

Appendix D
Detailed Description of Vegetative Regions and Biotic
Provinces

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Vegetative Regions

Rolling Plains. The original prairie vegetation included tall and mid-grasses such as little bluestem (*Schizachyrium scoparium* var. *frequens*), big bluestem (*Andropogon gerardii*), sand bluestem (*Andropogon hallii*), side-oats grama (*Bouteloua curtipendula*), Indian grass (*Sorghastrum nutans*), switchgrass (*Panicum virgatum*), hairy grama (*B. hirsuta*), blue grama (*B. gracilis*), Canada wildrye (*Elymus canadensis*) and western wheat (*Agropyron smithii*).

Mesquite (*Prosopis glandulosa*) is a common invader on all soils, while shinnery oak (*Quercus harvardii*) and sand sage (*Artemisia filifolia*) invade only sandy soils. Juniper (*Juniperus* spp.) clings to steep slopes along rivers.

Blackland Prairies. Studies have shown that the native vegetation of the Blackland Prairies should be classified as true prairie with little bluestem being a climax dominant.¹ Big bluestem, Indiangrass, switchgrass, hairy grama, sideoats grama, tall dropseed (*Sporobolus asper* var. *asper*), silver bluestem (*Bothriochloa saccharoides*) and Texas wintergrass (*Stipa leucotricha*) represent other important grasses in the vegetational region. With heavy grazing practices, invading or increasing species such as buffalograss (*Buchloe dactyloides*), Texas grama (*Bouteloua rigidisetata*) and smutgrass (*Sporobolus indicus*), along with other annuals, may become prevalent.² Improved pastures with the introduced grass species such as dallisgrass (*Paspalum dilatatum*) and bermudagrass (*Cynodon dactylon*) are common in the area. Asters (*Aster* spp.), prairie bluet (*Hedyotis nigricans* var. *nigricans*), prairie clover (*Dalea* spp.) and late coneflower (*Rudbeckia serotina*) are common forbs of these prairies.³

Wooded areas along riparian strips in the Blackland Prairies include such species as black willow (*Salix nigra*), oaks (*Quercus* spp.), pecan (*Carya illinoensis*), osage orange (*Maclura pomifera*), elms (*Ulmus* spp.) and eastern cottonwood (*Populus deltoides*).⁴ Woody invasive species that are commonly found in the vegetational area include post oak (*Quercus stellata*), blackjack oak (*Q. marilandica*) and cedar elm (*Ulmus crassifolia*) in the north, with honey mesquite (*Prosopis glandulosa*) being a common invader in the southern portion of the region.⁵

Post Oak Savannah. Typical native woody vegetation in this area includes post oak (*Quercus stellata*), blackjack oak (*Q. marilandica*), eastern juniper (*Juniperus virginiana*) and hackberries (*Celtis* spp.). Yaupon (*Ilex vomitoria*), American beautyberry (*Callicarpa americana*) and greenbriar (*Smilax bona-nox*) are common understory constituents of wooded areas. Common

¹ Gould, 1975.

² Gould, 1975 and Correll, S.S. and Johnston, M.C., *Manual of the Vascular Plants of Texas*, University of Texas at Dallas, 1970.

³ Hatch, S.L., Ghandi, K.N. and Brown, L.E., *Checklist of the Vascular Plants of Texas*, Texas Agricultural Experiment Station, Texas A&M University, College Station, Texas, 1990.

⁴ Hatch, et. al., 1990.

⁵ Gould, 1975.

native grasses in this region include little bluestem (*Schizachyrium scoparium*), Indiangrass (*Sorghastrum nutans*), switchgrass (*Panicum virgatum*) and Texas wintergrass (*Stipa leucotricha*). Forbs typical of the prairie portions include indigobush (*Amorpha fruticosa* v. *angustifolia*), senna (*Cassia* sp.), tick-clover (*Desmodium* spp.), prairie-clover (*Petalostemon* spp.), western ragweed (*Ambrosia psilostachya*) and croton (*Croton* spp.).⁶

Cross Timbers and Prairies. Upland vegetation within this region may vary from open savannah consisting of such native grasses as little bluestem (*Schizachyrium scoparium*), big bluestem (*Andropogon gerardi*), Indian grass (*Sorghastrum nutans*), switchgrass (*Panicum virgatum*), Canada wild-rye (*Elymus canadensis*), side-oats grama (*Bouteloua curtipendula*), hairy grama (*B. hirsuta*), tall dropseed (*Sporobolus* sp.) and Texas wintergrass (*Stipa leucotricha*).

Much of this region has been utilized for agriculture, primarily in the form of ranchland. With the advent of overgrazing and land mismanagement, invading grasses such as hairy tridens (*Erioneuron pilosum*), Texas grama (*B. rigidiseta*) and red lovegrass (*Eragrostis secundiflora*) have become common, along with dense brush consisting of post oak (*Quercus stellata*), blackjack oak (*Q. marilandica*), mesquite (*Prosopis glandulosa*) and junipers (*Juniperus* sp.). Along streams, riparian vegetation is typically dominated by such hardwood tree species as cedar elm (*Ulmus crassifolia*) and pecan (*Carya illinoensis*) and oaks, but mesquite is also a typical invader in these areas.⁷

Edwards Plateau. Grasses that are typical of the Edwards Plateau region include switchgrass (*Panicum virgatum*), Indian grass (*Sorghastrum nutans*), beardgrass (*Bothriochloa* spp.), little bluestem (*Schizachyrium scoparium*), sideoats grama (*Bouteloua curtipendula*), Canada wildrye (*Elymus canadensis*), curly mesquite (*Hilaria belangeri*) and buffalograss (*Buchloe dactyloides*). Other plants commonly found within this vegetational area include ashe juniper (*Juniperus ashei*), plateau live oak (*Quercus fusiformis*), Texas oak (*Q. texana*), Texas persimmon (*Diospyros texana*), elbowbush (*Forestiera pubescens*), Texas mountain laurel (*Sophora secundiflora*), prickly-pear cactus (*Opuntia* spp.) and pencil cactus (*O. leptocaulis*).⁸

⁶ Correll and Johnston, 1970 and Gould, 1975.

⁷ Correll and Johnston, 1970 and Hatch, et. al., 1990.

⁸ Hatch, et. al., 1990.

Biotic Provinces

Kansan. The mixed-grass plains region is dominated by little bluestem, big bluestem (*Andropogon gerardii*) and western wheatgrass. The mesquite-grass association is dominated by mesquite (*Prosopis grandulosa*), with various species of grama (*Bouteloua* spp.), three-awn (*Aristida* spp.) and broomweed (*Gutierrezia texana*). The short-grass plains are dominated by buffalograss (*Buchloe dactyloides*) with various species of grama grasses.

Characteristic mammals of the Kansan province include: black-footed ferret (*Mustela nigripes*), striped skunk (*Mephitis mephitis*), coyote (*Canis latrans*), northern grasshopper mouse (*Onychomys leucogaster*), southern plains woodrat (*Neotoma micropus*) and Ord=s Kangaroo rat (*Dipodomys ordii*).

Austroriparian. Common Austroriparian province mammals within Texas include: Virginia opossum (*Didelphis virginiana*), eastern mole (*Scalopus aquaticus*), eastern pipistrelle (*Pipistrellus subflavus*), eastern red bat (*Lasiurus borealis*), eastern gray squirrel (*Sciurus carolinensis*), eastern flying squirrel (*Glaucomys volans*), Baird's pocket gopher (*Geomys breviceps*), white-footed mouse (*Peromyscus leucopus*), hispid cotton rat (*Sigmodon hispidus*), eastern woodrat (*Neotoma floridana*), eastern cottontail (*Sylvilagus floridanus*) and swamp rabbit (*Sylvilagus aquaticus*).

Land turtles common to this province are ornate box turtle (*Terrapene ornata*) and eastern box turtle (*Terrapene carolina*). Common snake species found in this Texas region include: cottonmouth moccasin (*Agkistrodon piscivorus leucostoma*), copperhead (*Agkistrodon contortrix*), rough green snake (*Opheodrys aestivus*), rat snake (*Elaphe obsoleta*), coachwhip (*Masticophis flagellum*) and speckled kingsnake (*Lampropeltis geluta holbrooki*). Several Austroriparian species apparently reach their western limits in this Texas province, including the eastern harvest mouse (*Reithrodontomys humulis*), cotton mouse (*Peromyscus gossypinus*), spotted salamander (*Ambystoma maculatum*), marbled salamander (*Ambystoma opacum*), mole salamander (*Ambystoma talpoideum*), pig frog (*Rana grylio*) and pickerel frog (*Rana palustris*).

Balconian. Fifty-seven species of mammals are known from the Balconian province but no species is restricted to this province. The mammalian fauna of the Balconian contains a strong influence from the Chihuahuan species that range into the province from the west and the Austroriparian province from the east.

Some common mammals are the nine-banded armadillo (*Dasypus novimcinctus*), fox squirrel (*Sciurus niger*), white-footed mouse (*Peromyscus leucopus*), black rat (*Rattus rattus*), house mouse (*Mus musculus*), raccoon (*Procyon lotor*) and white-tailed deer (*Odocoileus virginiana*).

Approximately 400 avian species have been recorded as occurring in the Balconian Biotic Province. Common species include mourning dove (*Zenaida macroura*), yellow-billed cuckoo (*Coccyzus americanus*), chimney swift (*Chaetura pelagica*), black-chinned hummingbird

(*Archilochus alexandri*), red-bellied woodpecker (*Melanerpes carolinus*), purple martin (*Progne subis*), cliff swallow (*Hirundo pyrrhonota*), blue jay (*Cyanocitta cristata*), Carolina chickadee (*Parus carolinensis*), tufted titmouse (*Parus bicolor*), Carolina wren (*Thryothorus ludovicianus*), Bewick's wren (*Thryomanes bewickii*), northern mockingbird (*Mimus polyglottos*), white-eyed vireo (*Vireo griseus*), black-and-white warbler (*Mniotilta varia*), northern cardinal (*Cardinalis cardinalis*), rufous-crowned sparrow (*Aimophila ruficeps*), lark sparrow (*Chondestes grammacus*), great-tailed grackle (*Quiscalus mexicanus*) and house sparrow (*Passer domesticus*).

Texan. Mammals typical of this province include the Virginia opossum (*Didelphis virginiana*), eastern mole (*Scalopus aquaticus*), fox squirrel (*Sciurus niger*), Louisiana pocket gopher (*Geomys breviceps*), fulvous harvest mouse (*Reithrodontomys fulvescens*), white-footed mouse (*Peromyscus leucopus*), hispid cotton rat (*Sigmodon hispidus*), eastern cottontail (*Sylvilagus floridanus*) and swamp rabbit (*S. aquaticus*). Animals typical of grasslands of this province include the thirteen-lined ground squirrel (*Spermophilus tridecemlineatus*), hispid pocket mouse (*Chaetodipus hispidus*), deer mouse (*Peromyscus maniculatus*) and black-tailed jackrabbit (*Lepus californicus*).

Typical anuran species to this province are the Hurter's spadefoot (*Scaphiopus holbrookii hurteri*), Gulf Coast toad (*Bufo valliceps*), Woodhouse's toad (*Bufo woodhousii*), gray treefrog (*Hyla versicolor/chrysoscelis*), green treefrog (*Hyla cinerea*), bullfrog (*Rana catesbeiana*), southern leopard frog (*Rana sphenoccephala*) and eastern narrowmouth toad (*Microhyla carolinensis*).



Table D-1. Federal and State-Listed Threatened and Endangered Species of Potential Occurrence in the BGRWPA

Common Name	Scientific Name	USFWS/State	County of Occurrence
Amphibians			
Houston toad	<i>Anaxyrus houstonensis</i>	LE/E	Be, Br, Bu, Fa, Gr, Le, Li, Mi, Ro, Wa, Wi
Salado Springs salamander	<i>Eurycea chisholmensis</i>	LT/--	Be, Wi
Georgetown salamander	<i>Eurycea naufragia</i>	LT/--	Wi
Barton Springs salamander	<i>Eurycea sosorum</i>	LE/E	Wi
Jollyville Plateau salamander	<i>Eurycea tonkawae</i>	LT/--	Wi
Black-spotted newt	<i>Notophthalmus meridionalis</i>	--/T	Li
Arachnids			
Reddell harvestman	<i>Reddell harvestman</i>	LE/--	Wi
Bone Cave harvestman	<i>Texella reyesi</i>	LE/--	Wi
Birds			
Zone-tailed hawk	<i>Buteo albonotatus</i>	--/T	Be, Ca, Co, Cr, Ea, Ha, La, Wi
Red knot	<i>Calidris canutus rufa</i>	LT/--	Be, Bo, Br, Bu, Fa, Gr, Hi, Jo, Le, Li, Mc, Mi, Ro, Wa, Wi
Piping plover	<i>Charadrius melodus</i>	LT/T	Be, Bo, Br, Bu, Fa, Gr, Hi, Ho, Jo, Le, Li, Mc, Mi, Ro, So, Wa, Wi
Reddish egret	<i>Egretta rufescens</i>	--/T	Wa
Swallow-tailed kite	<i>Elanoides forficatus</i>	--/T	Br, Bu, Fa, Gr, Le, Li, Mi, Ro, Wa, Wi
Whooping crane	<i>Grus americana</i>	LE/E	Be, Bo, Br, Bu, Ca, Co, Cr, Ea, Er, Fa, Gr, Ha, Hs, Hi, Ho, Jo, Jn, Kn, La, Le, Li, Mc, Mi, Pa, Ro, Sh, So, St, Th, Wa, Wi, Yo
Bald eagle	<i>Haliaeetus leucocephalus</i>	--/T	Be, Bo, Br, Bu, Ca, Co, Cr, Ea, Er, Fa, Fi, Gr, Ha, Hs, Hi, Ho, Jo, Jn, Ke, Kn, La, Le, Li, Mc, Mi, Nola, Pa, Ro, Sh, So, St, Sn, Ta, Th, Wa, Wi, Yo
Black rail	<i>Laterallus jamaicensis</i>	PT/--	Be, Bo, Br, Bu, Ca, Co, Cr, Ea, Er, Fa, Fi, Gr, Ha, Hs, Hi, Ho, Jo, Jn, Ke, Kn, La, Le, Li, Mc, Mi, Nola, Pa, Ro, Sh, So, St, Sn, Ta, Th, Wa, Wi, Yo
Wood stork	<i>Mycteria americana</i>	--/T	Be, Br, Bu, Fa, Gr, Le, Li, Mi, Ro, Wa, Wi
Eskimo curlew	<i>Numenius borealis</i>	LE/E	Wa

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Descriptions of Biotic Provinces and Biotic Provinces

Common Name	Scientific Name	USFWS/State	County of Occurrence
Red-cockaded woodpecker	<i>Picoides borealis</i>	LE/E	Gr
White-faced ibis	<i>Plegadis chihi</i>	--/T	Be, Bo, Br, Bu, Ca, Co, Cr, Ea, Er, Fa, Fi, Gr, Ha, Hs, Hi, Ho, Jo, Jn, Ke, Kn, La, Le, Li, Mc, Mi, Nola, Pa, Ro, Sh, So, St, Sn, Ta, Th, Wa, Wi, Yo
Golden-cheeked warbler	<i>Setophaga chrysoparia</i>	LE/E	Be, Bo, Cr, Cr, Ea, Er, Ha, Hi, Ho, Jo, La, Mc, Pa, So, St, Wi, Yo
Interior least tern	<i>Sternula antillarum athalassos</i>	LE/E	Be, Bo, Br, Bu, Co, Cr, Ea, Er, Fa, Gr, Ha, Hi, Ho, Jo, La, Le, Li, Mc, Mi, Pa, Ro, Sh, So, St, Th, Wa, Wi, Yo
Black-capped vireo	<i>Vireo atricapilla</i>	--/E	Be, Bo, Ca, Co, Cr, Ea, Er, Ha, Hi, Ho, Jo, La, Mc, No, Pa, Sh, So, St, Ta, Wi, Yo
Fish			
Western creek chubsucker	<i>Erimyzon claviformis</i>	--/T	Br, Gr
Smalleye shiner	<i>Notropis buccula</i>	LE/--	Be, Bo, Br, Bu, Fa, Fi, Hs, Hi, Ke, Kn, Mc, Mi, Pa, Ro, Sn, Wa, Yo
Sharpnose shiner	<i>Notropis oxyrhynchus</i>	LE/--	Bo, Br, Bu, Fa, Fi, Hs, Hi, Ke, Kn, Li, Mc, Mi, Pa, Ro, Sn, Wa, Yo
Paddlefish	<i>Polyodon spathula</i>	--/T	Gr
Insects			
Coffin Cave mold beetle	<i>Batrisodes texanus</i>	LE/--	Wi
Tooth Cave ground beetle	<i>Rhandine peresphone</i>	LE/--	Wi
Kretschmarr Cave mold beetle	<i>Texamaurops reddelli</i>	LE/--	Be, Wi
Mammals			
Louisiana black bear	<i>Ursus americanus luteolus</i>	--/T	Gr
Rafinesque's big-eared bat	<i>Corynorhinus rafinesquii</i>	--/T	Gr
Texas kangaroo rat	<i>Dipodomys elator</i>	--/T	Kn
Mollusks			
False spike mussel	<i>Quadrula mitchelli</i>	--/T	Mi, Wi
Texas fatmucket	<i>Lampsilis bracteata</i>	C/T	No, Ta
Smooth pimpleback	<i>Quadrula houstonensis</i>	C/T	Be, Bo, Br, Bu, Co, Cr, Fa, Gr, Ha, Hi, La, Le, Li, Mc, Mi, Ro, Sh, Wa, Wi
Texas fawnsfoot	<i>Truncilla macrodon</i>	C/T	Be, Bo, Br, Bu, Cr, Er, Fa, Gr, Ha, Hs, Hi, Ho, Jo, Jn, La, Li, Mc, Mi, Pa, Ro, Sh, So, St, Th, Wa, Wi, Yo



Common Name	Scientific Name	USFWS/State	County of Occurrence																																						
Texas pimpleback	<i>Quadrula petrina</i>	C/T	La																																						
Plants																																									
Large-fruited sand-verbena	<i>Abronia macrocarpa</i>	LE/E	Ro																																						
Navasota ladies'-tresses	<i>Spiranthes parksii</i>	LE/E	Br, Bu, Gr, Li, Mi, Ro, Wa																																						
Reptiles																																									
Alligator snapping turtle	<i>Macrolemys temminckii</i>	--/T	Gr, Li																																						
Brazos water snake	<i>Nerodia harteri</i>	--/T	Bo, Er, Hs, Ho, Jo, Jn, Kn, La, Pa, Sh, So, St, Th, Yo																																						
Texas Horned Lizard	<i>Phrynosoma cornutum</i>	--/T	Be, Bo, Br, Bu, Ca, Co, Cr, Ea, Er, Fa, Fi, Gr, Ha, Hs, Hi, Ho, Jo, Jn, Ke, Kn, La, Le, Li, Mc, Mi, Nola, Pa, Ro, Sh, So, St, Sn, Ta, Th, Wa, Wi, Yo																																						
Timber Rattlesnake	<i>Crotalus horridus</i>	--/T	Bo, Br, Bu, Cr, Ea, Fa, Gr, Hi, Le, Mc, Mi, Ro, Ta, Wa, Wi																																						
<p>United States Fish and Wildlife Service Listing Abbreviations (USFWS): LE: Endangered (in danger of extinction throughout all or a significant portion of its range) LT: Threatened (likely to become endangered within the foreseeable future) PE, PT: Proposed endangered/threatened LE/SA,LT S/A: Endangered/threatened by similarity of appearance DL, PDL: Delisted, proposed delisted C: Candidate for listing, with biological vulnerability and threats to support listing LT w/CH: Threatened with Critical Habitat in Texas --: Not Federally Listed</p> <p>Texas Parks and Wildlife Department (TPWD) Listing Abbreviations: E: Listed as Endangered by the State of Texas T: Listed as Threatened by the State of Texas --: Rare, but with no regulatory listing status</p> <p>County Name Abbreviations</p> <table> <tbody> <tr> <td>Be: Bell</td> <td>Kn: Knox</td> </tr> <tr> <td>Bo: Bosque</td> <td>La: Lampasas</td> </tr> <tr> <td>Br: Brazos</td> <td>Le: Lee</td> </tr> <tr> <td>Bu: Burleson</td> <td>Li: Limestone</td> </tr> <tr> <td>Ca: Callahan</td> <td>Mc: McLennan</td> </tr> <tr> <td>Co: Comanche</td> <td>Mi: Milam</td> </tr> <tr> <td>Cr: Coryell</td> <td>No: Nolan</td> </tr> <tr> <td>Ea: Eastland</td> <td>Pa: Palo Pinto</td> </tr> <tr> <td>Er: Erath</td> <td>Ro: Robertson</td> </tr> <tr> <td>Fa: Falls</td> <td>Sh: Shackelford</td> </tr> <tr> <td>Fi: Fisher</td> <td>So: Somervell</td> </tr> <tr> <td>Gr: Grimes</td> <td>St: Stephens</td> </tr> <tr> <td>Ha: Hamilton</td> <td>Sn: Stonewall</td> </tr> <tr> <td>Hs: Haskell</td> <td>Ta: Taylor</td> </tr> <tr> <td>Hi: Hill</td> <td>Th: Throckmorton</td> </tr> <tr> <td>Ho: Hood</td> <td>Wa: Washington</td> </tr> <tr> <td>Jo: Johnson</td> <td>Wi: Williamson</td> </tr> <tr> <td>Jn: Jones</td> <td>Yo: Young</td> </tr> <tr> <td>Ke: Kent</td> <td></td> </tr> </tbody> </table>				Be: Bell	Kn: Knox	Bo: Bosque	La: Lampasas	Br: Brazos	Le: Lee	Bu: Burleson	Li: Limestone	Ca: Callahan	Mc: McLennan	Co: Comanche	Mi: Milam	Cr: Coryell	No: Nolan	Ea: Eastland	Pa: Palo Pinto	Er: Erath	Ro: Robertson	Fa: Falls	Sh: Shackelford	Fi: Fisher	So: Somervell	Gr: Grimes	St: Stephens	Ha: Hamilton	Sn: Stonewall	Hs: Haskell	Ta: Taylor	Hi: Hill	Th: Throckmorton	Ho: Hood	Wa: Washington	Jo: Johnson	Wi: Williamson	Jn: Jones	Yo: Young	Ke: Kent	
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