

U.S. Fish & Wildlife Service
U.S. Geological Survey

Paradise Lost?

*The Coastal Prairie of
Louisiana and Texas*

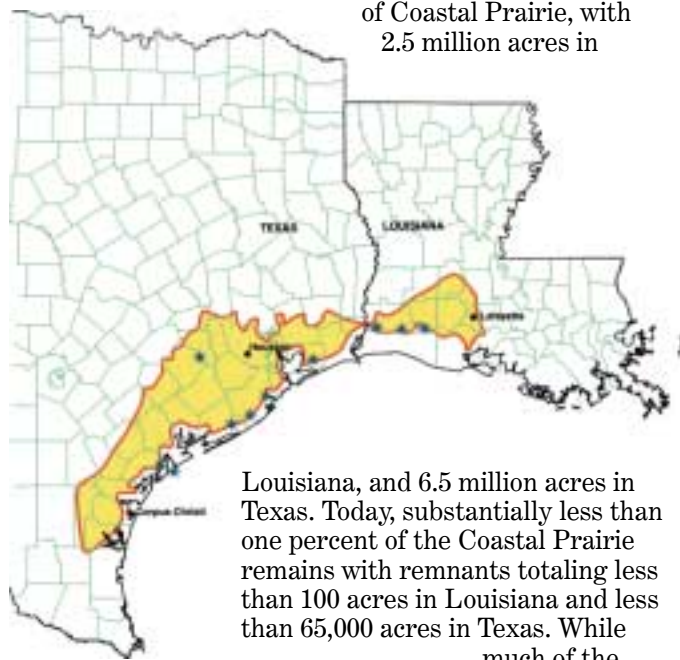


Coastal prairie is a native grassland found along the coast of Texas and Louisiana. Over nine million acres of prairie once existed as a grassland paradise for Native Americans and early settlers. Today less than 1% remains as a refuge for rare and endangered birds, mammals, reptiles, insects and plants. Is "Paradise Lost?" Private groups, conservation organizations, and government agencies are working together to protect and restore this "critically imperiled" ecosystem. They need your help and support if this effort is to succeed.

History

The Coastal Prairie is located along the western gulf coast of the United States, in southwest Louisiana and southeast Texas, just inland from the coastal marsh (see map). This Coastal Prairie is a tallgrass prairie similar in many ways to the tallgrass prairie of the midwestern United States. It is estimated that, in pre-settlement times, there were nine million acres of Coastal Prairie, with 2.5 million acres in

Historical range of Coastal Prairie. Stars represent national wildlife refuges.



Louisiana, and 6.5 million acres in Texas. Today, substantially less than one percent of the Coastal Prairie remains with remnants totaling less than 100 acres in Louisiana and less than 65,000 acres in Texas. While



Coastal Prairie railroad remnant in July

much of the former prairie has been converted to pasture for cattle grazing, the majority has been altered for growing rice, sugarcane, forage, and grain crops. In Louisiana, most of the prairie's few remaining remnants are found on narrow strips of land along railroad tracks. A larger amount remains in Texas because it was used for cattle production and never plowed. Many species, however, have been lost through overgrazing.

The “Cajun Prairie” of Louisiana

The portion of Coastal Prairie found in southwest Louisiana is often called the “Cajun Prairie” because it was settled in the early nineteenth century by exiled Acadian settlers. As of 1999, less than 100 acres remain of the 2.5 million acres that once dominated this area, making it one of our most endangered ecosystems. Most of the few remaining remnants of prairie in Louisiana are found on narrow strips of land along railroad tracks. Despite the small size of these remnants, most contain a high diversity of native tallgrass prairie flora.

Cajun prairie along railroad right-of-way in May



What makes Coastal Prairie a prairie?

The Coastal Prairie can be likened to the central and northern “tallgrass prairie.” Many wildflowers common to the Midwestern prairies such as button snakeroot, compass plant, Kansas gayfeather, and black-eyed susan are also found in Coastal Prairie. In those remnants that still exist in Louisiana, switchgrass, little bluestem, big bluestem, and Indiangrass dominate just as they do in the Midwest. Because of the region’s high rainfall, and the fact that Coastal Prairie gradually turns into coastal marsh in Louisiana, switchgrass is more common than in Midwestern prairies. In contrast, remnants of Coastal Prairie in Texas are dominated by little bluestem, brown-seed paspalum, and Indiangrass. Common wildflowers found here are the prairie coneflower, Texas coneflower, white heath aster and yellow-puff.



Attwater's prairie chicken

Coastal Prairie differs from that found in the Midwest because plant species like sweet golden rod, red milkweed, and the grasses slender bluestem and brown-seed paspalum are found here. Coastal Prairie also provides habitat for the Attwater's prairie chicken, a relative of the extinct heath hen once found in the Midwest.



Rejuvenating prairie with winter fire

Factors that contribute to the establishment and maintenance of prairie are soil type, fire, rainfall, and grazing. Drought, fire, and competition from adapted plant species combine to prevent the establishment of woody plants and maintain a grass-dominated ecosystem.



Grasshopper foraging on prairie grass

Many prairie species depend on fire for seed production because it removes accumulated plant litter and satisfies seed dormancy needs. Drought occurs in areas of low rainfall and heavy clay soils hold water making it unavailable to plants. Plants can also experience drought-like stress as a result of root restriction caused by a 8-12" deep hard pan layer in some soils that roots cannot penetrate. Grazing (historically bison and elk and now cattle) affects prairie vegetation in various ways. While it helps seeds to germinate by removing their seed

Grasses and grasslike plants of the Coastal Prairie



little bluestem



big bluestem



split-beard bluestem



pinewoods dropseed



gaping panicum



purple silkyscale



silver bluestem



bushy bluestem



switchgrass



Texas wintergrass



toothache grass



gulf cordgrass



Indiangrass



Eastern gamagrass



brown-seed paspalum



knotroot bristlegrass



falling beakrush



white-top sedge



Florida paspalum



thin paspalum



longspike tridens



Carolina's whipgrass



Vahl's hairy fimbry



yellow-eyed-grass

coat during digestion, it also stresses grazed plants and creates disturbances that allow other plants to establish. Smaller grazers such as grasshoppers and other plant-eating insects often concentrate on a single plant species, leaving its neighbors untouched, therefore giving them an advantage over their competitors.



Butterfly weed and blackeyed Susan in flower in May and June.

Natural prairie abounds with long-lived perennials which form a dense “sod” or mat of intertwined roots. Disturbances to this dense mass are rapidly filled in by growth from surrounding plants. With the exception of partridge pea, false-foxgloves and a few others, annuals are rare in undisturbed prairie sod.

Plants

Coastal prairie vegetation consists mostly of grasses overlain by a diverse variety of wildflowers and other plants. Its wildflowers are often found in patches creating a “flower garden” in the green sea of grass. Nearly 1,000 plant species have been identified in Coastal Prairie and almost all are perennials with underground structures (not all these structures are roots) like rhizomes, tubers, or crowns. These underground structures have a variety of functions, one of which is to ensure survival after fire. The underground portion of Coastal Prairie plants may be up to three times the size of the aboveground part.

Coastal Prairie flowers bloom in a vivid range of colors from the green of the green flowered milkweed and nose burn; to the white of flowering spurge and button snakeroot; to the yellow of partridge pea and compass plant; to the blue of blue waterleaf and Sampson’s snakeroot; to the pink of false dragonhead and sensitive



Kansas gayfeather in mass during August

briar; to the purple of gayfeathers and ironweed; and to the red of the red milkweed and winecup. Coastal Prairie wildflowers are a diverse group with many species belonging to the sunflower, legume, and mint families. Native Americans and European settlers on the Coastal Prairie used plants for foods, spices, dyes, textiles, and medicines.

Some of the more spectacular plants in Coastal Prairie include: blazing stars (with up to three foot spikes of purple flowers); compass plants (with leaves pointing east and west); button snakeroot (an important nectar source for many insects); sweet golden rod (with a liquorice odor and that can be used to make a tea); false indigos (yellow or white flowered species, whose flowers were used by early settlers to dye Easter eggs); and butterfly weed (with bright orange flowers favored by butterflies).

Wildflowers of the Coastal Prairie



white colic-root



false garlic



drummond rain lily



spider lily



swamp lily



spring beauty



snowy orchid



spring ladies'-tresses



ten petal anemone



Illinois bundleflower



white wild-indigo



hairy ticktrefoil



multibloom-hoarypea



white prairie clover



flowering spurge



snow on the prairie



New Jersey tea



woolly rose-mallow



*large-flowered
beeblossom*



pennywort



button snakeroot



water hemlock



American snowball



whorled milkweed



narrowleaf sandvine



tansy dogshade



silky evolvulus



cluster bushmint



*clustered
mountain-mint*



*slender mountain-
mint*



white mountain mint



poorjoe



prairie bluets



Indian plantain



narrowleaf boneset



roundleaf boneset



marsh fleabane



rabbit tobacco



climbing hemp vine



roundpod St. John's wort



nits and lice



St. Peter's-wort



doll's daisy



heath aster



yarrow



grassland prickly pear



Texas prickly pear



yellow meadowbeauty



golden colic-root



eastern yellow stargrass



prairie buttercup



narrowleaf seedbox



common evening-primrose



prairie parsley



huisache



yellow-puff



partridge pea



Canada lousewort



false dandelion



woolly groundsel



nodding wild-indigo



yellow wild indigo



arrowleaf rattlebox



Canadian goldenrod



seaside goldenrod



shiny goldenrod



sidebeak pencil-flower



stiff yellow flax



candyroot



sweet goldenrod



wrinkle-leaf goldenrod



flat-topped goldenrod



rayless goldenrod



hairy golden aster



Maryland golden-aster



silkgrass



compass plant



rosinweed



Texas coneflower



prairie coneflower



spotflower



annual sunflower



Maximilian sunflower



narrowleaf sunflower



ashy sunflower



tall coneflower



black-eyed susan



lanceleaf coreopsis



plains coreopsis



tall tickseed



yellow Indian-blanket



bitterweed



fringed sneezeweed



purple-head sneezeweed



meadow garlic



red iris



bearded grass-pink



sensitive briar



sessile-leaf ticktrefoil



round-head bushclover



coralbean



spurred butterfly pea



pink wildbean



downy milkpea



sandbur



Maryland milkwort



drumheads



pink milkwort



swamp milkwort



Turk's cap



Texas star hibiscus



false foxglove



sharpsepal beardtongue



Texas thistle



winecups



Maryland meadow beauty



showy evening-primrose



pale coneflower



hairy spiderwort



Virginia dayflower



centaury



prairie rose-gentian



butterfly-weed



eastern blue-eyed grass



prairienymph



southern blueflag



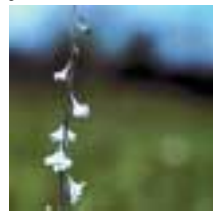
red milkweed



water southern morning-glory



saltmarsh morning-glory



Carolina larkspur



blue jasmine



Sampson's snakeroot



prairie phlox



American germander



slender false dragonhead



single stem scurpea



Louisiana vetch



arrow-leaf violet



Texas paintbrush



Lindheimer's beebalm



spotted beebalm



maypop



lanceleaf loosestrife



blueflower eryngo



hooker's eryngo



catchfly prairie gentian



eastern blue-star



Kansas gayfeather



scaly gayfeather



slender gayfeather



blue waterleaf



Texas vervain



rough skullcap



white bract blazingstar



tall ironweed



Texas ironweed



small skullcap



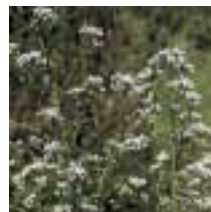
blue sage



lemon beebalm



blue-mist flower



ivyleaf boneset



late purple aster



silverleaf nightshade



western horsenettle



Muskogee beardtongue



western silver aster



willowleaf aster



American aloe



old field toadflax



Florida bluehearts



prairie petunia



woolly croton



three-seeded mercury



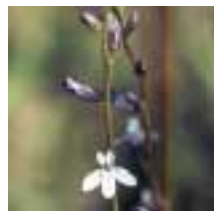
betonyleaf noseburn



Venus' looking-glass



downy lobelia



pale lobelia



green milkweed



long-leaf milkweed



pineland milkweed



white ibis



red-tailed hawks



praying mantis



hummingbird on
ashy sunflower

Animals

Coastal Prairie, and its adjacent marsh habitat, provided immense spaces for waterfowl and thousands of other forms of wildlife. Even in its altered state, Coastal Prairie routinely hosts more red-tailed hawk, northern harrier, white ibis, and white-faced ibis than any other region in the United States. Waterfowl, sandpipers, and other shorebirds are abundant during the fall, winter, and spring months, paralleling and often surpassing other regions with longstanding traditions as crucial stopover areas for these species. Many rare European species such as northern wheatear, black-tailed godwit, curlew sandpiper, and ruff have also been observed routinely.

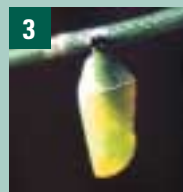
Prairie flowers and insects naturally go together. Native insects need native plants as food, and many prairie plants provide plentiful and continuous supplies of nectar. Prairie also provides habitat with relatively little insecticide residue. The result is unique insect diversity including butterflies, dragonflies, and numerous kinds of bees, wasps, ants, grasshoppers, beetles, and preying mantis. This plethora of insects provides a food source for many animals enhancing the habitat value of Coastal Prairie.

The most conspicuous prairie insects are the butterflies and skippers with more than 100 species found in Louisiana's prairie alone. The gulf fritillary, also known as the passion-vine butterfly, is the most common butterfly species found in Coastal Prairie. Monarchs, whose larvae depend on the many milkweeds found in Coastal Prairie, are frequent visitors. More than 100 different species of dragonfly eat mosquitoes and other insects as they dart and bob over the prairie. The prairie forceptail is a unique dragonfly in the Cajun Prairie as it is seen nowhere else.

What's at risk?

Wildflowers and grasses once covered the Coastal Prairie region, along with birds, butterflies, and other insects. In earlier times it was home to herds of bison and pronghorn antelope, and red wolves roamed among the riverine forests that crisscrossed the area. Today, the bison, antelope, and red wolves have disappeared, and this ecosystem is listed as "critically imperiled" by major conservation organizations.

No one knows how many Coastal Prairie species have followed the prairie vole and the Louisiana Indian paintbrush to extinction, but it is certain that many other species are now quite rare. The black-lace cactus and Texas prairie dawn-flower are the



Milkweed Butterflies

The milkweed butterflies are a family of mostly tropical butterflies that includes the monarch and the queen. Monarch butterflies cannot withstand freezing temperatures, so they migrate south for winter, flying several thousand miles. The larvae of these North American species feed on milkweeds, incorporating toxic substances into their bodies and making them distasteful to predators. Twelve species of milkweed occur in Coastal Prairie, making the area an important element in the migration flyway of monarchs. Some monarchs winter on the gulf coast, depending on the great variety of Coastal Prairie wildflowers for nectar.

Illustrated at left are the stages of metamorphosis of a monarch butterfly:

- 1. the egg,*
- 2. the caterpillar,*
- 3. the pupa or chrysalis, and*
- 4. the adult butterfly.*

Butterflies of the Coastal Prairie



black swallowtail



pipevine swallowtail



gorgone crescent



tiger swallowtail, male



zebra longwing



tiger swallowtail, female



red admiral



buckeye butterfly



cloudless sulphur



gulf fritillary, female



zebra swallowtail



hackberry



spring azure



pearl crescent



spicebush swallowtail



gulf fritillary, male



wood nymph



queen



variegated fritillary



goatweed



question mark



gray hairstreak



viceroy



red spotted purple



wild coco

only Coastal Prairie plant species on the U.S. Fish and Wildlife Service's endangered species list. However, more than a dozen plant species are listed as imperiled or critically imperiled, including the wild coco, Texas windmill grass, coastal gayfeather, and Correll's false dragonhead. Another 15 plant species are listed as rare to very rare including Texas coneflower, fringed sneezeweed, Silveus dropseed, southwestern bedstraw, and lemon beebalm.

In addition to plants, the Coastal Prairie is home to the federally-endangered Attwater's prairie chicken (North America's most endangered bird) and is the exclusive



American bison

wintering ground of the federally-endangered whooping crane. Other residents such as the gulf coast hog-nosed skunk and the Cagle's map turtle are also critically imperiled. A number of rare migratory grassland birds depend on coastal grasslands including Bachman's, Texas olive and Henslow's sparrows and the loggerhead shrike.

Threats

Development poses the greatest risk to what remains of Coastal Prairie. Most remnants are privately owned with only a small percentage preserved on government land. The largest and most pristine remnants in Texas are hay meadows, and they are in danger of development or conversion to other kinds of agriculture. Remnants along railroads make up much of what remains in Louisiana and are currently being destroyed when adjacent highways are widened or railroad beds are graded or sprayed with pesticides.



Henslow's sparrow



whooping crane

The suppression of fire allows remnants to become overgrown with native shrubs like eastern baccharis and wax myrtle. Another able invader, and a primary threat to Coastal Prairie, is the Chinese tallow tree. Chinese tallow and other exotic plants invade Coastal Prairie, often becoming the focus of land managers. While fire is an important tool in the control of these exotic plants, herbicides are also used. The impact of herbicide used for control of prairie invaders and weeds on adjacent croplands has not yet been fully explored. There are other exotic plants that are fire and herbicide tolerant and while they have not yet arrived in Coastal Prairie may

present even greater problems in the future.



Chinese tallow

The current absence of big bluestem, Indiangrass, and some wildflowers in many Texas prairies may be due to overgrazing

by cattle. Palatable native grasses such as big bluestem, Indiangrass, and eastern gamagrass cannot tolerate the close grazing of cattle but are adapted to the occasional, fast moving, tip nipping of bison. Foreign species, such as vaseygrass, from South America, and johnsongrass, from the Mediterranean, are adapted to cattle grazing and flourish in overgrazed prairie. While haying and rotational grazing are important tools of prairie management, overgrazing can decrease diversity and impact the effectiveness of fire.

Dragonflies of the Coastal Prairie



calico pennant



common green darner, male



black saddlebags



blue dasher, female



roseate skimmer, male



common whitetail, female



golden winged skimmer



widow skimmer, female



prairie forceptail, female



painted skimmer



eastern pondhawk, female



familiar bluet



prairie forceptail, male



blue footed dancer



widow skimmer, male



golden winged skimmer



Halloween pennant, female



ebony jewelwing



common whitetail, male



common green darner, male



Needham's skimmer



variegated meadowhawk



Rambur's forktail



citrine forktail, male

Restoration

Even if every acre of Coastal Prairie now in existence were preserved for future generations, we would continue to lose species to extinction. Plants and animals need large areas of habitat

for survival, so if future generations are to enjoy the biodiversity found in Coastal Prairie, more area must be restored. Enthusiasm for restoration of Coastal Prairie is growing thanks to the efforts of pioneers like Drs. Charles Allen and Malcolm Vidrine who in 1988 succeeded in

restoring a prairie in Eunice, Louisiana. A number of private groups and conservation organizations exchange information, provide education, work to preserve remnants, and assist restoration efforts while government agencies assist private land owners with incentive programs. Scientists at the U.S. Geological Survey's National Wetlands Research Center are conducting experiments relevant to prairie restoration and management and are developing methods to disseminate this information.

The U.S. Fish and Wildlife Service lists restoration of Coastal Prairie as one of its top priorities in the gulf coast area. National wildlife refuges including Anahuac, Aransas, Attwater, Brazoria, Cameron Prairie, Lacassine and Sabine are restoring and managing prairie on federal lands. Lacassine NWR in Louisiana has embarked on several Coastal Prairie restorations including 327 acres called the Duralde Prairie. Brazoria National Wildlife Refuge in Texas has undertaken to restore more than 5,000 acres of overgrazed prairie by limiting cattle grazing, conducting

prescribed burns, haying, and chemically controlling invasive plants.

The Coastal Prairie Conservation Initiative is a partnership between the U.S. Fish and Wildlife Service, the U.S. Department of Agriculture's Natural Resources Conservation Service, local soil and water conservation districts, and private landowners along the middle and upper gulf coast region of Texas. The goals of this initiative are to conserve and restore the Coastal Prairie ecosystem, reintroduce captive-bred Attwater's prairie chickens on private lands, and provide private landowners with incentives directed at Coastal Prairie conservation.

Restoration methods vary between geographical areas and individual restorationists, and

success varies from year to year. Planting a restoration involves:

1. site preparation by herbicide, solarization, and/or tillage;
2. planting by haying, seeding, hydromulching, sodding, plugging, and/or reintroduction; and
3. management by mowing, irrigation, grazing, and/or burning.

Fall and winter are generally the best times for planting. Seeds can be purchased commercially but are sometimes hard to find. If seeds are collected from wild populations it is best to collect from plants in the vicinity of your restoration. These



Sign at eleven-year-old restoration site.



*Top: USGS restoration experiments.
Below: mechanized seed collection.*



Hand held seed collection.

Other Species of the Coastal Prairie



cloudless sulphur



ambush bug



dickcissels



fence lizard



flower beetle



*grasshopper and
Turks cap*



giant swallowtail



gulf coast toad



grass spider



black swallowtail



*eastern hognosed
snake*



*halictid bee and
wild petunia*



loggerhead shrike



buckeye butterfly



green tree frog



crab spider



*walking stick on
blazing star*



tiger swallowtail



gulf fritillary



lynx spider



*halictid bee and
partridge pea*



Potter's wasp



leopard frog



*metallic bee on
tickseed*

plants are adapted to local conditions and their gene pools should be preserved. Restorationists do not agree on how far from a site seeds may be collected, and distances range from 50 to 250 miles. Most restorationists use 100 miles as a

rule of thumb, and that distance can be stretched east or west if no other seeds are available. Individuals or organizations interested in restoration should thoroughly explore the

options. Several books, websites, and experts are available to assist restorationists, and some are listed at the back of this brochure.

Management

Restorationists are often discouraged when the first few years after a restoration has been implemented, aggressive annual weeds dominate the site. However, they shouldn't despair for perennials will eventually displace the weedy annuals. Experts don't recommend the use of fertilizer because it will often give weedy annuals an advantage.

Burning is the natural mechanism by which prairie renews itself. Fire prevents woody plants from establishing, stimulates seed germination, replenishes nutrients, and allows light to reach young leaves. Winter burning after the first year speeds the change from an annual community to one dominated by perennial plants. Restorations can be burned every one to three years based on available fuel and management objectives. Historically, prairie fires occurred in the summer as a result of lightning strikes. Native Americans often burned

prairie in the winter and early spring. It is most common to burn when plants are dormant, but an occasional burn during the growing season enhances diversity. Where fire is not an option, the restoration may be mowed or hayed (mowing and haying are very different — hay is not removed after mowing), but this may affect the species that survive long term. Weeds such as Chinese tallow trees may have to be sprayed with herbicide or physically removed, especially from wet spots where fire does a poor job of control. It will take several years before a Coastal Prairie patch begins to mature, but when it does, most weedy exotics will be excluded naturally.

The Coastal Prairie is a unique and vital part of the biosphere that has almost vanished within the last 100 years. Much has been lost both in terms of land coverage and native species, and what remains is in need of protection and rehabilitation. Because so little remains, the future of Coastal Prairie depends on restoration. Americans can help in this effort to protect and restore Coastal Prairie by

supporting or participating in restoration efforts. Even a small backyard prairie garden (12' x 12') provides a piece of this native ecosystem. Thousands of such gardens dot the midwestern countryside, providing a refuge for native plants, insects, and birds, and an alternative, sustainable landscape.



Hay seeding Coastal Prairie at Lacassine National Wildlife Refuge.

Using fire to control Chinese tallow trees.



Appendix

Contacts for more information

Louisiana Organizations

Cajun Prairie Habitat Preservation Society, Dr. Charles Allen
Dept. of Biology, University of Louisiana at Monroe, Monroe, LA 71209
318/342 1814

Cajun Prairie Gardens, Dr. Malcolm Vidrine
1932 Fournerat Road, Eunice, LA 70535
337/457 4497

Lacassine National Wildlife Refuge
209 Nature Road, Lake Arthur, LA 70549
337/774 5923

Louisiana Native Plant Society, Beth Erwin, Secretary
P.O. Box 126, Collinston, LA 71229
318/874 7777

U.S.G.S. National Wetlands Research Center
700 Cajundome Boulevard, Lafayette, LA 70506
337/266 8500

U.S. Fish and Wildlife Service
646 Cajundome Boulevard, Suite 400, Lafayette, LA 70506
337/291 3100

Texas Organizations

Anahuac National Wildlife Refuge
P.O. Box 278, Anahuac, TX 77514
409/267 3337

Aransas National Wildlife Refuge
P.O. Box 100, Austwell, TX 77950
512/286 3559

Armond Bayou Nature Center, c/o Mark Kramer, Stewardship
Coordinator, 8500 Bay Area Blvd., P.O. Box 58828, Houston, TX 77258
713/474 2551

Attwater Prairie Chicken National Wildlife Refuge
P.O. Box 519, Eagle Lake, TX 77434
409/234 3021

Brazoria National Wildlife Refuge
1212 North Velasco, Angleton, TX 77515
409/849 7771

Coastal Prairie Conservation Initiative
Sam Houston RC&D Area, c/o John Campbell, Coordinator
1410 South Gordon, Alvin, TX 77511
281/388 1734

Environmental Institute, University of Houston, c/o Dr. Jim Lester,
Director, 2700 Bay Area Boulevard, Houston, TX 77058
281/283 3950

Houston Audubon Society
440 Wilchester Boulevard, Houston, TX 77079-7329
713/932 1639

Katy Prairie Conservancy
3015 Richmond Avenue, Suite 230, Houston, TX 77098-3114
713/523 6135

Lady Bird Johnson Wildflower Center
4801 Lacrosse Avenue, Austin, TX 78739
512/292 4200

Native Plant Society of Texas
P.O. Box 891, Georgetown, TX 78627
512/238 0695

Native Prairies Association of Texas
3503 Lafayette Avenue, Austin, TX 78722-1807
512/327 5437

The Nature Conservancy of Texas
P.O. Box 1440, San Antonio, TX 78295-1440
210/224 8774

Texas Organization for Endangered Species
P.O. Box 12773, Austin, TX 78711

Texas Audubon Society
2525 Wallingwood, Suite 301, Austin, TX 78746-6922
512/306 0225

Texas Society for Ecological Restoration
University of North Texas, 225D EESAT, Denton, TX 76203
940/565 4332

Texas Chapter - The Wildlife Society, Welder Wildlife Foundation
P.O. Box 1400, Sinton, TX 78387

Texas Chapter - Society for Range Management, Clifford W. Carter
234 Lakeview Drive, Victoria, TX 77905
361/578 9296

U.S. Fish and Wildlife Service
17629 el Camino Real, Suite 211, Houston, TX 70058
281/286 8282

Books

A Cajun Prairie Restoration Journal:1988-1995. M. F. Vidrine,
C. M. Allen and W. R. Fontenot

Butterflies of Houston & Southeast Texas, 1996. John & Gloria Tveten.

Grasses of Louisiana, 1992. Charles Allen.

Grasses of the Texas Gulf Prairies and Marshes, 1999.
Stephan L. Hatch, Joseph L. Schuster, and D. Lynn Drawe.

*Restoring Tallgrass Prairie: an illustrated manual for Iowa and the
upper midwest*, 1994. Shirley Shirley.

*The Tallgrass Restoration Handbook for prairies, savannas, and
woodlands*, 1997. Stephen Packard and Cornelia F. Mutel.

Wildflowers of Houston, 1993. John & Gloria Tveten.

Wildflowers of Texas, 1994. Geyata Ajilvsgi

Internet

Web sites

www.fws.gov (U.S. Fish and Wildlife Service)

www.nwrc.usgs.gov/coastalprairie (National Wetlands Research Center)

www.cajunprairie.org (Cajun Prairie Habitat Preservation Society)

www.fws.gov/r4lcs/lcsframe.htm (Lacassine NWR)

E-mail

fw4 es lafayette@fws.gov (Lafayette office of USFWS)

fw2 es houston@fws.gov (Houston office of USFWS)

fw4 rw lacassine@fws.gov (Lacassine NWR)

mvidrine@lsue.edu (Malcolm Vidrine, L.S.U. at Eunice)

larry_allain@usgs.gov (Larry Allain, N.W.R.C.)

biallen@alpha.nlu.edu (Charles Allen, U. of L. at Monroe)

Plant species photographs

common name	scientific name
American aloe	<i>Manfreda virginica</i>
American germander	<i>Teucrium canadense</i>
American snowball	<i>Styrax Americana</i>
Annual sunflower	<i>Helianthus annuus</i>
Arrowleaf rattlebox	<i>Crotalaria sagittalis</i>
Arrow-leaf violet	<i>Viola sagittata</i>
Ashy sunflower	<i>Helianthus mollis</i>
Bearded grass-pink	<i>Calopogon oklahomensis</i>
Betonyleaf noseburn	<i>Tragia betonicifolia</i>
Big bluestem	<i>Andropogon gerardii</i>
Black-eyed susan	<i>Rudbeckia hirta</i>
Blueflower eryngo	<i>Eryngium integrifolium</i>
Blue jasmine	<i>Clematis crispa</i>
Blue sage	<i>Salvia azurea</i>
Blue waterleaf	<i>Hydrolea ovata</i>
Blue-mist flower	<i>Eupatorium coelestinum</i>
Bushy bluestem	<i>Andropogon glomeratus</i>
Butterfly-weed	<i>Asclepias tuberosa</i>
Brown-seed Pasaplum	<i>Paspalum plicatulum</i>
Button snakeroot	<i>Eryngium yuccifolium</i>
Canada lousewort	<i>Pedicularis canadensis</i>
Canadian goldenrod	<i>Solidago canadensis</i>
Candyroot	<i>Polygala nana</i>
Carolina larkspur	<i>Delphinium carolinianum</i>
Centuary	<i>Centaurium breviflorum</i>
Climbing hemp vine	<i>Mikania scandens</i>
Cluster bushmint	<i>Hyptis alata</i>
Clustered mountain-mint	<i>Pycnanthemum muticum</i>
Common evening primrose	<i>Oenothera biennis</i>
Compass plant	<i>Silphium laciniatum</i>
Coralbean	<i>Erythrina herbacea</i>
Doll's daisy	<i>Bottonia diffusa</i>
Downy lobelia	<i>Lobelia puberula</i>
Downy milkpea	<i>Galactia volubilis</i>
Drumheads	<i>Polygala cruciata</i>
Drummond rain lily	<i>Cooperia drummondii</i>
Eastern blue-eyed-grass	<i>Sisyrinchium atlanticum</i>
Eastern blue-star	<i>Amsonia tabernaemontana</i>
Eastern gamagrass	<i>Tripsacum dactyloides</i>
Eastern yellow stargrass	<i>Hypoxis hirsuta</i>
Falling beakrush	<i>Rhynchospora caduca</i>
False dandelion	<i>Pyrrophappus carolinianus</i>
False foxglove	<i>Agalinis sp.</i>
False garlic	<i>Nothoscordum bivalve</i>
Flat-topped goldenrod	<i>Euthamia tenuifolia</i>
Florida bluehearts	<i>Buchnera floridana</i>
Florida paspalum	<i>Paspalum floridanum</i>
Flowering spurge	<i>Euphorbia corollata</i>
Fringed sneezeweed	<i>Helenium drummondii</i>
Gaping panicum	<i>Panicum hians</i>
Golden colic-root	<i>Aletris aurea</i>
Grassland prickly pear	<i>Opuntia macrorhiza</i>
Green milkweed	<i>Asclepias viridiflora</i>
Gulf cordgrass	<i>Spartina spartinae</i>

Plant species photographs

common name	scientific name
Gulf coast muhly	<i>Muhlenbergia capillaris</i>
Hairy golden aster	<i>Chrysopsis pilosa</i>
Hairy spiderwort	<i>Tradescantia hirsutiflora</i>
Hairy ticktrefoil	<i>Desmodium ciliare</i>
Heath aster	<i>Aster ericoides</i>
Hooker's eryngo	<i>Eryngium hookeri</i>
Huisache	<i>Acacia farnesiana</i>
Illinois bundleflower	<i>Desmanthus illinoensis</i>
Indiangrass	<i>Sorghastrum nutans</i>
Indian plantain	<i>Arnoglossum ovatum</i>
Ivyleaf boneset	<i>Eupatorium ivifolium</i>
Kansas gayfeather	<i>Liatris pycnostachya</i>
Lanceleaf loosestrife	<i>Lythrum alatum var. lanceolatum</i>
Lanceleaf tickseed	<i>Coreopsis lanceolata</i>
Large-flowered beeblossom	<i>Gaura lindheimeri</i>
Late purple aster	<i>Aster patens</i>
Lemon beebalm	<i>Monarda citriodora</i>
Lindheimer's beebalm	<i>Monarda lindheimeri</i>
Little bluestem	<i>Schizachyrium scoparium</i>
Longspike tridens	<i>Tridens strictus</i>
Long-leaf milkweed	<i>Asclepias longifolia</i>
Louisiana vetch	<i>Vicia ludoviciana</i>
Marsh fleabane	<i>Pluchea foetida</i>
Maryland golden-aster	<i>Chrysopsis mariana</i>
Maryland meadow beauty	<i>Rhexia mariana</i>
Maryland milkwort	<i>Polygala mariana</i>
Maypop	<i>Passiflora incarnata</i>
Maximilian sunflower	<i>Helianthus maximiliani</i>
Meadow garlic	<i>Allium canadense var. mobilense</i>
Multibloom-hoarypea	<i>Tephrosia onobrychoides</i>
Muskogee beardtongue	<i>Penstemon laxiflorus</i>
Narrowleaf boneset	<i>Eupatorium hyssopifolium</i>
Narrowleaf sandvine	<i>Cynanchum angustifolium</i>
Narrowleaf seedbox	<i>Ludwigia linearis</i>
Narrowleaf sunflower	<i>Helianthus angustifolius</i>
New Jersey tea	<i>Ceanothus americanus</i>
Nits and lice	<i>Hypericum drummondii</i>
Nodding wild-indigo	<i>Baptisia bracteata var. leucophaea</i>
Old field toadflax	<i>Linaria canadensis</i>
Pale coneflower	<i>Echinacea pallida</i>
Pale lobelia	<i>Lobelia appendiculata</i>
Partridge pea	<i>Chamaecrista fasciculata</i>
Pennywort	<i>Hydrocotyle sp.</i>
Pineland milkweed	<i>Asclepias obovata</i>
Pinewoods dropseed	<i>Sporobolus junceus</i>
Pink milkwort	<i>Polygala incarnata</i>
Pink wildbean	<i>Strophostyles umbellata</i>
Plains coreopsis	<i>Coreopsis tinctoria</i>
Poorjoe	<i>Diodia virginiana</i>
Prairie bluets	<i>Hedyotis nigricans</i>
Prairie buttercup	<i>Ranunculus fascicularis</i>
Prairie clover	<i>Dalea candida</i>
Prairie coneflower	<i>Ratibida pinnata</i>
Prairie parsley	<i>Polytaenia nuttallii</i>

Plant species photographs

common name	scientific name
Prairie petunia	<i>Ruellia humilis</i>
Prairie phlox.....	<i>Phlox pilosa</i>
Prairie rose-gentian	<i>Sabatia campestris</i>
Prairienymph	<i>Herbertia lahue</i> ssp. <i>caerulea</i>
Purple-head sneezeweed.....	<i>Helenium flexuosum</i>
Purple silky scale	<i>Anthraenantia rufa</i>
Rabbit tobacco	<i>Pseudognaphalium obtusifolium</i>
Rayless goldenrod.....	<i>Bigelovia virgata</i>
Red iris	<i>Iris fulva</i>
Red milkweed	<i>Asclepias lanceolata</i>
Rosinweed	<i>Silphium gracile</i>
Rough skullcap	<i>Scutellaria integrifolia</i>
Round-head bushclover	<i>Lespedeza capitata</i>
Roundleaf boneset.....	<i>Eupatorium rotundifolium</i>
Roundpod St. John's Wort	<i>Hypericum cistifolium</i>
Saltmarsh morning-glory	<i>Ipomoea sagittata</i>
Sandbur	<i>Krameria lanceolata</i>
Sampson's snakeroot	<i>Orbexilum pedunculatum</i>
Scaly gayfeather	<i>Liatris squarrosa</i>
Seaside goldenrod	<i>Solidago sempervirens</i>
Sensitive briar.....	<i>Schrankia microphylla</i>
Sessile-leaf ticktrefoil	<i>Desmodium sessilifolium</i>
Swampily	<i>Crinum americanum</i>
Sharpsepal beardtongue	<i>Penstemon tenuis</i>
Shiny goldenrod.....	<i>Solidago nitida</i>
Showy evening-primrose	<i>Oenothera speciosa</i>
Sidebeak pencil-flower	<i>Stylosanthes biflora</i>
Silkgrass	<i>Pityopsis graminifolia</i>
Silky evolvulus	<i>Evolvulus sericeus</i>
Silver bluestem	<i>Bothriochloa laguroides</i>
Silverleaf nightshade	<i>Solanum elaeagnifolium</i>
Single-stem scurfpea	<i>Orbexilum simplex</i>
Slender false dragonhead	<i>Physostegia intermedia</i>
Slender gayfeather	<i>Liatris acidota</i>
Slender mountain-mint	<i>Pycnanthemum tenuifolium</i>
Small skullcap	<i>Scutellaria parvula</i>
Snow-on-the-prairie	<i>Euphorbia bicolor</i>
Snowy orchid	<i>Habenaria nivea</i>
Southern blueflag	<i>Iris virginica</i>
Split-beard bluestem	<i>Andropogon ternarius</i>
Spot flower	<i>Acmella oppositifolia</i>
Spotted beebalm	<i>Monarda punctata</i>
Spider lily	<i>Hymenocallis caroliniana</i>
Springbeauty	<i>Claytonia virginica</i>
Spring ladies'-tresses	<i>Spiranthes vernalis</i>
Spurred butterfly pea.....	<i>Centrosema virginianum</i>
Stiff yellow flax	<i>Linum medium</i>
St. Peter's-wort	<i>Hypericum stans</i>
Swamp lily	<i>Crinum americanum</i>
Swamp milkwort	<i>Polygala leptocaulis</i>
Sweet goldenrod	<i>Solidago odora</i>
Switchgrass	<i>Panicum virgatum</i>
Tall coneflower	<i>Rudbeckia grandiflora</i>
Tall ironweed	<i>Vernonia gigantea</i>

Plant species photographs

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Tall tickseed	<i>Coreopsis tripteris</i>
Tansy dogshade	<i>Limnoscaiadium pinnatum</i>
Ten-petal anemone	<i>Anemone berlandieri</i>
Texas coneflower	<i>Rudbeckia texana</i>
Texas ironweed	<i>Vernonia texana</i>
Texas paintbrush	<i>Castilleja indivisa</i>
Texas prickly pear	<i>Opuntia lindheimeri</i>
Texas star hibiscus	<i>Hibiscus coccineus</i>
Texas thistle	<i>Cirsium texanum</i>
Texas vervain	<i>Verbena halei</i>
Texas wintergrass	<i>Nassella leucotricha</i>
Thin paspalum	<i>Paspalum setaceum</i>
Three seeded mercury	<i>Acalypha gracilens</i>
Toothache grass	<i>Ctenium aromaticum</i>
Turks' cap	<i>Malva viscus arboreus</i>
Venus' looking glass	<i>Tridanis perfoliata</i>
Virginia dayflower	<i>Commelina virginica</i>
Water hemlock	<i>Cicuta maculata</i>
Water southern morning-glory	<i>Stylisma aquatica</i>
Western horsetrill	<i>Solanum dimidiatum</i>
Western silver aster	<i>Aster sericeus</i>
White bract blazingstar	<i>Liatris elegans</i>
White colic-root	<i>Aletris farinosa</i>
White mountainmint	<i>Pycnanthemum albescens</i>
White prairieclover	<i>Dalea candida</i>
White-top sedge.....	<i>Rhynchospora colorata</i>
White wild-indigo	<i>Baptisia alba</i>
Whorled milkweed	<i>Asclepias verticillata</i>
Wild coco	<i>Pteroglossaspis ecristata</i>
Willowleaf aster	<i>Aster praealtus</i>
Winecups	<i>Callirhoe papaver</i>
Woolly croton	<i>Croton capitatus</i>
Woolly groundsel	<i>Senecio tomentosus</i>
Woolly rose-mallow	<i>Hibiscus lasiocarpus</i>
Wrinkled-leaf goldenrod	<i>Solidago rugosa</i>
Yarrow	<i>Achillea millefolium</i>
Yellow-eyed-grass	<i>Xyris laxiflora</i>
Yellow Indian-blanket	<i>Gaillardia aristata</i>
Yellow meadowbeauty	<i>Rhexia lutea</i>
Yellow wild indigo	<i>Baptisia sphaerocarpa</i>
Yellowpuff	<i>Neptunia lutea</i>

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