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Natural Resources Conservation Service
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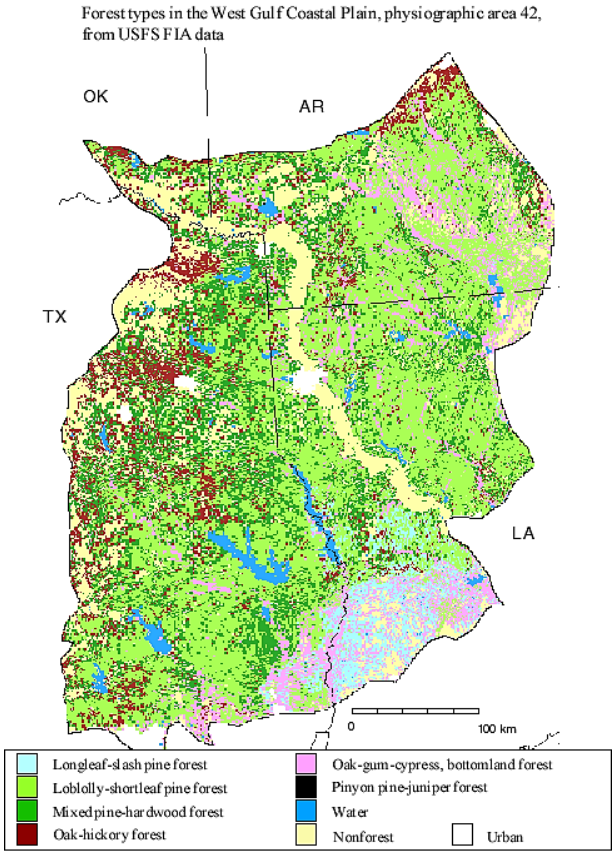
Beneficial Trees for Wildlife

Forestry and Plant Materials Technical Note

Background

Trees provide shelter and food sources for a wide array of wildlife. White tail deer browse leaves and twigs along with acorns each fall and winter when other food sources are unavailable. More than 100 animal species eat acorns including rabbits, squirrels, wild hog, and gamebirds (Ober 2014). Songbirds and small mammals consume fruits and seeds. Wood peckers (*Melanerpes* sp.) and red tailed hawk (*Buteo jamaicencis*) nest in the cavities of hollow or dead trees (Dickson and Connor 1982). Butterflies, moths, and honeybees use trees as larval hosts, nectar sources, and shelter (Hill and Webster 1995).



Funding for the preparation of this map was provided by the National Fish and Wildlife Foundation, through a challenge grant to The Nature Conservancy, Wings of the Americas program. Matching funds for this grant were donated by Canon U.S.A., Inc.

At right is a map illustrating forest types within the Western Gulf Coastal Plain. The Western Gulf Coastal Plain has a diversity of native hardwoods along with three species of southern pines (longleaf (*Pinus palustris*), shortleaf (*Pinus echinata*) and loblolly (*Pinus taeda*). Important native hardwoods used commercially and for wildlife include mockernut hickory (*Carya tomentosa*), hackberry (*Celtis laevigata*), green ash (*Fraxinus pennsylvanica*), black walnut (*Juglans nigra*), sweetgum (*Liquidambar styraciflua*), black tupelo (*Nyssa sylvatica*), white oak (*Quercus alba*), southern red oak (*Quercus falcata*), water oak (*Quercus nigra*), willow oak (*Quercus phellos*), shumard oak (*Quercus shumardii*), post oak (*Quercus stellata*), bald cypress (*Taxodium distichum*), and American elm (*Ulmus americana*) (Diggs 2006).

Purpose

The purpose of this technical note is to assist conservation planners and land managers by providing basic tree establishment information and a list of beneficial wildlife trees (Table 1) when they are planning wildlife and pollinator habitat in east Texas, western Louisiana, southwestern Arkansas, and southeastern Oklahoma.

Planning

Conservation planners and land managers should contact their local NRCS forester for assistance with developing a forest management plan. At the beginning of the planning process, the land manager needs to define their objective for the planting; examples include wildlife habitat improvement, timber production, or a combination of the two. Consideration should be given for long term objectives and how the land manager envisions the planting ten or twenty years in the future. The conservation planner uses this information to develop a forest management plan to address resource concerns of the planting site including background and site information, land manager objectives, existing site conditions, desired future conditions (DFC), and plan documentation. Plan goals, such as tree density, basal area, species composition and wildlife, etc. are included in the DFC section. The DFC also describes what the forest should look like after the planned management practices have been applied. For further information regarding wildlife habitat planning refer to USDA-NRCS Conservation Practice Standards 645-Upland Wildlife Habitat Management and 647-Early Successional Habitat Development and Management.

Selecting Trees for Wildlife Habitat

Below are some factors to consider when choosing trees to develop wildlife habitat (Diggs et al 2006):

- Choose native trees that occur in the Western Gulf Coastal Plain such as oaks, walnuts, hickories, persimmon, and plums. Include evergreen trees which are important for winter cover and shelter.
- Rapid growing, long lived species adapted to local climate and soil conditions such as fertility level, pH, and drainage conditions.
- Resistant or adapted to grazing or browsing, drought, fire, diseases, and insect damage.
- Produces abundant shoots, leaves, buds and fruit with high nutritive value that is desired by many species of wildlife. Choose a mixture of trees to produce food throughout the year.
- Preferably, not poisonous to man or livestock. For example, the leaves, twigs, bark, and seeds of black cherry contain cyanide in the bound form of cyanogenic glycoside and are poisonous to domestic livestock (Horsley 1981). Acorns, leaves, and buds of certain oak spp. can be fatally toxic to domestic livestock if they ingest too much plant material. As a precaution, livestock should not graze in areas of dense stands of oaks (Ober 2014).

Establishment

Site Preparation

Proper site preparation is critical for seedling survival. Site preparation can be accomplished by mechanical or chemical means, prescribed burning or combination of these methods. Mechanical site preparation methods include mowing, disking, roller chopping, combination plowing or subsoiling the planting area (USDA-NRCS 2006). Following is a brief description of each of these preparation methods.

- Mowing is an appropriate method for abandoned cropland or pastureland with grass, weeds, small brush and trees (up to 2" diameter) or where follow up mowing is planned. Mow vegetation as short as possible late in the growing season to make tree planting easier.
- Disking can be effective on open land, small brush, and compacted soils after chopping and burning. Disk to an 8" to 10" depth and allow time for soil settling prior to planting.
- A roller chopper is a large heavy bladed metal cylinder pulled by a bulldozer. This method is used on upland sites with brush and small trees (<5" diameter at breast height). Two passes with a roller chopper is usually required before applying additional preparation such as prescribed burning.
- A combination plow is a heavy implement pulled by a bulldozer or other large machine. This implement rips, disks, and beds a site in one pass. This method is used on tracts with large amounts of logging slash or small stems. It is best suited for shallow, clayey, or wet sites.
- Subsoiling is used on sites with a compacted soil layer (hardpan or clay subsoil). A large tractor or bulldozer pulls a long shank 18 to 24 inches below the soil surface and placed at the planned row spacing. The shank fractures the compacted soil layer providing space for better seedling root growth and water infiltration. Subsoiling is best completed while the site is dry from late summer to mid-October prior to planting.

Chemical site preparation (both pre-plant and post plant) with herbicides is used to control or suppress target weeds and grasses. Herbicides can be applied by ground or aerial application methods. Ground application methods include broadcasting (mist blower or mounted sprayer), injection, stem treatment (basal spray), hand spraying or soil treatment. Ground application by foot, skidders, bulldozers, and tractors is useful where drift must be minimized or for small tracts too hazardous for flying. Aerial herbicide applications using helicopters or fixed wing aircraft equipped with a broadcast spray boom are widely used for large acreages during site preparation. Applying appropriate approved herbicide to target vegetation and proper application (application rate, equipment, weather conditions, and site soil type) are important factors in chemical site preparation. All herbicides must be applied according to label instructions and never used outside of labelled restrictions (USDA-NRCS 2006

and Williams and Harrington 2012a). Herbicide treatments may have to be repeated for a couple of years to improve stand establishment.

Prescribed burning maybe an appropriate treatment for fallow land, pasture, or recently harvested forestland. Before conducting a prescribed burn, the land manager must have a burn plan and notify proper authorities. This method may be used in conjunction with other mechanical or chemical site preparations. For additional information about tree planting site preparation refer to USDA-NRCS Conservation Practice Standards and Specifications 490 - Tree/Shrub Site Preparation, USDA-NRCS Conservation Practice Standards and Specifications 338 – Prescribed Burning, and USDA-NRCS Texas Forestry Technical Note TX-FS-12-3.

Tree Planting Methods and Tree Density

Tree establishment methods include planting seedlings and direct seeding of acorns, nuts, or seeds. Tree planting methods include machine or hand planting of bare root seedlings, containerized trees or seedlings, and cuttings. A machine planter is pulled behind a tractor or bulldozer and makes a narrow slit in the soil. A person riding on the machine then places a seedling in the slit and the slit is closed by press wheels at the rear of the machine. Machine planting is useful for large plantings, for areas that are well prepared (little debris or windrowed), or old farm fields (Williams and Harrington 2012). Hand planting with a planting bar is labor intensive and used for small acreage, when tree seedlings are too large for the machine planter, or the planting area is not suitable for machine planting because of debris, terrain, or wet soil conditions. Advantages of planting seedlings or trees include density control, uniform growth, and known performance.

Direct seeding includes mechanical direct sowing or hand planting large seeds using dibbles and acorn planters. Mechanical direct sowing is done with seed drills or broadcast seeders. Larger seeds, such as acorns, can be drilled using special row planters or modified soybean planters. When small or light seed, such as pine, is sown with a broadcast spreader, a carrier such as sawdust is added to help regulate seeding rates. Direct seeding is appropriate on sites were access, terrain or drainage prohibits machine planting. Disadvantages of direct seeding may include no density control and more time required for stand establishment.

Tree density for wildlife habitat is approximately 303 trees per acre (12’ x12’ spacing), which is lower than timber production stands of 436 trees per acre (10’ x 10’ spacing). The spacing can be altered if needed (USDA-NRCS 2013). If the land manager intends to combine timber production and wildlife habitat then use a density of 350-370 trees per acre. For additional information about tree planting and spacing, refer to USDA-NRCS Practice Standards and Specifications 612 - Tree/Shrub Establishment. For further information regarding tree seedling establishment, planting methods and stand maintenance contact your local NRCS Forester.

Tree Species and Benefits

Trees benefit wildlife and pollinators throughout the year by providing food and cover. Some of the most important wildlife trees in east Texas include black cherry (*Prunus serotina*), common persimmon (*Diospyros virginiana*), Mexican wild plum (*Prunus mexicana*), oak spp. (*Quercus* spp.), southern magnolia (*Magnolia grandiflora*), and black tupelo (*Nyssa sylvatica*) (Diggs et al. 2006). As a group these trees benefit wildlife year round. In spring and summer they provide deer browse, serve as larval host for butterflies and moths, and a nectar source for bees. Later in the year, they provide fruit for birds, turkey, and mammals along with acorns in winter.

Chinquapin (Castanea pumila) leaves and developing nuts.

A list of beneficial trees (by species) for wildlife and pollinators is included in this technical note (see Table 1 below). The purpose of the table is to provide tree species information for conservation planners and land managers when they develop a wildlife habitat plan. This table provides plant information (bloom period, bloom color, site information, and soil pH) along with wildlife and pollinator utilization and commercial availability.

Table 1

Trees	Beneficial	To	Wildlife									
									Butterflies and Moths			
Plant	**Bloom Period**	**Bloom Color**	**Site**	**Soil pH range**	**Browse**	**Seeds**	**Fruit**	**Acorn or Nut**	**Larval Host**	**Food, Nectar Source**	**Bees**	**Commercially Available**
Downy serviceberry *Amelanchier arborea* var. *austromontana*	Early spring	white	Upland	< 6.8		Songbirds	Songbirds, small mammals				Native	
Pawpaw *Asimina triloba*	February to May	White, red, yellow, purple	Upland	6.1 to 7.5	Deer		Songbirds, small mammals		Zebra Swallowtail, Pawpaw sphinx			yes
American beautyberry *Callicarpa americana*	Late spring/ early summer	white, pink	Upland	5.0 to 8.0	Deer		Songbirds, small mammals					yes
Water hickory *Carya aquatica*	April-May	green	Well drained loamy or silt soils	4.8 to 6.0	Deer		Small mammals		Luna, funeral dagger, giant regal moths			
Pecan *Carya illinoensis*	April-May	yellow	Well-drained loam soils	4.8 to 7.5				Songbirds, small mammals	Gray Hairstreak			yes
Shagbark hickory *Carya ovata*	Late March to early June	green, brown	River bottoms, clayey soils	4.5 to 5.5				Gamebirds, songbirds, small mammals	Hickory Hairstreak, Banded Hairstreak	Angus Underwing, Judith Underwing, Residua Underwing		yes
Mockernut hickory *Carya tomentosa*	April-May	Yellowish-green	Well drained soils, full to part sun	4.5 to 5.5	Deer		Small mammals					

Table 1	(cont'd)											
									Butterflies and Moths			
Plant	**Bloom Period**	**Bloom Color**	**Site**	**Soil pH range**	**Browse**	**Seeds**	**Fruit**	**Acorn or Nut**	**Larval Host**	**Food, Nectar Source**	**Bees**	**Commercially Available**
Chinquapin *Castanea pumila*	March to June	white	Sandy, sandy loam well drained soils	< 6.8			Birds, mammals	Deer, squirrels, small mammals	Orange-tipped oakworm moth	Insects		yes
Sugarberry *Celtis laevigata*	Early spring	green	Bottomland	5.0 to 7.8	Deer		Gamebirds, songbirds, small mammals		Hackberry Emperor			yes
Common buttonbush *Cephalanthus occidentalis*	June to Sept.	white, pink	Wetland	5.1 to 7.8	Deer	Songbirds					Native, Honey, Bumble -bee	yes
Buckwheat tree *Cliftonia monophylla*	April to May	white, pink	Swamp edge	< 7.0							yes	
Rough leaf dogwood *Cornus drummondii*	April to June	white	Swamps, marshes, lake and streambank	6.1 to 7.8	Deer		Songbirds			Butterflies, insects	Native, Honey	yes
Dogwood *Cornus florida*	Early spring	white, pink	Upland	6.0 to 7.0	Deer	Turkey, songbirds, small mammals			Spring Azure, Dogwood Thyatrid moth		Native	yes
Swamp Dogwood *Cornus foemina*	Early spring	white	Bottomland	< 6.8	Deer	Turkey, songbirds, small mammals			Summer Azure			yes
Eastern mayhaw *Crataegus aestivales*	Early spring	white	Bottomland	4.0 to 7.3	Deer		Songbirds, small mammals		Waved Sphinx moth, Texarkana Underwing moth, Orba Underwing moth			yes

Table 1	(cont'd)											
									Butterflies and Moths			
Plant	**Bloom Period**	**Bloom Color**	**Site**	**Soil pH range**	**Browse**	**Seeds**	**Fruit**	**Acorn or Nut**	**Larval Host**	**Food, Nectar Source**	**Bees**	**Commercially Available**
Western mayhaw *Crataegus opaca*	Early spring	white	Bottomland	4.0 to 7.3	Deer		Songbirds, small mammals		Waved Sphinx moth, Texarkana Underwing moth, Orba Underwing moth		Native	yes
Persimmon *Diospyros virginiana*	Late spring/ early summer	yellow, green	Bottomland	4.4 to 7.3			Deer, songbirds, gamebirds small mammals		Luna moth, Royal Walnut moth		Honey	yes
Green ash *Fraxinus pennsylvanica*	April to June	green, purple, brown	Bottomland	3.6 to 7.5	Deer	Gamebirds, small mammals	Songbirds		Eastern Tiger Swallowtail, Orange Sulphur, Giant Sulphur, Mourning Cloak			
Honey locust *Gleditsia triacanthos*	Late spring/ early summer	yellow	Bottomland	5.1 to 7.3		Gamebirds, songbirds	Songbirds, small mammals		Silver-spotted Skipper, Bicolored honey locust moth, Bisected honey locust moth	Silver-spotted Skipper	Bees	
American holly *Ilex opaca*	April to June	white, green	Swamps to bottomland to uplands	5.6 to 6.5		Deer, gamebirds songbirds, small mammals	Deer, gamebirds songbirds small mammals		Henry's Elfin		Honey	

Table 1	(cont'd)											
									Butterflies and Moths			
Plant	**Bloom Period**	**Bloom Color**	**Site**	**Soil pH range**	**Browse**	**Seeds**	**Fruit**	**Acorn or Nut**	**Larval Host**	**Food, Nectar Source**	**Bees**	**Commercially Available**
Tulip tree *Liriodendron tulipifera*	April to June	yellow, green, brown	Well-drained soils	4.5 to 7.0		Songbirds, small mammals			Tulip tree silkmoth, Eastern Tiger Swallowtail, Promethea silkmoth		Honey	Yes
Southern magnolia *Magnolia grandiflora*	April to June	white	Moist soils, bottomland terraces	6.1 to 7.3		Squirrels, birds, turkey, quail			Tulip Tree Beauty Moth			Yes
Bigleaf magnolia *Magnolia macrophylla*	Early summer	white	Moist soils but well drained, ravines	5.0 to 8.0		Squirrels, birds, turkey, quail			Tulip Tree Beauty Moth			Yes
Sweet bay *Magnolia virginiana*	June-Sept.	white	lowlands	<6.8		Squirrels, birds, turkey, quail			Sweetbay silkmoth			
Southern crabapple *Malus angustifolia*	Spring	pink	Upland	< 6.8	Deer		Songbirds, small mammals				Native, Honey, Bumble bee	Yes
Water tupelo *Nyssa aquatica*	March to April	green	wetlands	5.1 to 6.0			Songbirds, small mammals, deer				Honey	Yes
Black tupelo *Nyssa sylvatica*	April to June	greenish white	Wetlands-swamp and flat ground to uplands	5.0 to 7.4	Deer		Songbirds, small mammals					Yes
Chickasaw plum *Prunus angustifolia*	March to May	white	Bottomland to uplands	< 7.0			Deer, songbirds, small mammals			Red Spotted Purple	Native	Yes

Table 1	(cont'd)											
									Butterflies and Moths			
Plant	**Bloom Period**	**Bloom Color**	**Site**	**Soil pH range**	**Browse**	**Seeds**	**Fruit**	**Acorn or Nut**	**Larval Host**	**Food, Nectar Source**	**Bees**	**Commercially Available**
Hortulan plum *Prunus hortulana*	Spring	white	uplands	5.5 to 6.5			Songbirds, small mammals					
Mexican plum *Prunus mexicana*	February to April	White, pink	Dry to moist sandy to clay loam soils	6.1 to 7.8			Deer, birds, small mammals		Tiger Swallowtail, Cecropia moths		Native	Yes
Black cherry *Prunus serotina*	May to July	white	Bottomland to uplands	4.5 to 7.3	Deer		Birds, turkey, mammals		Eastern Tiger Swallowtail, Cherry Gail Azure, Viceroy, Columbia Silkmoth	New England Buckmoth	Native, Honey, Bumble -bee	
Common chokecherry *Prunus virginiana*	April to July	white	uplands	6.8 to 7.2	Deer	Birds	Birds		Small-eyed sphinx, Columbia silkmoth	California Hairstreak, Sequoia sphinx	Native	
White oak *Quercus alba*	Late March to late May	yellow	Well drained loam and sandy soils	6.8-7.2	Deer			Deer, gamebirds songbirds, small mammals	Edwards Hairstreak			yes
Southern Red Oak *Quercus falcata*	March to May	Yellow	Dry upland, sandy or clay loam soil	5.0 to 7.3	Deer			Small mammals, rodents, deer	Banded Hairstreak, White M Hairstreak			yes
Bluejack oak *Quercus incana*	March to May	Red, green, yellow	Well drained, sandy upland soils	5.0 to 7.0	Deer			Deer, turkey, quail, squirrels		Banded Hairstreak, Sleepy Duskywing		

Table 1	(cont'd)											
									Butterflies and Moths			
Plant	**Bloom Period**	**Bloom Color**	**Site**	**Soil pH range**	**Browse**	**Seeds**	**Fruit**	**Acorn or Nut**	**Larval Host**	**Food, Nectar Source**	**Bees**	**Commercially Available**
Overcup oak *Quercus lyrata*	March to May	yellow	Clay or silty clay bottoms and terraces	4.5 to 7.5	Deer			Deer, gamebirds small mammals				
Bur oak *Quercus macrocarpa*	April to mid-June	Yellow, green, brown	Moist well drained loam soils	4.5 to 7.5	Deer			Deer, small mammals	Edwards Hairstreak, Horaces Duskywing butterfly			yes
Blackjack oak *Quercus marilandia*	March to May	White, red, green	Sandy or loam soils	4.6 to 5.6	Deer			Deer, gamebirds songbirds, small mammals	Horaces Duskywing, White M Hairstreak			limited
Chinquapin oak *Quercus muehlenbergii*	April to May	Yellow, green, brown	Rocky or sandy soils	6.5 to about 7.0	Deer			Deer, gamebirds songbirds, small mammals	Gray Hairstreak			yes
Water oak *Quercus nigra*	March to May	yellow	Sandy or clay loam soils along stream or swamps	3.6 to 6.3	Deer			Deer, gamebirds small mammals	White M hairstreak, Northern Hairstreak			yes
Willow oak *Quercus phellos*	February to May	Yellow-green	Rich, wet clay or loam bottomland	3.6 to 6.3	Deer			Deer, gamebirds small mammals	White M Hairstreak, Horaces Duskywing			yes
Shumard oak *Quercus shumardii*	March to May	White, green	Moist hillsides or bottomland in clay soils	4.4 to 7.3	Deer			Deer, gamebirds songbirds, small mammals	Horaces Duskywing butterfly			yes

Table 1	(cont'd)											
									Butterflies and Moths			
Plant	**Bloom Period**	**Bloom Color**	**Site**	**Soil pH range**	**Browse**	**Seeds**	**Fruit**	**Acorn or Nut**	**Larval Host**	**Food, Nectar Source**	**Bees**	**Commercially Available**
Post oak *Quercus stellata*	March to May	Yellow, brown	Well drained, coarse textured sandy soils	5.0 to 7.5	Deer			Deer, gamebirds small mammals	Northern Hairstreak, Horaces Duskywing			yes
Black locust *Robinia pseudoacacia*	May to June	white	Upland	4.8 to 8.2	Deer	Birds			Silver-spotted Skipper		Native, Honey	
Black willow *Salix nigra*	Early spring	yellow	Wetland	4.5 to 9.0	Deer				Mourning Cloak, Viceroy, Red-spotted Purple, Tiger Swallowtail		Native, Honey, Bumble bee	yes
American black elderberry *Sambucus nigra* L. ssp. *canadensis*	June to August	white	bottomland	6.8 to 7.2	Deer		Songbirds, small mammals				Native	Yes
Common sassafras *Sassafras albidum*	March to April	yellow, green, brown	Moist, well-drained soils	< 6.8	Deer	Songbirds			Spicebush butterfly, Tiger Swallowtail, Pale Swallowtail	Spicebush Swallowtail Promethea silkmoth		
Bald cypress *Taxodium distichum*	April	Purple	Bottomland wet sites, moist uplands	4.6 to 7.5		Birds, small mammals			Baldcypress sphinx			yes
American basswood *Tilia americana*	Early to mid-summer	yellow	Lower slopes, river bottoms	6.8 to 7.2	Deer		Birds, small mammals		Four-horned Sphinx moth, Waved Sphinx moth, Imperial Moth	yes	Native, Honey	

Table 1	(cont'd)											
									Butterflies and Moths			
Plant	**Bloom Period**	**Bloom Color**	**Site**	**Soil pH range**	**Browse**	**Seeds**	**Fruit**	**Acorn or Nut**	**Larval Host**	**Food, Nectar Source**	**Bees**	**Commercially Available**
American elm *Ulmus americana*	February to April	Red, green	Bottomland clay, silty-clay loams	5.5 to 8.0	Deer	Songbirds	Small mammals		Eastern Comma, Mourning Cloak, Columbia silkmoth, Question Mark, Painted Lady			yes
Hercules-club *Zanthoxylum clava-herculis*	March-April	white	Gulf coastal plain, moist soil	6.0 to 7.5	Deer		Gamebirds, songbirds, small mammals		Giant Swallowtail	Adult butterflies	Native	yes
***List is not all inclusive.**												

Conclusion

Forests within the Western Gulf Plain contain a diversity of native hardwoods and pines which provide food and shelter for wildlife and pollinators. Planning and establishing suitable wildlife habitat is a process involving the land manager, conservation planner, NRCS staff forester, and NRCS wildlife biologist.

Bur oak (Quercus macrocarpa) leaves and developing acorns.

Pawpaw (Asimina triloba) tree with developing fruit.

This process includes several steps:

1. The land manager defines their present and future goals for the planting.
2. The conservation planner develops a plan consistent with NRCS conservation practice standards and specifications and addresses land manager goals. *Table 1 (above) in this technical note provides specific tree species information for conservation planners developing wildlife habitat plans.*
3. Prepare the planting site using appropriate mechanical treatment, chemical application, or prescribed burning to control competing competition and aid tree seedling survival.
4. Establish the stand by planting tree seedlings (machine or hand planting) or direct planting of tree seeds (acorns, nuts, etc.).
5. Continue with post planting site management (mowing, post planting chemical applications, etc.) to control competing vegetation.

For additional information about tree species and establishment or habitat requirements of individual wildlife species, contact your local NRCS staff forester or NRCS Wildlife Biologist respectively.

References

Andersen, P. 2015. The pecan tree. IFAS Extension pub. HS982. IFAS Extension, University of Florida. Gainesville, FL.

Beck, D. 1990. Yellow-Poplar (*Liriodendron tulipifera*). Silvics of North America, vol.2 Hardwoods. Agr. Handbook 654. USDA-USFS. Washington, DC.

Bernheim Arboretum and Research Forest. n.d. Downy serviceberry, *Amelanchier arborea*. Accessed online (3/17/16): http://bernheim.org/explore/arboretum/bernheim-select/downy-serviceberry/

Blair, R. 1990. Honeylocust (*Gleditsia triacanthos*). Silvics of North America, vol.2 Hardwoods. Agr. Handbook 654. USDA-USFS. Washington, DC.

Braswell, J. and C. Sloan. Fruit and nut review: peaches, nectarines, and plums. Information sheet 1434. Mississippi State University Extension. Mississippi State University. Starkville, MS.

Coladonato, M. 1991. *Ilex opaca*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. Missoula, MT.

Coladonato, M. 1992. *Callicarpa americana*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. Missoula, MT.

Coladonato, M. 1992. *Carya tomentosa*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. Missoula, MT.

Coladonato, M. 1992. Ulmus *americana*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. Missoula, MT.

Dickson, J. 1990. Eastern redbud (*Cercis canadensis*). Silvics of North America, vol. 2, Hardwoods. Agr. Handbook 654. United States Department of Agriculture, Forest Service. Washington, D.C.

Dickson, J. and R. Conner. 1982. Winter birds and snags in an east Texas clearcut. Proc. Ann. Conf. Southeast Assoc. Fish and Wildlife Agencies 36:638-642.

Diggs, G., B. Lipscomb, M. Reed, and R. O'Kennon. 2006. Illustrated flora of east Texas. Center for Environmental Studies and Department of Biology, Austin College, Sherman, TX and Botanical Research Institute of Texas. Ft. Worth, TX.

Graney, D. 1990. Shagbark Hickory (*Carya ovata*). Silvics of North America, vol.2 Hardwoods. Agr. Handbook 654. USDA-USFS. Washington, DC.

Gucker, C. 2005. *Fraxinus pennsylvanica*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. Missoula, MT.

Halls, L. 1977. Southern fruit producing woody plants used by wildlife. General Tech. Rep. SO-16. United States Department of Agriculture, Forest Service. Southern Forest Experiment Station. New Orleans, LA.

Halls, L. 1990. Common persimmon (*Diospyros virginiana*). Silvics of North America, vol. 2, Hardwoods. Agr. Handbook 654. United States Department of Agriculture, Forest Service. Washington, D.C.

Horsley, S. 1981. Glucose-1-benzoate and prunasin from *Prunus serotina*. Phytochemistry 20:1127-1128.

Huntley, J.C. 1990. Black Locust (*Robinia pseudoacacia*). Silvics of North America, vol.2 Hardwoods. Agr. Handbook 654. USDA-USFS. Washington, DC.

Illinois Wildflowers. 2016. Shagbark Hickory. Accessed online 3/25/2016 at http://www.illinoiswildflowers.info/trees/plants/shbk_hickory.html

Illinois wildflowers. Common elderberry (*Sambacus nigra*). Accessed online 3/16/16 at http://www.illinoiswildflowers.info/trees/plants/cm_elder.html

Johnson, P. 1990. Bur Oak (*Quercus macrocarpa*). Silvics of North America, vol.2 Hardwoods. Agr. Handbook 654. USDA-USFS. Washington, DC.

Johnson, R. 1990. Water tupelo (*Nyssa aquatica*). Silvics of North America, vol. 2, Hardwoods. Agr. Handbook 654. United States Department of Agriculture, Forest Service. Washington, D.C.

Ladybird Johnson Wildflower Center. 2015. *Quercus incana* (Bluejack oak). Native Plant Database. Ladybird Johnson Wildflower Center. University of Texas. Austin, TX.

Ladybird Johnson Wildflower Center. 2016. *Carya illinoinensis (illinoensis*) (Pecan). Native Plant Database. Ladybird Johnson Wildflower Center. University of Texas. Austin, TX.

Ladybird Johnson Wildflower Center. 2016. *Carya ovata* (Shagbark hickory). Native Plant Database. Ladybird Johnson Wildflower Center. University of Texas. Austin, TX.

Ladybird Johnson Wildflower Center. 2016. *Cornus drummondii* (Roughleaf dogwood). Native Plant Information Database. Ladybird Johnson Wildflower Center. University of Texas. Austin, TX.

Ladybird Johnson Wildflower Center. 2016. *Castanea pumila (Chinquapin)*. Native Plant Information Database. Ladybird Johnson Wildflower Center. University of Texas. Austin, TX.

Ladybird Johnson Wildflower Center. 2016. *Malus angustifolia* (Southern crabapple). Native Plant Information Database. Ladybird Johnson Wildflower Center. University of Texas. Austin, TX.

Ladybird Johnson Wildflower Center. 2016. *Prunus mexicana* (Mexican plum). Native Plant Information Database. Ladybird Johnson Wildflower Center. University of Texas. Austin, TX.

Ladybird Johnson Wildflower Center. 2016. *Prunus virginiana* (Chokecherry). Native Plant Information Database. Ladybird Johnson Wildflower Center. University of Texas. Austin, TX.

Ladybird Johnson Wildflower Center. 2016. *Quercus alba* (White oak). Native Plant Database. Ladybird Johnson Wildflower Center. University of Texas. Austin, TX.

Ladybird Johnson Wildflower Center. 2016. *Quercus falcata* (Southern red oak). Native Plant Database. Ladybird Johnson Wildflower Center. University of Texas. Austin, TX.

Ladybird Johnson Wildflower Center. 2016. *Quercus lyrata* (Overcup oak). Native Plant Information Database. Ladybird Johnson Wildflower Center. University of Texas. Austin, TX.

Ladybird Johnson Wildflower Center. 2016. *Quercus macrocarpa* (bur oak). Native Plant Information Database. Ladybird Johnson Wildflower Center. University of Texas. Austin, TX.

Ladybird Johnson Wildflower Center. 2016. *Quercus michauxii* (Swamp chestnut oak). Native Plant Information Database. Ladybird Johnson Wildflower Center. University of Texas. Austin, TX.

Ladybird Johnson Wildflower Center. 2016. *Quercus muehlenbergii* (Chinkapin oak). Native Plant Information Database. Ladybird Johnson Wildflower Center. University of Texas. Austin, TX.

Ladybird Johnson Wildflower Center. 2016. *Quercus nigra* (Water oak). Native Plant Information Database. Ladybird Johnson Wildflower Center. University of Texas. Austin, TX.

Ladybird Johnson Wildflower Center. 2016. *Quercus phellos* (Willow oak). Native Plant Information Database. Ladybird Johnson Wildflower Center. University of Texas. Austin, TX.

Ladybird Johnson Wildflower Center. 2016. *Quercus shumardii* (Shumard oak). Native Plant Information Database. Ladybird Johnson Wildflower Center. University of Texas. Austin, TX.

Ladybird Johnson Wildflower Center. 2016. *Quercus stellata* (Post oak). Native Plant Information Database. Ladybird Johnson Wildflower Center. University of Texas. Austin, TX.

Ladybird Johnson Wildflower Center. 2016. *Sambucus nigra* ssp. *canadensis* (Common elderberry) Native Plant Information Database. Ladybird Johnson Wildflower Center. University of Texas. Austin, TX.

Ladybird Johnson Wildflower Center. 2016. *Taxodium distichum* (Post oak). Native Plant Information Database. Ladybird Johnson Wildflower Center. University of Texas. Austin, TX.

Ladybird Johnson Wildflower Center. 2016. *Ulmus americana* (American elm). Native Plant Information Database. Ladybird Johnson Wildflower Center. University of Texas. Austin, TX.

Lorenzo, A. 2002. May Hawthorn (*Crataegus aestivalis*). USDA-Natural Resources Conservation Service Plant Guide. USDA-NRCS Plant Materials Program.

Lyons, R., T. Ginnett, and R. Taylor. 1999. Woody plants and wildlife-brush sculpting in south Texas and the Edwards plateau. (Pub. E-459). Texas A&M Agrilife Extension. Texas A&M University. College Station, TX.

McGee, C. and K. Outcalt. 1990. Black Tupelo (*Nyssa sylvatica*). Silvics of North America, vol.2 Hardwoods. Agr. Handbook 654. USDA-USFS. Washington, DC.

Miller, J. and K. Miller. 1999. Forest plants of the southeast and their wildlife uses. Southern Weed Science Society. Auburn, AL.

Missouri Botanical Garden. 2016. *Carya tomentosa* – Plant Finder. Missouri Botanical Garden. St. Louis, MO.

Missouri Botanical Garden. 2016. *Quercus macrocarpa* - Plant Finder. Missouri Botanical Garden. St. Louis, MO.

Ober, H. 2014. The value of oaks to wildlife. Publication WEC248. UF/IFAS Extension Service. Univ. of Florida and Florida A&M Univ. Cooperative Extension Program. Gainesville, FL.

Oliver, M. 2016. Bottomland hardwood tree establishment (Unpublished material). USDA-NRCS Texas State. Temple, TX.

Peronto, M. and R. Manley. 2008. Common chokecherry (Bull. #2576). University of Maine Cooperative Extension, University of Maine. Orono, ME.

Peronto, M. and R. Manley. 2008. Native trees and shrubs for Maine landscapes Shadblow serviceberry (*Amelanchier canadensis*). Publication 2563e. The University of Maine Cooperative Extension, University of Maine. Orono, ME.

Peterson, J. 1990. Pecan (*Carya Illinoensis*). Silvics of North America, vol.2 Hardwoods. Agr. Handbook 654. USDA-USFS. Washington, DC.

Rogers, R. 1990. White oak (*Quercus alba*). Silvics of North America, vol.2 Hardwoods. Agr. Handbook 654. USDA-USFS. Washington, DC.

Sander, I. 1990. Chinkapin Oak (*Quercus muehlenbergii*). Silvics of North America, vol.2 Hardwoods. Agr. Handbook 654. USDA-USFS. Washington, DC.

Schlaegel, B. 1990. Willow Oak (*Quercus phellos*). Silvics of North America, vol.2 Hardwoods. Agr. Handbook 654. USDA-USFS. Washington, DC.

Self, A. 2016. Soil pH and tree species suitability in Mississippi (Pub. 2311). Mississippi State University Extension Service, Mississippi State University. Starkville, MS.

Snyder, S.A. 1991. *Cephalanthus occidentalis*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. Missoula, MT.

Snyder, S.A. 1992. *Amelanchier arborea*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. Missoula, MT.

Solomon, J. 1990. Overcup Oak (*Quercus lyrata*). Silvics of North America, vol.2 Hardwoods. Agr. Handbook 654. USDA-USFS. Washington, DC.

Stransky, J. 1990. Post Oak (*Quercus stellata*). Silvics of North America, vol.2 Hardwoods. Agr. Handbook 654. USDA-USFS. Washington, DC.

Sullivan, J. 1993. *Asima triloba*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. Missoula, MT.

Sullivan, J. 1993. *Celtis laevigata*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. Missoula, MT.

Sullivan, J. 1993. *Quercus lyrata*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. Missoula, MT.

Sullivan, J. 1993. *Quercus shumardii*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. Missoula, MT.

Sullivan, J. 1994. *Quercus incana*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. Missoula, MT.

Tesky, J.L. 1992. *Salix nigra*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. Missoula, MT.

Uchytil, R. 1991. *Prunus serotina*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. Missoula, MT.

USDA-NRCS. 2002. Southern crabapple (*Malus angustifolia*). USDA-Natural Resources Conservation Service Plant Materials Program. Accessed online 3/17/16 at http://plants.usda.gov/factsheet/pdf/fs_maan3.pdf

USDA-NRCS. 2006. NRCS field office technical guide: conservation practice specification for code 490-tree/shrub site preparation. USDA-NRCS Texas. Temple, TX.

USDA-NRCS. 2013. NRCS field office technical guide: conservation practice specification for code 612-tree/shrub establishment. USDA-NRCS Texas. Temple, TX.

USDA-NRCS. 2016. Plant characteristics of bur oak. The PLANTS Database. (http://plants.usda.gov, 29 March 2016). National Plant Data Team, Greensboro, NC 27401.

USDA-NRCS. 2016. Plant characteristics of overcup oak. The PLANTS Database. (http://plants.usda.gov, 29 March 2016). National Plant Data Team, Greensboro, NC 27401.

USDA-NRCS. 2016. Plant characteristics of swamp chestnut oak. The PLANTS Database. (http://plants.usda.gov, 30 March 2016). National Plant Data Team, Greensboro, NC 27401.

USDA-NRCS. 2016. Plant characteristics of willow oak. The PLANTS Database. (http://plants.usda.gov, 31 March 2016). National Plant Data Team, Greensboro, NC 27401.

Vines, R. 1960. Trees, shrubs, and vines of the southwest. University of Texas. Austin, TX.

Williams, R. and S. Harrington. 2012. Seedling planting guidelines -Texas Forestry Technical Note TX-FS-12-4. USDA-NRCS Texas. Temple, TX.

Williams, R. and S. Harrington. 2012a. Site preparation-Texas Forestry Technical Note TX-FS-12-3. USDA-NRCS Texas. Temple, TX.