Appendix C

Endangered & Threatened Species

HARRIS COUNTY

AMPHIBIANS

		Federal Status	State Status
Houston toad	*Bufo houstonensis*	LE	E

endemic; sandy substrate, water in pools, ephemeral pools, stock tanks; breeds in spring especially after rains; burrows in soil of adjacent uplands when inactive; breeds February-June; associated with soils of the Sparta, Carrizo, Goliad, Queen City, Recklaw, Weches, and Willis geologic formations

BIRDS

		Federal Status	State Status
American Peregrine Falcon	*Falco peregrinus anatum*	DL	T

year-round resident and local breeder in west Texas, nests in tall cliff eyries; also, migrant across state from more northern breeding areas in US and Canada, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.

Bald Eagle	*Haliaeetus leucocephalus*	DL	T

found primarily near rivers and large lakes; nests in tall trees or on cliffs near water; communally roosts, especially in winter; hunts live prey, scavenges, and pirates food from other birds

Black Rail *Laterallus jamaicensis*

salt, brackish, and freshwater marshes, pond borders, wet meadows, and grassy swamps; nests in or along edge of marsh, sometimes on damp ground, but usually on mat of previous year's dead grasses; nest usually hidden in marsh grass or at base of Salicornia

Brown Pelican	*Pelecanus occidentalis*	LE-PDL	E

largely coastal and near shore areas, where it roosts and nests on islands and spoil banks

Henslow's Sparrow *Ammodramus henslowii*

wintering individuals (not flocks) found in weedy fields or cut-over areas where lots of bunch grasses occur along with vines and brambles; a key component is bare ground for running/walking

Mountain Plover *Charadrius montanus*

breeding: nests on high plains or shortgrass prairie, on ground in shallow depression; nonbreeding: shortgrass plains and bare, dirt (plowed) fields; primarily insectivorous

Peregrine Falcon	*Falco peregrinus*	DL	T

both subspecies migrate across the state from more northern breeding areas in US and Canada to winter along coast and farther south; subspecies (F. p. anatum) is also a resident breeder in west Texas; the two subspecies' listing statuses differ, F.p. tundrius is no longer listed in Texas; but because the subspecies are not easily distinguishable at a distance, reference is generally made only to the species level; see subspecies for habitat.

Red-cockaded Woodpecker	*Picoides borealis*	LE	E

cavity nests in older pine (60+ years); forages in younger pine (30+ years); prefers longleaf, shortleaf, and loblolly

HARRIS COUNTY

BIRDS

		Federal Status	State Status
Snowy Plover	*Charadrius alexandrinus*		

formerly an uncommon breeder in the Panhandle; potential migrant; winter along coast

Southeastern Snowy Plover	*Charadrius alexandrinus tenuirostris*		

wintering migrant along the Texas Gulf Coast beaches and bayside mud or salt flats

White-faced Ibis	*Plegadis chihi*		T

prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats

White-tailed Hawk	*Buteo albicaudatus*		T

near coast on prairies, cordgrass flats, and scrub-live oak; further inland on prairies, mesquite and oak savannas, and mixed savanna-chaparral; breeding March-May

Whooping Crane	*Grus americana*	LE	E

potential migrant via plains throughout most of state to coast; winters in coastal marshes of Aransas, Calhoun, and Refugio counties

Wood Stork	*Mycteria americana*		T

forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including salt-water; usually roosts communally in tall snags, sometimes in association with other wading birds (i.e. active heronries); breeds in Mexico and birds move into Gulf States in search of mud flats and other wetlands, even those associated with forested areas; formerly nested in Texas, but no breeding records since 1960

FISHES

		Federal Status	State Status
American eel	*Anguilla rostrata*		

coastal waterways below reservoirs to gulf; spawns January to February in ocean, larva move to coastal waters, metamorphose, then females move into freshwater; most aquatic habitats with access to ocean, muddy bottoms, still waters, large streams, lakes; can travel overland in wet areas; males in brackish estuaries; diet varies widely, geographically, and seasonally

Creek chubsucker	*Erimyzon oblongus*		T

tributaries of the Red, Sabine, Neches, Trinity, and San Jacinto rivers; small rivers and creeks of various types; seldom in impoundments; prefers headwaters, but seldom occurs in springs; young typically in headwater rivulets or marshes; spawns in river mouths or pools, riffles, lake outlets, upstream creeks

Smalltooth sawfish	*Pristis pectinata*	LE	E

different life history stages have different patterns of habitat use; young found very close to shore in muddy and sandy bottoms, seldom descending to depths greater than 32 ft (10 m); in sheltered bays, on shallow banks, and in estuaries or river mouths; adult sawfish are encountered in various habitat types (mangrove, reef, seagrass, and coral), in varying salinity regimes and temperatures, and at various water depths, feed on a variety of fish species and crustaceans

HARRIS COUNTY

MAMMALS

		Federal Status	State Status
Louisiana black bear	*Ursus americanus luteolus*	LT	T

possible as transient; bottomland hardwoods and large tracts of inaccessible forested areas

Plains spotted skunk	*Spilogale putorius interrupta*		

catholic; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie

Rafinesque's big-eared bat	*Corynorhinus rafinesquii*		T

roosts in cavity trees of bottomland hardwoods, concrete culverts, and abandoned man-made structures

Red wolf	*Canis rufus*	LE	E

extirpated; formerly known throughout eastern half of Texas in brushy and forested areas, as well as coastal prairies

Southeastern myotis bat	*Myotis austroriparius*		

roosts in cavity trees of bottomland hardwoods, concrete culverts, and abandoned man-made structures

MOLLUSKS

		Federal Status	State Status
Little spectaclecase	*Villosa lienosa*		

creeks, rivers, and reservoirs, sandy substrates in slight to moderate current, usually along the banks in slower currents; east Texas, Cypress through San Jacinto River basins

Louisiana pigtoe	*Pleurobema riddellii*		

streams and moderate-size rivers, usually flowing water on substrates of mud, sand, and gravel; not generally known from impoundments; Sabine, Neches, and Trinity (historic) River basins

Pistolgrip	*Tritogonia verrucosa*		

stable substrate, rock, hard mud, silt, and soft bottoms, often buried deeply; east and central Texas, Red through San Antonio River basins

Rock pocketbook	*Arcidens confragosus*		

mud, sand, and gravel substrates of medium to large rivers in standing or slow flowing water, may tolerate moderate currents and some reservoirs, east Texas, Red through Guadalupe River basins

Sandbank pocketbook	*Lampsilis satura*		

small to large rivers with moderate flows and swift current on gravel, gravel-sand, and sand bottoms; east Texas, Sulfur south through San Jacinto River basins; Neches River

Texas pigtoe	*Fusconaia askewi*		

rivers with mixed mud, sand, and fine gravel in protected areas associated with fallen trees or other structures; east Texas River basins, Sabine through Trinity rivers as well as San Jacinto River

Wabash pigtoe	*Fusconaia flava*		

HARRIS COUNTY

MOLLUSKS

		Federal Status	State Status

creeks to large rivers on mud, sand, and gravel from all habitats except deep shifting sands; found in moderate to swift current velocities; east Texas River basins, Red through San Jacinto River basins; elsewhere occurs in reservoirs and lakes with no flow

REPTILES

		Federal Status	State Status
Alligator snapping turtle	*Macrochelys temminckii*		T

perennial water bodies; deep water of rivers, canals, lakes, and oxbows; also swamps, bayous, and ponds near deep running water; sometimes enters brackish coastal waters; usually in water with mud bottom and abundant aquatic vegetation; may migrate several miles along rivers; active March-October; breeds April-October

Green sea turtle	*Chelonia mydas*	LT	T

Gulf and bay system; shallow water seagrass beds, open water between feeding and nesting areas, barrier island beaches; adults are herbivorous feeding on sea grass and seaweed; juveniles are omnivorous feeding initially on marine invertebrates, then increasingly on sea grasses and seaweeds; nesting behavior extends from March to October, with peak activity in May and June

Kemp's Ridley sea turtle	*Lepidochelys kempii*	LE	E

Gulf and bay system, adults stay within the shallow waters of the Gulf of Mexico; feed primarily on crabs, but also snails, clams, other crustaceans and plants, juveniles feed on sargassum and its associated fauna; nests April through August

Leatherback sea turtle	*Dermochelys coriacea*	LE	E

Gulf and bay systems, and wide-ranging open water sea turtle; omnivorous, shows a preference for jellyfish; nests from November to February, but not known to nest in Gulf of Mexico, just forages

Loggerhead sea turtle	*Caretta caretta*	LT	T

Gulf and bay system primarily for juveniles, adults are most pelagic of the sea turtles; omnivorous, shows a preference for mollusks, crustaceans, and coral; nests from April through November

Smooth green snake	*Liochlorophis vernalis*		T

Gulf Coastal Plain; mesic coastal shortgrass prairie vegetation; prefers dense vegetation

Texas horned lizard	*Phrynosoma cornutum*		T

open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive; breeds March-September

Timber/Canebrake rattlesnake	*Crotalus horridus*		T

swamps, floodplains, upland pine and deciduous woodlands, riparian zones, abandoned farmland; limestone bluffs, sandy soil or black clay; prefers dense ground cover, i.e. grapevines or palmetto

HARRIS COUNTY

PLANTS

		Federal Status	State Status
Coastal gay-feather	*Liatris bracteata*		

Texas endemic; coastal prairie grasslands of various types, from salty prairie on low- lying somewhat saline clay loams to upland prairie on nonsaline clayey to sandy loams; flowering in fall

Giant sharpstem umbrella-sedge *Cyperus cephalanthus*

in Texas on saturated, fine sandy loam soils, along nearly level fringes of deep prairie depressions; also in depressional area within coastal prairie remnant on heavy black clay; in Louisiana, most sites are coastal prairie on poorly drained sites, some on slightly elevated areas surrounded by standing shallow water, and on moderately drained sites; soils include very strongly acid to moderately alkaline silt loams and silty clay loams; flowering/fruiting May-June, August-September, and possibly other times in response to rainfall

Houston daisy *Rayjacksonia aurea*

Texas endemic; on and around naturally barren or sparsely vegetated saline slick spots or pimple mounds on coastal prairies, usually on sandy to sandy loam soils, occasionally in pastures and on roadsides in similar soil types where mowing may mimic natural prairie disturbance regimes; flowering late September-November (-December)

Texas meadow-rue *Thalictrum texanum*

endemic; mesic woodlands or forests, including wet ditches on partially shaded roadsides; flowering March-May

Texas prairie dawn	*Hymenoxys texana*	LE	E

Texas endemic; in poorly drained, sparsely vegtated areas (slick spots) at the base of mima mounds in open grassland or almost barren areas on slightly saline soils that are sticky when wet and powdery when dry; flowering late February-early April

Texas windmill-grass *Chloris texensis*

Texas endemic; sandy to sandy loam soils in relatively bare areas in coastal prairie grassland remnants, often on roadsides where regular mowing may mimic natural prairie fire regimes; flowering in fall

Threeflower broomweed *Thurovia triflora*

endemic; black clay soils of remnant grasslands, also tidal flats; flowering July-November

Hymenoxys texana

Photographer: Stephen M. Young

CPC Number: 2296

These small plants are found growing in sparsely vegetated, barren areas.

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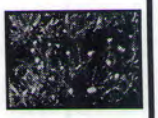

Photographer: Stephen M. Young

CPC National Collection Plant Profile

Hymenoxys texana

Family:	**Asteraceae**
Common Names:	**prairie dawn, Texas bitterweed**
Author:	**(Coult. & Rose) Cockerell**
CPC Number:	**2296**

Distribution
Protection
Conservation
References

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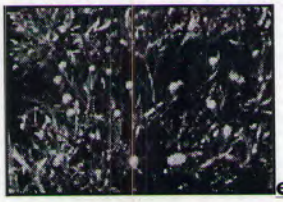

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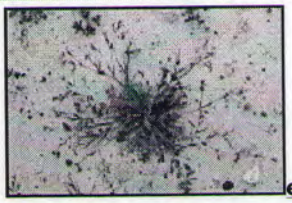

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Photographer: Stephen M. Young

Hymenoxys texana is **Fully Sponsored**

Primary custodian for this plant in the CPC National Collection of Endangered Plants is:
Mercer Arboretum and Botanic Gardens
Dave Berkshire contributed to this Plant Profile.

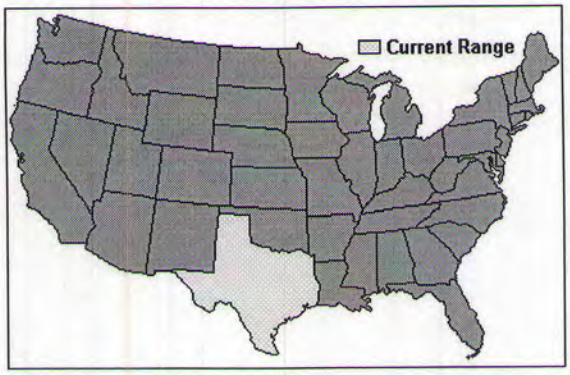
Hymenoxys texana

Prairie dawn is a member of the sunflower family, but this small annual only reaches a height of seven inches and so is often overlooked. This plant is found only in the open grasslands of the northern part of the Gulf Prairie region of Harris and Fort Bend Counties of Texas. In late winter its oblong, somewhat fleshy leaves cluster at the plant base and in late February to April a small (0.15-0.23 inch long) round head of yellow disk flowers appears. The minute ray flowers are concealed by the bracts. The plant sets seeds from April to May and dies before the bare ground dries and cracks in the summer heat. The seeds are cone-shaped and hairy. (Stark 1996).

Prairie Dawn was first collected near Hockley in Harris County, Texas in 1889. Thought to be extinct (Correll and Johnston 1979), the plant was rediscovered north of Cypress in Harris County in 1981 by James Kessler (Mahler 1982 & 1983).

Distribution & Occurrence **Top**

State Range
Texas



Habitat

Grows within a narrow range of soil and site conditions in the open grasslands of the northern part of the Gulf Prairie region. Slick areas composed of fine-sandy compacted soil occur in seasonally wet depressions or saline swales at the periphery of low mounds termed mima or pimple mounds (Stark 1996). The upper 7 inches of the soils, in the Narta soil series, are poorly drained and are powdery when dry and sticky and soft when wet. These soils are often saline and moderately alkaline. Little water is available to plant roots beyond the upper 7 inches. Plants endure soil conditions ranging from saturated during the winter to droughty in the summer. Hymenoxys texana also persists in the low areas of abandoned rice fields, vacant lots, and pastures where mima mounds have been bulldozed and natural vegetation has returned. Prairie Dawn does not colonize recently disturbed soils and is susceptible to competition.

Plants that grow in association with Prairie Dawn include Short-spike Windmillgrass, the rare Texas Windmillgrass, Gulf Cordgrass, Whorled Dropseed, Filly Panicum, Little Barley, Annual Bentgrass, Bearded Flatsedge, False Onion, Bottlebrush Plantain, Pepperweed, Sandparsley, the rare Houston Camphor Daisy, Western Dwarf-dandelion, Chaffweed, Golden Hedgehyssop, Common evax, Prairie Flameflower, Purslane, Wine-cup, Cotton-flower, Silky Evolvulus and Bracted Sida (Stark 1996).

Distribution

Endemic to the Gulf Coastal Prairie of Harris, Fort Bend and Trinity Counties, Texas.

Number Left

Since 1986, populations found in Harris and Fort Bend Counties may total ~ 50 sites comprising an unknown number of individuals (Stark 1996).

Protection Top

Global Rank:	G2	1/16/2002	**Guide to Global Ranks**
Federal Status:	LE	3/13/1987	**Guide to Federal Status**
Recovery Plan:	Yes	4/13/1990	

State/Area Protection

State/Area	Rank	Status	Date

Conservation, Ecology & Research Top

Ecological Relationships

Changes in soil salinity and acidity occur in these areas as result of the fluctuating water table. Blue-green alga, Nostoc, often covers the barren or sparsely vegetated microhabitats where Prairie Dawn is found. Prairie Dawn and other annuals that persist in these conditions complete their life cycles during the favorable conditions in early Spring. (Stark 1996).

Threats

- Competition from woody vegetation
- heavy grazing by cattle and primarily,
- urban development (road construction and residential development) of the Coastal Prairies, especially within the Houston city limits where these plants are found.

Current Research Summary

- Genetic studies completed by L. Brown and J.L. Strother (1988) documented disploidy, 2N= 16 and 6 in Hymenoxys texana.
- Germination and growth to maturity studies at Mercer Arboretum and Botanic Gardens in 1988-89 revealed non-specific soil requirements and ease of cultivation. Seedlings, however, do not tolerate extended periods of submerging.
- Public educational display plants for the Endangered Species Garden at Mercer are germinated within our greenhouses. The Endangered Species Garden established in 1994 with support from Star Enterprises displays rare native plants for the public to view year-round. In Spring 2002, the River Oaks Garden Club of Houston, TX provided a generous gift to begin the expansion and renovation of Mercer's Endangered Species Garden. Plants produced for educational display gardens or for specific restoration and reintroduction projects are produced within Mercer's nursery greenhouses and within our Conservation Area. The Conservation Area provides secure, raised beds for mass propagation of plants/seeds. Each bed is provided with independently controlled irrigation and substrates that meet the unique requirements for each species.
- Seeds from several sites within Harris County collected by Dr. Larry Brown of Houston Community College and Ralph Taylor of the Harris County Flood Control District are stored at Mercer Arboretum and Botanic Gardens. Banked wild-collected seed date to 1988. Mercer also banks subsets of rare seeds collected from field surveys and from propagation work with our collaborating CPC institution, the Lady Bird Johnson Wildflower Center, Austin, TX and the National Center for Genetic Resources Preservation (NCGRP) in Ft. Collins, CO (formerly called the National Seed Storage Laboratories.
- Seeds from an in-house propagation of 1993 that had been in storage in Mercer's seed bank freezer germinated under greenhouse conditions at ~70% with ~50% survivorship during the Winter of 2001. Plants germinated in our greenhouses are used for display in our Endangered Species Garden and Mercer's Plaza and displays for off-site conservation programs given by Mercer.

http://www.cp4.hctx.net/mercer/mplant.htm. This article appeared in Harris County Precinct 4 magazine, Parkscape, Autumn 2001 and reached 33,000 possible readers. Harris County Precinct 4 magazine, Parkscape publishes public information articles about the plant conservation efforts of Mercer Arboretum and Botanic Gardens. 115,000 issues are circulated annually of this quarterly publication. Articles about rare plants maintained at Mercer may be viewed at: http://www.cp4.hctx.net/mercer/mplant.htm.

Current Management Summary

Semi-protected on 2 sites with a good possibility for management. Current management includes monitoring and seasonal mowing/burning of sites where possible.

Research Management Needs

- Further develop protected sanctuaries within Harris and Ft. Bend Counties.

Monitoring Efforts

Not Available

Ex Situ Needs

- Expand seed bank.
- Propagation of seed for reintroduction efforts.

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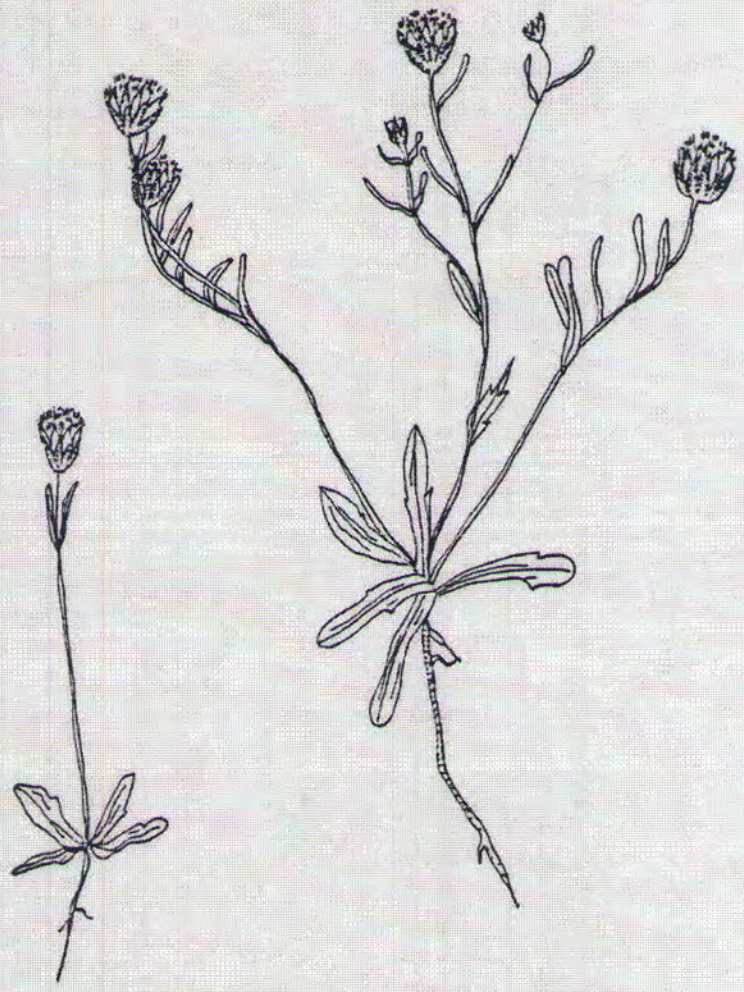
HYMENOXYS TEXANA RECOVERY PLAN



U.S. Fish and Wildlife Service

Albuquerque, New Mexico

1989

Texas Prairie Dawn-Flower Hymenoxys texana:
First collected in 1889. Considered extinct until rediscovery in 1981.
Listed as Endangered without Critical Habitat in 1986.
Global and State Rank: G2S2

DESCRIPTION:
Member of the sunflower family (Asteraceae).
Single-stemmed or branching annual reaching a height of up to 6 inches.
Basal leaves are spoon-shaped, with entire or toothed margins.
Stem leaves are alternate, narrow with parallel sides, with no or few teeth on margins.
Flowers are yellow and are actually a cluster of flowers less than one half inch long.
Flowers March to early April.
Seeds are cone-shaped and mature April-May.

OCCURRENCE: Fort Bend, Harris, Trinity counties

HABITAT:
Sparsely vegetated areas of fine-sandy soil in open grasslands. Poorly drained depressions and saline swales, including periphery of low pimple mounds. Soil often covered with a blue-green algae. Disturbed soils if soil structure remains relatively intact.

PRIOR / CURRENT IMPACTS
Highway development, urban expansion, herbicide use, conversion to improved pasture, invasion of brush and other woody species.

STATUS:
Known sites originally limited to west and northwestern portions of Harris County. New sites in northeast and southeast Harris County. Another new site in Trinity County. Most populations occur on private land. Harris County is currently undergoing tremendous and rapid urban development. All areas of natural habitat are rapidly disappearing.

RECOVERY EFFORTS:
A large population of the species is informally protected by the U.S. Army Corps of Engineers within Addicks Reservoir. The largest known population was recently discovered on a 100-acre tract of land owned by the Katy Prairie Conservancy in northwest Harris County. This tract of land was originally purchased by Conservancy to protect remnant coastal prairie. A large population was recently discovered in southeast Harris County. Much of the population will be lost to highway development, but a 24-acre tract will be set aside by Harris County and managed as a conservation area.

Morphology

Non-technical

Plants annual 3.5-18 cm (1.4-7.1 in.) high with several divergent branches arising from a rosette of basal leaves. Basal leaves 1-15 mm (.04-.59 in.) wide, up to 4 cm (1.6 in.) long, widest toward the tip, margins with short teeth or lobes from mid-blade to tip. Stem leaves few, linear. Flower heads usually few, small. Bracts of flower heads in two series 5-6 mm (.16-.20 in.) long. Ray flowers minute and concealed by the bracts. Disk flowers yellow, 3-4 mm (.12-.16 in.) long. Fruits about 2 mm (.08 in.) long with 5 apical scales 1-2 mm (.04-.08 in.) long.

Technical

Plants annual with an elongated taproot. Stems erect, 3.5-18 cm (1.4-7.1 in.) high, rising from a rosette of somewhat fleshy leaves. Stems and leaves slightly to moderately densely pubescent with scale-like trichomes, these often forming chains of oval segments. Each plant consisting of a single stem or of 2-5 or more separate stems. Stems often divided 1-9 cm (.4-3.5 in.) above the base into two or more branches. Individual stems or branches terminated by a single flower head. Heads 1-35 or more per plant. Rosette leaves spathulate, triple-nerved on lower surface, 1-15 mm (.04-.59 in.) wide, to 4 cm (1.6 in.) long; margins pinnately lobed from mid-blade to tip; lobes blunt, 1-4 mm (.04-.16 in.) long; larger lobes with one or more smaller secondary lobes. Upper leaves smaller than rosette leaves; lowest stem leaf attached to stem 1-9 cm (.4-3.5 in.) above the base, often associated with the initial branch; larger mid-stem leaves with 1-4 marginal lobes; the lower

1-9 cm (.4-3.5 in.) portion of stem usually leafless. Upper leaves linear, entire. Upper and lower leaf surfaces glandular punctate. Immature flower heads bent downward in a gentle curve, erect at anthesis. Involucre 5-6 mm (.20-.24 in.) long, biseriate. Outer phyllaries 8, 4-5 mm (.16-.20 in.) long, a pale, thick, broad medial rib extends to about 1 mm (.04 in.) below the acute apex; the apex and upper margins green and flexible; lower 1 mm (.04 in.) portion rigid, strongly thickened and united; free above. Inner phyllaries 8, free, 5-6 mm (.20-.24 in.) long, entirely coriaceous, convergent in fruit, the acuminate apex often with a small purple blotch. Flower heads radiate; receptacle high-conical. Ray flowers minute, pistillate, mostly shorter than phyllaries and concealed by them; composed of two parts: lower portion a 1.5-2 mm (.06-.03 in.) long yellow tube with marginal trichomes; upper portion open, glabrous, 0.8-1 mm (.03-.04 in.) long, with three small white to yellow apical lobes. Disk flowers 3-4 mm (.12-.16 in.) long; ovary pubescent; corolla tube two-parted: lower portion a pale yellow (becoming green in age) tube, pubescent with marginal lines of ascending trichomes; upper part an expanded, glabrous, five-lobed, deep yellow tube surrounding the anthers. Achenes about 2 mm (.08 in.) long, compressed to four sided or somewhat terete, with ascending trichomes. Pappus scales 5, 1-2 mm (.04-.08 in.) long, glabrous, broadly to narrowly obovate; apex aristate. Chromosome number $2\underline{n} = 6$ (Strother & Brown 1988) from seven populations and $2\underline{n} = 16$ (Kessler & Hatch 1984) from one population. The chromosome count of $2\underline{n} = 16$ and one of the $2\underline{n} = 6$ counts came from the same site north of Cypress.

Habitat

The known sites of Hymenoxys texana are in Harris and Fort Bend Counties to the west of Houston. This region falls within the Gulf Prairies and Marshes Vegetation Area of Gould (1969).

Hymenoxys texana is found in small conspicuous sparsely vegetated areas of fine-sandy compacted soil. These bare spots are often present on the lower sloping portion of pimple (mima) mounds or on the level land around the mound's base. Pimple mounds are small (usually 10-50 feet in diameter) low (usually less than 12 inches high) mounds of sandier soil than the surrounding flat areas. Pimple mounds occur in the upper Gulf Prairies and are of unknown origin. Other bare spots occupied by Hymenoxys texana occur where soils have been severely disturbed in the past. These areas include abandoned rice fields, vacant lots, and pastures where the pimple mounds have been leveled. In all these circumstances, disturbance occurred long enough in the past that most of the land, except for the bare spots occupied by Hymenoxys texana, has returned to a complete cover of natural vegetation.

The soils in western Harris County where Hymenoxys texana occurs belong to the Hockley-Gessner and Katy-Aris associations of nearly level, loamy prairie soils. These soils have not been mapped in sufficient detail to identify the soil series for all the small Hymenoxys texana sites, but some sites occur on soil of the Narta series. The Narta series consists of nearly level somewhat poorly drained saline soils. These soils occur in marshes and were formed in ancient clayey coastal deposits. A test of soil samples from one Hymenoxys texana site north of Cypress

revealed a high concentration of salts in the light sandy soil of the bare spots and lower levels of the same salts in the adjacent darker soil where Hymenoxys texana was absent. Undoubtedly, soil salinity is one factor that prevents most plants from becoming established on the bare spots.

The bare spots are usually wet to moist during the cool months of winter and early spring, but they dry out to almost desert-like conditions during the hot summer. Hymenoxys texana and most other annual plants on these sites escape the desiccating summer conditions by completing their life cycles in the moist months of early spring. However, in the annual endemics Gutierrezia triflora (Thurovia) and Machaeranthera aurea (Houston machaeranthera) which occur with Hymenoxys texana flower and fruit production occur during the cooler fall months. Most Hymenoxys texana plants are dead by May with the principal period of flowering and seed maturation being from mid-March to mid-April. The few perennial plants on these sites include three succulents and some non-succulent grass and dicot species. The perennial and non-succulent Guilleminea lanuginosa (cottonflower) survives the dry summer by means of a deep root system.

Associated Species

A surprising number of taxa, including two other endemic species, Gutierrezia triflora and Machaeranthera aurea, and some species with their principal ranges to the west, are found with Hymenoxys texana. The following list of associated species was compiled by Larry Brown and Steve Young in the spring of 1987.