Yucca brevifolia*)
- Scale Broom (*Lepidospartum squamatum*) **on** itself
- Seep Willow (*Baccharis viminea*) **on** Nolina sp.

Woods That Have Provided Non-Notched Spindle Embers

Woods That Offer Non-Notched Embers On Softer Hearthboards

<i>Acer macrophyllum</i>	Big-leaf Maple
<i>Aesculus californica</i>	CA Buckeye
<i>Chlorogalum pomeridianum</i>	Soaproot
<i>Cirsium vulgare</i>	Bull Thistle
<i>Conyza canadensis</i>	Horseweed
<i>Eriophyllum staechadifolium</i>	Seaside Woolly Sunflower
<i>Grindelia stricta</i>	Marsh Gum Plant
<i>Helianthus</i> sp.	Garden Sunflower
<i>Rubus discolor</i>	Himalayan Blackberry
<i>Sambucus mexicana</i>	Blue Elderberry
<i>Scrophularia californica</i>	CA Figwort
<i>Sequoia sempervirens</i>	Coast Redwood
<i>Silybum marianum</i>	Milk Thistle
<i>Solidago spathulata</i>	Coast Goldenrod
<i>Sonchus oleraceus</i>	Sow Thistle
<i>Symphoricarpos albus</i>	Snowberry
<i>Typha latifolia</i>	Cattail
<i>Verbascum thapsus</i>	Common Mullein



Woods That Offer Non-Notched Embers On Harder Hearthboards

<i>Acer macrophyllum</i>	Big-leaf Maple
<i>Acer negundo</i>	Box Elder
<i>Achillea millefolium</i>	Yarrow
<i>Aesculus californica</i>	CA Buckeye
<i>Artemisia douglasiana</i>	Mugwort
<i>Baccharis salicifolia</i>	Mule Fat
<i>Chlorogalum pomeridianum</i>	Soaproot

<i>Conyza canadensis</i>	Horseweed
<i>Cytisus scoparius</i>	Scotch Broom
<i>Erigeron</i> sp.	Fleabane Daisy
<i>Helianthus</i> sp.	Garden Sunflower
<i>Holodiscus discolor</i>	Ocean Spray
<i>Lithocarpus densiflorus</i>	Tan Oak
<i>Lonicera hispidula</i>	Hairy Honeysuckle
<i>Madia elegans</i>	Tarweed
<i>Rubus discolor</i>	Himalayan Blackberry
<i>Rubus parviflorus</i>	Thimbleberry
<i>Sambucus mexicana</i>	Blue Elderberry
<i>Sequoia sempervirens</i>	Coast Redwood
<i>Solidago spathulata</i>	Coast Goldenrod
<i>Typha latifolia</i>	Cattail
<i>Urtica californica</i>	Stinging Nettle
<i>Verbascum thapsus</i>	Common Mullein

Woods That Did Not Offer Non-Notched Embers

<i>Acacia</i> sp.	Acacia
<i>Alnus rhombifolia</i>	White Alder
<i>Arbutus menziesii</i>	Madrone
<i>Artemisia californica</i>	CA Sagebrush
<i>Baccharis douglasii</i>	Marsh Baccharis
<i>Baccharis pilularis</i>	Coyote Brush
<i>Calocedrus ducurrens</i>	Incense Cedar
<i>Ceanothus thyrsiflorus</i>	CA Lilac
<i>Conium maculatum</i>	Poison Hemlock
<i>Cornus sericera</i>	American Dogwood
<i>Corylus cornuta</i>	Hazelnut
<i>Cupressus macrocarpa</i>	Monterey Cypress
<i>Cydonia oblonga</i>	Quince
<i>Dipsacus fullonum</i>	Fuller's Teasel
<i>Escallonia macrantha</i>	Escallonia
<i>Eucalyptus globulus</i>	Blue Gum Eucalyptus
<i>Euonymus occidentalis</i>	W. Burning Bush
<i>Hedera helix</i>	English Ivy
<i>Heteromeles arbutifolia</i>	Toyon
<i>Juniperus communis</i>	Common Juniper
<i>Larix</i> sp.	Tamarack
<i>Lupinus arborus</i>	Tree Lupine
<i>Malus</i> sp.	Apple
<i>Mimulus aurantiacus</i>	Sticky Monkeyflower
<i>Myrica californica</i>	Pac. Wax Myrtle
<i>Phyllostachys</i> sp.	Bamboo
<i>Prunus cerasifera</i>	Cherry Plum
<i>Pseudotsuga menziesii</i>	Douglas Fir
<i>Pteridium aquilinum</i>	Bracken Fern
<i>Pyrus</i> sp.	Pear
<i>Rhamnus californica</i>	Coffeeberry
<i>Rhododendron macrophyllum</i>	Pacific Rhododendron
<i>Rhododendron occidentale</i>	Western Azalea
<i>Ribes menziesii</i>	Canyon Gooseberry

Rosa gymnocarpa	Wood Rose
Rumex crispus	Curly Dock
Salix lutea	Yellow Willow
Salix sp.	Willow
Tamarix parviflora	Smallflower Tamarisk
Thuja plicata	Western Red Cedar
Ulmus minor	Smooth-leaved Elm
Umbellularia californica	CA Bay Laurel
Vaccinium ovatum	Evergreen Huckleberry
Vitus californica	Wild Grape

Successful Fire Plow Combinations

- Seep Willow (*Baccharis viminea*) **on** CA Fan Palm (*Washingtonia filifera*)
- Seep Willow (*Baccharis viminea*) **on** Coast Redwood (*Sequoia sempervirens*)
- CA Buckeye (*Aesculus californica*) **on** itself
- **On** Sotol (*Dasyilirion wheeleri*):
 - Seep Willow (*Baccharis viminea*)
 - Sotol (*Dasyilirion wheeleri*)



Successful Fire Saw Combinations

- Whipple's Yucca (*Yucca whipplei*) **on** itself
- Sotol (*Dasyilirion wheeleri*) **on** Whipple's Yucca (*Yucca whipplei*)
- CA Fan Palm (*Washingtonia filifera*) **on** itself
- CA Fan Palm (*Washingtonia filifera*) **on** CA Buckeye
- Bamboo (*Phyllostachys* sp.) **on** itself
- Red Elderberry (*Sambucus racemosa*) **on** itself

Preferred Bow Drill Materials of the Central Coast Section of the California Floristic Province

Great

Sambucus mexicana	Blue Elderberry
Aesculus californica	CA Buckeye
Sequoia sempervirens	Coast Redwood
Pseudotsuga menziesii	Douglas Fir
Clematis ligusticifolia	Clematis
Acer macrophyllum	Big-leaf Maple
Lonicera hispidula var. vacillans	Hairy Honeysuckle
Thuja plicata	W. Red Cedar
Conyza canadensis	Horseweed
Pinus radiata	Monterey Pine
Vitus californica	Wild Grape

Good

Rosa gymnocarpa	Wood Rose
Acacia sp.	Acacia
Pyrus sp.	Pear
Acer negundo	Box Elder
Eucalyptus globulus	Eucalyptus
Prunus sp.	Wild Cherry
Malus sp.	Apple
Ribes menziesii	Canyon Gooseberry
Hedera helix	English Ivy
Prunus cerasifera	Cherry Plum
Salix sp.	Willow sp.
Cupressus abramsiana	Santa Cruz Cypress
Rubus parviflorus	Thimbleberry
Umbellularia californica	CA Bay Laurel
Cytisus scoparius	Scotch Broom
Artemisia californica	CA Sagebrush
Cornus sericea	American Dogwood
Rhododendron macrophyllum	Pacific Rhododendron
Lupinus arboreus	Tree Lupine
Euonymus occidentalis	Western Burning Bush
Alnus rhombifolia	White Alder

Difficult

Baccharis pilularis	Coyote Brush
Ceanothus thyrsiflorus	CA Wild Lilac
Rhamnus californica	Coffeeberry
Corylus cornuta var. californica	CA Hazelnut
Lithocarpus densiflorus	Tan Oak
Vaccinium ovatum	Evergreen Huckleberry

Extremely Difficult

Myrica californica	Pac. Wax Myrtle
Holodiscus discolor	Ocean Spray
Heteromeles arbutifolia	Toyon

Quercus wislizeni
Rubus discolor
Arbutus menziesii

Interior Live Oak
Himalayan Blackberry
Madrone

Successful Bow Drill Spindle Woods Used On Fungal Hearthboards

- **On** Tinder Fungus (*Fomes fomentarius*)
 - Clematis (*Clematis lingusifolia*)
 - Green Ash (*Fraxinus pennsylvanica*)
 - Burning Bush (*Euonymus purpureus*)

- **On** Artist's Conk Fungus (*Ganoderma applanatum*)
 - Big-Leaf Maple (*Acer macrophyllum*)
 - Basswood (*Tilia americana*)
 - Green Ash (*Fraxinus pennsylvanica*)
 - CA Fan Palm (*Washingtonia filifera*)
 - Seep Willow (*Baccharis viminea*)

- **On** Red-Belted Conk Fungus (*Fomitopsis pinicola*)
 - Big-Leaf Maple (*Acer macrophyllum*)
 - Red-Osier Dogwood (*Cornus stolonifera*)
 - Burning Bush (*Euonymus purpureus*)
 - CA Fan Palm (*Washingtonia filifera*)

- **On** Birch Polypore Fungus (*Piptoporus betulina*)
 - Big-Leaf Maple (*Acer macrophyllum*)
 - Western Red Cedar (*Thuja plicata*)

Miscellaneous Successful Hand Drill Combinations

- Sunflower (*Helianthus annuus*) **on** itself
- Interior Live Oak (*Quercus wislizenii*) **on** CA Buckeye (*Aesculus californica*)
- Bamboo (*Phyllostachys* sp.)--with the node at the spindle's working end--**on** CA Fan Palm (*Washingtonia filifera*)
- Seep Willow (*Baccharis viminea*) **on**
 - Douglas Fir bark (*Pseudotsuga menziesii*)
 - on Sea Grape (*Coccoloba uvifera*)
 - on Red Mangrove (*Rhizophora mangle*)