Appendix D: Forest Type Codes and Names

Note: The forest type names used by FIA do not come from a single published reference. The current list of forest type names has been developed over time using sources such as historical FIA lists, lists from the Society of American Foresters, and FIA analysts who developed names to meet current analysis and reporting needs.

Appendix Contents:

Code	Forest type group
960	Other hardwoods group
970	Woodland hardwoods group
980	Tropical hardwoods group
990	Exotic hardwoods group
999	Nonstocked

The following list includes classifications for forest types in the Continental U.S. and Alaska. The types designated East (E) West (W) are commonly found in those regions, however, types designated for one region may occasionally be found in another.

Forest Types

East	West	Code	Forest type / type group
-	**-**	**100**	**White / red / jack pine group**
E	-	101	Jack pine
E	-	102	Red pine
E	-	103	Eastern white pine
E	-	104	Eastern white pine / eastern hemlock
E	-	105	Eastern hemlock
-	**-**	**120**	**Spruce / fir group**
E	-	121	Balsam fir
E	W	122	White spruce
E	-	123	Red spruce
E	-	124	Red spruce / balsam fir
E	W	125	Black spruce
E	-	126	Tamarack
E	-	127	Northern white-cedar
E	-	128	Fraser fir
E	-	129	Red spruce / Fraser fir
	-	**140**	**Longleaf / slash pine group**
E	-	141	Longleaf pine
E	-	142	Slash pine
-	**-**	**150**	**Tropical softwoods group**
E	-	151	Tropical pines
-	**-**	**160**	**Loblolly / shortleaf pine group**
E	-	161	Loblolly pine
E	-	162	Shortleaf pine
E	-	163	Virginia pine
E	-	164	Sand pine
E	-	165	Table mountain pine
E	-	166	Pond pine
E	-	167	Pitch pine
E	-	168	Spruce pine
-	**-**	**170**	**Other eastern softwoods group**
E	-	171	Eastern redcedar

East	West	Code	Forest type / type group
E	-	172	Florida softwoods
-	**-**	**180**	**Pinyon / juniper group**
E	W	182	Rocky Mountain juniper
E	W	184	Juniper woodland
E	W	185	Pinyon / juniper woodland
-	**-**	**200**	**Douglas-fir group**
E	W	201	Douglas-fir
-	W	202	Port-Orford-cedar
-	W	203	Bigcone Douglas-fir
-	**-**	**220**	**Ponderosa pine group**
E	W	221	Ponderosa pine
-	W	222	Incense-cedar
-	W	224	Sugar pine
-	W	225	Jeffrey pine
-	W	226	Coulter pine
-	**-**	**240**	**Western white pine group**
-	W	241	Western white pine
-	**-**	**260**	**Fir / spruce / mountain hemlock group**
-	W	261	White fir
-	W	262	Red fir
-	W	263	Noble fir
-	W	264	Pacific silver fir
-	W		Engelmann spruce
-	W	266	Engelmann spruce / subalpine fir
-	W	267	Grand fir
-	W	268	Subalpine fir
-	W	269	Blue spruce
-	W	270	Mountain hemlock
-	W	271	Alaska-yellow-cedar
-	**-**	**280**	**Lodgepole pine group**
-	W	281	Lodgepole pine
-	**-**	**300**	**Hemlock / Sitka spruce group**
-	W	301	Western hemlock
-	W	304	Western redcedar
-	W	305	Sitka spruce
-	**-**	**320**	**Western larch group**
-	W	321	Western larch

East	West	Code	Forest type / type group
-	**-**	**340**	**Redwood group**
-	W	341	Redwood
-	W	342	Giant sequoia
-	**-**	**360**	**Other western softwoods group**
-	W	361	Knobcone pine
-	W	362	Southwestern white pine
-	W	363	Bishop pine
-	W	364	Monterey pine
-	W	365	Foxtail pine / bristlecone pine
-	W	366	Limber pine
-	W	367	Whitebark pine
-	W	368	Miscellaneous western softwoods
-	W	369	Western juniper
-	**-**	**370**	**California mixed conifer group**
-	W	371	California mixed conifer
-	**-**	**380**	**Exotic softwoods group**
E	-	381	Scotch pine
E	W	383	Other exotic softwoods
E	-	384	Norway spruce
E	-	385	Introduced larch
-	**-**	**390**	**Other softwoods group**
E	-	391	Other softwoods
-	**-**	**400**	**Oak / pine group**
E	-	401	Eastern white pine / northern red oak / white ash
E	-	402	Eastern redcedar / hardwood
E	-	403	Longleaf pine / oak
E	-	404	Shortleaf pine / oak
E	-	405	Virginia pine / southern red oak
E	-	406	Loblolly pine / hardwood
E	-	407	Slash pine / hardwood
E	-	409	Other pine / hardwood
-	**-**	**500**	**Oak / hickory group**
E	-	501	Post oak / blackjack oak
E	-	502	Chestnut oak
E	-	503	White oak / red oak / hickory
E	-	504	White oak
E	-	505	Northern red oak

East	West	Code	Forest type / type group
E	-	506	Yellow-poplar / white oak / northern red oak
E	-	507	Sassafras / persimmon
E	-	508	Sweetgum / yellow-poplar
E	-	509	Bur oak
E	-	510	Scarlet oak
E	-	511	Yellow-poplar
E	-	512	Black walnut
E	-	513	Black locust
E	-	514	Southern scrub oak
E	-	515	Chestnut oak / black oak / scarlet oak
E	-	516	Cherry / white ash / yellow-poplar
E	-	517	Elm / ash / black locust
E	-	519	Red maple / oak
E	-	520	Mixed upland hardwoods
-	**-**	**600**	**Oak / gum / cypress group**
E	-	601	Swamp chestnut oak / cherrybark oak
E	-	602	Sweetgum / Nuttall oak / willow oak
E	-	605	Overcup oak / water hickory
E	-	606	Atlantic white-cedar
E	-	607	Baldcypress / water tupelo
E	-	608	Sweetbay / swamp tupelo / red maple
E	-	609	Baldcypress / pondcypress
-	**-**	**700**	**Elm / ash / cottonwood group**
E	-	701	Black ash / American elm / red maple
E	-	702	River birch / sycamore
E	W	703	Cottonwood
E	W	704	Willow
E	-	705	Sycamore / pecan / American elm
E	-	706	Sugarberry / hackberry / elm / green ash
E	-	707	Silver maple / American elm
E	-	708	Red maple / lowland
E	W	709	Cottonwood / willow
-	W	722	Oregon ash
-	**-**	**800**	**Maple / beech / birch group**
E	-	801	Sugar maple / beech / yellow birch
E	-	802	Black cherry
E	-	805	Hard maple / basswood

East	West	Code	Forest type / type group
E	-	809	Red maple / upland
-	**-**	**900**	**Aspen / birch group**
E	W	901	Aspen
E	W	902	Paper birch
E	-	903	Gray birch
E	W	904	Balsam poplar
E	W	905	Pin cherry
-	**-**	**910**	**Alder / maple group**
-	W	911	Red alder
-	W	912	Bigleaf maple
-	**-**	**920**	**Western oak group**
-	W	921	Gray pine
-	W	922	California black oak
-	W	923	Oregon white oak
-	W	924	Blue oak
-	W	931	Coast live oak
-	W	933	Canyon live oak
-	W	934	Interior live oak
-	W	935	California white oak (valley oak)
-	**-**	**940**	**Tanoak / laurel group**
-	W	941	Tanoak
-	W	942	California laurel
-	W	943	Giant chinkapin
-	**-**	**960**	**Other hardwoods group**
-	W	961	Pacific madrone
-	W	962	Other hardwoods
-	**-**	**970**	**Woodland hardwoods group**
-	W	971	Deciduous oak woodland
-	W	972	Evergreen oak woodland
-	W	973	Mesquite woodland
-	W	974	Cercocarpus (mountain brush) woodland
-	W	975	Intermountain maple woodland
-	W	976	Miscellaneous woodland hardwoods
-	**-**	**980**	**Tropical hardwoods group**
E	-	982	Mangrove
E	W	983	Palms
-	W	984	Dry forest

East	West	Code	Forest type / type group
-	W	985	Moist forest
-	W	986	Wet and rain forest
-	W	987	Lower montane wet and rain forest
-	W	988	Cloud forest
-	W	989	Other tropical hardwoods
-	**-**	**990**	**Exotic hardwoods group**
E	-	991	Paulownia
E	-	992	Melaleuca
E	W	993	Eucalyptus
E	W	995	Other exotic hardwoods
-	**-**	**999**	**Nonstocked**

Forest types are named for the predominant species (or group of species) on the condition. If softwoods predominate (50 percent or more of tree stocking), then the forest type will be one of the softwood types (codes 101 through 391) and vice versa for hardwoods (codes 401 through 995).

For the Eastern United States, there are mixed hardwood-pine forest types (codes 401 through 409) when the pine and/or redcedar (either eastern or southern) component is between 25 and 49 percent of the stocking. If the pine/redcedar component is less than 25 percent of the stocking, then one of the hardwood forest types is assigned.

WHITE/RED/JACK PINE GROUP

In these pure pine forest types, stocking of the pine component needs to be at least 50 percent. Otherwise, forest types listed under the Oak / Pine Group are used (codes 401 through 409).

101

Jack pine: Associates - northern pin oak, bur oak, red pine, bigtooth aspen, paper birch, northern red oak, eastern white pine, red maple, balsam fir, white spruce, black spruce, and tamarack. Sites - Dry to mesic sites.

102

Red pine: Associates - eastern white pine, jack pine, red maple, northern red oak, white spruce, balsam fir, quaking aspen, bigtooth aspen, paper birch, northern pin oak. Sites - common on sandy soils, but reaches best development on well-drained sandy loam to loam soils.

103

Eastern white pine: Associates - pitch pine, gray birch, aspen, red maple, pin cherry, white oak, paper birch, sweet birch, yellow birch, black cherry, white ash, northern red oak, sugar maple, basswood, hemlock, northern white cedar, yellow poplar, white oak, chestnut oak, scarlet oak, and shortleaf pine. Sites - wide variety, but best development on well drained sands and sandy loams.

104

Eastern white pine/ eastern hemlock (includes Carolina hemlock): Associates - beech, sugar maple, basswood, red maple, yellow birch, gray birch, red spruce, balsam fir, black cherry, white ash, paper birch, sweet birch, northern red oak, white oak, chestnut oak, yellow poplar, and cucumbertree. Sites - wide variety but favors cool locations, moist ravines, and north slopes.

105

Eastern hemlock (includes Carolina hemlock): Associates - white pine, balsam fir, red spruce, beech, sugar maple, yellow birch, basswood, red maple, black cherry, white ash, paper birch, sweet birch, northern red oak, and white oak. Sites - cool locations, moist ravines, and north and east slopes.

SPRUCE/FIR GROUP

These types are mostly in the Eastern United States. See FIR/SPRUCE/MOUNTAIN HEMLOCK for Western United States.

121

Balsam fir: Associates - black, white, or red spruce; paper or yellow birch; quaking or bigtooth aspen, beech; red maple; hemlock; tamarack; black ash; or northern white cedar. Sites - upland sites on low-lying moist flats and in swamps.

122

White spruce: Associates - black spruce, paper birch, quaking aspen, red spruce, balsam fir, and balsam poplar. Sites - Transcontinental; grows well on calcareous and well-drained soils, but is found on acidic rocky and sandy sites, and sometimes in fen peatlands along the maritime coast.

123

Red spruce: Associates - vary widely and may include red maple, yellow birch, eastern hemlock, eastern white pine, white spruce, northern white cedar, paper birch, pin cherry, gray birch, mountain-ash, beech, striped maple, sugar maple, northern red oak, red pine, and aspen. Sites - include moderately well-drained to poorly drained flats and thin slopes and on varying acidic soils in abandoned fields and pastures. This code should be used where red spruce comprises a plurality or majority of the stand's stocking but where balsam fir is either nonexistent or has very little stocking (<5 percent of total). Otherwise the plot would be coded 124, red spruce/balsam fir.

124

Red spruce/balsam fir: Associates - red maple, paper birch, white pine, hemlock, white spruce, and northern white cedar. Sites - moderately drained to poorly drained flats or on thin soiled upper slopes.

125

Black spruce: Associates - white spruce, quaking aspen, balsam fir, paper birch, tamarack, northern white cedar, black ash, and red maple. Sites - wide variety from moderately dry to very wet.

126

Tamarack: Associates - black spruce, balsam fir, white spruce, northern white-cedar, and quaking aspen. Sites - found on wetlands and poorly drained sites.

127

Northern white cedar: Associates - balsam fir, tamarack, black spruce, white spruce, red spruce, black ash, and red maple. Sites - mainly occurs in swamps, but also in seepage areas, limestone uplands and old fields.

128
Fraser fir: Associates - red spruce, hemlock, yellow birch, less frequently, beech, sugar maple, yellow buckeye, mountain-ash, and mountain maple. Sites - mainly occurs in the Appalachian Mountains of North Carolina and Tennessee. This type is used if the stocking of Fraser fir is at least 50 percent of the total stocking.

129
Red spruce/Fraser fir: Associates - hemlock, yellow birch, and less frequently, beech, sugar maple, yellow buckeye, mountain-ash, and mountain maple. Sites - mainly occurs in the Appalachian Mountains of North Carolina and Tennessee. For this type to be used, the sum of the stocking of red spruce and Fraser fir must be at least 50 percent of the total stocking and red spruce stocking must be between 5 and 49 percent of total and Fraser fir stocking must be between 5 and 49 percent of total.

LONGLEAF/SLASH PINE GROUP

141
Longleaf pine: Longleaf pine occurs as a pure type or comprises a majority of the trees in the overstory. Associates - slash, loblolly and shortleaf pine, southern red oak, blackjack oak, water oak, persimmon, and sweetgum. Sites - those areas that can and do burn on a periodic basis usually occurs on middle and upper slopes with a low severity of hardwood and brush competition. SRS distribution coastal plain and piedmont units.

142
Slash pine: Slash pine is pure or provides a majority of the stocking. Associates on moist sites; a wide variety of moist site hardwoods, pond pine, and pondcypress. On dry sites; a wide variety of dry site hardwoods, longleaf, loblolly, and sand pine. Sites both moist and well drained flatwoods, and bays. SRS distribution coastal plain and piedmont units from North Carolina to Florida.

TROPICAL SOFTWOODS GROUP

151
Tropical pines: Tropical pine forests and plantations composed of Caribbean pine (***Pinus caribea***). Associates are ***P. oocarpa***, ***P. patula*** and other pine species native to the Florida Keys, Caribbean, Central America and Mexico. Pines are not native to Puerto Rico or the U.S. Virgin Islands but can be found in plantations or naturally regenerating to a limited extent on sites that were formerly plantations. ***P. caribea*** was once rare on the South Florida mainland, but practically non-existent there now and it is not used in plantations in Florida.

LOBLOLLY/SHORTLEAF PINE GROUP

161
Loblolly pine: Associates - sweetgum, southern red oak, post oak, blackjack oak, blackgum, yellow poplar, and pond pine. Sites - upland soils with abundant moisture but good drainage, and on poorly drained depressions.

162
Shortleaf pine: Associates - white oak, southern red oak, scarlet oak, black oak, hickory, post oak, blackjack oak, blackgum, red maple, pitch pine, and Virginia pine. Sites - low, well drained ridges to rocky, dry, south slopes and the better drained spur ridges on north slopes and also on old fields.

163
Virginia pine: Associates - shortleaf pine, white oak, chestnut oak, southern red oak, black oak, sweetgum, red maple, blackgum, and pitch pine. Sites - dry sites, often abandoned fields.

164
Sand pine: Sand pine occurs in pure stands or provides a majority of the stocking. Associates - dwarf live oak, dwarf post oak, turkey oak, persimmon, and longleaf pine. Sites - dry, acidic, infertile sands. SRS distribution found chiefly in the central peninsula and panhandle of Florida, although planted stands extend into the sandhills of Georgia and South Carolina.

165
Table mountain pine: Associates - chestnut oak, scarlet oak, pitch pine, and black oak. Sites - poor, dry, often rocky slopes.

166
Pond pine: Associates - loblolly pine, sweetgum, baldcypress, and Atlantic white cedar. Sites - rare, but found in southern New Jersey, Delaware, and Maryland in low, poorly drained areas, swamps, and marshes.

167
Pitch pine: Associates - chestnut oak, scarlet oak, table mountain pine, black oak, and blackgum. Sites - relatively infertile ridges, dry flats, and slopes.

168
Spruce pine: Spruce pine comprises a majority of the stocking. Associates - any of the moist site softwood or hardwood species. Sites - moist or poorly drained areas. SRS distribution of this type is rarely encountered and is found almost exclusively in the coastal plain.

OTHER EASTERN SOFTWOODS GROUP

171
Eastern redcedar (includes southern redcedar): Associates - gray birch, red maple, sweet birch, Virginia Pine, shortleaf pine, oak. Sites - usually dry uplands and abandoned fields on limestone outcrops and other shallow soils but can grow well on good sites.

172
Florida softwoods (includes either Florida yew or Florida torreya): Either of these two species comprises the majority of stocking. Sites - Along bluffs and ravines of the Apalachicola River and its tributaries in north Florida and South Georgia.

PINYON / JUNIPER GROUP

182
Rocky Mountain juniper: Rocky Mountain juniper comprises the majority of stocking. Associates - ponderosa pine, Douglas-fir, other junipers, pinyons, and oaks. Sites - often found on calcareous and somewhat alkaline soils.

184
Juniper woodland: Includes Pinchot juniper, redberry juniper, Ashe juniper, California juniper, alligator juniper, Utah juniper, oneseed juniper and pinyon is NOT present. Associates - various woodland oaks and cercocarpus, ponderosa pine, Arizona cypress, and Douglas-fir. Sites - lower elevation with low annual precipitation.

185
Pinyon-juniper woodland: Includes all pinyons and all junipers except Rocky Mountain and western juniper. Must have pinyon present. Associates - various woodland oaks and cercocarpus, ponderosa pine, Arizona cypress, and Douglas-fir. Sites - occurs at lower elevations with low annual precipitation.

DOUGLAS-FIR GROUP

201
Douglas-fir: Associates - western hemlock, grand fir, Pacific silver fir, white fir, noble fir, California red fir, western redcedar, bigleaf maple, red alder, ponderosa pine, western white pine, western hemlock, Sitka spruce. Sites - throughout the western U.S.

202
Port-Orford-cedar: Associates - Douglas-fir, western hemlock, Sitka spruce, grand fir, lodgepole pine, western redcedar, redwood, tanoak, red alder, bigleaf maple and California laurel. Sites - higher elevations tending to occur on northerly aspects.

203
Bigcone Douglas-fir: Associates - Canyon live oak, ponderosa, Jeffrey, sugar, knobcone, and Coulter pines, incense-cedar, white fir, California black oak, California laurel, and bigleaf maple. Sites - Mainly confined to the Transverse and Peninsular Ranges of southern California. Stands are found on many combinations of slope, aspect, soil, but as elevations increase, the preferred aspect shifts from cooler to warmer slopes.

PONDEROSA PINE GROUP

221
Ponderosa pine (includes Arizona pine): Associates - Douglas-fir, lodgepole pine, grand fir, Jeffrey pine, western larch, quaking aspen, Utah juniper, Gambel oak. Sites - this forest type is distributed over vast areas in the West and therefore can have great differences in environmental conditions.

222
Incense-cedar: Associates - Douglas-fir, ponderosa pine, sugar pine, western white pine, Jeffrey pine, white and grand fir, western hemlock, western redcedar, Port-Orford-cedar, giant sequoia, Oregon white oak, California black oak, tanoak, giant chinkapin, and Pacific madrone; it is rarely found in pure stands. Sites - Grows from the coastal fog belt to the dry inland slopes of eastern California and central Oregon. Once established, incense-cedar is a good competitor on hot, dry sites and commonly shares an upper canopy position on southwestern slopes. On cooler, moister aspects, it is usually subdominant to other species.

224
Sugar pine: Associates - In the northern part of its range: Douglas-fir, ponderosa pine, grand fir, incense-cedar, western hemlock, western redcedar, Port-Orford-cedar, tanoak, and madrone. In the central part of its range: ponderosa pine, Jeffrey pine, white fir, incense-cedar, California red fir, giant sequoia, and California black oak. Farther south: Jeffrey pine, ponderosa pine, Coulter pine, incense-cedar, white fir, and bigcone Douglas-fir. Sites - grows in areas that have warm, dry summers and cool, wet, mild winters. Terrain is commonly steep and rugged, favoring warm exposures as the elevation increases. Found in Oregon and California, but is most abundant in the mixed conifer forests on the west slope of the Sierra Nevada.

225
Jeffrey pine: Associates - Incense-cedar, ponderosa pine, sugar pine, Douglas-fir, Port-Orford-cedar, western white pine, knobcone pine, gray or California foothill pine, red and white fir. Sites - thrives in fairly harsh environments throughout most of its range, and is cold hardy, drought tolerant, adapted to short growing seasons, and tolerant of infertile sites. The majority of trees in this forest type are found in California, although its range extends into SW Oregon and western Nevada.

226
Coulter pine: Associates - blue oak, California black oak, interior live oak, coast live oak, California white oak, California scrub oak, buckeye, ponderosa pine. Sites - grows singly or in small stands primarily on dry, rocky slopes of southern California coastal ranges, between 3,000 and 6,000 feet. Occurs from Mt. Diablo and the Santa Lucia Mountains down to the San Bernardino, San Jacinto, and Cuyamaca Mountains in the south.

WESTERN WHITE PINE GROUP

241
Western white pine: Associates - western larch, grand fir, western redcedar, and western hemlock. Sites - occurs primarily on moist, mid-elevation sites from 1,500 to 4,000 feet.

FIR/SPRUCE/MOUNTAIN HEMLOCK GROUP

261
White fir: Associates - Douglas-fir, sugar pine, ponderosa pine, Jeffrey pine, incense-cedar, California red fir, blue spruce, limber pine, and aspen. Sites - deep well-drained sandy loam-covered slopes and benches with a northerly exposure.

262
Red fir (includes California and Shasta red fir): Associates - Jeffrey pine, western white pine, lodgepole pine, mountain hemlock, and sugar pine. Sites - found at elevations ranging from 5,400 to 7,500 feet.

263
Noble fir: Associates - Douglas-fir, Pacific silver fir, western and mountain hemlocks, lodgepole pine, western redcedar, and Alaska-yellow-cedar. Sites - found on a variety of sites where precipitation is high and snowpacks are common, generally above 3,000 feet in elevation in the Cascade and Coast ranges.

264
Pacific silver fir: Associates - western and mountain hemlocks, western redcedar, Alaska-yellow-cedar, grand fir, Sitka spruce, lodgepole pine, subalpine fir, and Engelmann spruce. Sites - most abundant on sites where summer drought is minimal and snowpacks are common, such as areas of heavy rainfall, seepage, or prolonged snowmelt.

265
Engelmann spruce: Associates - western white pine, western redcedar, western hemlock, Douglas-fir, western larch, grand fir, subalpine fir, and lodgepole pine. For this type to be used, the total stocking of Engelmann spruce must be at least 75 percent of the total stocking.

266
Engelmann spruce-subalpine fir: Associates - western white pine, western redcedar, western hemlock, Douglas-fir, western larch, grand fir, and lodgepole pine. Sites - this type is widespread in the Western U.S. For this

type to be used, the sum of the stocking of Engelmann spruce and subalpine fir must be at least 75 percent of the total stocking and Engelmann spruce stocking must be between 5 and 74 percent of total and subalpine fir stocking must be between 5 and 74 percent of total.

267
Grand fir: Associates - ponderosa pine, Douglas-fir, western hemlock, western redcedar, western white pine, Pacific yew, lodgepole pine, and western larch. Sites - in Idaho, found on moist slopes from 1,500 to 5,200-foot elevations; in Oregon, it occupies moist low-elevation sites, but also extends up to mid-elevations to as high as 6,000 feet.

268
Subalpine fir: Associates - western white pine, western redcedar, western hemlock, Douglas-fir, western larch, grand fir, Engelmann spruce, and lodgepole pine. For this type to be used, the total stocking of subalpine fir must be at least 75 percent of the total stocking. Sites - found at high elevations, near timberline.

269
Blue spruce: Associates - Douglas-fir, ponderosa pine, white fir, lodgepole pine, and Rocky Mountain juniper. Sites - restricted to the southern Rocky Mountains, typically located in the montane zone.

270
Mountain hemlock: Associates - Alaska-yellow-cedar, Pacific silver fir, western white pine, lodgepole pine, noble fir, and subalpine fir. Sites - occurs in cold, moist regions and growing conditions are poor.

271
Alaska-yellow-cedar: Associates - In California, California red fir, Brewer spruce, incense-cedar, Pacific yew, and western white pine; in Oregon and Washington, found with mountain hemlock, subalpine fir, Pacific silver fir, noble fir, western white pine, and western hemlock. Sites - Cool and humid climate, most stands grow within 100 miles of the Pacific coast.

LODGEPOLE PINE GROUP

281
Lodgepole pine: Associates - subalpine fir, Engelmann spruce, white spruce, Douglas-fir, western redcedar, red alder, and western hemlock. Sites - one of the most widespread types in the Western U.S. tolerating a broad range of temperature and moisture regimes.

HEMLOCK/SITKA SPRUCE GROUP

301
Western hemlock: Associates - Sitka spruce, western redcedar, Douglas-fir, Alaska-yellow-cedar, grand fir, Engelmann spruce, bigleaf maple, and red alder. Sites - nearly any soil provides a seedbed but requires abundant moisture. Often comes in cut-over or burned-over areas.

304
Western redcedar: Associates - western white pine, western hemlock, western larch, grand fir, Douglas-fir, and Pacific silver fir. Sites - inhabits moist flats and slopes, the banks of rivers and swamps and can be found in bogs.

305
Sitka spruce: Associates - western hemlock, Douglas-fir, western redcedar, Port-Orford-cedar, red alder, bigleaf maple, and black cottonwood. Sites - limited to a relatively narrow oceanside strip characterized by mild winters, cool summers, and abundant moisture throughout the growing season.

WESTERN LARCH GROUP

321

Western larch: Associates - Douglas-fir, subalpine fir, lodgepole pine, Engelmann spruce, western hemlock, and western redcedar. Sites - best growth on deep, moist, porous soils in high valleys and on mountain slopes of northern and western exposure.

REDWOOD GROUP

341
Redwood: Associates - Douglas-fir, grand fir, western hemlock, California torreya, Pacific yew, and western redcedar. Sites - largely confined to coastal topography between 35 degrees 41 minutes and 42 degrees 9 minutes north latitude.

342
Giant sequoia: Associates- California white fir, sugar pine, incense-cedar, California red fir, white fir, ponderosa pine and California black oak. Sites - Deep, well-drained soils with high soil moisture available during dry summers. Most stands found above 4,000 feet elevation, rarely forming pure stands.

OTHER WESTERN SOFTWOODS GROUP

361
Knobcone pine: Associates - Gray or California foothill pine, canyon live oak and many western oaks, Douglas-fir, and Port-Orford-cedar. Sites - found on soils that are shallow, dry, stony or high in magnesium.

362
Southwestern white pine: Associates - Douglas-fir, white fir, ponderosa pine, Gambel oak, and aspen. Sites - higher elevations in Arizona and New Mexico**.**

363
Bishop pine: Grows singly or in small stands along the coast of California.

364
Monterey pine: Grows singly or in small stands. Sites - Native stands are found in the high humidity and summer fogs of the central-coast area of California in San Mateo, Santa Cruz, Monterey, and San Luis Obispo Counties.

365
Foxtail pine/bristlecone pine: Associates - limber pine, white fir, Engelmann spruce, ponderosa pine, and pinyon. Sites - found on rocky outcrops, usually on southern or southwestern exposures and can range in elevation from 8,000 to 11,000 feet.

366
Limber pine: Associates - low to mid elevations: Douglas-fir, ponderosa pine, Rocky Mountain juniper; mid to high elevations: lodgepole pine and aspen; high elevations: Engelmann spruce, subalpine fir, bristlecone pine, and whitebark pine. Sites - a very wide range of elevations and latitudes across the Rocky Mountains; can be the majority species as an early seral stage under a variety of harsh establishment conditions, as climax in dry, high elevation sites in the central and southern Rockies.

367
Whitebark pine: Associates - subalpine fir, subalpine larch, Engelmann spruce, and lodgepole pine. Sites - poor, high elevation.

368
Miscellaneous western softwoods: A "catch-all" group for such species as all cypress (Cupressus) species, subalpine larch, Brewer spruce, Apache pine, Chihuahua pine, Washoe pine, Torrey pine, Pacific yew, and California torreya.

369
Western juniper: Associates - ponderosa pine and Jeffrey pine. Sites - found on dry sites and ranges in elevation from just above sea level to 6,500 feet.

CALIFORNIA MIXED CONIFER GROUP

371
California mixed conifer: Associates - a complex association of ponderosa pine, sugar pine, Douglas-fir, white fir, red fir, and incense-cedar. Generally, five or six conifer species are intermixed either as single trees or in small groups. Sites - Mixed conifer sites are often on east-facing slopes of the California Coast Range and on the west-facing and higher elevation east-facing slopes of the Oregon Cascades and Sierra Nevadas.

EXOTIC SOFTWOODS GROUP

381
Scotch pine: Plantation type, not naturally occurring.

383
Other exotic softwoods: Austrian pine.

384
Norway spruce: Plantation type, not naturally occurring.

385
Introduced larch: Introduced larch (species code 0070).

OTHER SOFTWOODS GROUP

391
Other softwoods: All softwood species identified to genus level only, except cypress, baldcypress, and larch.

OAK/PINE GROUP

In these oak/pine forest types, stocking of the pine component needs to be 25-49 percent.

401

Eastern white pine/northern red oak/white ash: Associates - red maple, basswood, yellow birch, bigtooth aspen, sugar maple, beech, paper birch, black cherry, hemlock, and sweet birch. Sites - deep, fertile, well-drained soil.

402

Eastern redcedar/hardwood: Associates - oak, hickory, walnut, ash, locust, dogwood, blackgum, hackberry, winged elm, shortleaf pine, and Virginia pine. Sites - usually dry uplands and abandoned fields.

403

Longleaf pine/oak: Longleaf pine and scrub oaks primarily turkey, bluejack, blackjack, and dwarf post oak comprise the type. Associates - southern scrub oaks in the understory. Sites - common on sandhills where soils are dry, infertile, and coarse textured. SRS distribution coastal plain and piedmont units.

404

Shortleaf pine/oak: Associates - (oaks generally include white, scarlet, blackjack, black, post, and southern red), hickory, blackgum, sweetgum, Virginia pine, and pitch pine. Sites - generally in dry, low ridges, flats, and south slopes.

405

Virginia pine/southern red oak: Associates - black oak, scarlet oak, white oak, post oak, blackjack oak, shortleaf pine, blackgum, hickory, pitch pine, table mountain pine, chestnut oak. Sites - dry slopes and ridges.

406

Loblolly pine/hardwood: Associates - wide variety of moist and wet site hardwoods including blackgum, sweetgum, yellow poplar, red maple, white and green ash, and American elm; on drier sites associates include southern and northern red oak, white oak, post oak, scarlet oak, persimmon, and hickory. Sites - usually moist to very moist though not wet all year, but also on drier sites.

407

Slash pine/hardwood: Slash pine and a variable mixture of hardwoods comprise the type. Associates codominant with the slash pine component are sweetbay, blackgum, loblolly bay, pondcypress, pond pine, Atlantic white-cedar, red maple, ash, and water oak. Sites - undrained or poorly drained depressions such as bays or pocosins and along pond margins. SRS distribution primarily coastal plain units.

409

Other pine/hardwood: A type used for those unnamed pine-hardwood combinations that meet the requirements for oak-pine. These are stands where hardwoods (usually oaks) comprise the plurality of the stocking with at least a 25 to 49 percent pine, eastern redcedar, or southern redcedar component.

OAK/HICKORY GROUP

501
Post oak/blackjack oak (includes dwarf post oak): Associates - black oak, hickory, southern red oak, white oak, scarlet oak, shingle oak, live oak, shortleaf pine, Virginia pine, blackgum, sourwood, red maple, winged elm, hackberry, chinkapin oak, shumard oak, dogwood, and eastern redcedar. Sites - dry uplands and ridges.

502
Chestnut oak: Associates - scarlet oak, white oak, black oak, post oak, pitch pine, blackgum, sweetgum, red maple, red oak, shortleaf pine, Virginia pine. Sites - rocky outcrops with thin soil, ridge tops.

503
White oak/red oak/hickory (includes all hickories except water and shellbark hickory): Associates - pin oak, northern pin oak, chinkapin oak, black oak, dwarf chinkapin oak, American elm, scarlet oak, bur oak, white ash, sugar maple, red maple, walnut, basswood, locust, beech, sweetgum, blackgum, yellow-poplar, and dogwood. Sites - wide variety of well-drained upland soils.

504
White oak: Associates - black oak, northern red oak, bur oak, hickory, white ash, yellow-poplar. Sites - scattered patches on upland, loamy soils but on drier sites than type 503.

505
Northern red oak: Associates - black oak, scarlet oak, chestnut oak, and yellow-poplar. Sites - spotty distribution on ridge crests and north slopes in mountains but also found on rolling land, slopes, and benches on loamy soil.

506
Yellow-poplar/white oak/northern red oak: Associates - black oak, hemlock, blackgum, and hickory. Sites - northern slopes, coves, and moist flats.

507
Sassafras/persimmon: Associates - elm, eastern redcedar, hickory, ash, sugar maple, yellow-poplar, Texas sophora, and oaks. Sites - abandoned farmlands and old fields.

508
Sweetgum/yellow-poplar: Associates - red maple, white ash, green ash, and other moist site hardwoods. Sites - generally occupies moist, lower slopes.

509
Bur oak: Associates - northern pin oak, black oak, chinkapin oak, and eastern redcedar in northern and dry upland sites; shagbark hickory, black walnut, eastern cottonwood, white ash, American elm, swamp white oak, honey locust, and American basswood in southern and lowland sites. Sites - drier uplands to moist bottomlands with the drier uplands more common in the northern part of the range and the moist bottomlands more common in the southern part of the range.

510
Scarlet oak: Associates - black oak, southern red oak, chestnut oak, white oak, post oak, hickory, pitch pine, blackgum, sweetgum, black locust, sourwood, dogwood, shortleaf pine, and Virginia pine. Sites - dry ridges, south or west facing slopes and flats but often moister situations probably as a result of logging or fire.

511

Yellow poplar: Associates - black locust, red maple, sweet birch, cucumbertree, and other moist site hardwoods (except sweetgum, see type 508) and white oak and northern red oak (see type 503). Sites - lower slopes, northerly slopes, moist coves, flats, and old fields.

512

Black walnut: Associates - yellow-poplar, white ash, black cherry, basswood, beech, sugar maple, oaks, and hickory. Sites - coves and well-drained bottoms.

513

Black locust: Associates - many species of hardwoods and hard pines may occur with it in mixture, either having been planted or from natural seeding. Sites - may occur on any well-drained soil but best on dry sites, often in old fields.

514

Southern scrub oak: This forest cover type consists of a mixture of scrub oaks that may include several of the following species: turkey oak, bluejack oak, dwarf live oak, Durand oak, and bear oak (otherwise known as scrub oak). Also includes anacahuita. Sites - dry sandy ridges the type frequently develops on areas formerly occupied by longleaf pine. SRS distribution common throughout all coastal plain units and into the lower Piedmont.

515

Chestnut oak/black oak/scarlet oak: Associates - northern and southern red oaks, post oak, white oak, sourwood, shagbark hickory, pignut hickory, yellow-poplar, blackgum, sweetgum, red maple, eastern white pine, pitch pine, Table Mountain pine, shortleaf pine, and Virginia pine. Sites - dry upland sites on thin-soiled rocky outcrops on dry ridges and slopes.

516

Cherry/white ash/yellow-poplar: Associates - sugar maple, American beech, northern red oak, white oak, blackgum, hickory, cucumbertree, and yellow birch. Sites - fertile, moist, well-drained sites.

517

Elm/ash/black locust: Associates - Black locust, silver maple, boxelder, blackbead ebony, American elm, slippery elm, rock elm, red maple, green ash predominate. Found in North Central region, unknown in Northeast. Sparse in the West. Sites - upland.

519

Red maple/oak: Associates - the type is dominated by red maple and some of the wide variety of central hardwood associates include upland oak, hickory, yellow-poplar, black locust, sassafras as well as some central softwoods like Virginia and shortleaf pines. Sites - uplands.

520

Mixed upland hardwoods: Includes Ohio buckeye, yellow buckeye, Texas buckeye, red buckeye, painted buckeye, American hornbeam, American chestnut, eastern redbud, flowering dogwood, hawthorn spp., cockspur hawthorn, downy hawthorn, Washington hawthorn, fleshy hawthorn, dwarf hawthorn, honeylocust, Kentucky coffeetree, Osage-orange, all mulberries, blackgum, sourwood, southern red oak, shingle oak, laurel oak, water oak, live oak, willow oak, black locust, blackbead ebony, anacahuita, and September elm. Associates - Any mixture of hardwoods of species typical of the upland central hardwood region, should include at least some oak. Sites - wide variety of upland sites.

OAK/GUM/CYPRESS GROUP

601
Swamp chestnut oak/cherrybark oak: Associates - Shumard oak, Delta post oak, white ash, hickory, white oak, blackgum, sweetgum, southern red oak, post oak, American elm, winged elm, yellow poplar, and beech. Sites - within alluvial floodplains of major rivers, on all ridges in the terraces, and on the best fine sandy loam soils on the highest first bottom ridges.

602
Sweetgum/Nuttall oak/willow oak: Associates - American holly, green ash, American elm, pecan, cottonwood, red maple, honeylocust, persimmon, anacahuita. Sites very wet.

605
Overcup oak/water hickory (includes shellbark hickory): Associates - pin oak, willow oak, American elm, green ash, hackberry, persimmon, and red maple. Sites - in South within alluvial floodplains in low, poorly drained flats with clay soils; also in sloughs and lowest backwater basins and low ridges with heavy soils that are subject to late spring inundation.

606
Atlantic white cedar: Associates - North includes gray birch, pitch pine, hemlock, blackgum, and red maple. South includes pond pine, baldcypress, and red maple. Sites - usually confined to sandy bottomed, peaty, interior, and river swamps, wet depressions, and stream banks.

607
Baldcypress/water tupelo: 25-50 percent stocking of baldcypress (either baldcypress or Montezuma baldcypress). Associates - blackgum, willow, red maple, American elm, persimmon, overcup oak, and sweetgum. Sites - very low, poorly drained flats, deep sloughs, and swamps; wet most all the year. Also, floodplains and stream margins.

608
Sweetbay/swamp tupelo/red maple: Associates - blackgum, Florida maple, water birch, gum bumelia, waterlocust, loblolly bay, all magnolias, red maple, Ogechee tupelo, red bay, water-elm, Oglethorpe oak, loblolly and pond pines, American elm, and other moist site hardwoods. Sites - very moist but seldom wet all year shallow ponds, muck swamps, along smaller creeks in Coastal Plain (rare in Northeast).

609
Baldcypress/pondcypress: >50 percent stocking of baldcypress and/or pondcypress. Associates - blackgum, willow, red maple, American elm, persimmon, overcup oak, and sweetgum. Sites - very low, poorly drained flats, deep sloughs, and swamps; wet most all the year. Also, floodplains and stream margins.

ELM/ASH/COTTONWOOD GROUP

701
Black ash/American elm/red maple (includes slippery and rock elm): Associates - swamp white oak, silver maple, sycamore, pin oak, blackgum, white ash, and cottonwood. Sites - moist to wet areas, swamps, gullies, and poorly drained flats.

702
River birch/sycamore: Associates - red maple, black willow, and other moist site hardwoods. Sites - moist soils at edges of creeks and rivers.

703
Cottonwood: Associates - willow, white ash, green ash, and sycamore. Sites - streambanks where bare, moist soil is available.

704
Willow (includes peachleaf and black willow): Associates - cottonwood, green ash, sycamore, pecan, American elm, red maple, and boxelder. Sites - streambanks where bare, moist soil is available.

705
Sycamore/pecan/American elm (includes slippery and rock elm): Associates - sweetgum, green ash, hackberry, silver maple, cottonwood, willow, boxelder, and river birch. Sites - bottomlands, alluvial floodplains of major rivers.

706
Sugarberry/hackberry/elm/green ash (includes American, winged, cedar, slippery and rock elm): Associates - boxelder, pecan, blackgum, persimmon, honeylocust, red maple, and hackberry. Sites - low ridges and flats in floodplains.

707
Silver maple/American elm: Silver maple and American elm are the majority species in this type. Associates - chalk maple, sweetgum, pin oak, swamp white oak, eastern cottonwood, sycamore, green ash, and other moist-site hardwoods, according to the region. Sites - primarily on well-drained moist sites along river bottoms and floodplains, and beside lakes and larger streams.

708
Red maple/lowland: Red maple comprises a majority of the stocking. Because this type grows on a wide variety of sites over an extensive range, associates are diverse. Associates include yellow-poplar, blackgum, sweetgum, and loblolly pine. Site - generally restricted to very moist to wet sites with poorly drained soils, and on swamp borders.

709
Cottonwood/willow (includes peachleaf, black and Bebb willow): Associates - white ash, green ash, sycamore, American elm, red maple and boxelder. Sites - stream banks where bare, moist soil is available.

722
Oregon ash: Associates - red alder, bigleaf maple, black cottonwood, willow. Sites - riparian areas, prefers damp, loose soils, below 3000 feet.

MAPLE/BEECH/BIRCH GROUP

801
Sugar maple/beech/yellow birch: Associates - butternut, basswood, red maple, hemlock, northern red oak, white ash, white pine, black cherry, sweet birch, American elm, rock elm, and eastern hophornbeam. Sites - fertile, moist, well-drained sites.

802
Black cherry: Associates - sugar maple, northern red oak, red maple, white ash, basswood, sweet birch, butternut, American elm, and hemlock. Sites - fertile, moist, well-drained sites.

805
Hard maple/basswood (includes American, Carolina, and white basswood): Associates - black maple, white ash, northern red oak, eastern hophornbeam, American elm, red maple, eastern white pine, eastern hemlock. Sugar maple and basswood occur in different proportions but together comprise the majority of the stocking. Sites - fertile, moist, well-drained sites.

809
Red maple/upland: Associates - the type is dominated by red maple and some of the wide variety of northern hardwood associates include sugar maple, beech, birch, aspen, as well as some northern softwoods like white pine, red pine, and hemlock; this type is often the result of repeated disturbance or cutting. Sites - uplands. (see Type 519 under oak/hickory group.)

ASPEN/BIRCH GROUP

901
Aspen: Associates - Engelmann spruce, lodgepole pine, ponderosa pine, Douglas-fir, subalpine fir, white fir, white spruce, balsam poplar, and paper birch. Sites - aspen has the capacity to grow on a variety of sites and soils, ranging from shallow stony soils and loamy sands to heavy clays.

902
Paper birch (includes northern paper birch): Associates - aspen, white spruce, black spruce, and lodgepole pine. Sites - can be found on a range of soils, but best developed on well-drained sandy loam and silt loam soils.

903
Gray birch: Associates - oaks, red maple, white pine, and others. Sites - poor soils of abandoned farms and burns.

904
Balsam poplar: Associates - paper birch, white spruce, black spruce, and tamarack. Sites - occurs on rich floodplains where erosion and folding are active.

905
Pin cherry: Associates - quaking and bigtooth aspen; paper and yellow birch; striped, red and sugar maple; beech; northern red oak; balsam fir; and red spruce. In the Appalachians, Fraser fir and mountain-ash are additional associates. In the central and Lake States, chokecherry and black cherry are common. Sites - Occurs over a wide range of soils and drainage classes, found on sites varying from dry rocky ledges and sandy plains to moist loamy soils.

ALDER/MAPLE GROUP

911
Red alder: Associates - Douglas-fir, western hemlock, western redcedar, grand fir, Sitka spruce, black cottonwood, bigleaf maple, willow. Sites - stream bottoms and lower slopes, west of the Cascades, usually within 125 miles of the coast, below 2,400 feet.

912
Bigleaf maple: Associates - Douglas-fir, western hemlock, western redcedar, black cottonwood, Pacific madrone, Pacific dogwood, red alder. Sites - Flat interior valleys, gently sloping stream bottoms, and moderate to steep slopes; favors moist, well-drained soils of river terraces and floodplains, but also grows on drier rocky, south-facing slopes in the Coast Ranges of northwestern Oregon.

WESTERN OAK GROUP

921
Gray pine: Associates - Blue oak, California black oak, interior live oak, coast live oak, California white oak, California scrub oak, buckeye, western juniper, Coulter pine. Sites - dry foothill woodland communities of California's Central Valley, on rocky slopes and steep canyon walls below 3,000 feet. Prefers areas with hot, dry summers and absence of summer fog. Tolerates infertile, low moisture soils.

922
California black oak: Associates - ponderosa pine, Douglas-fir, incense-cedar, knobcone pine, Pacific madrone, tanoak, and Oregon white oak.

923
Oregon white oak: Associates - Douglas-fir, bigleaf maple, and Oregon ash. Sites - commonly occurs in very moist locations, in mixture with Oregon ash on floodplains of the Willamette Valley, and on poorly drained heavy clay soils.

924
Blue oak: Associates - Gray pine, interior live oak, canyon live oak, valley oak, and California buckeye. Sites - low valleys and foothills of the Coast Ranges and Sierras in California.

931
Coast live oak: Associates - knobcone pine, Monterey pine, interior live oak, valley oak, blue oak, tanoak, Pacific madrone, and California laurel. Sites - usually occupies well-drained soils.

933
Canyon live oak: Associates - Douglas-fir, bigcone Douglas-fir, ponderosa pine, Jeffrey pine, bigleaf maple, Pacific madrone, and California laurel. Sites - found on steep rocky canyon slopes and boulder-filled bottoms.

934
Interior live oak: Associates - Blue oak, coast live oak, valley oak, canyon live oak, gray pine, ponderosa pine, Douglas-fir. Sites - from valleys to foothills, below 5,000 feet; grows on moister sites than blue oak.

935

California white oak (valley oak): Associates - Canyon live oak, coast live oak, California black oak, blue oak, California buckeye, gray pine, ponderosa pine. Sites - hot interior valleys and slopes below 2,000 feet; tolerates cool wet winters and hot dry summers; prefers fertile soils of valley floors.

TANOAK/LAUREL GROUP

941

Tanoak: Associates - Douglas-fir, Pacific madrone, and canyon live oak. Sites - sea level to 5,000 feet elevation from southern Oregon south along the Coast Ranges to the Santa Ynez Mountains in California.

942

California laurel: Associates - usually found in mixed stands with a wide variety of associated species. Sites - from the cool, humid conditions of dense coastal forests to hot, dry sites found inland in open woodlands and chaparral, below 4,000 feet.

943

Giant chinkapin: Associates - rarely grows in pure stands, usually a component of other types. Found with Douglas-fir, western hemlock, incense-cedar, white fir, western white pine, sugar pine, ponderosa pine, Pacific madrone, tanoak, and California black oak. Sites - from valley bottoms to ridgetops, in the coast and cascade ranges, below 5,000 feet. Tolerates infertile and droughty sites.

OTHER HARDWOODS GROUP

961

Pacific madrone: Associates - a wide variety of species, but most common with Douglas-fir and tanoak. Sites - grows on all aspects but is found most often on those facing south and west, and tolerates low soil moisture in summer.

962

Other hardwoods: A "catch-all" group for hardwood species identified only to the genus level, with the exception of the following species (Note: This code primarily applies to a mapped subplot, where only one or two "uncommon" tree species are tallied): hackberry spp., hawthorn spp., eucalyptus spp., persimmon spp., magnolia spp., mulberry spp., mesquite spp., citrus spp., royal palm spp., willow spp., and saltcedar spp., and striped maple, mountain maple, California buckeye, Arizona alder, serviceberry, Arizona madrone, pawpaw, sweet birch, Virginia roundleaf birch, Allegany chinkapin, Ozark chinkapin, southern catalpa, northern catalpa, yellowwood, Pacific dogwood, pumpkin ash, blue ash, velvet ash, Carolina ash, Texas ash, all silverbells, California black walnut, southern California black walnut, Texas walnut, Arizona walnut, all apple species, eastern hophornbeam, California sycamore, Arizona sycamore, chokecherry, peach, Canada plum, wild plum, bitter cherry, Allegheny plum, Chickasaw plum, sweet cherry, sour cherry, European plum, Mahaleb plum, western soapberry, American mountain-ash, northern mountain-ash, Joshua tree, smoketree, great leucaena, and Berlandier ash.

WOODLAND HARDWOODS GROUP

971
Deciduous oak woodland: Areas with predominantly Gambel oak, which is often associated with ponderosa pine, white fir, Douglas-fir, alligator juniper, bigtooth maple, and chokecherry. Sites - most soils, on elevations generally ranging from 4,000 to 8,000 feet.

972
Evergreen oak woodland: Areas with predominantly evergreen oaks, such as Arizona white oak, Emory oak, Engelmann oak, Mexican blue oak, silverleaf oak, gray oak and/or netleaf oak. Other associates - various pinyons and junipers. Sites - alluvial soils, from 4,000 to 7,500 feet elevation.

973
Mesquite woodland: Honey mesquite and screwbean mesquite comprise the majority of the stocking of this cover type. Honey mesquite associates, which are many, vary with climate and soils. Sites - occurs on a wide variety of soils at elevations mostly below 5,000 feet.

974
Cercocarpus (Mountain brush) woodland (includes curlleaf mountain-mahogany): Associates - Rocky Mountain juniper, big sagebrush, and snowberry. Sites - dry, course-textured soils.

975
Intermountain maple woodland (includes Rocky Mountain and/or bigtooth maple): Associates - chokecherry, boxelder, birchleaf mountain-mahogany, and Gambel oak. Sites - most soils but does not tolerate long flooding periods. Found growing between 4,500 and 7,500 feet elevation.

976
Miscellaneous woodland hardwoods [includes acacia, New Mexico locust, and/or Arizona ironwood (tesota)]: Sites - occurs on a wide variety of soils at elevations mostly below 5,000 feet.

TROPICAL HARDWOODS GROUP

982
Mangrove: Forests in which mangrove comprises a majority of the stocking. Associates cabbage palm on some of the higher sites in the area. Sites - predominantly salt marshes; mangrove frequently develops its own island or shoreline made up of a dense mat of root structures. SRS distribution restricted to South Florida and the Keys.

983
Palms: Includes paurotia-palm, silver palm, coconut palm, royal palm spp., cabbage palmetto, Mexican palmetto, key thatch palm, Florida thatch palm, and other palms. Associates - Sand live oak, slash pine, live oak, laurel oak, water oak, baldcypress, southern magnolia, red maple, redbay, swamp tupelo, sweetgum, southern redcedar, and loblolly pine. In extreme southern Florida, tropical hardwoods replace temperate hardwoods as associates. Sites - can tolerate a broad range of soil pH, salinity, and drainage.

984
Dry forest (FGDC - Lowland to Submontane Drought Deciduous, Semi-deciduous and Semi-evergreen Forest; Holdridge life zone - Subtropical Dry Forest): *Bursera simaruba* (L.) Sarg., *Bucida buceras* L., *Cephalocereus royenii* (L.) Britton, and *Guaiacum officinale* L. are species commonly associated with

Puerto Rican dry forest. The more heavily-disturbed dry forest areas have numerous, smaller stemmed *Leucaena leucocephala* (Lam.) deWit, *Prosopis juliflora* (Sw.) DC., *Acacia macracantha* Humb. & Bonpl. and *Acacia farnesiana* (L.) Willd. individuals. Some of the native tree species that are common in subtropical dry forest in the U.S. Virgin Islands are *Bursera simaruba* (L.) Sarg., *Amyris elemifera* L., *Capparis cynophallophora* L., Cordia rickseckeri Millsp., *Pisonia subcordata* Sw., *Guaiacum officinale* L., *Plumeria alba* L., and *Pictetia aculeata* (Vahl) Urban. The more heavily-disturbed dry forest areas have numerous, smaller stemmed *Leucaena leucocephala* (Lam.) deWit, *Prosopis juliflora* (Sw.) DC., *Acacia macracantha* Humb. & Bonpl., and *Acacia farnesiana* (L.) Willd. Individuals.

985

Moist forest (FGDC - Lowland and Submontane Seasonal Evergreen; Holdridge life zone - Subtropical Moist Forest): In the Caribbean, subtropical moist forests are found in areas with 1000 to 2200 mm of annual precipitation. The subtropical moist life zone is the most extensive on Puerto Rico and covers a wide variety of soil parent materials, topographic classes and land uses resulting in highly diverse mixes that typically include *Tabebuia heterophylla* (DC.) Britton, *Spathodea campanulata* Beauv., *Guarea guidonia* (L.) Sleumer, *Andira inermis* (W. Wright) Kunth ex DC., *Roystonea borinquena* O. F. Cook, *Mangifera indica* L., *Cecropia peltata* L., *Schefflera morototonii* (Aubl.) Maguire, Steyermark and species of the Nectandra, Ocotea, and Coccoloba genera. Some of the many natural indicator species of subtropical moist forest in the U.S. Virgin Islands include the *Andira inermis* (W. Wright) Kunth ex DC., *Guapira fragrans* (Dum.-Cours.) Little, *Spondias mombin* L., *Bucida buceras* L., *Hura crepitans* L., *Ceiba pentandra* (L.) Gaertn., *Cedrela odorata* L., *Pimenta racemosa* var. *racemosa*, *Roystonea borinquena* O.F. Cook (on St. Croix only), *Hymanaea courbaril* L., *Cecropia schreberiana* Miq., and *Tabebuia heterophylla* (DC.) Britt. While subtropical moist forests have some of the same introduced species found in subtropical dry forest, *Tamarindus indica* L. and *Melicoccus bijugatus* Jacq. are also common.

986

Wet and rain forest (FGDC - Submontane Evergreen Forest; Holdridge life zone - Subtropical Wet and Rain Forest): In the Caribbean, subtropical wet and rain forests are found in areas with 2000 to 4000 mm of annual precipitation. *Dacryodes excelsa* Vahl., *Sloanea berteriana* Choisy, Manilkara bidentata (A.DC.) are species indicative of the tabonuco forest type. *Cecropia peltata* L., Schefflera morototonii (Aubl.) Maguire and *Ochroma lagopus* Sw. are also common in wet forest stands at early stages of succession or recovery from disturbance. Wet forest shade coffee plantations hold species such as *Guarea guidonia* (L.) Sleumer, *Inga laurina* (Sw.) Willd., *Inga vera* Willd., and *Erythrina poeppigiana* (Walp.) O.F. Cook.

987

Lower montane wet and rain forest (FGDC - Montane Evergreen Forest; Holdridge life zone - Lower Montane Wet and Rain Forest): In the Caribbean, lower montane wet and rain forests are found in areas with elevations between 700-1000 meters. Forest types and their typical species include the palo colorado forest type (*Cyrilla racemiflora* L., *Ocotea spathulata* Mez., *Micropholis guyanensis* (A. DC.) Pierre and *Micropholis garciniifolia* Pierre), elfin forest type (*Eugenia borinquensis* Britton, *Tabebuia rigida* Urban, *Weinmannia pinnata* L. and *Calycogonium squamulosum* Cogn.) and the palm brake forest type (*Prestoea montana* (Graham) Nichols.).

988

Cloud forest: These forests are covered with clouds or fog much of the time. The trees have low canopies and are often dripping with moisture. The trees are typically small-leafed and covered with masses of epiphytic mosses and liverworts, which also form a deep ground cover.

989

Other tropical hardwoods: This type consists of dense forests of hardwood trees and palms. Includes gumbo-limbo, tamarind, poisonwood, pigeon-plum, torchwood, willow bustic, false mastic, pond apple, sheoak, gray sheoak, river sheoak, camphor tree, fiddlewood, citrus spp., soldierwood, Geiger tree, carrotwood, red stopper, inkwood, strangler fig, shortleaf fig, blolly, manchineel, paradise tree, Java plum, false tamarind, mango,

fishpoison tree, and octopus tree. Associates -black ironwood (leadwood), lancewood, and mastic as well as more temperate live oak and red bay. Sites - Occurs on land slightly higher than surrounding fresh and saltwater marshes or on pine land.

EXOTIC HARDWOODS GROUP

991

Paulownia: Stands with the majority of stocking composed of *Paulownia tomentosa*, commonly known as Princess tree, royal paulownia or empress tree. Sites - can be found along roadsides, streambanks, and forest edges. It tolerates infertile and acid soils and drought conditions. It easily adapts to disturbed habitats, including previously burned areas, forests defoliated by pests (such as the gypsy moth) and landslides and can colonize rocky cliffs and scoured riparian zones. Paulownia can also be found in plantations.

992

Melaleuca: Stands with the majority of stocking composed of melaleuca (*Melaleuca quinquenervia*). Melaleuca trees, also known as punk trees or paperbark tea trees, are native to Australia. Sites - In the gulf-coastal plain, it is found in swamps and glades, often eliminating all other forms of vegetation.

993

Eucalyptus: Associates - As an introduced and naturalized species, it has few common associates. Usually planted as an ornamental, in plantations for firewood, or along roads and parks for cover. Sites - good drainage, low salinity, mild temperate climates.

995

Other exotic hardwoods: Includes any of the following species: Norway maple, ailanthus, mimosa, European alder, Chinese chestnut, ginkgo, Lombardy poplar, European mountain-ash, West Indian mahogany, Siberian elm, saltcedar spp., chinaberry, Chinese tallowtree, tung-oil-tree, Russian-olive, and avocado.

Appendix E: Tree Species Group Codes

Appendix Contents:

Softwood species groups

Code	Species group name	Region
1	Longleaf and slash pines	Eastern
2	Loblolly and shortleaf pines	Eastern
3	Other yellow pines	Eastern
4	Eastern white and red pines	Eastern
5	Jack pine	Eastern
6	Spruce and balsam fir	Eastern
7	Eastern hemlock	Eastern
8	Cypress	Eastern
9	Other eastern softwoods	Eastern
10	Douglas-fir	Western
11	Ponderosa and Jeffrey pines	Western
12	True fir	Western
13	Western hemlock	Western
14	Sugar pine	Western
15	Western white pine	Western
16	Redwood	Western
17	Sitka spruce	Western
18	Engelmann and other spruces	Western
19	Western larch	Western
20	Incense-cedar	Western
21	Lodgepole pine	Western
22	Western redcedar	Western
23	Woodland softwoods	All
24	Other western softwoods	Western

Hardwood species groups

Code	Speceis group name	Region
25	Select white oaks	Eastern
26	Select red oaks	Eastern
27	Other white oaks	Eastern
28	Other red oaks	Eastern
29	Hickory	Eastern
30	Yellow birch	Eastern
31	Hard maple	Eastern
32	Soft maple	Eastern
33	Beech	Eastern
34	Sweetgum	Eastern
35	Tupelo and blackgum	Eastern
36	Ash	Eastern
37	Cottonwood and aspen	Eastern
38	Basswood	Eastern
39	Yellow-poplar	Eastern
40	Black walnut	Eastern
41	Other eastern soft hardwoods	Eastern
42	Other eastern hard hardwoods	Eastern
43	Eastern noncommercial hardwoods	Eastern
44	Cottonwood and aspen	Western
45	Red alder	Western
46	Oak	Western
47	Other western hardwoods	Western
48	Woodland hardwoods	All

Tropical and subtropical species groups

Code	Species group name	Region
51	Tropical and subtropical pines	Tropical-/-Subtropical
52	Other tropical and subtropical softwoods	Tropical-/-Subtropical
53	Tropical and subtropical palms	Tropical-/-Subtropical
54	Tropical and subtropical hardwoods	Tropical-/-Subtropical

Urban species groups

Code	Species group name	Region
55	Urban--specific hardwoods	All
56	Urban--specific softwoods	All

Appendix F: Tree Species Codes, Names, and Occurrences

The FIA tree species code list and other information regarding names and occurrences are available at the following links:

Supplemental documents:

- FIA Master Tree Species List (Excel format) (https://www.fia.fs.fed.us/library/field-guides-methods-proc/index.php) - This list contains all tree species tallied in the continental U.S. as well as both the Caribbean and Pacific Islands, including Hawaii. After taking into account the three exclusion areas (Non-urban exclusions [NUE], National Forest System [NFS] exclusions, and Mainland exclusions [MLE]), these are the species used to define FIA forest land. Species not listed are considered shrubs and do not factor into defining FIA forest land. See below for exclusion area species lists.
- Changes to FIA Master Tree Species List (https://www.fia.fs.fed.us/library/field-guides-methods-proc/index.php) - This list, located in the FIA National Field Guide for Phase 2 Plots (appendix 14), contains changes (dropped, added, or modified) to the FIA Master Tree Species list. This list began in October 2019 with the FIA National Field Guide, version 9.0.

Table downloads:

- FIA Data Mart (https://apps.fs.usda.gov/fia/datamart/CSV/datamart_csv.html) - The **REF_SPECIES** table, which is downloadable from the FIA Data Mart, contains the species code, species group code, descriptive common name, scientific name, and many other attributes for each species.

Exclusion area species lists:

The following lists summarize species that are not tally trees on FIA plots located in an exclusion area. There are three exclusion area categories: (1) Non-urban exclusions (NUE), (2) National Forest System (NFS) exclusions, and (3) Mainland exclusions (MLE). For exclusion areas, these species are defined as shrubs and they are not used to define FIA forest land.

1. **Non-urban exclusions (NUE)** - The following species are not tally trees on plots located in non-urban areas. Urban zones are census-defined areas with a population density of 500 people per square mile associated with a town or city with a population of at least 2,500. **Note:** These species are valid as tally trees in urban zones.

Table F-1: Species excluded as tally trees in non-urban areas.

Woodland	FIA code	Common name	Genus	Species
-	299	unknown dead conifer	Tree	evergreen
w	300	acacia spp.	Acacia	spp.
-	508	oneseed hawthorn	Crataegus	monogyna
-	772	sour cherry	Prunus	cerasus
w	902	New Mexico locust	Robinia	neomexicana
-	928	Scouler's willow	Salix	scouleriana
-	998	unknown dead hardwood	Tree	broadleaf
-	5188	gray alder	Alnus	incana
-	5192	green alder	Alnus	viridis
-	5436	California redbud	Cercis	orbiculata
-	6524	Chinese fringetree	Chionanthus	retusus
-	7469	yaupon	Ilex	vomitoria
w	7577	Japanese privet	Ligustrum	japonicum
w	7578	glossy privet	Ligustrum	lucidum
w	7579	California privet	Ligustrum	ovalifolium
-	7637	Oyama magnolia	Magnolia	sieboldii
-	8112	paloverde	Parkinsonia	spp.
-	8345	Carolina laurelcherry	Prunus	caroliniana
-	8504	arroyo willow	Salix	lasiolepis

2. **National Forest System (NFS) exclusions** - The following species are not tally trees on plots located in non-urban areas within National Forest System (NFS) lands for the regions specified below (Regions 1, 2, 3, 4, 5, 6, 8, 9, and/or 10). Refer to appendix C for region and national forest codes. **Note:** These species are valid as tally trees in urban zones.

Table F-2: Species excluded as tally trees on National Forest System lands.

NFS region	Woodland	FIA code	Common name	Genus	Species
3	w	303	sweet acacia	Acacia	farnesiana
5, 6, 10	-	356	serviceberry spp.	Amelanchier	spp.
5, 6	w	475	curlleaf mountain-mahogany	Cercocarpus	ledifolius
5, 6, 10	-	500	hawthorn spp.	Crataegus	spp.
5, 6, 10	-	660	apple spp.	Malus	spp.
3, 4	-	763	chokecherry	Prunus	virginiana
3, 4	-	768	bitter cherry	Prunus	emarginata
3	-	805	canyon live oak	Quercus	chrysolepis

NFS region	Woodland	FIA code	Common name	Genus	Species
5, 6, 10	-	5146	vine maple	Acer	circinatum
3	-	6961	golden dewdrops	Duranta	erecta
3	-	7262	Creole cotton	Gossypium	barbadense
3	-	7264	Gossypium hirsutum	Gossypium	hirsutum
3	-	8111	Jerusalem thorn	Parkinsonia	aculeata
5, 6 ,10	-	8420	pear spp.	Pyrus	spp.
3	-	8472	castorbean	Ricinus	communis

3. **Mainland exclusions (MLE)** - The following species are not tally trees on plots located in non-urban areas within the United States mainland (the continental United States). These species codes are valid for tally trees in the Caribbean and Pacific Islands, including Hawaii.

   Table F-3: Species excluded as tally trees in the United States mainland.

Woodland	FIA code	Common name	Genus	Species
-	999	other or unknown live tree	Tree	unknown
-	6862	swamp titi	Cyrilla	racemiflora