

23. Mixed Hardwood-Loblolly Pine/Hardwood Slope Forest

Rarity Rank: Mixed Hardwood-Loblolly Pine Forest- S4/G4
Hardwood Slope Forest - S3S4/G4

Synonyms: Mixed Pine Hardwood, Loblolly Pine-Hardwood, Beech-Magnolia Forest, Mixed Hardwood Forest, Hammock, Mixed Mesic Hardwood Forest

Ecological Systems:

CES203.476 East Gulf Coastal Plain Southern Mesic Slope Forest

CES203.280 West Gulf Coastal Plain Mesic Hardwood Forest

CES203.378 West Gulf Coastal Plain Pine-Hardwood Forest

General Description:

(Note: Hardwood slope forests and mixed hardwood - loblolly pine forests are described as distinct communities in the LNHP Natural Communities of Louisiana. They are considered together here due to their floristic similarity and similarity in management needs.)



These two communities can be similar in species composition but they differ in topographic position and soil moisture, with hardwood slope forests being more mesic. Both communities are more or less evenly distributed in the uplands statewide.

Hardwood slope forests occur on slopes (often steep) rising out of small (or larger) stream floodplains. Mixed hardwood - loblolly pine forests are found upslope and, depending on moisture regime, on low ridge tops. *Pinus taeda* (loblolly pine) may be present but infrequent in a hardwood slope forest, but comprises 20 percent or more of the overstory, associated with various hardwood species, in a mixed hardwood - loblolly pine forest.

Without fire, mixed hardwood-loblolly pine forest succession is toward hardwood dominance. Given the available pine needle fuel, regular fire was a process maintaining a significant pine component. Other types of disturbances may also allow loblolly pine to remain a component of the forest. Fire may have occurred very rarely in hardwood slope forests, but is not a process required to maintain this community. In hardwood slope forests, *Fagus grandifolia* (beech) and *Magnolia grandiflora* (southern magnolia) are typically canopy dominants. However, in north Louisiana, southern magnolia is often infrequent or absent. Other primary overstory species include *Quercus alba* (white oak), *Q. shumardii* (shumard oak), *Q. michauxii* (swamp white oak), *Q. nigra* (water oak), *Q. laurifolia* (laurel oak), *Q. velutina* (black oak), *Magnolia acuminata* (cucumber tree), *M. macrophylla* (big-leaf magnolia), *M. pyramidata* (pyramid magnolia, rarely),

Liriodendron tulipifera (tulip tree), *Liquidambar styraciflua* (sweetgum), *Carya tomentosa* (mockernut hickory), *C. cordiformis* (bitternut hickory), and *C. glabra* (pignut hickory). *Pinus taeda* may be present sporadically in the overstory, and *Pinus glabra* (spruce pine) is an occasional associate in the Florida Parishes. Significant midstory and understory associates are *Oxydendrum arboreum* (sourwood), *Halesia diptera* (silverbell), *Styrax grandifolia* (bigleaf snowbell), *Cornus florida* (flowering dogwood), *Symplocos tinctoria* (sweetleaf), *Prunus caroliniana* (cherry-laurel), *Stewartia malacodendron* (silky camelia), *Amelanchier arborea* (downy service-berry), *Ilex ambigua* (holly), *Illicium floridanum* (starbush, southeastern Louisiana), *Carpinus caroliniana* (ironwood), *Ostrya virginiana* (eastern hophornbeam), *Vaccinium arboreum* (winter huckleberry), *V. elliotii* (Elliott's blueberry), and *Erythrina herbacea* (red coral bean). Herbaceous species include *Hexastylis arifolia* (wild ginger, southeast Louisiana), *Trillium* spp. (wake-robbers), *Polygonatum biflorum* (smooth solomon's seal), *Uvularia perfoliatum* (bellwort), *Tipularia discolor* (crane-fly orchid), *Viola* spp. (violets), *Spigelia marilandica* (Indian pink), *Podophyllum peltatum* (may-apple), *Sanicula* spp. (snakeroots), *Polymnia uvedalia* (bear-paw), *Chamaelirium luteum* (devil's-bit), *Lilium michauxii* (Carolina lily), *Arisaema* spp. (jack-in-the-pulpits), *Prenanthes altissima* (tall rattlesnake root), *Polystichum acrostichoides* (Christmas fern), and *Phegopteris hexagonoptera* (broad beech-fern). On salt domes in the coastal zone, this natural community lacks beech, but includes *Q. virginiana* (live oak), various elms (*Ulmus* spp.), and other species not typical of hardwood slope forests above the coastal zone.

In mixed hardwood - loblolly pine forests *Pinus taeda* comprises at least 20 percent of the overstory. On moist sites *Liquidambar styraciflua* (sweetgum), *Fagus grandifolia*, *Quercus nigra*, *Q. pagoda* (cherrybark oak), *Q. michauxii*, *Q. alba*, *Liriodendron tulipifera* (yellow poplar), *Ulmus americana* (American elm), *Magnolia grandiflora*, *Acer rubrum*, and *Carya glabra* are important hardwood components. On dryer upland sites protected from fire, overstory dominants in addition to loblolly are *Quercus falcata* (southern red oak), *Q. stellata* (post oak), *Q. nigra*, *Q. marilandica* (blackjack oak), *Nyssa sylvatica* (black gum) and *Carya tomentosa*. This community occurs infrequently on sandy, xeric sites and here, *Q. incana* (bluejack oak) and *Q. hemispherica* (upland laurel oak) are frequent associates. Shrubs and understory species may include, depending on moisture regime, *Ilex glabra* (gallberry), *Callicarpa americana* (french mulberry), *Cornus florida*, *Crataegus* spp. (hawthorns), *Oxydendrum arboreum* (sourwood), *Vaccinium elliotii*, *V. arboreum*, *Rhus copallina* (winged sumac), *Toxicodendron radicans* (poison ivy), *Morella cerifera* (wax myrtle), *Ilex vomitoria* (yaupon), *Rubus* spp. (blackberries), *I. decidua* (deciduous holly), *Malus angustifolia* (crab apple), and *Gelsemium sempervirens* (yellow jessamine), *Mitchella repens* (partridge-berry), and *Viola* spp. (violets).

Current Extent and Status:

As indicated by rarity ranks for these two communities this habitat is not as imperilled as many others. A mixed loblolly pine-hardwood type is expanding in some cases into uplands due to fire suppression. However, older, more natural examples of this habitat are threatened by conversion to pine plantations (Martin and Smith 1993, Grace

and Smith 1995, Williams and Smith 1995). Natural occurrences are scattered mainly in the WGCP of central Louisiana and EGCP in the eastern Florida Parishes. There are a few occurrences known on Macon Ridge in the MRAP and it was probably much more common there historically. A number of occurrences are on conservation lands such as Kisatchie National Forest. The hardwood slope forest community is estimated to have occupied 100,000 to 500,000 acres historically and of that an estimated 25 to 50 % still remains (Smith 1993). Mixed hardwood-loblolly pine forest is estimated to have been more extensive, occupying 500,000 to 1,000,000 acres historically with the same percentage thought to remain today (Smith 1993).



MIXED HARDWOOD - LOBLOLLY PINE/HARDWOOD SLOPE FOREST SPECIES OF CONSERVATION CONCERN (45)		
<p>AMPHIBIANS</p> <p>Louisiana Slimy Salamander Southern Red-backed Salamander Southern Red Salamander Oak Toad Barking Treefrog Eastern Spadefoot</p> <p>BIRDS</p> <p>Bald Eagle American Woodcock Yellow-billed Cuckoo Chuck-Will's-Widow Brown-headed Nuthatch Wood Thrush Bell's Vireo Yellow-throated Vireo</p>	<p>Northern Parula Prairie Warbler Worm-eating Warbler Swainson's Warbler Louisiana Waterthrush Kentucky Warbler Hooded Warbler Field Sparrow Orchard Oriole</p> <p>BUTTERFLIES</p> <p>Wild Indigo Duskywing Pepper and Salt Skipper Yucca Giant Skipper Falcate Orangetip Harvester Little Metalmark</p>	<p>MAMMALS</p> <p>Southeastern Shrew Southeastern Myotis Northern Myotis Silver-haired Bat Big Brown Bat Louisiana Black Bear Long-tailed Weasel Eastern Spotted Skunk</p> <p>REPTILES</p> <p>Eastern Glass Lizard Western Worm Snake Northern Scarlet Snake Mole Kingsnake Scarlet Kingsnake Pine Woods Littersnake Harlequin Coral Snake Timber Rattlesnake</p>

Priority Species Research and Survey Needs:

Songbirds:

- Continue to support research on silviculture/land management practices and their effects on all songbird species.
- Develop long-term monitoring projects that focus on abundances and reproductive success (with emphasis on species of conservation concern) in this habitat type through the establishment of MAPS stations and BBS routes.

Butterflies: Conduct surveys to determine current distribution and abundance of all butterfly species, especially species of conservation concern, for inclusion in the LNHP database.

Chuck-Will's-Widow: Research is needed to better understand population dynamics of this species. Studies should focus on distribution patterns, habitat availability and use, nesting success, and territory size requirements. Implementation of night-time surveys along with sighting reports by foresters, birders, etc. are needed to augment spars BBS records.

Bats:

- Northern Myotis: This species was first documented in Louisiana in 2003 (Crnkovic 2003). Conduct intensive surveys to determine its current status in Louisiana and to evaluate the importance of bridges as roost sites (Leberg 2004).
- Develop projects that target species of conservation concern and focus on their distribution, abundance, and ecological needs in this habitat type (Lacki et al. 2001).
- Research the genetic identities of different Myotis species in the state (Leberg 2004).

Eastern Spotted Skunk: Considered critically imperiled in Louisiana. Intensive surveys are needed to update occurrence records and abundance for inclusion in the LNHP database.

Long-tailed Weasel: Considered vulnerable in Louisiana. Intensive surveys are needed to update occurrence records and abundance for inclusion in the LNHP database.

Ringtail: Louisiana represents the eastern edge of its range. Intensive surveys are needed to determine its current status in Louisiana.

Determine the microhabitat preferences and requirements of species utilizing mixed hardwood-loblolly pine/hardwood slope forest to understand how these species are utilizing the habitat to develop management guidelines for these species.

Species Conservation Strategies:

1. Louisiana Slimy Salamander, Southern Red-backed Salamander, Western Worm Snake: This guild of species occurs in isolated slope sites, and appears to be intolerant of habitat alteration. Encourage timber companies to designate no-cut zones (especially on slopes, slope crests, and riparian borders).
2. Songbirds:
 - Continue to encourage landowners to maintain areas in early successional stage to benefit bird species which depend on this habitat.
 - Work with NRCS, USFWS, USFS to develop and distribute technical pamphlets which contain information about the importance of early successional habitat for species of conservation concern.
 - Continue to monitor songbird abundance and reproductive success (with emphasis on species of conservation concern) in this habitat through the establishment of MAPS stations.

3. Chuck-Will's-Widow: Work with federal agencies and bird conservation organizations to produce technical pamphlets highlighting the habitat and management requirements of this species and make available to landowners.
4. Bald Eagle: Continue with long-term monitoring of active bald eagle nests, successful breeding pairs, and fledged eagles.
5. Louisiana Black Bear: Partner with the BBCC, USFWS and continue to support the implementation of recovery efforts for this species.
6. Establish monitoring systems and protocols for target bats species and other mammal species associated with mixed hardwood-loblolly pine/hardwood slope forest.
7. Work with landowners to initiate or continue the implementation of PIF bird conservation plans, conservation plans developed for amphibians and reptiles, and USFWS threatened and endangered species recovery plans over the next 10 years.

Threats Affecting Habitat:

The following table illustrates the threats identified for this habitat type and the sources of these threats. This represents all threats and sources of threats identified across all ecoregions of the state where this habitat occurs.

Source of Threat	Threat			
	Altered Composition/ Structure	Habitat Destruction or Conversion	Habitat Disturbance	Habitat Fragmentation
Conversion to agriculture or other forest types		XXX		XXX
Development/maintenance of pipelines, roads or utilities			XXX	XXX
Fire suppression	XXX			
Incompatible forestry practices	XXX		XXX	XXX
Invasive/alien species	XXX			
Recreational use/vehicles			XXX	
Residential development		XXX	XXX	XXX

Habitat Conservation Strategies:

1. Develop best management practices for restoration of this habitat type including appropriate fire regimes and herbicide uses.
2. Continue to encourage landowners to implement BMPs and adopt SFI standards in the management of this habitat type.
3. Encourage use of existing NRCS, USFWS programs in providing cost share incentives to landowners for invasive species control.
4. Develop partnerships with federal and state agencies, NGO's and others to identify potential parcels of this habitat type for acquisition and conservation.

5. Work with the legislature to provide incentives (tax breaks, etc.) to landowners to retain the natural state of areas where this habitat occurs.
6. Work with appropriate planning commissions to provide LNHP data that illustrates locations of this habitat type.

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