

## **APPENDIX C – WILDLIFE DOCUMENTS**

### **Items included in Appendix C:**

IPaC Report – USFWS

SGCN List – TPWD

Rare Species Listing – TPWD

WHAP Report – USACE

Prairie Assessment Report – USACE



## United States Department of the Interior



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<http://www.fws.gov/southwest/es/arlingtontexas/>

<http://www.fws.gov/southwest/es/EndangeredSpecies/lists/>

In Reply Refer To:

August 09, 2021

Consultation Code: 02ETAR00-2020-SLI-0338

Event Code: 02ETAR00-2021-E-05961

Project Name: Benbrook Lake Masterplan Revision

Subject: Updated list of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, which may occur within the boundary of your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under section 7(a)(1) of the Act, Federal agencies are directed to utilize their authorities to carry out programs for the conservation of threatened and endangered species. Under and 7(a)(2) and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to determine whether their actions may affect threatened and endangered species and/or designated critical habitat. A Federal action is an activity or program authorized, funded, or carried out, in whole or in part, by a Federal agency (50 CFR 402.02).

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For Federal actions other than major construction activities, the Service suggests that a biological evaluation (similar to a Biological Assessment) be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

After evaluating the potential effects of a proposed action on federally listed species, one of the following determinations should be made by the Federal agency:

1. *No effect* - the appropriate determination when a project, as proposed, is anticipated to have no effects to listed species or critical habitat. A "no effect" determination does not require section 7 consultation and no coordination or contact with the Service is necessary. However, the action agency should maintain a complete record of their evaluation, including the steps leading to the determination of affect, the qualified personnel conducting the evaluation, habitat conditions, site photographs, and any other related information.
2. *May affect, but is not likely to adversely affect* - the appropriate determination when a proposed action's anticipated effects to listed species or critical habitat are insignificant, discountable, or completely beneficial. Insignificant effects relate to the size of the impact and should never reach the scale where "take" of a listed species occurs. Discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not be able to meaningfully measure, detect, or evaluate insignificant effects, or expect discountable effects to occur. This determination requires written concurrence from the Service. A biological evaluation or other supporting information justifying this determination should be submitted with a request for written concurrence.
3. *May affect, is likely to adversely affect* - the appropriate determination if any adverse effect to listed species or critical habitat may occur as a consequence of the proposed action, and the effect is not discountable or insignificant. This determination requires formal section 7 consultation.

The Service has performed up-front analysis for certain project types and species in your project area. These analyses have been compiled into *determination keys*, which allows an action agency, or its designated non-federal representative, to initiate a streamlined process for determining a proposed project's potential effects on federally listed species. The determination keys can be accessed through IPaC.

The Service recommends that candidate species, proposed species, and proposed critical habitat be addressed should consultation be necessary. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at: <http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

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Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.), and projects affecting these species may require development of an eagle conservation plan (<https://www.fws.gov/birds/management/managed-species/eagle-management.php>). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds/collisions/communication-towers.php>.

For additional information concerning migratory birds and eagle conservation plans, please contact the Service's Migratory Bird Office at 505-248-7882.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

## Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

**Arlington Ecological Services Field Office**

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## Project Summary

Consultation Code: 02ETAR00-2020-SLI-0338

Event Code: 02ETAR00-2021-E-05961

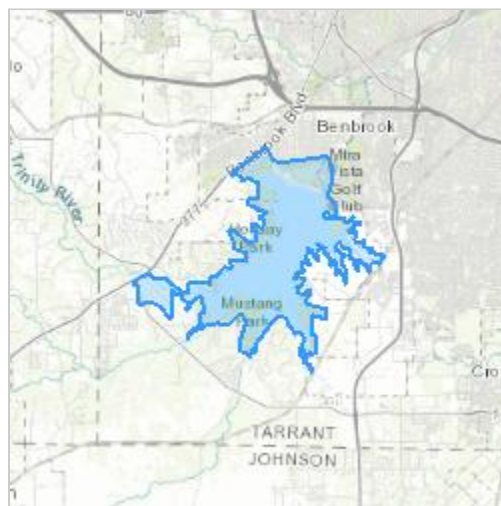
Project Name: Benbrook Lake Masterplan Revision

Project Type: LAND - MANAGEMENT PLANS

Project Description: The Benbrook Master Plan (Tarrant County, Texas) is the long-term strategic land use management document that guides the comprehensive management and development of all the project's recreational, natural, and cultural resources within the federal fee boundary. Under the guidance of ER-1130-2-550 Change 7, the Plan guides the efficient and cost-effective development, management, and use of project lands. It is a dynamic tool that provides for the responsible stewardship and sustainability of the project's resources for the benefit of present and future generations. The Plan works in tandem with the Operational Management Plan (OMP), which is the implementation tool for the resource objectives and development needs identified in the Master Plan. The Master Plan guides and articulates the USACE responsibilities pursuant to federal laws. Efforts are under way to revise the current Lake Master Plan. The Master Plan revision will update land classifications, plan for the modernization of existing parks, and inform the management of wildlife and other resource lands within USACE managed property at Benbrook Lake for the next 25 years

### Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@32.62580519829734,-97.46908154978324,14z>



Counties: Tarrant County, Texas

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## Endangered Species Act Species

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 2 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries<sup>1</sup>, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

## Birds

NAME	STATUS
<p>Piping Plover <i>Charadrius melodus</i></p> <p>Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered.</p> <p>There is <b>final</b> critical habitat for this species. The location of the critical habitat is not available.</p> <p>This species only needs to be considered under the following conditions:</p> <ul style="list-style-type: none"> <li>▪ Wind Energy Projects</li> </ul> <p>Species profile: <a href="https://ecos.fws.gov/ecp/species/6039">https://ecos.fws.gov/ecp/species/6039</a></p>	Threatened
<p>Red Knot <i>Calidris canutus rufa</i></p> <p>There is <b>proposed</b> critical habitat for this species. The location of the critical habitat is not available.</p> <p>This species only needs to be considered under the following conditions:</p> <ul style="list-style-type: none"> <li>▪ Wind Energy Projects</li> </ul> <p>Species profile: <a href="https://ecos.fws.gov/ecp/species/1864">https://ecos.fws.gov/ecp/species/1864</a></p>	Threatened
<p>Whooping Crane <i>Grus americana</i></p> <p>Population: Wherever found, except where listed as an experimental population</p> <p>There is <b>final</b> critical habitat for this species. The location of the critical habitat is not available.</p> <p>Species profile: <a href="https://ecos.fws.gov/ecp/species/758">https://ecos.fws.gov/ecp/species/758</a></p>	Endangered

## Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

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CROSS TIMBERS SPECIES OF GREATEST CONSERVATION NEED									
Scientific Name	Common Name	Status		Abundance Ranking		General Habitat Type(s) in Texas These are VERY broad habitat types as a starting place State of the practice resources are listed in each taxa line for more detailed information W.B. Davis and D.J. Schmidly. 1997 and 1994. Mammals of Texas (online and in print). Texas Tech University (1997) and Texas Parks and Wildlife Department (1994). <a href="http://www.nsr.ttu.edu/tmot1/Default.htm">http://www.nsr.ttu.edu/tmot1/Default.htm</a> (accessed 2011)	Other Notes	Endemic in Texas	
		Federal	State	Global	State				
<b>MAMMALS</b>									
<i>Conepatus leuconotus</i>	Hog-nosed skunk			G5	S4	Shrubland, Savanna/Open Woodland, Barren/Sparse Vegetation,		N	
<i>Dipodomys elator</i>	Texas kangaroo rat		T	G1G2	S2	Shrubland, Agricultural	status in review	Y	
<i>Lutra canadensis</i>	River otter			G5	S4	Riparian	Appendix II, CITES	N	
<i>Mustela frenata</i>	Long-tailed weasel			G5	S5	Forest, Woodland, Desert Scrub, Shrubland, Savanna/Open Woodland	Statewide	N	
<i>Myotis velifer</i>	Cave myotis			G5	S4	Caves/Karst,		N	
<i>Neovison vison</i>	Mink			G5	S4	Riparian, Riverine, Lacustrine, Freshwater Wetland		N	
<i>Puma concolor</i>	Mountain lion			G5	S2	Forest, Woodland, Desert Scrub, Shrubland, Savanna/Open Woodland, Riparian	Statewide	N	
<i>Spilogale putorius</i>	Eastern spotted skunk			G4T	S4	Savanna/Open Woodland, Grassland		N	
<i>Sylvilagus aquaticus</i>	Swamp rabbit			G5	S5	Riparian, Freshwater Wetland		N	
<i>Tadarida brasiliensis</i>	Brazilian free-tailed bat			G5	S5	Cave/Karst, Artificial Refugia	Statewide	N	
<i>Taxidea taxus</i>	American badger			G5	S5	Grassland, Desert scrub, Woodland, Savanna/Open Woodland, Forest		N	
<b>BIRDS</b>									
The Birds of North America Online (A. Poole, Ed.). 2005 (with current updates by species). Retrieved from The Birds of North America Online database: <a href="http://bna.birds.cornell.edu/BNA/">http://bna.birds.cornell.edu/BNA/</a> (accessed 2011). Supported by information from the Cornell Lab of Ornithology and the American Ornithologists' Union ( <a href="http://www.aou.org/">http://www.aou.org/</a> ).									
<i>Anas acuta</i>	Northern Pintail			G5	S3B,S5N	Lacustrine, freshwater wetland, saltwater wetland, coastal, marine	Winter	2	
<i>Colinus virginianus</i>	Northern Bobwhite			G5	S4B	Grassland, Shrubland, Savanna/Open Woodland	deleted for CHIH	4	
<i>Tympanuchus cupido</i>	Greater Prairie-Chicken (Interior)			G4	S1B	Grassland	Year-round	6	
<i>Meleagris gallopavo</i>	Wild Turkey			G5	S5B	Shrubland, Savanna/Open Woodland, Forest, Riparian, Agricultural	Year-round, added <i>merriami</i> for CHIH	8	
<i>Egretta thula</i>	Snowy Egret			G5	S5B	Riparian, Riverine, Lacustrine, Freshwater Wetland, Saltwater Wetland, Estuary, Coastal, Cultural Aquatic	Breeding	12	
<i>Egretta caerulea</i>	Little Blue Heron			G5	S5B	Riparian, Riverine, Lacustrine, Freshwater Wetland, Saltwater Wetland, Estuary, Coastal, Cultural Aquatic	Breeding	13	
<i>Butorides virescens</i>	Green Heron			G5	S5B	Riparian, Riverine, Lacustrine, Freshwater Wetland, Cultural Aquatic	Breeding	16	
<i>Ictinia mississippiensis</i>	Mississippi Kite			G5	S4B	Woodland, Forest, Riparian, Developed:Urban/Suburban/Rural	Breeding	20	
<i>Haliaeetus leucocephalus</i>	Bald Eagle			G5	S3B,S3N	Riparian, Lacustrine, Freshwater Wetland, Saltwater Wetland	Year-round, added CRTB	22	
<i>Circus cyaneus</i>	Northern Harrier			G5	S2B,S3N	Grassland, Shrubland	Year-round	23	
<i>Buteo lineatus</i>	Red-shouldered Hawk			G5	S4B	Woodland, Forest, Riparian, Freshwater Wetland	Year-round	26	
<i>Buteo swainsoni</i>	Swainson's Hawk			G5	S4B	Desert Scrub, Grassland, Shrubland	Breeding	28	
<i>Pluvialis dominica</i>	American Golden-Plover			G5	S3	Grassland, Freshwater Wetland, Agricultural	Migrant	39	
<i>Sternula antillarum</i>	Least Tern	LE*	E*	G4	S3B	Riverine, Lacustrine, Freshwater Wetland, Saltwater Wetland, Estuary, Coastal, Marine, Developed: Industrial	Year-round; subspecies <i>athalassos</i>	54	
<i>Athene cunicularia</i>	Burrowing Owl			G4	S3B	Desert Scrub, Grassland, Shrubland, Agricultural, Developed	Year-round	63	
<i>Asio flammeus</i>	Short-eared Owl			G5	S4N	Grassland, Shrubland, Agricultural	Winter	65	
<i>Caprimulgus carolinensis</i>	Chuck-will's-widow			G5	S3S4B	Woodland, Forest, Riparian	Breeding	66	
<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker			G5	S3B	Savanna/Open Woodland, Woodland, Forest, Riparian, Developed: Urban/Suburban/Rural	Year-round	67	
<i>Tyrannus forficatus</i>	Scissor-tailed Flycatcher			G5	S3B	Desert Scrub, Grassland, Shrubland, Agricultural, Developed	Breeding	71	
<i>Lanius ludovicianus</i>	Loggerhead Shrike			G4	S4B	Desert Scrub, Grassland, Shrubland, Savanna/Open Woodland, Agricultural, Developed	Year-round	73	
<i>Vireo bellii</i>	Bell's Vireo			G5	S3B	Desert scrub, Shrubland, Riparian	Breeding	74	
<i>Vireo atricapilla</i>	Black-capped Vireo	LE	E	G3	S2B	Shrubland	Breeding	75	
<i>Poecile carolinensis</i>	Carolina Chickadee			G5	S5B	Woodland, Forest, Riparian, Developed: Urban/Suburban/Rural	Year-round	76	
<i>Anthus spragueii</i>	Sprague's Pipit	C		G4	S3N	Barren/Sparse Vegetation, Grassland, Shrubland, Agricultural	Winter	80	
<i>Dendroica chrysoparia</i> *	Golden-cheeked Warbler	LE	E	G2	S2B	Woodland	Breeding; *taxonomic change likely to <i>Setophaga chrysoparia</i>	83	
<i>Aimophila cassinii</i>	Cassin's Sparrow			G5	S4B	Grassland, Shrubland	Breeding	92	
<i>Aimophila ruficeps</i>	Rufous-crowned Sparrow			G5	S4B	Grassland	Year-round	95	
<i>Spizella pusilla</i>	Field Sparrow			G5	S5B	Grassland, Shrubland, Savanna/Open Woodland	Year-round	96	
<i>Ammodramus savannarum</i>	Grasshopper Sparrow			G5	S3B	Grassland, Agricultural	Year-round	97	
<i>Chondestes grammacus</i>	Lark Sparrow			G5	S4B	Grassland, Shrubland, Savanna/Open Woodland	Year-round	98	
<i>Ammodramus leconteii</i>	Le Conte's Sparrow					Grassland	Winter	101	
<i>Zonotrichia querula</i>	Harris's Sparrow			G5	S4	Shrubland, Agricultural	Winter	103	
<i>Calcarius mccownii</i>	McCown's Longspur			G4	S4	Grassland, Agricultural	Winter, TBPR (northern), ECPL (northern)	104	
<i>Piranga rubra</i>	Summer Tanager			G5	S5B	Savanna/Open Woodland, Woodland, Forest, Riparian, Developed: Urban/Suburban/Rural	Breeding	106	
<i>Passerina ciris</i>	Painted Bunting			G5	S4B	Shrubland, Agricultural	Breeding	107	
<i>Spiza americana</i>	Dickcissel			G5	S4B	Grassland, Agricultural	Breeding	108	
<i>Sturnella magna</i>	Eastern Meadowlark			G5	S5B	Grassland, Shrubland, Savanna/Open Woodland	Year-round; subspecies <i>lilliana</i> added for CHIH	109	
<i>Icterus spurius</i>	Orchard Oriole			G5	S4B	Shrubland, Savanna/Open Woodland, Woodland, Riparian	Breeding	111	
<b>REPTILES AND AMPHIBIANS</b>									
J.E. Werler and J.R. Dixon. 2000. Texas Snakes: Identification, Distribution, and Natural History. University of Texas Press, Austin. 519 pgs. J.R. Dixon. 1987. Amphibians and Reptiles of Texas. Texas A&M University Press, College Station. 434 pp.									
<i>Anaxyrus (Bufo) woodhousii</i>	Woodhouse's toad			G5	SU	woodland, forest, freshwater wetland		N	
<i>Apalone mutica</i>	smooth softshell turtle					riparian, riverine, lacustrine, freshwater wetland	added	N	
<i>Cheyleydra serpentina</i>	Common snapping turtle					riparian, riverine	added	N	



Scientific Name	Common Name	Status		Abundance Ranking		General Habitat Type(s) in Texas These are VERY broad habitat types as a starting place State of the practice resources are listed in each taxa line for more detailed information	Other Notes	Endemic in Texas
		Federal	State	Global	State			
<i>Crotalus atrox</i>	Western diamondback rattlesnake				S4	barren/sparse vegetation, desert scrub, grassland, shrubland, savanna, woodland, caves/karst		N
<i>Crotalus horridus</i>	Timber (Canebrake) Rattlesnake		T	G4	S4	woodland, forest, riparian		N
<i>Eurycea chisolmensis</i>	Salado Springs Salamander	C		G1	S1	freshwater wetland (springs)		Y
<i>Eurycea naufragia</i>	Georgetown Salamander	C		G1	S1	caves and karst, freshwater wetland (springs)		Y
<i>Graptemys versa</i>	Texas map turtle			G4	SU	riparian, riverine		Y
<i>Heterodon nasicus</i>	Western hognosed snake					desert scrub, grassland, shrubland	added	N
<i>Macrochelys temminckii</i>	alligator snapping turtle		T	G3G4	S3	riparian, riverine, cultural aquatic	added	N
<i>Nerodia harteri</i>	Brazos Water Snake		T		S1	riparian, riverine, cultural aquatic		Y
<i>Phrynosoma cornutum</i>	Texas horned lizard		T	G4G5	S4	desert scrub, grassland, savanna		N
<i>Pseudacris streckeri</i>	Strecker's Chorus Frog			G5	S3	grassland, savanna, woodland, riparian, cultural aquatic, freshwater wetland		N
<i>Sistrurus catenatus</i>	massasauga					grassland, barren/sparse vegetation, shrubland, coastal,	added	N
<i>Terrapene ornata</i>	Ornate box turtle			G5	S3	grassland, barren/sparse vegetation, desert scrub, savanna, woodland		N
<i>Thamnophis sirtalis annectans</i>	Texas Garter Snake (Eastern Texas/New Mexico)			G5	S2	riparian, around lacustrine and cultural aquatic sites		Y
<i>Trachemys scripta</i>	Red-eared slider					riparian, riverine, lacustrine, freshwater wetland, cultural aquatic	added	N
<p><b>FRESHWATER FISHES</b></p> <p>C. Thomas, T.H. Bonner and B.G. Whiteside. 2007. Freshwater Fishes of Texas: A Field Guide. Sponsored by The River Systems Institute at Texas State University, published by Texas A&amp;M University Press.  <i>Editor's Note: All freshwater fishes life history information in this table was sourced directly from the online version; citations are embedded in the online version at <a href="http://www.bio.txstate.edu/~tbonner/txfishes/">http://www.bio.txstate.edu/~tbonner/txfishes/</a></i></p> <p>Range in Texas, as known</p>								
<i>Anguilla rostrata</i>	American eel			G4	S5	streams and reservoirs in drainages connected to marine environments	mouth upstream to and including the Kiamichi River), Sabine Lake (including minor	N
<i>Cyprinostomus elongatus</i>	Blue sucker		T	G3G4	S3	large, deep rivers, and deeper zones of lakes	(including minor coastal drainages west to Galveston Bay), Galveston Bay (including	N
<i>Hiodon alosoides</i>	Goldeye					large lakes; backwaters	Red River	N
<i>Ictalurus lupus</i>	Headwater catfish			G3	S2	clear streams and rivers with moderate gradients, deep spring runs	Guadalupe, and Colorado basins, but appears to be extirpated from these systems	N
<i>Macrhybopsis storeriana</i>	Silver chub					common over silt or mud, turbid water with very soft sand/silt substrate	other populations of this species, which range through the Mississippi River Basin to	N
<i>Micropterus treculii</i>	Guadalupe bass			G3	S3	small lentic environments; commonly taken in flowing water	of the Brazos, Colorado, Guadalupe, and San Antonio basins; species also found outside	Y
<i>Notropis bairdi</i>	Red River shiner					streambeds with widely fluctuating flows subject to high summer temperatures, high rates of evaporation,	Red River, from the mouth upstream to and including the Kiamichi River	N
<i>Notropis oxyrhynchus</i>	Sharpnose shiner	C		G3	S3	Moderate current velocities and depths, sand bottom	captured into the Red River drainage; introduced in Colorado River drainage	Y
<i>Notropis potteri</i>	Chub shiner		T	G4	S3	turbid, flowing water with silt or sand substrate; tolerant of high salinities	Brazos River, Colorado River, San Jacinto River, Trinity Rivers, and Galveston Bay	N
<i>Polyodon spathula</i>	Paddlefish		T	G4	S3	sized rivers, sluggish pools, backwaters, bayous, and oxbows with abundant zooplankton; large reservoirs if	eastward; currently only Red River, from the mouth upstream to and including the	N
<p><b>INVERTEBRATES</b></p> <p><i>www.bugguide.net</i> – good tool for identification and taxonomic information.  <i>www.texasento.net</i> – compilation of information on insects in Texas  <i>www.odonatacentral.org</i> – resource for identification and distribution of damselflies and dragonflies  <i>www.butterfliesandmoths.org</i> – resource for identification and distribution of Lepidoptera  <i>www.texasmussels.wordpress.com</i> – resource for information on freshwater mussels in Texas                  Howells, R. G., R. W. Neck and H. D. Murray. 1996. Freshwater Mussels of Texas. Texas Parks and Wildlife Press, Austin.</p> <p><i>Editor's Note: Most karst invertebrates are likely endemic</i></p>								
<i>Amblycorypha uhleri</i>	A katydid			G2G3*	S2?*	Savanna/Open Woodland	Terrestrial - Insects - Grasshoppers	
<i>Arethaea ambulator</i>	A katydid			G2G3*	S2?*	Savanna/Open Woodland	Terrestrial - Insects - Grasshoppers	
<i>Bombus pensylvanicus</i>	American bumblebee			GU	SU*	Grassland, Savanna/Open Woodland	Terrestrial - Insect - Bee/Wasp/Ant	
<i>Pleurobema riddellii</i>	Louisiana pigtoe		T	G1G2	S1	Riverine	Aquatic - Freshwater - Mollusks; new state rank and threatened state status	
<i>Pogonomyrmex comanche</i>	Comanche harvester ant			G2G3*	S2*	Barren/Sparse Vegetation	Terrestrial - Insect - Bee/Wasp/Ant; ecoregions added	
<i>Potamilus amphichaenus</i>	Texas heelsplitter		T	G1G2	S1	Riverine	Aquatic - Freshwater - Mollusks; new state rank and threatened state status	
<i>Quadrula aurea</i>	Golden orb		T	G1	S2*	Riverine	Aquatic - Freshwater - Mollusks; new state rank and threatened state status	Y
<i>Quadrula houstonensis</i>	Smooth pimpleback		T	G2	S1S2*	Riverine	Aquatic - Freshwater - Mollusks; new state rank and threatened state status	Y
<i>Quadrula mitchelli</i>	False Spike		T	GH	SH	Riverine	Aquatic - Freshwater - Mollusks; new state rank and threatened state status	
<i>Taeniopteryx starki</i>	Texas willowfly			G1	S1	Riparian, Riverine	Aquatic - Insects - Stoneflies	
<i>Truncilla macrodon</i>	Texas fawnfoot		T	G2Q	S1*	Riverine	Aquatic - Freshwater - Mollusks; new state rank and threatened state status	Y
<p><b>PLANTS</b></p> <p>J.M. Poole, W.R. Carr, D.M. Price and J.R. Singhurst. 2007. Rare Plants of Texas. Texas A&amp;M University Press, College Station.                  D.S. Correll and M.C Johnston. 1979. Manual of the Vascular Plants of Texas. The University of Texas at Dallas, Richardson.                  M.C. Johnston. 1990. The Vascular Plants of Texas: A List Up-dating the Manual of the Vascular Plants of Texas, 2nd Edition. Marshall C. Johnston, Austin.                  F.W. Gould. 1975. The Grasses of Texas. Texas A &amp; M University Press, College Station.                  S.D. Jones, J.K. Wipff, and P.M. Montgomery. 1997. Vascular Plants of Texas: A Comprehensive Checklist including Synonymy; Bibliography, and Index. University of Texas Press, Austin.                  R.A. Vines. 2004. Trees, Shrubs and Woody Vines of the Southwest. Blackburn Press.</p>								
<i>Agalinis auriculata</i>	earleaf false foxglove			G3	SH	Savanna/Open Woodland; Grassland	Terrestrial	N
<i>Agalinis densiflora</i>	Osage Plains false foxglove			G3	S2	Savanna/Open Woodland - Outcrops	Terrestrial	N
<i>Argythamnia aphoroides</i>	Hill Country wild-mercury			G2G3	S2S3	Savanna/Open Woodland	Terrestrial	Y
<i>Carex edwardsiana</i>	canyon sedge			G3G4S3S4	S3S4	Woodland (slopes above Riparian)	Wetland	Y
<i>Carex shinneryi</i>	Shinner's sedge			G3?	S2	Grassland	Wetland	N
<i>Clematis texensis</i>	scarlet leather-flower			G3G4	S3S4	Woodland	Terrestrial	Y
<i>Croton alabamensis var. texensis</i>	Texabama croton			G3T2	S2	Woodland	Terrestrial	Y
<i>Cuscuta exaltata</i>	tree dodder			G3	S3	Woodland	Terrestrial	N
<i>Dalea reverchonii</i>	Comanche Peak prairie-clover			G2	S2	Savanna/Open Woodland; Grassland	Terrestrial	Y

Scientific Name	Common Name	Status		Abundance Ranking		General Habitat Type(s) in Texas		Other Notes	Endemic in Texas
		Federal	State	Global	State	These are VERY broad habitat types as a starting place State of the practice resources are listed in each taxa line for more detailed information			
<i>Echinacea atrorubens</i>	Topeka purple-coneflower			G3	S3	Savanna/Open Woodland		Terrestrial	N
<i>Festuca versuta</i>	Texas fescue			G3	S3	Woodland		Terrestrial	N
<i>Gaura triangulata</i>	prairie butterfly-weed			G3G4	S3	Grassland		Terrestrial	N
<i>Hexalectris nitida</i>	Glass Mountains coral-root			G3	S3	Woodland		Terrestrial	N
<i>Ipomoea shumardiana</i>	Shumard's morning glory			G2G3	S1	Savanna/Open Woodland		Terrestrial	N
<i>Liatris glandulosa</i>	glandular gay-feather			G3	S3	Savanna/Open Woodland		Terrestrial	Y
<i>Oenothera coryi</i>	Cory's Evening-primrose			G3	S3	Savanna/Open Woodland		Terrestrial	Y
<i>Pediomelum cyphocalyx</i>	turnip-root scurfpea			G3G4	S3S4	Grassland		Terrestrial	Y
<i>Pediomelum reverchonii</i>	Reverchon's curfpea			G3	S3	Grassland		Terrestrial	N
<i>Physaria engelmannii</i>	Engelmann's bladderpod			G3	S3	Savanna/Open Woodland		Terrestrial	Y
<i>Prunus minutiflora</i>	Texas almond			G3G4	S3S4	Savanna/Open Woodland		Terrestrial	N
<i>Schoenoplectus hallii</i>	Hall's baby bulrush			G2G3	S1	Freshwater Wetland (ponds)		Wetland	N
<i>Senecio quaylei</i>	Quayle's butterweed			G1Q	S1	Savanna/Open Woodland		Terrestrial	Y
<i>Styrax platanifolius subsp. platanifolius</i>	sycamore-leaf snowbell			G3T3	S3	Woodland		Terrestrial	Y
<i>Valerianella stenocarpa</i>	bigflower cornsalad			G3	S3	Savanna/Open Woodland		Terrestrial	Y
<i>Yucca necopina</i>	Glen Rose yucca			G1G2	S1S2	Savanna/Open Woodland		Terrestrial	Y

Last Update: 3/5/2021

## TARRANT COUNTY

### AMPHIBIANS

**Strecker's chorus frog** *Pseudacris streckeri*

Terrestrial and aquatic: Wooded floodplains and flats, prairies, cultivated fields and marshes. Likes sandy substrates.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

**Woodhouse's toad** *Anaxyrus woodhousii*

Terrestrial and aquatic: A wide variety of terrestrial habitats are used by this species, including forests, grasslands, and barrier island sand dunes. Aquatic habitats are equally varied.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: SU

### BIRDS

**bald eagle** *Haliaeetus leucocephalus*

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

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3B,S3N

**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 years dead grasses; nest usually hidden in marsh grass or at base of Salicornia

Federal Status: LT	State Status: T	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S2

**Franklin's gull** *Leucophaeus pipixcan*

This species is only a spring and fall migrant throughout Texas. It does not breed in or near Texas. Winter records are unusual consisting of one or a few individuals at a given site (especially along the Gulf coastline). During migration, these gulls fly during daylight hours but often come down to wetlands, lake shore, or islands to roost for the night.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S2N

**interior least tern** *Sternula antillarum athalassos*

Sand beaches, flats, bays, inlets, lagoons, islands. Subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams, rivers; also know to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc); eats small fish and crustaceans, when breeding forages within a few hundred feet of colony

Federal Status: DL: Delisted	State Status: E	SGCN: Y
Endemic: N	Global Rank: G4T3Q	State Rank: S1B

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## TARRANT COUNTY

### BIRDS

**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

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S2

**piping plover** *Charadrius melodus*

Beaches, sandflats, and dunes along Gulf Coast beaches and adjacent offshore islands. Also spoil islands in the Intracoastal Waterway. Based on the November 30, 1992 Section 6 Job No. 9.1, Piping Plover and Snowy Plover Winter Habitat Status Survey, algal flats appear to be the highest quality habitat. Some of the most important aspects of algal flats are their relative inaccessibility and their continuous availability throughout all tidal conditions. Sand flats often appear to be preferred over algal flats when both are available, but large portions of sand flats along the Texas coast are available only during low-very low tides and are often completely unavailable during extreme high tides or strong north winds. Beaches appear to serve as a secondary habitat to the flats associated with the primary bays, lagoons, and inter-island passes. Beaches are rarely used on the southern Texas coast, where bayside habitat is always available, and are abandoned as bayside habitats become available on the central and northern coast. However, beaches are probably a vital habitat along the central and northern coast (i.e. north of Padre Island) during periods of extreme high tides that cover the flats. Optimal site characteristics appear to be large in area, sparsely vegetated, continuously available or in close proximity to secondary habitat, and with limited human disturbance.

Federal Status: LT	State Status: T	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S2N

**Rufa Red Knot** *Calidris canutus rufa*

Red knots migrate long distances in flocks northward through the contiguous United States mainly April-June, southward July-October. A small plump-bodied, short-necked shorebird that in breeding plumage, typically held from May through August, is a distinctive and unique pottery orange color. Its bill is dark, straight and, relative to other shorebirds, short-to-medium in length. After molting in late summer, this species is in a drab gray-and-white non-breeding plumage, typically held from September through April. In the non-breeding plumage, the knot might be confused with the omnipresent Sanderling. During this plumage, look for the knot's prominent pale eyebrow and whitish flanks with dark barring. The Red Knot prefers the shoreline of coast and bays and also uses mudflats during rare inland encounters. Primary prey items include coquina clam (*Donax* spp.) on beaches and dwarf surf clam (*Mulinia lateralis*) in bays, at least in the Laguna Madre. Wintering Range includes-Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Jefferson, Kennedy, Kleberg, Matagorda, Nueces, San Patricio, and Willacy. Habitat: Primarily seacoasts on tidal flats and beaches, herbaceous wetland, and Tidal flat/shore.

Federal Status: LT	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4T2	State Rank: S2N

**western burrowing owl** *Athene cunicularia hypugaea*

Open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4T4	State Rank: S2

**white-faced ibis** *Plegadis chihi*

Prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; currently confined to near-coastal rookeries in so-called hog-wallow prairies. Nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S4B

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## TARRANT COUNTY

### BIRDS

**whooping crane** *Grus americana*

Small ponds, marshes, and flooded grain fields for both roosting and foraging. Potential migrant via plains throughout most of state to coast; winters in coastal marshes of Aransas, Calhoun, and Refugio counties.

Federal Status: LE                      State Status: E                      SGCN: Y  
Endemic: N                              Global Rank: G1                      State Rank: S1N

### INSECTS

**American bumblebee** *Bombus pensylvanicus*

Habitat description is not available at this time.

Federal Status:                      State Status:                      SGCN: Y  
Endemic:                              Global Rank: G3G4                      State Rank: SNR

**Comanche harvester ant** *Pogonomyrmex comanche*

Habitat description is not available at this time.

Federal Status:                      State Status:                      SGCN: Y  
Endemic: Y                              Global Rank: G2G3                      State Rank: S2

### MAMMALS

**big brown bat** *Eptesicus fuscus*

Any wooded areas or woodlands except south Texas. Riparian areas in west Texas.

Federal Status:                      State Status:                      SGCN: Y  
Endemic: N                              Global Rank: G5                      State Rank: S5

**big free-tailed bat** *Nyctinomops macrotis*

Habitat data sparse but records indicate that species prefers to roost in crevices and cracks in high canyon walls, but will use buildings, as well; reproduction data sparse, gives birth to single offspring late June-early July; females gather in nursery colonies; winter habits undetermined, but may hibernate in the Trans-Pecos; opportunistic insectivore

Federal Status:                      State Status:                      SGCN: Y  
Endemic:                              Global Rank: G5                      State Rank: S3

**black bear** *Ursus americanus*

Generalist. Historically found throughout Texas. In Chisos, prefers higher elevations where pinyon-oaks predominate; also occasionally sighted in desert scrub of Trans-Pecos (Black Gap Wildlife Management Area) and Edwards Plateau in juniper-oak habitat. For ssp. *luteolus*, bottomland hardwoods, floodplain forests, upland hardwoods with mixed pine; marsh. Bottomland hardwoods and large tracts of inaccessible forested areas.

Federal Status:                      State Status: T                      SGCN: Y  
Endemic: N                              Global Rank: G5                      State Rank: S3

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## TARRANT COUNTY

### MAMMALS

#### black-tailed prairie dog

*Cynomys ludovicianus*

Dry, flat, short grasslands with low, relatively sparse vegetation, including areas overgrazed by cattle; live in large family groups

Federal Status:

State Status:

SGCN: Y

Endemic: N

Global Rank: G4

State Rank: S3

#### cave myotis bat

*Myotis velifer*

Colonial and cave-dwelling; also roosts in rock crevices, old buildings, carports, under bridges, and even in abandoned Cliff Swallow (*Hirundo pyrrhonota*) nests; roosts in clusters of up to thousands of individuals; hibernates in limestone caves of Edwards Plateau and gypsum cave of Panhandle during winter; opportunistic insectivore.

Federal Status:

State Status:

SGCN: Y

Endemic: N

Global Rank: G4G5

State Rank: S4

#### eastern spotted skunk

*Spilogale putorius*

Generalist; open fields prairies, croplands, fence rows, farmyards, forest edges & woodlands. Prefer wooded, brushy areas & tallgrass prairies. *S.p. ssp. interrupta* found in wooded areas and tallgrass prairies, preferring rocky canyons and outcrops when such sites are available.

Federal Status:

State Status:

SGCN: Y

Endemic: N

Global Rank: G4

State Rank: S1S3

#### long-tailed weasel

*Mustela frenata*

Includes brushlands, fence rows, upland woods and bottomland hardwoods, forest edges & rocky desert scrub. Usually live close to water.

Federal Status:

State Status:

SGCN: Y

Endemic: N

Global Rank: G5

State Rank: S5

#### mountain lion

*Puma concolor*

Generalist; found in a wide range of habitats statewide. Found most frequently in rugged mountains & riparian zones.

Federal Status:

State Status:

SGCN: Y

Endemic: N

Global Rank: G5

State Rank: S2S3

#### swamp rabbit

*Sylvilagus aquaticus*

Primarily found in lowland areas near water including: cypress bogs and marshes, floodplains, creeks and rivers.

Federal Status:

State Status:

SGCN: Y

Endemic: N

Global Rank: G5

State Rank: S5

#### tricolored bat

*Perimyotis subflavus*

Forest, woodland and riparian areas are important. Caves are very important to this species.

Federal Status:

State Status:

SGCN: Y

Endemic: N

Global Rank: G2G3

State Rank: S3S4

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## TARRANT COUNTY

### MAMMALS

**western hog-nosed skunk** *Conepatus leuconotus*

Habitats include woodlands, grasslands & deserts, to 7200 feet, most common in rugged, rocky canyon country; little is known about the habitat of the ssp. *telmalestes*

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S4

**woodland vole** *Microtus pinetorum*

Include grassy marshes, swamp edges, old-field/pine woodland ecotones, tallgrass fields; generally sandy soils.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

### MOLLUSKS

**Louisiana Pigtoe** *Pleurobema riddellii*

Occurs in small streams to large rivers in slow to moderate currents in substrates of clay, mud, sand, and gravel. Not known from impoundments (Howells 2010f; Randklev et al. 2013b; Troia et al. 2015). [Mussels of Texas 2019]

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G1G2	State Rank: S1

**Sandbank Pocketbook** *Lampsilis satura*

Occurs in small streams to large rivers in slow to moderate current in sandy mud to sand and gravel substrate. Can occur in a variety of habitats but most common in littoral habitats such as banks or backwaters or in protected areas along point bars (Randklev et al. 2013b; Randklev et al. 2014a; Troia et al. 2015). [Mussels of Texas 2019]

Federal Status:	State Status: T	SGCN: Y
Endemic:	Global Rank: G2?	State Rank: S1

**Texas Heelsplitter** *Potamilus amphichaenus*

Occurs in small streams to large rivers in standing to slow-flowing water; most common in banks, backwaters and quiet pools; adapts to some reservoirs. Often found in soft substrates such as mud, silt or sand (Howells et al. 1996; Randklev et al. 2017a). [Mussels of Texas 2019]

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G1G3	State Rank: S1

### REPTILES

**alligator snapping turtle** *Macrochelys temminckii*

Aquatic: Perennial water bodies; rivers, canals, lakes, and oxbows; also swamps, bayous, and ponds near running water; sometimes enters brackish coastal waters. Females emerge to lay eggs close to the waters edge.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S2

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## TARRANT COUNTY

### REPTILES

**eastern box turtle** *Terrapene carolina*

Terrestrial: Eastern box turtles inhabit forests, fields, forest-brush, and forest-field ecotones. In some areas they move seasonally from fields in spring to forest in summer. They commonly enters pools of shallow water in summer. For shelter, they burrow into loose soil, debris, mud, old stump holes, or under leaf litter. They can successfully hibernate in sites that may experience subfreezing temperatures.

Federal Status: State Status: SGCN: Y  
Endemic: N Global Rank: G5 State Rank: S3

**slender glass lizard** *Ophisaurus attenuatus*

Terrestrial: Habitats include open grassland, prairie, woodland edge, open woodland, oak savannas, longleaf pine flatwoods, scrubby areas, fallow fields, and areas near streams and ponds, often in habitats with sandy soil.

Federal Status: State Status: SGCN: Y  
Endemic: N Global Rank: G5 State Rank: S3

**smooth softshell** *Apalone mutica*

Aquatic: Large rivers and streams; in some areas also found in lakes and impoundments (Ernst and Barbour 1972). Usually in water with sandy or mud bottom and few aquatic plants. Often basks on sand bars and mudflats at edge of water. Eggs are laid in nests dug in high open sandbars and banks close to water, usually within 90 m of water (Fitch and Plummer 1975).

Federal Status: State Status: SGCN: Y  
Endemic: N Global Rank: G5 State Rank: S3

**Texas garter snake** *Thamnophis sirtalis annectens*

Terrestrial and aquatic: Habitats used include the grasslands and modified open areas in the vicinity of aquatic features, such as ponds, streams or marshes. Damp soils and debris for cover are thought to be critical.

Federal Status: State Status: SGCN: Y  
Endemic: Y Global Rank: G5T4 State Rank: S1

**Texas horned lizard** *Phrynosoma cornutum*

Terrestrial: Open habitats with sparse vegetation, including grass, prairie, 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. Occurs to 6000 feet, but largely limited below the pinyon-juniper zone on mountains in the Big Bend area.

Federal Status: State Status: T SGCN: Y  
Endemic: N Global Rank: G4G5 State Rank: S3

**timber (canebrake) rattlesnake** *Crotalus horridus*

Terrestrial: Swamps, floodplains, upland pine and deciduous woodland, riparian zones, abandoned farmland. Limestone bluffs, sandy soil or black clay. Prefers dense ground cover, i.e. grapevines, palmetto.

Federal Status: State Status: SGCN: Y  
Endemic: N Global Rank: G4 State Rank: S4

**western box turtle** *Terrapene ornata*

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## TARRANT COUNTY

### REPTILES

Terrestrial: Ornate or western box turtles inhabit prairie grassland, pasture, fields, sandhills, and open woodland. They are essentially terrestrial but sometimes enter slow, shallow streams and creek pools. For shelter, they burrow into soil (e.g., under plants such as yucca) (Converse et al. 2002) or enter burrows made by other species.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

**western massasauga**                      *Sistrurus tergeminus*

Terrestrial: Shortgrass or mixed grass prairie, with gravel or sandy soils. Often found associated with draws, floodplains, and more mesic habitats within the arid landscape. Frequently occurs in shrub encroached grasslands.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3G4	State Rank: S3S4

### PLANTS

**earleaf false foxglove**                      *Agalinis auriculata*

Known in Texas from one late nineteenth century specimen record labeled -Benbrook-; in Oklahoma, degraded prairies, floodplains, fallow fields, and borders of upland sterile woods; in Arkansas, blackland prairie; Annual; Flowering August - October

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: SH

**Engelmann's bladderpod**                      *Physaria engelmannii*

Grasslands and calcareous rock outcrops in a band along the eastern edge of the Edwards Plateau, ranging as far north as the Red River (Carr 2015).

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S3

**Glen Rose yucca**                      *Yucca necopina*

Grasslands on sandy soils and limestone outcrops; flowering April-June

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G1G2	State Rank: S3

**Hall's prairie clover**                      *Dalea hallii*

In grasslands on eroded limestone or chalk and in oak scrub on rocky hillsides; Perennial; Flowering May-Sept; Fruiting June-Sept

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G3	State Rank: S2

**Osage Plains false foxglove**                      *Agalinis densiflora*

Most records are from grasslands on shallow, gravelly, well drained, calcareous soils; Prairies, dry limestone soils; Annual; Flowering Aug-Oct

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S2

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## TARRANT COUNTY

### PLANTS

**Reverchon's scurfpea**

*Pedimelum reverchonii*

Mostly in prairies on shallow rocky calcareous substrates and limestone outcrops; Perennial; Flowering Jun-Sept; Fruiting June-July

Federal Status:

State Status:

SGCN: Y

Endemic: N

Global Rank: G3

State Rank: S3

**Shinner's sedge**

*Carex shinersii*

Occurs in ditches and swales in prairie landscapes (Carr 2015).

Federal Status:

State Status:

SGCN: Y

Endemic: N

Global Rank: G3

State Rank: S2

**Texas milk vetch**

*Astragalus reflexus*

Grasslands, prairies, and roadsides on calcareous and clay substrates; Annual; Flowering Feb-June; Fruiting April-June

Federal Status:

State Status:

SGCN: Y

Endemic: Y

Global Rank: G3

State Rank: S3

**Topeka purple-coneflower**

*Echinacea atrorubens*

Occurring mostly in tallgrass prairie of the southern Great Plains, in blackland prairies but also in a variety of other sites like limestone hillsides; Perennial; Flowering Jan-June; Fruiting Jan-May

Federal Status:

State Status:

SGCN: Y

Endemic: N

Global Rank: G3

State Rank: S3

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**WILDLIFE HABITAT APPRAISAL PROCEDURE (WHAP) SUMMARY  
REPORT BENBROOK LAKE MASTER PLAN  
TARRANT COUNTY, TEXAS**



**US Army Corps  
of Engineers®**  
Fort Worth District

**July 2020**

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## Introduction

Habitat assessments were conducted at Benbrook Lake on April 8-11, 2019 using Texas Parks and Wildlife Department's (TPWD) Wildlife Habitat Appraisal Procedure ([WHAP] TPWD 1995). WHAP survey point locations were based on points believed or known to have various habitat types and features based on aerial imagery from existing Geographical Information Systems (GIS) data as well as from local knowledge of the area. A total of 118 WHAP points were surveyed, all within U.S. Army Corps of Engineers (USACE) fee boundary (Figures 1A, 1B, and 1C).

The purpose of this report is to describe wildlife habitat quality within the USACE Benbrook Lake fee-owned property in Tarrant County, Texas. This report is being prepared by the USACE Regional Planning and Environmental Center to provide habitat quality information and inform land classifications as part of the Benbrook Lake Master Plan revision process.

## Study Area

USACE fee-owned property at Benbrook Lake, approximately 8,745 acres, is located within the Fort Worth metroplex in north central Texas. More specifically, the lake sits primarily between the cities of Fort Worth and Benbrook, Texas within the Cross Timbers ecoregion.



Benbrook Lake lies on the Clear Fork of the Trinity River. The major tributaries to the Clear Fork are the South Fork, Bear Creek, Mustang Creek, Rock Creek and Squaw Creek. Downstream of the Benbrook Lake dam, Clear Fork meanders through numerous low water dams until its confluence with the West Fork of the Trinity River.

## Methodology

An interagency team of TPWD and USACE biologists, foresters, and park rangers conducted the habitat surveys on April 8-11, 2019. TPWD's WHAP protocol was used to analyze and describe existing habitats.

The WHAP requires evaluating representative sites of each cover type present within an area of interest. For this project, a search area of 0.1 acre (circle with radius of 37.2 feet) was used at each WHAP site to compile a list of plant species occurring at each site and to complete the Biological Components Field Evaluation Form

([https://tpwd.texas.gov/publications/pwdpubs/media/pwd\\_rp\\_w7000\\_0145.pdf](https://tpwd.texas.gov/publications/pwdpubs/media/pwd_rp_w7000_0145.pdf)). Field data collected on the form at each WHAP site included the following components:

1. Site Potential
2. Temporal Development of Existing Successional Stage
3. Uniqueness and Relative Abundance
4. Vegetation Species Diversity
5. Vertical Vegetation Stratification
6. Additional Structural Diversity
7. Condition of Existing Vegetation

At each site, a 1/10<sup>th</sup> acre plot was evaluated and points were assigned to all applicable components based on field conditions. A habitat quality score, where values range from 0.0 (low quality) to 1.0 (high quality), was then calculated for each site by adding together all points and multiplying by 0.01. Habitat quality was then determined for all sites within the same habitat type. Photographs were taken at each site and are included as Attachment B.



The TPWD developed the WHAP to allow a qualitative, holistic evaluation of wildlife habitat for particular tracts of land statewide without imposing significant time requirements in regard to field work and compilation of data (TPWD 1995). The WHAP was not designed to evaluate habitat quality in relation to specific wildlife species.

The WHAP is based on the following assumptions:

1. Vegetation structure including species composition and physiognomy is itself sufficient to define the habitat suitability for wildlife;
2. A positive relationship exists between vegetation diversity and wildlife species diversity;
3. Vegetation composition and primary productivity directly influence population densities of wildlife species.

As designed, the WHAP is intended to be used for the following applications:

1. Evaluating impacts upon wildlife populations from specific development project alternatives.
2. Establishing baseline data prior to anticipated or proposed changes in habitat conditions for specific areas.
3. Comparing tracts of land that are candidates for land acquisition or mitigation.
4. Evaluating general habitat quality and wildlife management potential for tracts of land over large geographical areas, including wildlife planning units.



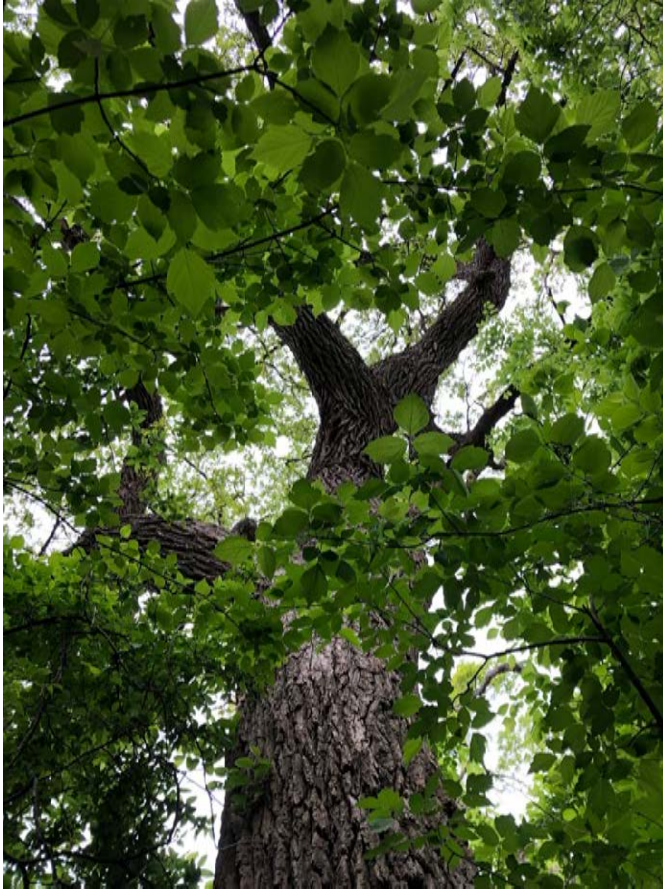
The WHAP protocol can be used to assess a wide range of habitats, however it was originally developed to assess and develop mitigation requirements for loss of bottomland hardwoods and other aquatic habitats. Scores can be scored higher for these habitats based on how the scoring is allotted to each WHAP habitat component. Upland forest and grassland habitat types cannot reach a score indicative of high quality habitat although they may exhibit high quality features. Subsequently, high quality upland habitat may not be identified or can be overlooked.

Grasslands, in particular, fall into this category. Consider the Site Potential component with a maximum score of 0.25 points, it allocates more points based on higher hydrologic connectivity. In order to receive the highest score for this component, the area must exhibit at least one of the following: at least periodically support predominately hydrophytic vegetation, is predominately undrained hydric soil and supports or is capable of supporting hydrophytic vegetation, and/or is saturated with water or covered by shallow water during 1-2 months during the growing season of each year. In a grassland setting, when conditions become conducive to hydrophytic plant growth, a successional shift from a grassland to herbaceous wetlands, swamps, or riparian forest is likely to occur. Therefore, grasslands would almost always be limited to a maximum score of 0.12 points (uplands with thick surface layer).

Similarly, grasslands would be limited to a maximum of 0.12 points for the Temporal Development of Existing Successional Stage component, whereas other forested habitats could receive the full 0.25 points.

High value grasslands may not have any woody vegetation, nor vegetation that is no more than 12 ft tall, and very little additional structural components. To account for this, areas categorized as grasslands have their Total Scores not reflect the Vegetation Species Diversity component, and makes the maximum score for Vertical Vegetation Stratification component as 4 and Additional Structural Diversity component as 1.





These components alone regularly exclude grassland habitat from receiving the maximum score of 1 on the WHAP point scale. In order to identify the maximum score each habitat type can receive, USACE environmental staff scored each criteria given ideal conditions for riparian/bottomland hardwood forest (BHF), upland forest (includes all non-riparian/BHF forests), grassland, swamp, and marsh habitats. The maximum values scores, shown in Table 1, were then used to normalize scores for habitats that are prevented from reaching the maximum WHAP score primarily due to arbitrary low scores in the two WHAP components described above. Normalizing habitat scores will identify high quality habitat that would otherwise not be detected.

**Table 1. Maximum Total Score per Habitat Type**

Cover Type	Component Number								Maximum Total Score
	1	2	3	4	5	6	7	7B	
Marsh	25	20	20	20	NA	5	10	NA	1.00
Riparian/BHF	25	20	20	15	5	5	5	5	1.00
Upland Forest	12	20	20	15	5	5	5	5	0.87
Grassland	12	12	20	0	4	1	5	5	0.59

Marsh, and riparian/BHF habitats can all achieve the maximum score, therefore, no normalization of scores were made for these habitat types. Upland forests and grasslands, however, can only reach within 0.13 and 0.41 points of the maximum WHAP score, even in ideal conditions.

To evaluate all habitat types on an even scoring basis, upland forest and grassland scores were normalized by dividing their original scores by the maximum possible score for their respective habitat types. For example, if a grassland site received an initial score of 0.42, it would be divided by the maximum total points a grassland site can receive, 0.59. The normalized total score used for further analysis for the grassland site would be 0.75.

This adjustment allows habitat type scores to be analyzed and compared to their corresponding habitat type maximum total score. Rather than, for instance, a grassland being evaluated on a bottomland hardwood scoring scale.

All WHAP scores analyzed and discussed from here forward reflect the normalized total scores. As mentioned above, marsh, and riparian/BHF habitats were not normalized as they can already achieve maximum scores. Grassland scores were normalized by dividing initial scores by 0.59, while all upland forest scores were normalized by dividing the initial score by 0.87.

## Habitat

Using TPWD's Texas Ecological Mapping Systems (<https://tpwd.texas.gov/landwater/land/programs/landscape-ecology/ems/>), Benbrook Lake lies within the Cross Timbers ecoregion. The most common habitat types include Marsh, Riparian/BHF, Upland Forest, and Grassland (Elliot, 2014). Table 2 displays all habitats surveyed and the number of points surveyed within each respective habitat type.

**Table 2. Survey Points per Habitat Type**

Habitat Type	Points Surveyed
Marsh	1
Riparian/BHF	38
Upland Forest	20
Grassland	59
<b>Total Points Surveyed</b>	<b>118</b>



Elliot (2014) provided general habitat type descriptions and associated vegetation communities for the Ecological Systems Classification and Mapping Project in support of the Comprehensive Wildlife Conservation Strategy for the Texas Parks and Wildlife Department. These descriptions were meant to be broad and depict typical vegetative assemblages across vast areas as the observable vegetation communities can vary based on local conditions.

Historically, tallgrass prairies consisting of little bluestem, big bluestem, yellow Indiangrass, tall dropseed, eastern gamagrass and many forbs, such as asters, clovers, and black-eyed susan dominated the region. Before nearly all of the prairie was developed, bison and pronghorn, greater prairie chickens, and even ocelot utilized this area. Only an estimated 5,000 widely scattered acres in small tracts remain of the original 12 million acres of the region, or less than one-tenth of one percent of remaining prairie. Riparian hardwoods, primarily bur oak, Shumard oak, sugar hackberry, elm, ash, eastern cottonwood, and pecan, meander this prairie. The ecoregion receives the name from early settlers having to repeatedly cross through thick timbers that would slow down their travels and serve as a landmark (TPWD, 2019). The area is further characterized by numerous low flowing streams.

Figure 2 displays the distribution of habitat types within the USACE boundary at Benbrook Lake. For analysis purposes, habitat types were pooled into one of four categories: Marsh, Riparian/BHF, Upland Forest, and Grasslands.

## Results and Discussion

The total habitat score for each point surveyed is a representation of multiple habitat attributes including vegetative diversity and structure, site soil potential, successional stage, and uniqueness of that habitat across the landscape. Data analysis highlights are discussed below, while detailed data for each point surveyed can be found in Attachment A: Benbrook Lake WHAP Summary Results of this report.

Grassland (N = 59) and riparian/BHF (N = 38) were the most abundant habitat types surveyed. Grassland scores ranged from 0.2 to 1 while riparian/BHF scores ranged from 0.22 to 0.88.

The average, maximum, and minimum total scores observed for each habitat type surveyed is shown in Table 3.

**Table 3. Average, Maximum, and Minimum Total Scores per Habitat Type**

Habitat Type	Average Total Score	Maximum Total Score	Minimum Total Score
Marsh	0.81	0.81	0.81
Riparian/BHF	0.65	0.88	0.22
Upland Forest	0.66	0.94	0.45
Grassland	0.73	1	0.2



Figures 3A, 3B, and 3C show the range of total scores for all points surveyed (N = 118) as well as the twelve additional points that were skipped due to inaccessibility or multiple points occurring in the same area. Skipped points show a total score of 0 in figures 3A, 3B, and 3C. Overall, grassland and upland forest habitats exhibited the highest average total score (0.73 and 0.66), marsh was excluded because there was only one point classified under this habitat condition. The difference between Upland Forest and Riparian/BHF is Average Total Score is 0.01. With such a close of a margin, these two habitats are equal in value. This could be attributed to the fact they scored on average very similar values for all the scoring components.

Beyond vegetative diversity, the three major metrics within the WHAP scoring criteria that allocate points are site potential, successional stage, and uniqueness and relative abundance. Table 4 shows these metrics' average score per habitat type.

**Table 4. Average Site Potential, Successional Stage, and Uniqueness and Relative Abundance Scores per Habitat Type**

Habitat Type	Average Site Potential	Average Successional Stage	Average Uniqueness and Relative Abundance
Marsh	25	20	20
Riparian/BHF	18.68	10.89	12.37
Upland Forest	11	10.7	11.75
Grassland	10.41	8.95	11.47

Site potential allocates more points based on soil substrates characteristics and hydrologic connectivity that can support hydrophytic habitats, such as marshes, swamps, and bottomland hardwood forests that are often considered to be higher quality, more diverse habitat. This allows areas to score higher even though a recent disturbance, such as fire or flood, may have removed most of the vegetation. Areas scoring high in site potential but low in other metrics can be targeted for management efforts as these areas' vegetation community response should be favorable, thus increasing habitat value.



Successional stage refers to the age of the vegetative community. Older, mature forests, as do climax prairies, score higher than younger pole stands or disturbed grasslands as they provide more diverse forage, cover, and niche habitats. These scores are expected to increase across the board except in areas around the lake that may not have the soil types to support hydrophytic vegetation and are flooded frequently enough to limit upland forest or grassland growth and development.

Uniqueness and Relative Abundance takes into consideration the rarity of a habitat or vegetative community and its abundance in the region. Ongoing urban expansion has significantly influenced the region's remaining habitat composition. Few large, contiguous patches of habitat remain within the DFW metroplex. Benbrook Lake and the surrounding terrestrial habitat represents one of these remaining patches that have become less abundant across the region. As urban

development continues, the remaining habitat at Benbrook Lake will likely increase in overall wildlife value and uniqueness. Figure 4 displays the areas with the maxed out Uniqueness and Relative Abundance criteria. Based on this figure, three areas were identified as having the most unique and rare habitats, Pecan Valley Park, South Holiday Park, and Mustang Park.

Riparian/BHF forests typically exhibit the highest average site potential, successional stage, and uniqueness and relative abundance among the habitat types surveyed. For this survey

Riparian/BHF forest didn't, and this might be because there is not a lot of old growth and mature timber and the site potential is typical for the region which leads to a lower uniqueness and relative abundance component score as well.

Overall, 60% of surveyed grassland points (Figure 3A, 3B, 3C) scored over 0.70 indicating medium to high value grassland habitat. As the surrounding area continues to be developed, these remaining native prairie habitats will become increasingly unique in the region.

In total, 6 points surveyed received scores over 0.90 indicating very high quality habitat (Figure 5). These areas primarily support grasslands habitats featuring grass species diversity including Little Bluestem, Ten Petal Anemone, and Purple Paintbrush. In addition, these 6 points all received the maximum scores for site potential and successional stage criteria which can also be seen in Figures 6 and 7.

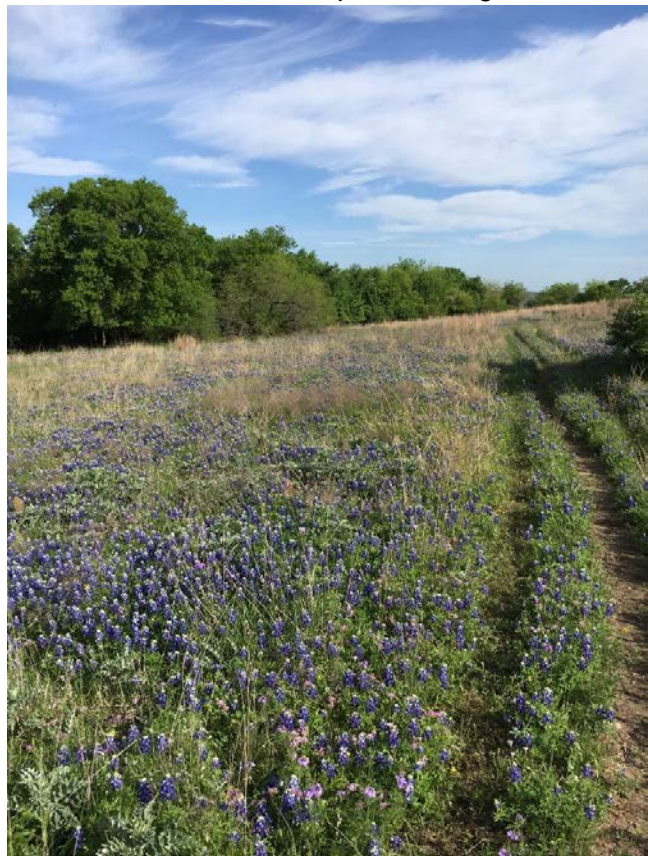
In summary, combining the WHAP analytical analysis, continued urban development, and spatial distribution of higher scoring points, two areas were identified as having higher quality in relation to the remaining lands administered by USACE at Benbrook Lake. The two areas include land along the East Dutch Branch Creek and land along North Holiday Park Day Use Area. However when Figures 3A, 3B, and 3C WHAP Total Score are compared to Figure 6 WHAP Maxed Out Site Potential, the areas within Pecan Valley Park have the greatest potential to be improved upon.

## Recommendations

Even with planned and unplanned disturbances, there are numerous areas of valuable wildlife habitat remaining on USACE fee-owned property at Benbrook Lake.

Overall, habitat management has proven effective in maintaining medium- to high-quality wildlife habitat on USACE lands at Benbrook Lake.

Based on the results of the WHAP survey efforts, areas to consider for Wildlife Management or Environmentally Sensitive Areas land classifications include those areas having the highest scores. The planning team for the Benbrook Lake Master Plan revision will take into account the WHAP scores when making land classification decisions.



## References

Elliott, Lee F., David D. Diamond, C. Diane True, Clayton F. Blodgett, Dyan Pursell, Duane German, and Amie Treuer-Kuehn. 2014. Ecological Mapping Systems of Texas: Summary Report. Texas Parks & Wildlife Department, Austin, Texas.

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## Benbrook Lake WHAP Summary Results Figures

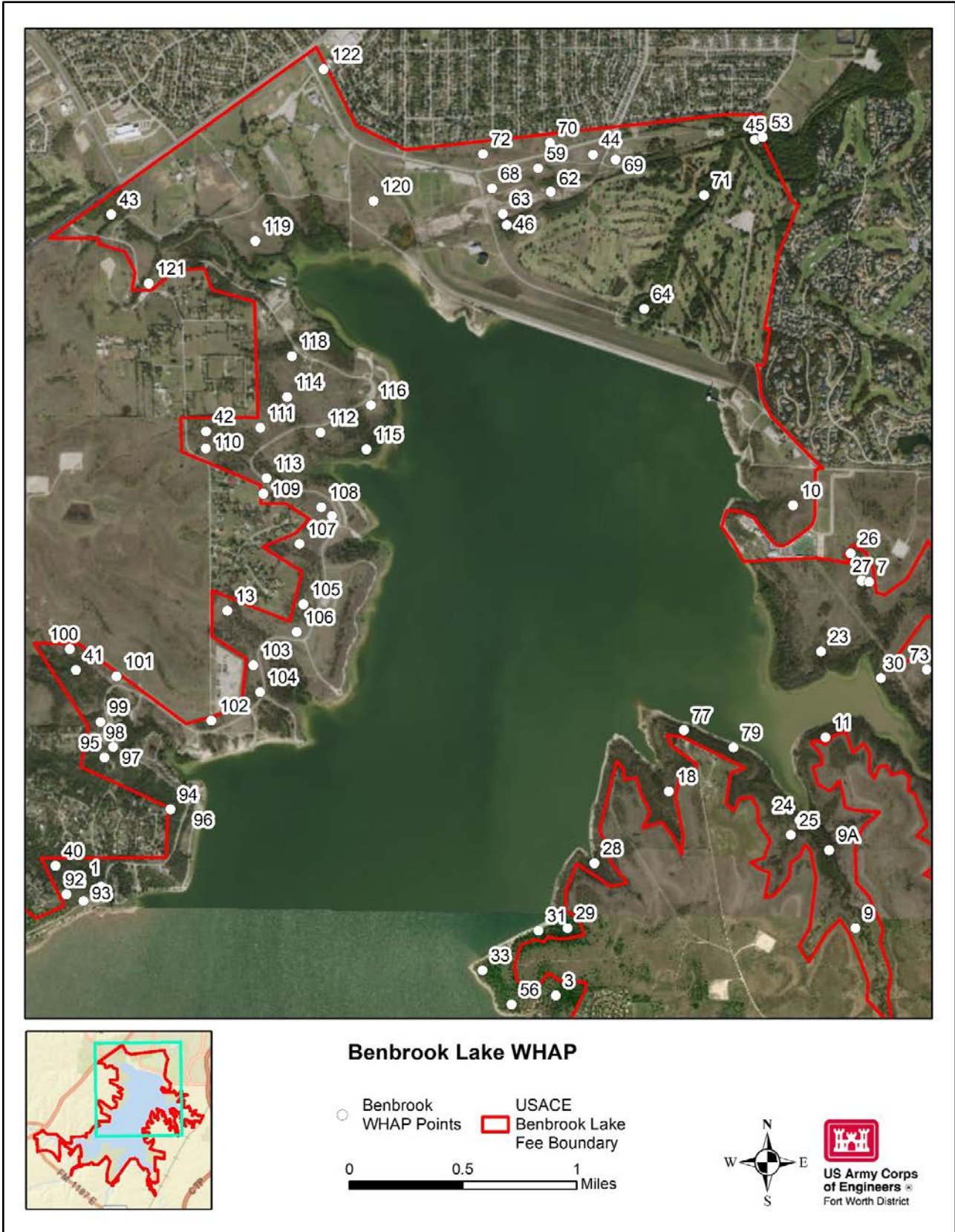


Figure 1A. Distribution of WHAP Points within the Fee-Owned Boundary at Benbrook Lake.



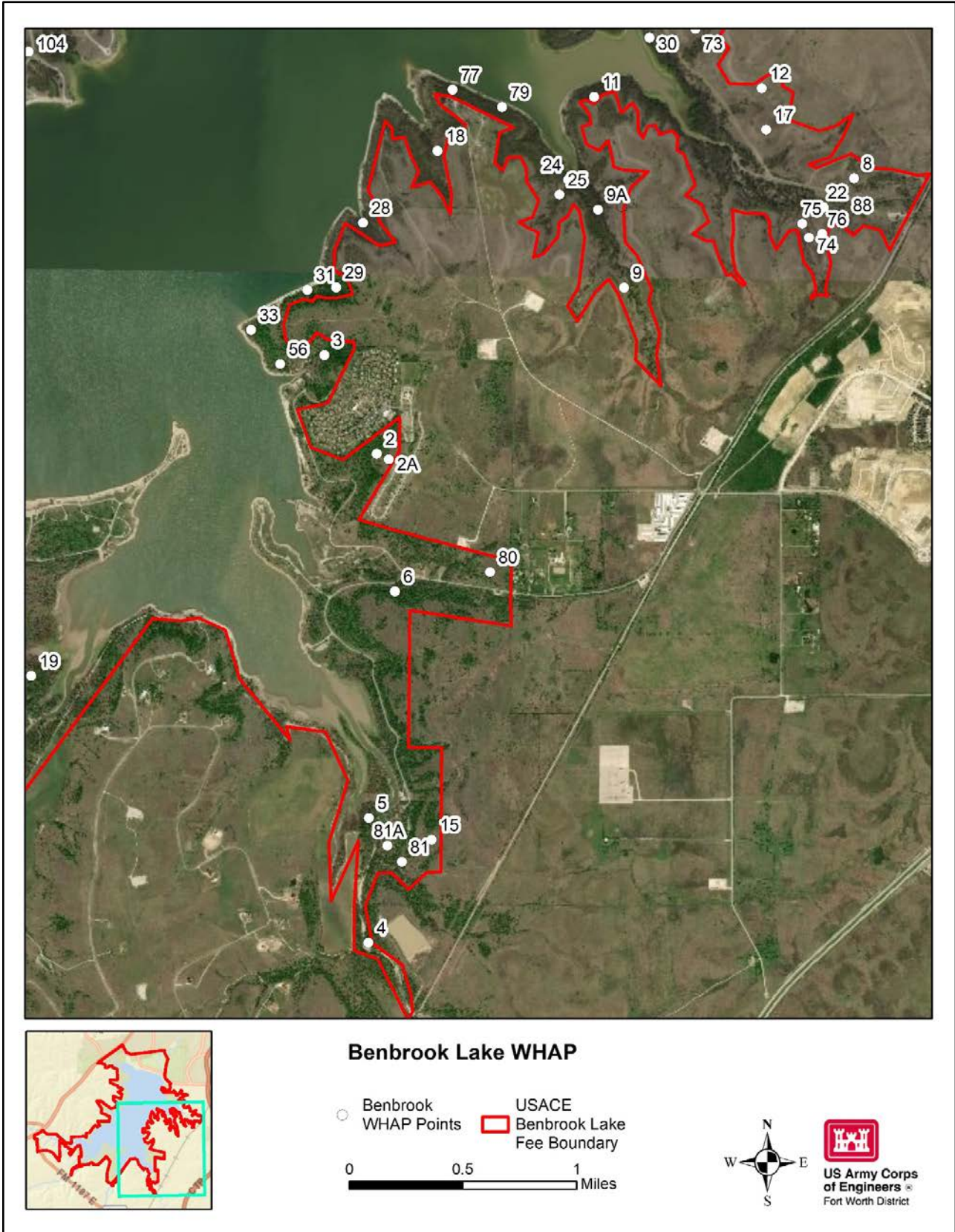


Figure 1B. Distribution of WHAP Points Within the Fee-Owned Boundary at Benbrook Lake.

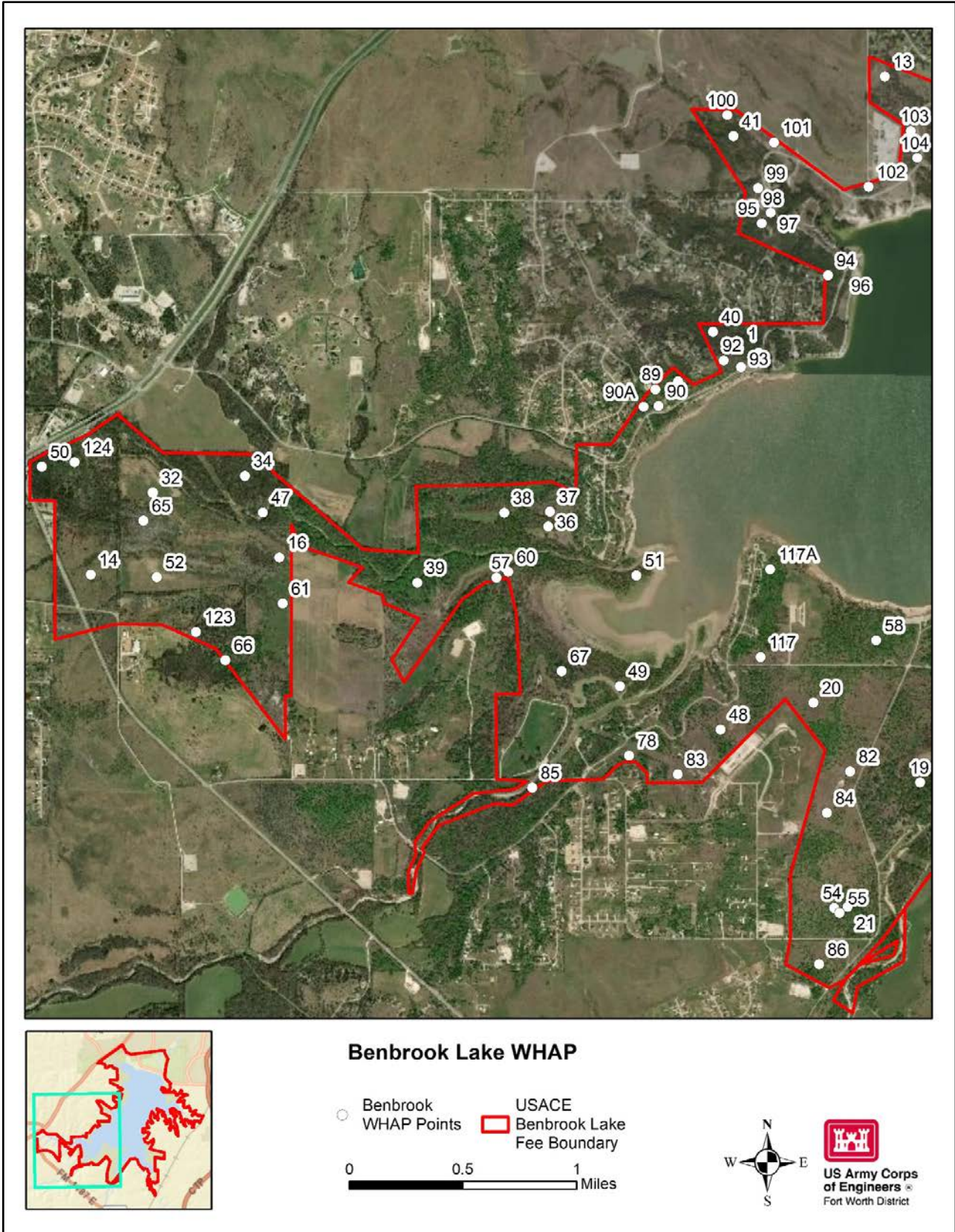


Figure 1C. Distribution of WHAP Points Within the Fee-Owned Boundary at Benbrook Lake.

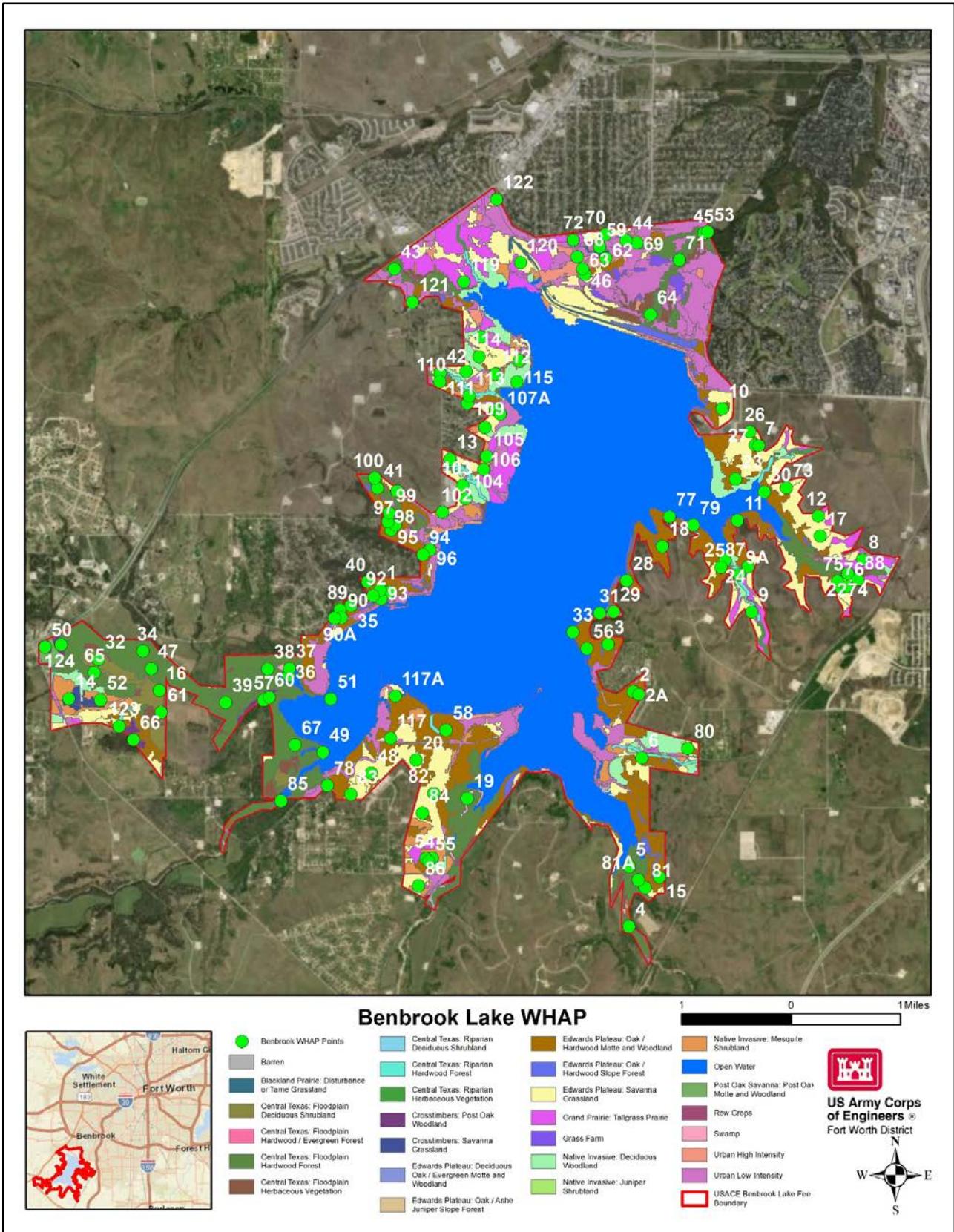


Figure 2. Distribution of Habitat Types within the Fee-Owned Boundary at Benbrook Lake.

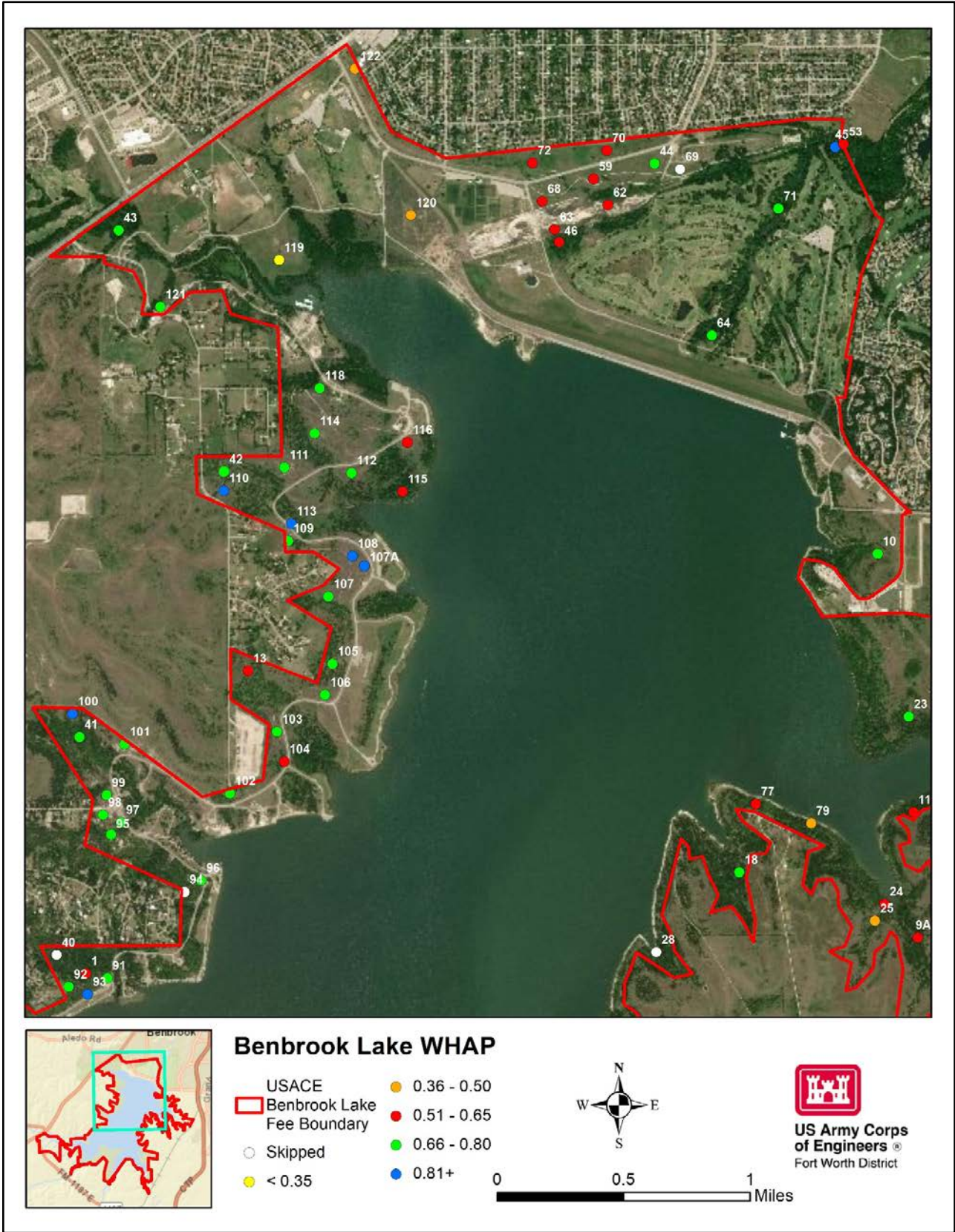


Figure 3A. Total Score Range for All Points Surveyed  
Pg-15

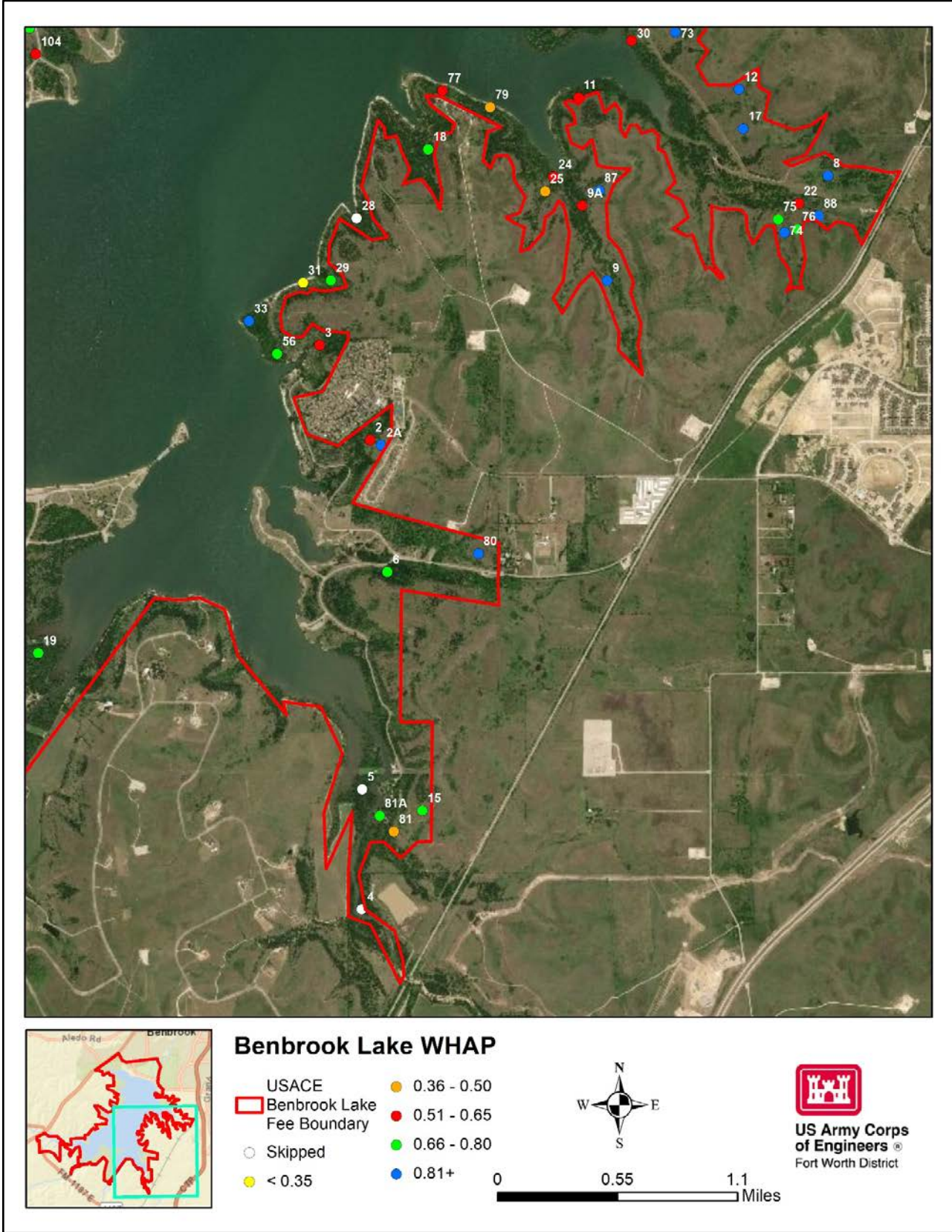


Figure 3B. Total Score Range for All Points Surveyed

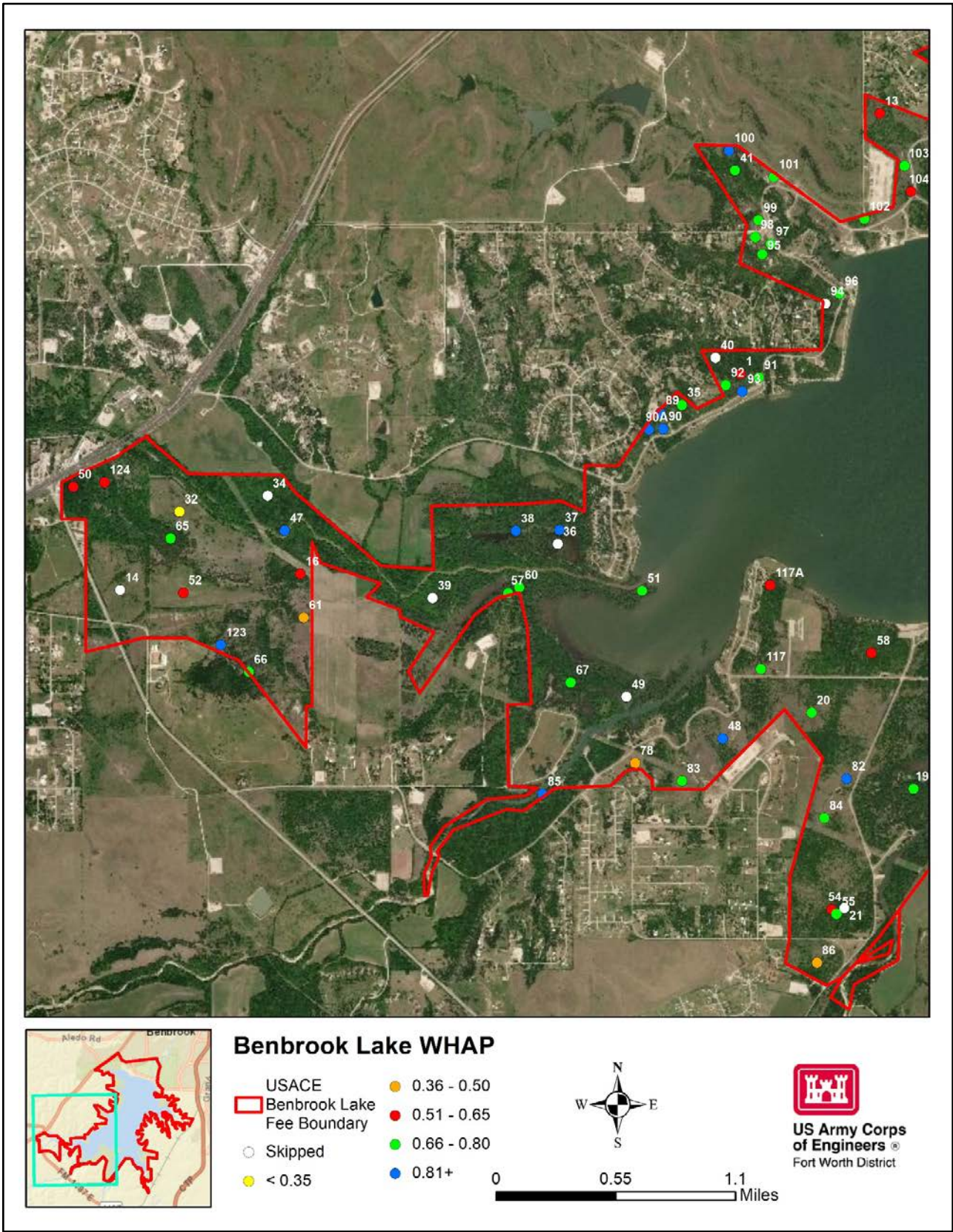


Figure 3C. Total Score Range for All Points Surveyed  
Pg-17

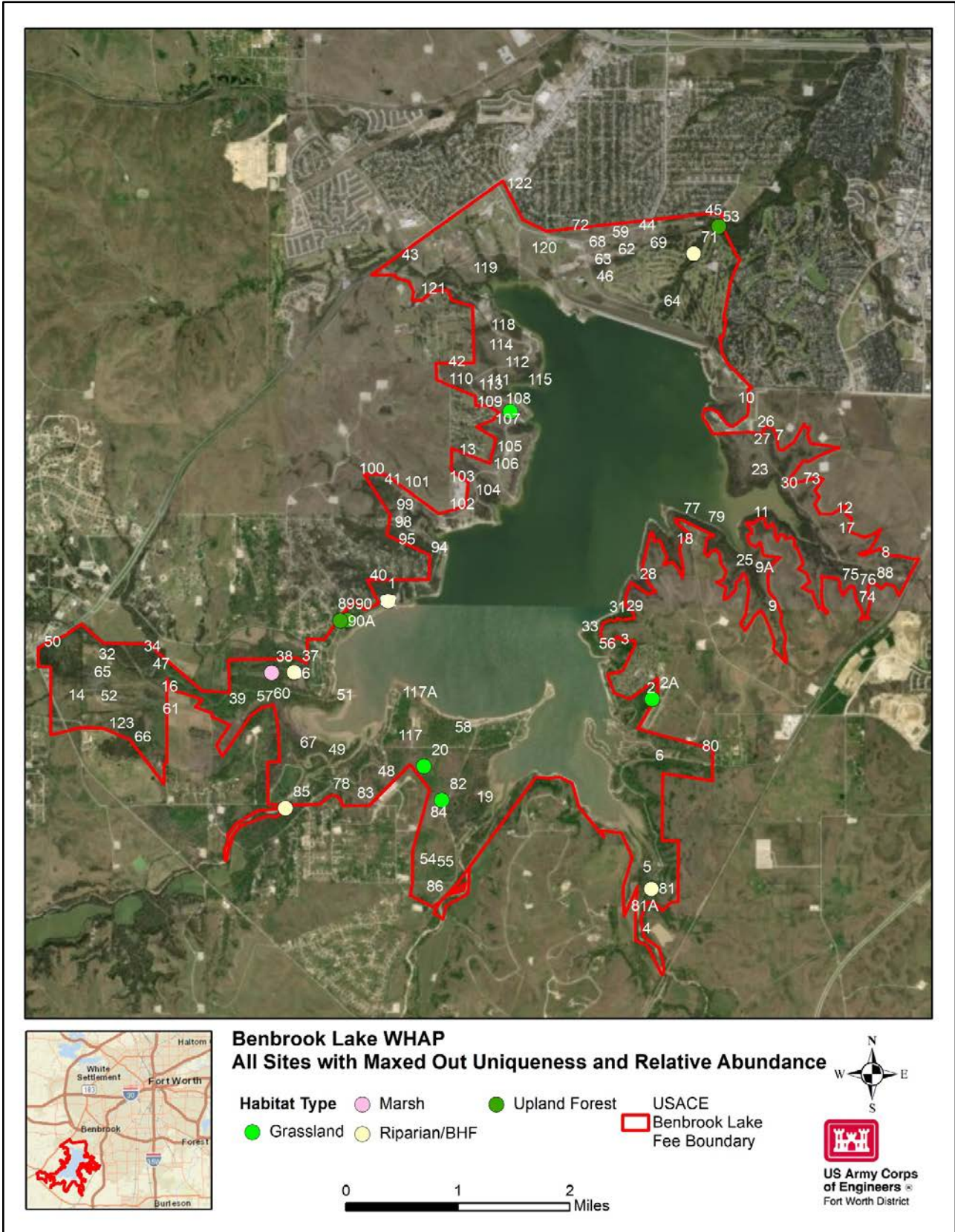
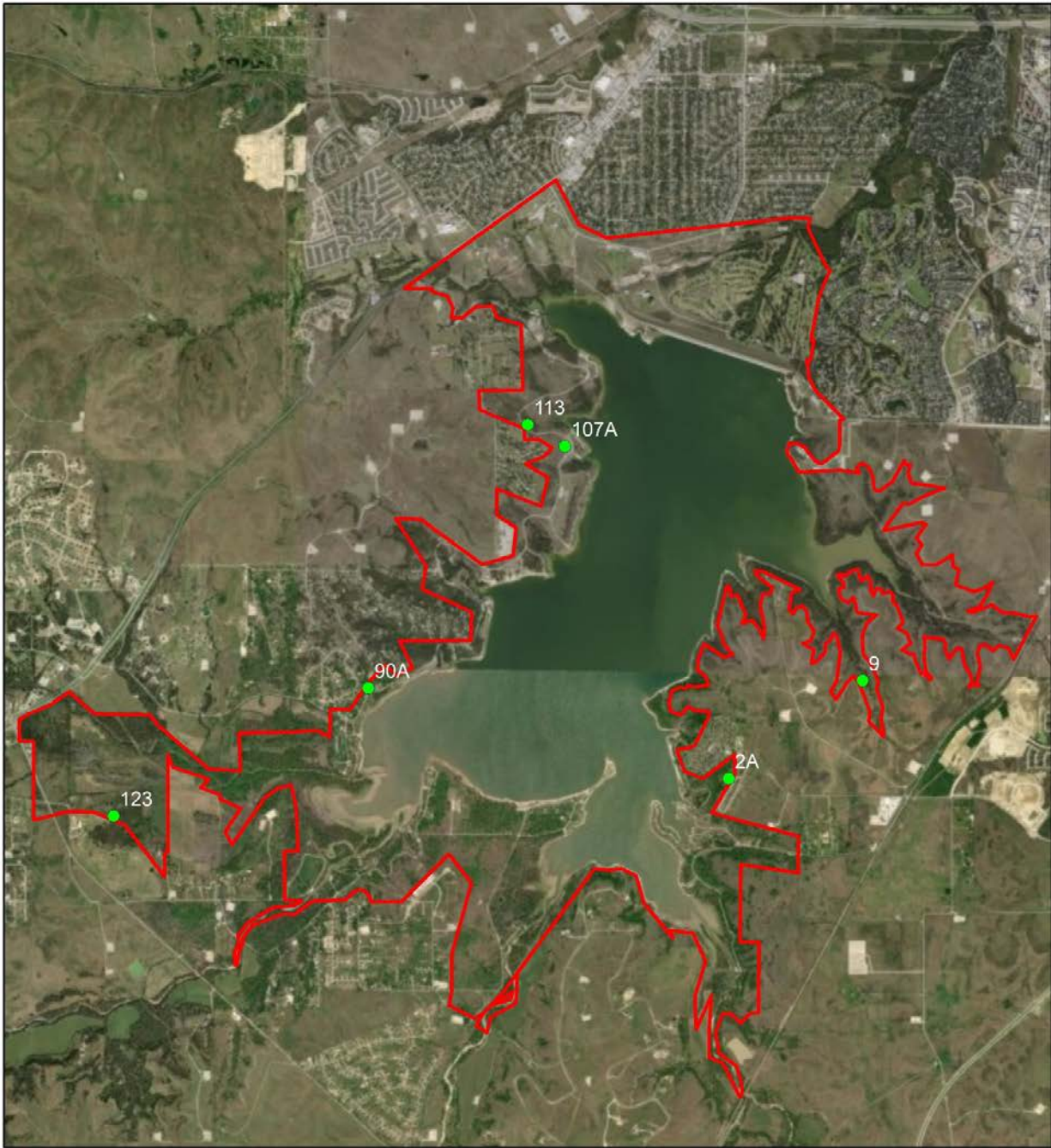


Figure 4. WHAP Point Sites with Maxed Out Uniqueness and Relative Abundance.



**Benbrook Lake WHAP  
All Sites with Total Scores >0.90**

- Benbrook WHAP Points
- USACE Benbrook Lake Fee Boundary



**Figure 5. Survey Points with Total Scores >0.90.**



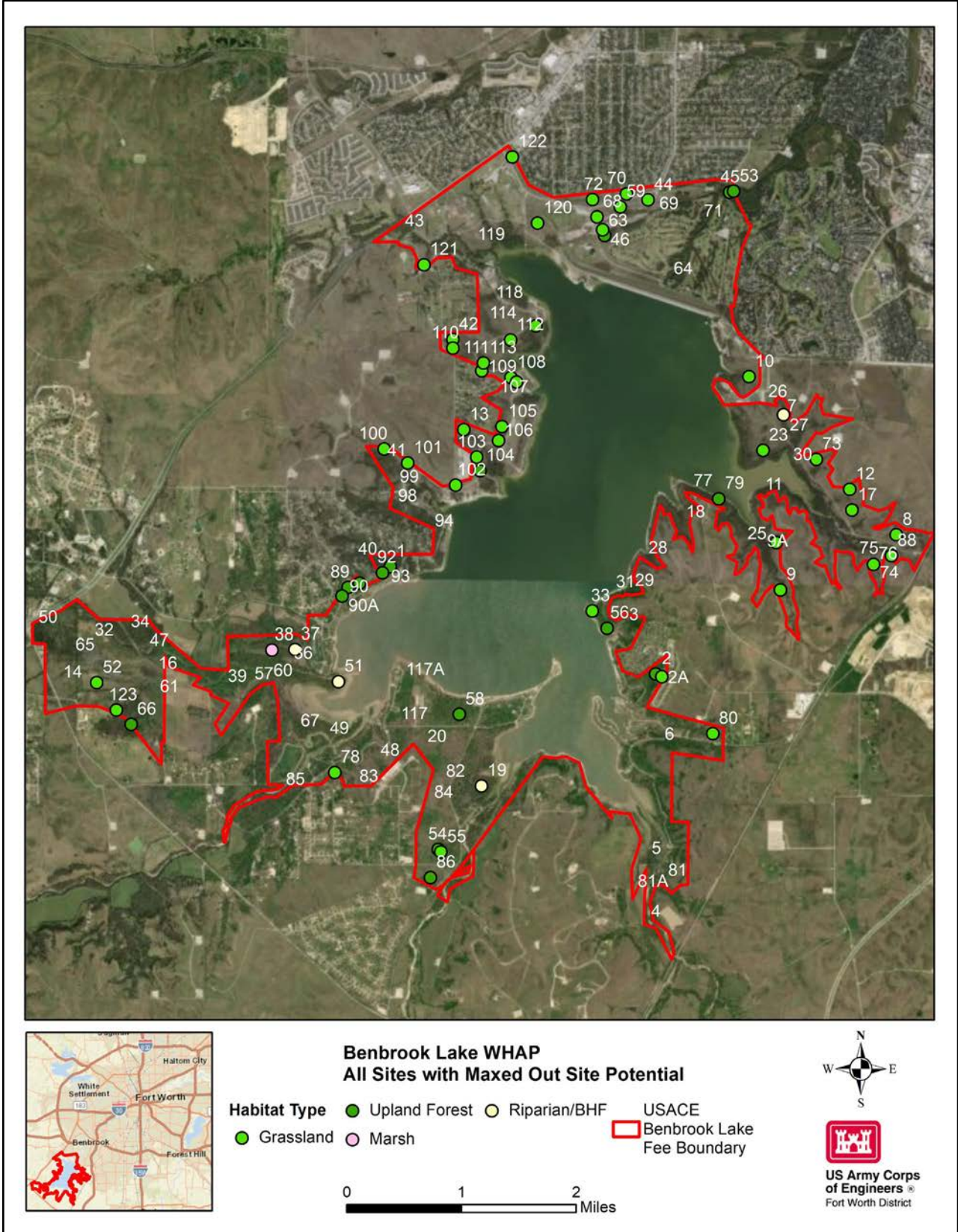


Figure 6. WHAP Point Sites with Maxed Out Site Potential

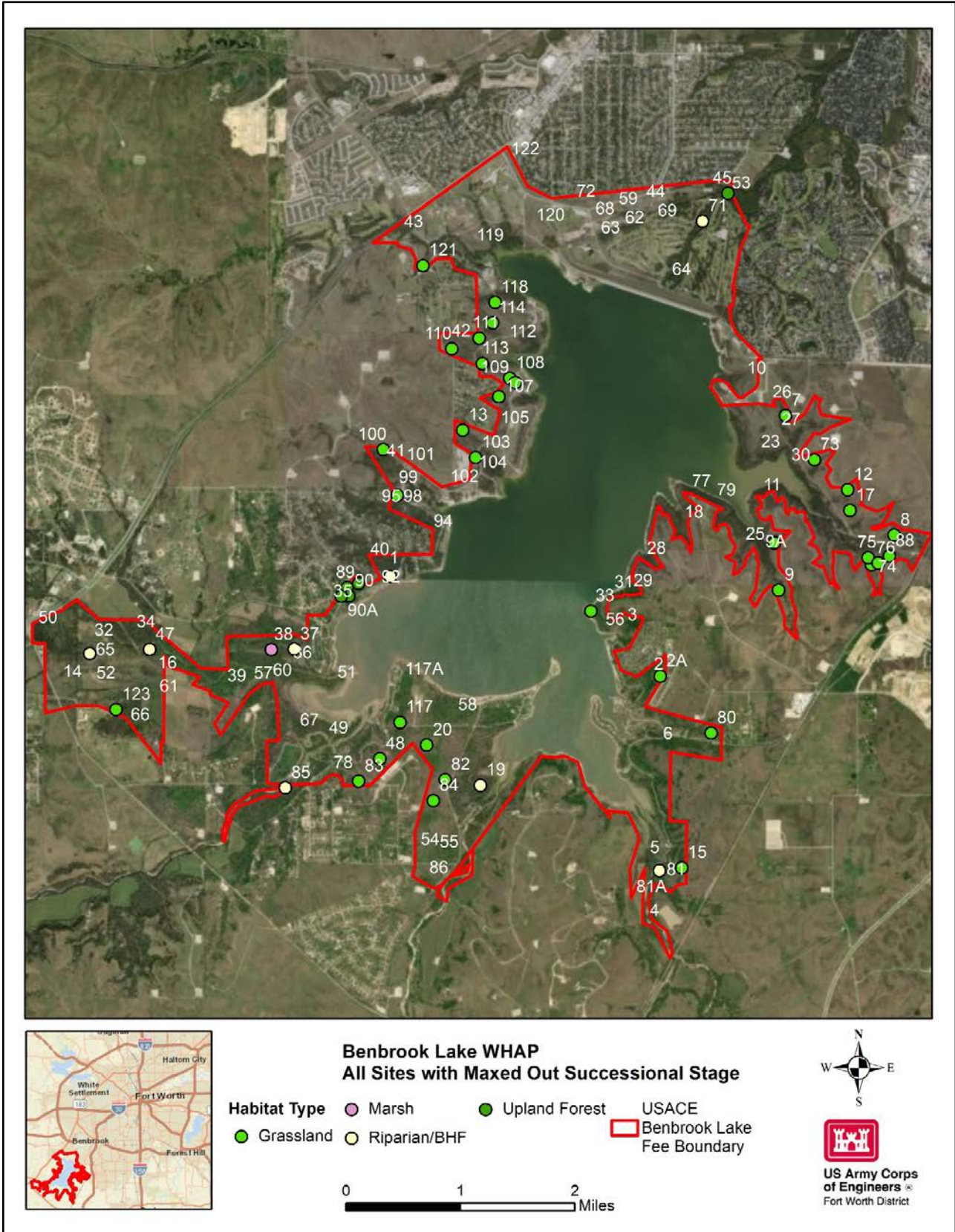


Figure 7. WHAP Point Sites with Maxed Out Successional Stage

## Attachment A: Benbrook Lake WHAP Results Summary

Point Number	Habitat Type	Final Score	Berry Drupe	Legume Pod	Acorn	Nut Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Notes	Trout Lily Present yes/No	Reverchon's Skurpea Present yes/no
1	Upland Forest	0.57	Glossy Privet, Elbow Bush, Gum Bumelia, Elbow Bush, Hackberry, Poison Ivy, Rusty Leaf Viburnum	NA	Red Oak	NA	Cedar Elm	Juniper spec.,	NA	Mexican Buckeye	Trout Lily, Hedge Parsley, Cedar Sedge, Bedstraw, Wood Sorrel	NA	Yes	No
2	Upland Forest	0.55	Hackberry, Greenbriar, unknown vine, Elbow Bush	NA	NA	NA	Cedar Elm, American Elm	Juniper spec.,	NA	NA	Rabbit Tobacco, Bedstraw, Wild Lettuce, Bastard Cabbage, Cutgrass	NA	No	No
2A	Grassland	0.98	NA	NA	NA	NA	NA	NA	NA	NA	Eryngo spec., Vetch spec, Cloth-of-gold, Purple Paintbrush, Texas Paintbrush, Wild Onion, Purple Paintbrush, Wild Onion, Chervil, Little Bluestem, Beardtongue spec., Corn Salad, Pennyroyal, Verbena spec., Ten Petal Anemone, Flax spec., Plantain spec., 1 unknown,	NA	No	No
3	Riparian/B HF	0.60	Virginia Creeper, Dew Berry, Poison Ivy, Greenbriar, Mulberry, Hackberry, Deciduous Holly, Japanese Honeysuckle, Privet spec.,	NA	NA	NA	Cedar Elm, Ash spec.,	NA	NA	NA	Cutgrass, Wild Lettuce, Vetch spec, Bedstraw, Fleabane, Moss, Vetch spec.,	NA	No	No
4	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	No	No
5	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	No	No
6	Riparian/B HF	0.72	Mexican Plum, Greenbriar, Poison Ivy, Gum Bumelia	NA	NA	NA	American Elm, Cedar Elm	NA	NA	Osage Orange, Buttonbush	Fleabane, Thistle, Corn Salad, Ragweed, Cloth-of-gold, Woodland Sorrel, Bedstraw, Ten Petal Anemone, Wild Lettuce, Chervil, Wild Onion, Venus Looking Glass, Vetch spec,	NA	No	No
7	Grassland	0.73	NA	NA	NA	NA	NA	NA	NA	Prickly Pear Cactus	Hedge Parsley, Blazing Star, Paintbrush, Engelmann's Dalsy, Cloth of Gold, Bluebonnet, Seep Mully, White Tridens, Corn Salad, Old Field Threawn, Bull Nettle, Mealy Cup Sage, Milkweed, Little Bluestem	NA	No	No
8	Grassland	0.88	Yaupon	NA	NA	NA	NA	NA	NA	Prickly Pear Cactus	Corn Salad, Cloth of Gold, Wild Garlic, Blue-eyed Star Grass, Plantain, Paintbrush, Green Thread, Side Oats Grama, Silver Bluestem, Little Bluestem, Meadowflax, Queen's Delight, Salvia sp., Wild Carrot, Stone Seed, Blazing Star	NA	No	No

Point Number	Habitat Type	Final Score	Berry Drupe	Legume Pod	Acorn	Nut Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Notes	Trout Lily Present yes/No	Reverchon's Skurfpea Present yes/no
9	Grassland	0.92	Gum Bumella, Hawthorn	Honey Locust	NA	NA	Cedar Elm	NA	NA	Prickly Pear	American Germander, Crow Poison, Artemisia, Bull Thistle, Little Bluestem, Prairie Verbena, Tenpetal Anemone, Basket Flower, Corn Salad, Carex spec, Cloth of Gold, Indian Blanket, Tick Seed, Indian Plantain	Coming out of riparian zone	No	No
9A	Riparian/B HF	0.61	Hackberry, Greenbriar, Poison Ivy	NA	NA	NA	American Elm	NA	NA	NA	Carex spec., Wild Rye, Corn Salad, Bedstraw, Wild Lettuce	Along creek	No	No
10	Grassland	0.69	Hackberry, Poison Ivy, Gum Bumella	NA	NA	NA	Cedar Elm	NA	NA	Jersey Tea, Prickly Pear Cactus	Engelmann's Daisy, Little Bluestem, Western Ragweed, Mexican Hat, Prairie Verbena, Wild Garlic, Cloth of Gold, Wild Carrot, Tenpetal Anemone, Bull Thistle, Johnsongrass, Bedstraw, Bluebonnet, Vetch spec,	NA	No	No
11	Upland Forest	0.56	Yaupon, Mexican Plum, Gum Bumella, Greenbriar, Spiny Hackberry	NA	NA	NA	Cedar Elm, Green Ash	NA	NA	Prickly Pear	Jersey Tea, Tick Seed, Wild Lettuce, Carex spec., Corn Salad, Tenpetal Anemone	Very steep	No	No
12	Grassland	0.85	Gum Bumella, Yaupon, Trumpet Creeper	NA	NA	NA	NA	NA	NA	Prickly Pear Cactus	White Rosinweed, Cloth of Gold, Silver Bluestem, Little Bluestem, Paintbrush, Purple Coneflower, Plantain, American Basketflower, Corn Salad, Salvia sp.	NA	No	No
13	Grassland	0.63	NA	NA	NA	NA	NA	NA	NA	Prickly Pear Cactus, Yucca	Bluebonnet, Cloth-of-gold, Ten Petal Anemone, Sideoats Grama, Fringed Pawnee, Scurf Pea, Roadside Gaura, Thistle, Engelmann's Daisy, Little Bluestem, Gedge Spec., Tickseed, Introduced bunchgrass	NA	No	No
14	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	No	No
15	Grassland	0.73	NA	NA	NA	NA	NA	NA	NA	Prickly Pear Cactus, Missouri Foxtail Cactus	New Jersey Tea, Coreopsis, Chervil, Cloth-of-gold, Beardtongue, Thistle, Purple Paintbrush, Little Bluestem, Dropseed spec., Blue Star, Wild Onion, Storksbill, Bluebonnet, Reverchon's Skurfpea	can't read the note	No	Yes
16	Riparian/B HF	0.57	Mustang Grape, Hackberry	Honey Locust, Mesquite	NA	NA	Cedar Elm	NA	NA	Cottonwood	Speedwell, Johnsongrass, American Germander, Bee Balm, Geranium, Coreopsis, New Jersey Tea, Chervil, Purple Paintbrush, Thistle spec., Little Bluestem, Dropseed spec., Blue Star, Bluebonnet, Wild Onion, Storksbill, Scurfpea,	NA	No	No

Point Number	Habitat Type	Final Score	Berry	Drupe	Legume		Nut	Nuttlelike	Samara	Cone	Achene	All Others	Herbaceous Species	Notes	Trout Lily	Reverchon's
					Pod	Acorn									Present yes/No	Skurpea Present yes/no
17	Grassland	0.88	NA		NA	NA	NA	NA	NA	NA	NA	Prickly Pear Cactus	Blazing Star, Prairie Verbena, Western Ragweed, Wild Garlic, Engelmann's Daisy, Cloth of Gold, Little Bluestem, Plantain, Milkweed, Blue-eyed Star Grass, Paintbrush, Old Field Threewain, Gaura, Gayfeather, Big Bluestem, Stone Seed, Scribner's Panicum, Crow Poison, Tenpetal Anemone	NA	No	No
18	Riparian/B HF	0.73		Gum Bumelia, Greenbriar, Yaupon, Poison Ivy	NA	NA	NA	NA	Cedar Elm, Green Ash	Ashe Juniper	NA	NA	Corn Salad, Bedstraw, Carex spec., Spike Rush, Inland Sea Oats, Canada Wild Rye, Wild Onion, Oxalis, American Germander, Giant Ragweed	NA	No	No
19	Riparian/B HF	0.76		Carolina Snailseed, Greenbriar, Poison Ivy, Hackberry, Mulberry	Honey Locust	NA	NA	NA	Cedar Elm, American Elm, Box Elder	NA	American Sycamore	Cottonwood	NA	NA	No	No
20	Grassland	0.80	NA		NA	NA	NA	NA	NA	NA	NA	NA	Mock Vervain, Roadside Gaura, Ten Petal Anemone, Chervil, Tickseed, Gayfeather, Corn Salad, Little Bluestem, Engelmann's Daisy, Rabbit	NA	No	No
21	Skipped	Skipped	Skipped		Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	No	No
22	Riparian/B HF	0.52		Gum Bumelia, Dewberry, Greenbriar, Mustang Grape, Western Soapberry, Poison Ivy, Hackberry	NA	NA	NA	NA	Cedar Elm	NA	NA	Prickly Pear Cactus	Bedstraw, Ragweed, Hedge Parsley, Silver Wormwood, Oxalis, American Germander, Cranes Bill, Texas Bluegrass, Tenpetal Anemone, Giant Ragweed, Bull Thistle, Big Bluestem, Corn Salad, Vetch spec,	NA	No	No
23	Grassland	0.71		Yaupon, Roughleaf Dogwood, Dewberry, Hackberry	Honey Locust	NA	NA	NA	Cedar Elm	NA	NA	Prickly Pear Cactus	Hedge Parsley, Wild Carrot, Little Bluestem, Bee Balm, Indiangrass, Corn Salad, Carex spec., Bedstraw, Gayfeather, Vetch spec,	Slightly riparian	No	No
24	Riparian/B HF	0.61		Poison Ivy, Yaupon, Hackberry, Greenbriar	Honey Locust	NA	NA	NA	American Elm, Box Elder	NA	NA	Cottonwood	Speedwell, Wild Lettuce, Carex spec., Vetch spec,	Frequently Inundated	No	No
25	Riparian/B HF	0.47		Hackberry, Poison Ivy, Greenbriar, Yaupon, Dewberry	Honey Locust	NA	NA	NA	Cedar Elm	NA	NA	NA	Bedstraw, Carex spec., Inland Sea Oats	NA	No	No
26	Grassland	0.61		Hackberry, Yaupon	NA	NA	NA	NA	Cedar Elm	NA	NA	Prickly Pear Cactus	Crow Poison, Corn Salad, Hedge Parsley, Prairie Verbena, Queen's Delight, Bull Thistle, Bee Balm, Wild Bedstraw, Carex spec., Wild Onion, Corn Salad, Bull Nettle, Dandelion, Hedge	NA	No	No
27	Riparian/B HF	0.69		Hackberry, Chinese Privet, Poison Ivy, Mexican Plum, Gum	Honey Locust	NA	NA	NA	Cedar Elm	Ashe Juniper	NA	Prickly Pear Cactus	NA	Seep nearby	No	No
28	Skipped	Skipped	Skipped		Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	No	No

Point Number	Habitat Type	Final Score	Berry	Drupe	Legume Pod	Acorn	Nut	Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Notes	Trout Lily Present yes/No	Reverchon's Skurfpea Present yes/no	
29	Riparian/B HF	0.72	Virginia Creeper, Greenbriar, Hackberry		Honey Locust	NA	NA	NA	Cedar Elm, Ash spec., Maple Spec.,	NA	NA	Osage Orange, Buttonbush	Engelmann's Daisy, Cucumber spec., Chervil, Wild Lettuce, Corn Salad, Ragweed, Cutgrass	Floodpool, flat drainage	No	No	
30	Riparian/B HF	0.54	Poison Ivy, Yaupon, Gum Bumelia, Hackberry, Greenbriar		Honey Locust	NA	NA	NA	Cedar Elm	NA	NA	NA	Hedge Parsley, Geranium, Carex spec.,	NA	No	No	
31	Riparian/B HF	0.22	Greenbriar, Decidious Holy, Elbow Bush		NA	NA	NA	NA	Cedar Elm	Juniper spec.,	NA	Prickly Pear Cactus	Wood Sorrel, Jersey Tea, Chervil, Wild Onion, Dropseed spec., Cloth-of-gold, 2 unknowns, Little Bluestem, Foxglove,	Floodpool outcrop, transition zone.	No	No	
32	Riparian/B HF	0.34	NA		Honey Locust	NA	NA	NA	NA	NA	NA	NA	Ten Petal Anemone, Dakota Mock Vervain, Ragweed, Corn Salad, Geranium, Clover spec., Wild Carrot, Johnson Grass, Bermuda Grass, Germander, Thistle, Engelmann's Daisy, Dallis Grass, Bedstraw, Sedge spec., Vetch spec.,	NA	No	No	
33	Grassland	0.90	NA		NA	NA	NA	NA	NA	NA	NA	Prickly Pear Cactus	Wild Onion, Rabbit Tobacco, Sedge spec., Bluebonnet, Dropseed spec., Carex spec., Chervil, Corn Salad, Thistle, Crow Poison, Ten Petal Anemone, 3 unknowns,	NA	No	No	
34	Skipped	Skipped	Skipped		Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	No	No	
35	Upland Forest	0.78	Possumhaw, Rusty Blackhaw, Greenbriar, Chinese Privet, Grape spec., Honeysuckle		Eastern Redbud, Eastern Redcedar	NA	Buckley Oak		Cedar Elm	NA	NA	Mexican Buckeye	Sedge spec., Inland Seaotias, Geranium, Avens spec., Carrot Spec., Bedstraw,	NA	No	No	
36	Skipped	Skipped	Skipped		Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	No	No	
37	Riparian/B HF	0.85	Poison Ivy, Mulberry, Greenbriar,		NA	NA	NA	NA	Ash spec., Box Elder	NA	NA	Cottonwood,	Cutgrass		Skipped Heron Nest, Large Old Cottonwood Stand, ESA Potential	No	No
38	Marsh	0.81	NA		NA	NA	NA	NA	Box Elder	NA	NA	Buttonbush, Black Willow	Duck Weed, Pond Weed	Surveyed from the bird blind	No	No	
39	Skipped	Skipped	Skipped		Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	No	No	
40	Skipped	Skipped	Skipped		Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	No	No	
41	Riparian/B HF	0.69	Glossy Privet, Greenbriar, Hackberry, Mexican Plum, Elbow Bush, Roughleaf Dogwood		NA	NA	NA	NA	Cedar Elm, Green Ash	NA	NA	NA	Buttonbush, Mexican Buckeye, Mexican Buckeye	Corn Salad, Fleabane, Wild Onion, Cucumber Chickweed, Hedge Parsley, Wood Sorrel, Speedwell, Chervil, Carex spec., Wild Lettuce, Bedstraw, White Avens	Creek in transition	No	No

Point Number	Habitat Type	Final Score	Berry Drupe	Legume Pod	Acorn	Nut Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Notes	Trout Lily Present yes/No	Reverchon's Skurfpea Present yes/no
42	Grassland	0.69	Hackberry, Serviceberry, Chinese Privet, Greenbriar, Honey Suckle	Honey Locust, Mesquite	NA	NA	NA	Juniper spec., Eastern Red Cedar	NA	Prickly Pear Cactus, Osage Orange	Texas Star Flower, Ten Petal Anemone, Bedstraw, Little Bluestem, Thistle, Wild Pea, Cloth-of-gold, Prairie Parsley, Dandelion, Bluebonnet, Dakota Mock Vervain, Crow Poison	NA	No	No
43	Riparian/B HF	0.69	Hackberry, Chinaberry, Sumac, Poison Ivy, Virginia Creeper, Gum Bumelia, Greenbriar, Carolina Snailseed, Dewberry,	NA	NA	NA	Cedar Elm, Green Ash	NA	NA	NA	Parsley, Grama Spec., Bedstraw, Blue-eyed Grass, Wild Strawberry, 1 unknown species of grass, Thistle, Vetch spec	NA	No	No
44	Grassland	0.69	NA	NA	NA	NA	NA	NA	NA	Yucca	Wild Onion, Sunflower, Bluebonnet, Gayfeather, Verbena, Little Bluestem, Purple Paintbrush, Shortpod Mustard	NA	No	No
45	Upland Forest	0.89	Persimmon, Virginia Creeper, Greenbriar, Western Soapberry?, Privet spec., Rusty Blackhaw, Grape spec.,	Eve's Necklace	Bur Oak	NA	American Elm, Cedar Elm, Texas Ash	NA	NA	NA	Sedge spec., Nettle, 1 unknown	NA	No	No
46	Upland Forest	0.62	Roughleaf Dogwood, Poison Ivy, Greenbriar, Hackberry, Privet spec., 2 unknown	1 unknown	NA	NA	NA	Juniper spec	NA	NA	Bedstraw, Dandelion spec., 2 unknowns	NA	No	No
47	Riparian/B HF	0.81	Virginia Creeper, Hackberry, Mulberry	NA	Bur Oak	NA	Box Elder, American Elm	NA	NA	NA	Chasmanthium, Giant Ragweed, Wild Carrot, Speedwell, American Germander, Bedstraw, Hedge Parsley, Carex spec., Cookiebur, Cranes Bill, Corn Salad	Lots of bare soil, bottomland hardwood	No	No
48	Grassland	0.81	NA	NA	NA	NA	NA	NA	NA	Yucca	Seep Muhly, Buffalograss, Gramma spec., Corn Salad, Texas Yellowstar, Dakota Mock Vervain, Plantain spec., Purple Paintbrush, Skullcap, Tickseed, Salvia	NA	No	No
49	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	No	No
50	Riparian/B HF	0.60	Greenbriar, Hackberry, Soapberry, Serviceberry, grape spec., Ivy spec., Virginia Creeper	Honey Locust	Bur Oak	NA	Cedar Elm	NA	NA	NA	Forget-me-not, Sedge spec., Bedstraw, Chervil, Inland Sea Oats, Brome spec., Avens spec., Clover spec., Morning Glory	NA	No	No
51	HF	0.74	NA	NA	NA	NA	Elder	NA	NA	Buttonbush	Junegrass, Pennywort	Willows	No	No
52	Grassland	0.58	Ground Plum	Mesquite	NA	NA	NA	NA	NA	NA	Johnsongrass, Tick Seed, Corn Salad, Ragwort, American Germander, Texas Winter Grass, Bedstraw, Vetch spec	Low quality, near easement	No	No



Point Number	Habitat Type	Final Score	Berry Drupe	Legume Pod	Acorn	Nut Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Notes	Trout Lily Present yes/No	Reverchon's Skurpea Present yes/no
53	Upland Forest	0.57	Nandina, Virginia Creeper, Carolina Snailseed, Mulberry, Hackberry, Grape spec., Privet spec., Greenbriar	Easter Redbud	Bur Oak	NA	Cedar Elm, Texas Ash	NA	NA	NA	Wild Garlic	NA	No	No
54	Upland Forest	0.52	Hackberry, Greenbriar	Honey Locust, Mesquite	NA	NA	Cedar Elm	NA	NA	Prickly Pear Cactus	Chervil, Bedstraw, Carex spec., Corn Salad, Ten Petal Anemone, Little Bluestem, 1 unknown	NA	No	No
55	Grassland	0.68	Hackberry	Mesquite	NA	NA	NA	NA	NA	Prickly Pear Cactus	Paintbrush, Sunflower Species, Bluebonnet, Verbena spec., Carex spec., Corn Salad, Indian Blanket, Rabbit Tobacco, Ten Petal Anemone, Switchgrass, Cloth-of-gold, Wood Sorrel,	NA	No	No
56	Upland Forest	0.71	Gum Bumelia, Poison Ivy, Privet spec., Hackberry, Elbow Bush,	NA	NA	NA	American Elm, Cedar Elm	Juniper spec.,	NA	NA	Wood Sorrel, Vetch spec., Chervil, 1 unknown, Carex spec., Cutgrass, Bedstraw	Floodpool	No	No
57	Riparian/B HF	0.72	Hackberry, Greenbriar	NA	NA	NA	Box Elder, Cedar Elm	NA	NA	Cottonwood	Speedwell, Wild Carrot, Carex spec., Dandelion, Inland Sea Oats, Fleabane, Scurf's Pea, Giant Ragweed, Oxalis spp., Bedstraw	NA	No	No
58	Upland Forest	0.60	Hackberry, Roughleaf Dogwood, Gum Bumelia, Poison Ivy, Greenbriar	Honey Locust	NA	NA	Cedar Elm	Eastern Redcedar	NA	Osage Orange, Prickly Pear Cactus	Corn Salad, Forget-me-not, Bedstraw, Sedge Spec., Chervil, Clover spec., Thistle, Germander, Field Madder, plantain spec., Geranium, Vetch spec	NA	No	No
59	Grassland	0.61	NA	NA	NA	NA	NA	NA	NA	Yucca	1 unknown flower, Yellow Aster, Little Bluestem, Paintbrush spec., Sage Grass?, Crow Poison, 7 unknowns	NA	No	No
60	Riparian/B HF	0.71	Hackberry, Greenbriar, Mustang Grape	NA	NA	NA	Box Elder, Cedar Elm	NA	NA	NA	Hedge Parsley, Inland Sea Oats, Wild Carrot, Bedstraw, Carex spec., Speedwell, Giant Ragweed, Giant Ragweed, American Germander	NA	No	No
61	Riparian/B HF	0.49	Mustang Grape	Honey Mesquite, Honey Locust	NA	NA	Cedar Elm, Green Ash	NA	NA	NA	Speedwell, Carex spec., Ragwort, Bee Balm, Geranium, Johnsongrass, Wild Lettuce	NA	No	No
62	Riparian/B HF	0.59	Peppervine, Gum Bumelia, Roughleaf Dogwood, Deciduous Holly?, Hackberry, Poison Ivy	NA	NA	NA	Ash spec., Cedar Elm	Juniper spec	NA	NA	Cutgrass, Ragweed spec., Wild Onion, Wild Garlic, Redseed Plantain, Sunflower, Inland Sea Oats, Ten Petal Anemone,	Beaver cut trees	No	No
63	Grassland	0.58	NA	NA	NA	NA	NA	NA	NA	Prickly Pear Cactus	1 unknown flower, Yellow Aster, Corn Salad, Bastard Cabbage, Little Bluestem, 2 Carex spec., 4 unknowns, Dropseed spec.,	NA	No	No

Point Number	Habitat Type	Final Score	Berry/Drupe	Legume Pod	Acorn	Nut/Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Notes	Trout Lily Present yes/No	Reverchon's Skurfpea Present yes/no
64	Riparian/B HF	0.76	Greenbriar, Sugarberry, Mustang Grape, Mulberry, Virginia Creeper, Gum Bumella, Poison Ivy, Elderberry	NA	Bur Oak	NA	Box Elder, Green Ash, Cedar Elm, American Elm	NA	NA	Buttonbush	Carex spec., Bedstraw, Inland Sea Oats, Wildrye, Wild Carrot, Purpletop, Chasmanthium	NA	No	No
65	Riparian/B HF	0.66	Grape spec., Roughleaf Dogwood, Poison Ivy	Honey Locust	NA	NA	Green Ash	NA	NA	Cottonwood, Blackwillow	Inland Sea Oats, Goldenrod, Ragweed, Sedge Spec.	NA	No	No
66	Upland Forest	0.67	Gum Bumella, Yaupon, Virginia Creeper, Poison Ivy, Greenbriar	Redbud, Honey Locust	Shumard Oak	NA	Cedar Elm	NA	NA	Prickly Pear Cactus	Corn Salad, Tickseed, Chasmanthium, Seep Muhly, Inland Sea Oats, Carex spec., Little Bluestem, Scribner's Panicum, Speedwell, Sporobolus, Bee Balm, Stoneseed, Crow Poison, Engelmann's Daisy, Bull Nettle, Blazing Star	Not really big enough to be considered just grassland. Mix of woodland.	No	No
67	Riparian/B HF	0.66	Greenbriar, Hackberry	NA	NA	NA	Box Elder, Cedar Elm	NA	NA	Cottonwood, Buttonbush	Geranium, Carex spec., Bedstraw	Not much ground cover-frequently inundated	No	No
68	Grassland	0.61	NA	NA	NA	NA	NA	NA	NA	Prickly Pear Cactus, Yucca	unknown flower, Yellow Aster, Ten Petal Anemone, Bluebonnet, 2 Carex spec., Little Bluestem, 5 unknowns, Crow Poison, Verbena, Paintbrush spec., Corn Salad	NA	No	No
69	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	No	No
70	Grassland	0.61	Poison Ivy	NA	NA	NA	NA	NA	NA	NA	Carex spec., Chervil, Goldenrod, Texas Prairie Parsley, Texas Bluegrass, Beaked Cornsalad, Frogfruit, Fleabane, Vetch spec, Crow, Poison, Snow on the Prairie, Showy Pink Primrose	NA	No	No
71	Riparian/B HF	0.78	Rusty Blackhaw, Cornelberry, Roughleaf Dogwood, Dewberry, Hackberry, Poison Ivy, Carolina Snailseed, Grape Vine, Mulberry, Gum Bumella	NA	Bur Oak, Shumard Oak	NA	Green Ash, American Elm	NA	American Sycamore	NA	Inland Sea Oats, Cut Grass, Lizard Tongue	NA	No	No

Point Number	Habitat Type	Final Score	Berry Drupe	Legume Pod	Acorn	Nut Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Notes	Trout Lily Present yes/No	Reverchon's Skurfpea Present yes/no
72	Grassland	0.58	NA	NA	NA	NA	NA	NA	NA	Yucca	Bedstraw, Ground Cherry, Western Ragweed, Greenthread, Bushy Bluestem, Little Bluestem, Texas Bluegrass, Blue-eyed Grass, Skullop, Texas Thistle, Engelmann's Daisy, Foxglove, Ten Petal Anemone, Snow On The Prairie	NA	No	No
73	Grassland	0.86	NA	NA	NA	NA	NA	NA	NA	Prickly Pear Cactus	Blazing Star, Paintbrush, Mealy Blue Sage, Cloth of Gold, Corn Salad, Silver Bluestem, Little Bluestem, Engelmann's Daisy, Blue-eyed Star Grass, Bull Nettle, Plantain, Wild Carrot	NA	No	No
74	Grassland	0.88	Dewberry	NA	NA	NA	Cedar Elm	NA	NA	Prickly Pear Cactus	Bull Thistle, Wild Carrot, Side Oats Grama, Four-nerve Daisy, Cranes Bill, Wild Lettuce, Crow Poison, Cloth of Gold, White Rosinweed, Paintbrush, Gaura, Corn Salad, Blazing Star, Prairie Verbena, Engelmann's Daisy, Meadowflax, Tenpetal Anemone, Little Bluestem, Blue-eyed Star Grass, Stone Seed, Allium, Tick Seed, Gayfeather, Sporobolus	NA	No	No
75	Grassland	0.80	NA	NA	NA	NA	NA	NA	NA	Prickly Pear Cactus, Jersey Tea	Paintbrush, Coneflower, Texas Sage, Engelmann's Daisy, Four-nerve Daisy, Little Bluestem, Blg Bluestem, Seep Muhly, Blazing Star, White Rosinweed, Queen's Delight, Wild Onion, Threawn, Prairie Verbena, Blue-eyed Star Grass, Corn Salad, Crow Poison, Side Oats Grama, Bull Thistle	NA	No	No
76	Grassland	0.71	NA	NA	NA	NA	Cedar Elm	NA	NA	Prickly Pear Cactus, Jersey Tea	Four-nerve Daisy, Blazing Star, Little Bluestem, Sporobolus, Blue-eyed Star Grass, Threawn, Engelmann's Daisy, Corn Salad, False Indigo, Prairie Verbena, Indiangrass, Tenpetal Anemone, Bull Thistle, Wild Onion, Crow Poison, Meadowflax, Wild Hyacinth	NA	No	No

Point Number	Habitat Type	Final Score	Berry	Drupe	Legume Pod	Acorn	Nut	Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Notes	Trout Lily Present yes/No	Reverchon's Skurfpea Present yes/no
77	Riparian/B HF	0.61	Gum Bumella, Hack Berry, Yaupon, Poison Ivy, Greenbriar		Honey Mesquite	NA	NA	NA	Cedar Elm	NA	NA	Prickly Pear Cactus	Hedge Parsley, Corn Salad, American Germander, Bedstraw, Oxalis, Texas Star, Tenpetal Anemone, Thistle, Carex spec., Bee Balm, Geranium, Engelmann's Daisy, Indian Blanket, Wild Lettuce	NA	No	No
78	Grassland	0.44	NA		NA	NA	NA	NA	NA	NA	NA	NA	Four-nerve Daisy, Engelmann's Daisy, Corn Salad, Mimosa, Roadside Gaura, Ten Petal Anemone, Drummond's Onion, Skulicap, Purple Paintbrush, Plantain spec., Bermuda Grass, unknown wintergrass, Woollywhite, unknown Daisy	NA	No	No
79	Upland Forest	0.45	Japanese Privet, Gum Bumella, Greenbriar		NA	NA	NA	NA	Cedar Elm, Greer	NA	NA	NA	Bedstraw, Hedge Parsley, Carex Spec.,	With exotic, m	No	No
80	Grassland	0.90	NA		NA	NA	NA	NA	NA	NA	NA	Prickly Pear Cactus	Dropseed spec., Little Bluestem, Ten Petal Anemone, Cloth-of-gold, Wild Onion, Texas Paintbrush, Blue Star, Plantain spec., Roadside Gaura, Eryngo spec., Engelmann's Daisy, Crow Poison, Storksbill	NA	No	No
81	Riparian/B HF	0.49	Greenbriar, Dewberry, Roughleaf Dogwood, Gum Bumella, Elbow Bush, Privet spec., Grapevine spec.,		NA	Post Oak, Burr Oak, White Oak?	Hickory/ Pecan ?		Cedar Elm, American Elm	NA	NA	NA	Cutgrass, Corn Salad, False Wild Indigo, Ten Petal Anemone,	NA	No	No
81A	Riparian/B HF	0.75	NA		NA	Burr Oak	NA		Cedar Elm	NA	NA	NA	Chervil, Carex spec.,	Large Burr Oaks	No	No
82	Grassland	0.88	NA		NA	NA	NA	NA	NA	NA	NA	Prickly Pear Cactus	Corn Salad, Bluebonnet, Little Bluestem, Drummond's Onion, Four-nerve Daisy, Tridens Grass Spec., Tickseed, Texas Paintbrush, Germander, Purple Paintbrush, Texas Paintbrush, Storksbill, Buffalograss, Dakota Mock Vervain, Vetch spec,	NA	No	No
83	Grassland	0.73	NA		NA	NA	NA	NA	NA	NA	NA	Yucca, Prickly Pear Cactus	Little Bluestem, Indian Grass, Blue-eyed Grass, Drummond's Onion, Crow Poison, Blue Star, Four-nerve Daisy, Sedge spec., Lily spec., Gayfeather, Engelmann's Daisy, Hairy Sedge, Plantain Spec.	NA	No	No

Point Number	Habitat Type	Final Score	Berry	Drupe	Legume Pod	Acorn	Nut	Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Notes	Trout Lily Present yes/No	Reverchon's Skurfpea Present yes/no
84	Grassland	0.71	NA		NA	NA	NA	NA	NA	NA	NA	Prickly Pear Cactus	Corn Salad, Engelmann's Daisy, Texas Paintbrush, Blue-eyed Grass, False Dandelion, Cloth-of-gold, Four-nerve Daisy, Dakota Mock Vervain, Sedge spec., plantain spec, Texas Yellowstar, Wild Carrot, Seep Muhly, Little Bluestem, Tickseed	NA	No	No
85	Riparian/B HF	0.88	Greenbriar, Mustang Grape, Virginia Creeper, Gum Bumelia		NA	Shumard Oak, Bur Oak		Pecan	Box Elder, Cedar Elm, American Elm,	NA	NA	Cottonwood	Giant Ragweed, Honeysuckle, Wild Onion, Inland Sea Oats, Bedstraw	NA	No	No
86	Upland Forest	0.49	Hackberry, Greenbriar, Gum Bumelia, Western Soapberry, Poison Ivy		NA	NA	NA		Cedar Elm	NA	NA	Prickly Pear Cactus	Hedge Parsley, American Germander, Corn Salad, Carex spec., Oxalis spp., bull nettle, Bedstraw, Wild Lettuce, Ten-petal Anemone, Purple Top, Vetch spec,	NA	No	No
87	Grassland	0.90	Hawthorn, Hackberry		NA	NA	NA	NA	NA	NA	NA	Prickly Pear Cactus	Vetch Spec., Cloth-of-gold, Big Bluestem, Little Bluestem, Silver Bluestem, Tickseed, Scurfpea, Indian Blanket, Paintbrush spec., Silver Wormwood, Prairie Verbena, Seep Muhly, White Rosinweed, Panicum spec., Engelmann's Daisy, Snakeweed, Coneflower	NA	No	No
88	Grassland	0.90	Gum Bumelia,		NA	NA	NA	NA	Cedar Elm	NA	NA	NA	New Jersey Tea, Blue Star, Four-nerve Daisy, Little Bluestem, Big Bluestem, Sporobolus spec., Seep Muhly, Antelope Horn, Tickseed, Corn Salad, Aster spec., Wild Lettuce, Indian Blanket, Engelmann's Daisy, Stone Seed, Sideoats Grama	NA	No	No
89	Upland Forest	0.65	Rusty Blackhaw, Poison Ivy, Greenbriar, Gum Bumelia, Soapberry		Eastern Redbud, Eve's Necklace, Eastern Redcedar	NA		Bigelow Oak	Cedar Elm	NA	NA	Yucca, Mexican Buckeye	Unknown grass, Sedge spec, Carrot spec., Inland Sea Oats, Fawn Lilly	NA	No	No
90	Upland Forest	0.63	Honeysuckle, Skunkbush, Poison Ivy, Roughleaf Dogwood, Stretchberry, Greenbriar, Hackberry		Eastern Redbud, Ashe Juniper,	Buckley Oak	NA		NA	NA	NA	Yucca, Mexican Buckeye	Four-nerve Daisy, Mimosa, Scurf Pea, Grama spec., Little Bluestem, Purple Paintbrush, Geranium, Gayfeather	NA	No	No

Point Number	Habitat Type	Final Score	Berry Drupe	Legume Pod	Acorn	Nut Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Notes	Trout Lily Present yes/No	Reverchon's Skurfpea Present yes/no
90A	Upland Forest	0.94	Mexican Plum, Greenbriar, Glossy Privet, Chinese Privet, Virginia Creeper, Roughleaf Dogwood, Carolina Buckthorn, Rusty Blackhaw, Hackberry	Texas Redbud, Eve's Necklace	NA	Texas Walnut, Buckley Oak, Pecan	Cedar Elm, Winged Elm	NA	NA	Yucca, Prickly Pear Cactus, Mexican Buckeye, unknown grass	Chervil, Engelmann's Daisy, Sedge spec., Aster spec., Clover spec., Corn Salad, Inland Sea Oats, Aven spec., Geranium	NA	No	No
91	Riparian/B HF	0.80	Rusty Blackhaw, Hackberry, Gum Bumelia, Possumhaw Holly, Virginia Creeper, Mustang Grape, Greenbriar, Nandina, Elbow Bush, Japanese Privet	NA	Red Oak	NA	Cedar Elm	NA	NA	Yucca, Mexican Buckeye,	Wood Sorrel, Cedar Sedge, Cutgrass, Hedge Parsley, Wild Lettuce, Wild Onion, Bedstraw, White Arens	Off the equestrian trail	No	No
92	Upland Forest	0.76	Deciduous Holly, Western Soapberry, Virginia Creeper, Hackberry, Poison Ivy, Chinaberry, Mustang Grape, Privet spec., Gum Bumelia, Rusty Leaf Viburnum	Eastern Redbud, Eve's Necklace,	Red Oak	NA	Green Ash, Cedar Elm	Juniper spec.,	NA	NA	Boneset, Hedge Parsley, Bedstraw, Forget-me-not, Wildrye, Chervil, White Arens, Henbit	NA	No	No
93	Riparian/B HF	0.86	Virginia Creeper, Greenbriar, Possumhaw Holly, Hackberry, Glassy Privet	NA	NA	NA	Cedar Elm	Juniper spec	NA	Cottonwood	Cutgrass, Wood Sedge, Wild Lettuce, Hedge Parsley, Speedwell, Cucumber Weed, Sedge spec., Buttercup, Chervil	Large Elm and Sycamore	No	No
94	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	No	No
95	Riparian/B HF	0.78	Glossy Privet, Virginia Creeper, Poison Ivy, Honey Suckle, Greenbriar, Roughleaf Dogwood, Possumhaw Holly, Privet spec., Hackberry, Rusty Blackhaw	Eastern Redbud, Eve's Necklace	Red Oak, Bur Oak	NA	Green Ash, Cedar Elm	Juniper spec.,	NA	NA	Purpletop, Wood Sorrel, Bedstraw, 2 Sedge spec., Juncus spec., Engleman's Sedge, Hairy Vetch, Curleydock	NA	No	No
96	Upland Forest	0.67	Poison Ivy, Rusty Blackhaw, Gum Bumelia, Elbow Bush, Fragrant Sumac, 1 unknown, Honey Suckle,	Eastern Redbud	Red Oak	NA	NA	Juniper spec.	NA	Grooved Nipple Cactus, Yucca, Prickly Pear Cactus, Mexican Buckeye,	New Jersey Tea, Trout Lily, Carex spec., Blue Star, Coreopsis, Scurfpea	NA	Yes	No
97	Upland Forest	0.67	White Honeysuckle, Elbow Bush, Poison Ivy, Japanese Honeysuckle, Rusty Blackhaw, New Jersey Tea, Dwarf Leaf Plantain	Eastern Redbud,	Red Oak	NA	NA	Juniper spec.	NA	Yucca, Mexican Buckeye,	Trout Lily, Carex spec., Linear-leaf Scurfpea, Fox Glove, Little Bluestem, Blue-eyed Grass, Sedge spec., Chervil, Corn Salad, Seep Muhly, Deaf Plantain,	NA	Yes	No

Point Number	Habitat Type	Final Score	Berry Drupe	Legume Pod	Acorn	Nut Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Notes	Trout Lily Present yes/No	Reverchon's Skurfpea Present yes/no
98	Grassland	0.73	Elbow Bush, Aromatic Sumac, Chickasaw Plum, New Jersey Tea,	NA	NA	NA	NA	Juniper spec	NA	Yucca	Little Bluestem, Tall Grama, Chervil, Corn Salad, Penny Royal, Compass Plant, Rabbit Tobacco, Fringed Bluestar, Buckwheat, Barbara's Buttons, Seep Muhly, Drummond's Skulicop, Bluebonnet, Big Fruit Primrose, White-milk Wort, Blue-eyed Grass,	NA	No	No
99	Grassland	0.68	Mexican Plum, Aromatic Sumac	NA	NA	NA	Cedar Elm	Juniper spec.	NA	Prickly Pear Cactus	Artemisia spec., Bedstraw, Dropseed spec., Purple Paintbrush, Indian Grass, Engelmann's Daisy, Fringed Phacelia, Wild Onion, Blue-eyed Grass, Ten Petal Anemone, Snow on the Prairie Sundrops, Meadow Flax, American Basket-flower, Beebalm, Verbena Spec., Wood Vetch	Invaded prairie, potential restoration	No	No
100	Grassland	0.90	Gum Bumella, Elbow Bush, Aromatic Sumac	NA	NA	NA	NA	Juniper spec.	NA	Yucca, Prickly Pear Cactus, Mexican Buckeye	Bedstraw, Compass Plant, Storksbill, Engelmann's Sage, Carex spec. Arundo Donax, Pennyroyal, Wild Onion, Chervil, Blue Star, 1 unknown, Reverchon's Scurfpea, Rabbit Tobacco	NA	No	Yes
101	Grassland	0.73	Aromatic Sumac	NA	NA	NA	NA	NA	NA	Yucca, Prickly Pear Cactus	Prairie Dropseed, Greenthread spec., Indian Blanket, Storksbill, Texas Buckwheat, Four-nerve Daisy, Ten Petal Anemone, Prairie Verbena, Purple Paintbrush, Drummond's Onion, Bracted Spurge, Phyllanthus, Dwarf Plantain, Threeawn, Blue Star, Sun Drops, Rabbit Tobacco, Corn Salad, Chervil, Sage Spec., Engelmann's Daisy,	High Quality, ESA, SGN,	No	No
102	Grassland	0.68	Skunkbush, Prairie Leaf, Gum Bumella, Hackberry	Mesquite	NA	NA	NA	NA	NA	Yucca, Prickly Pear Cactus	Bluebonnet, Purple Paintbrush, Cloth-of-gold, Drummond's Onion, Ten Petal Anemone, Four-nerve Daisy, Flax, Thistle, Sideoats Grama, Johnson Grass, Roadside Gaura, Dakota Mock Vervain, Storksbill, Plantain spec, Engelmann's Daisy,	NA	No	No

Point Number	Habitat Type	Final Score	Berry	Drupe	Legume Pod	Acorn	Nut	Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Notes	Trout Lily Present yes/No	Reverchon's Skurfpea Present yes/no
103	Grassland	0.78	Toothache Tree, Poison Ivy, Roughleaf Dogwood		NA	NA	NA		American Elm	NA	NA	NA	Prairie Parsley, Ragweed, Vetch spec., Thistle, Germander, Queen's Delight, Geranium, 2 Sedge spec., Little Bluestem, Ten Petal Anemone, Bluebonnet, Euphorbia, Reticulated-seeded Spurge, Eastern Gamagrass	NA	No	No
104	Upland Forest	0.55	Polson Ivy, Gum Bumelia, Glossy Privet, Roughleaf Dogwood, Hackberry, Greenbriar, Serviceberry, plum		Honey Locust	NA	NA		NA	NA	NA	Prickly Pear Cactus	Ten Petal Anemone, Carrot spec., Scurf Pea, unknown grass, Avens spec., Clover spec., Germander, Prairie Parsley, Vetch spec	NA	No	No
105	Grassland	0.69	Hackberry, Elbow Bush, Polson Ivy, Glossy Privet, Roughleaf Dogwood, Greenbriar, Stretchberry, Gum Bumelia		NA	NA	NA		Cedar Elm	Juniper spec.	NA	Prickly Pear Cactus	Common Spikerush, 2 Sedge spec., Queen's Delight, Germander, Texas Wintergrass, Cloth-of-gold, Crow Poison, Forget-me-not, Indian Grass, Little quaking-grass, Dakota Mock Vervain, Ragweed, Cranesbill, Seep Muhly, Thistle, Vetch spec	NA	No	No
106	Grassland	0.69	Hackberry, Gum Bumelia, Roughleaf Dogwood, Polson Ivy, Serviceberry		NA	NA	NA		NA	Juniper spec.	NA	Yucca, Prickly Pear Cactus	Great Plains Ragwort, Bluebonnet, Ten Petal Anemone, Texas Wintergrass, Chervil, Sedge spec., Clover spec., unknown grass, Vetch spec	NA	No	No
107	Grassland	0.76	NA		NA	NA	NA		NA	NA	NA	Prickly Pear Cactus, Yucca	Storksbill, Drummond's Onion, Engelmann's Daisy, Four-nerve Daisy, Woollywhite, Hairy Grama, Ten Petal Anemone, Texas Paintbrush, Purple Paintbrush, Cloth-of-gold, Bastard Caobage, unknown grama, threeawn, Little Bluestem, Sideoats Grama	NA	No	No
107A	Grassland	1.00	Toothache Tree		NA	NA	NA		NA	NA	NA	Yucca	Little Bluestem, Wild Lettuce, Ten Petal Anemone, Salvia Spec., Sedge Spec., Big Bluestem, Seep Muhly, Blue Eyed Star Grass, Thistle, Corn Salad, Engelmann's Daisy, Carrot Spec., Sedge Spec., Vetch spec	NA	No	No



Point Number	Habitat Type	Final Score	Berry	Drupe	Legume Pod	Acorn	Nut	Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Notes	Trout Lily Present yes/No	Reverchon's Skurfpea Present yes/no
108	Grassland	0.88	NA		NA	NA	NA	NA	NA	NA	NA	Yucca	Little Bluestem, Seep Muhly, Dakota Mock Vervain, Blue Star, Crow Poison, Gayfeather, Salvia spec., unknown grass, Engelmann's Daisy, Four-nerve Daisy, Nettle, Corn Salad, Chervil, Coreopsis spec., Compass Plant	NA	No	No
109	Grassland	0.68	Dewberry,	Hackberry	Mesquite, Honey Locust	NA	NA	NA	NA	NA	NA	Buttonbush	Switchgrass, Eryngo spec., Plantain Spec., Speedwell, Drummond's Onion, Crow Poison, Cloth-of-gold, Corn Salad, Wild Lettuce, Engelmann's Daisy, Vetch spec	NA	No	No
110	Grassland	0.85	Skunkbush, Gum Bumelia		NA	NA	NA	NA	NA	NA	NA	Yucca, Prickly Pear Cactus,	Sideoats Grama, Engelmann's Daisy, Four-nerve Daisy, Cloth-of-gold, Dakota Mock Vervain, Drummond's Onion, Seep Muhly, Flax, Bluebonnet, Crow Poison, Corn Salad, Partridge PEa, Thistle, Gayfeather, Purple Paintbrush	NA	No	No
111	Grassland	0.71	NA		NA	NA	NA	NA	NA	NA	NA	Yucca,	Little Bluestem, Hairy Grama, Four-nerve Daisy, Drummond's Onion, Tickseed, Blue-eyed Grass, unknown clump grass, Ten Petal Anemone, Engelmann's Daisy, Storksbill,	NA	No	No
112	Grassland	0.78	NA		Mesquite	NA	NA	NA	Cedar Elm	NA	NA	Prickly Pear Cactus	Blue Star, Gayfeather, Sideoats Grama, Little Bluestem, Drummond's Onion, Cloth-of-gold, Corn Salad, Thistle, Wild Lettuce, Ten Petal Anemone, Tickseed,	No Invasives	No	No
113	Grassland	0.92	Skunkbush,		NA	NA	NA	NA	Prickly Ash	Ashe Juniper	NA	Yucca	Blue-eyed Grass, Corn Salad, Threeawn, Four-nerve Daisy, Bastard Cabbage, Cloth-of-gold, Ten Petal Anemone, Ceanothus spec., Panicum Grass, Drummond's Onion, unknown fall grass, Tickseed, Little Bluestem, Hairy Grama, Engelmann's Daisy	NA	No	No
114	Grassland	0.71	NA		NA	NA	NA	NA	NA	NA	NA	Prickly Pear Cactus, Yucca	Blue Star, Drummond's Onion, Cloth-of-gold, Storksbill, Hairy Grama, Purple Paintbrush, Yarrow, Ten Petal Anemone, Corn Salad, Threeawn, Plantain spec., Tickseed, Thistle, Buffalo Grass	NA	No	No

Point Number	Habitat Type	Final Score	Berry/Drupe	Legume Pod	Acorn	Nut/Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Notes	Trout Lily Present yes/No	Reverchon's Skurpea Present yes/no
115	Riparian/B HF	0.52	Hackberry	Honey Locust	NA	NA	Cedar Elm	NA	NA	NA	2 types of grasses, Crow Poison, Miner Lettuce, Sedge spec., Dollar Weed, 1 unknown, Speedwell, Cranesbill, Geranium, Germander	Floodpool, large cottonwoods	No	No
116	Grassland	0.58	Gum Bumella, Skunk Bush,	False Indigo,	NA	NA	NA	NA	NA	NA	Switchgrass, King Ranch Bluestem, Rosinweed spec., Fringed Puccoon, Ten Petal Anemone, Vervain spec., Blue-eyed Grass, Daisy spec., Little Bluestem, Bushy Ligustrum, Corn Salad, Engelmann's Daisy, Beggarslice, Sideoats Grama	NA	No	No
117	Grassland	0.69	Hackberry	Honey Locust	NA	NA	Cedar Elm	NA	NA	Prickly Pear Cactus	Little Bluestem, Skullcap, Corn Salad, Cloth-of-gold, Engelmann's Daisy, Dakota Mock Vervain, Germander, Chervil, Dalls Grass, Geranium, Plantain Spec., Thistle, Tickseed, Vetch	NA	No	No
117A	Riparian/B HF	0.58	Hackberry, Carolina Snailseed,	Honey Locust	NA	Oak spec.,	Cedar Elm	NA	NA	NA	Chervil, Clover, Sedge Spec., Forget-me-not, Germander, Inland Sea Oats, Geranium, Bedstraw, 2 Clover Spec., Fleabane, Corn Salad, Vetch spec	NA	No	No
118	Grassland	0.73	Skunk Bush, Serviceberry, Gum Bumella, Toothache	NA	NA	NA	Cedar Elm	Ashe Juniper	NA	Yucca	Blue Star, Crow Poison, Onion spec., Blue-eyed Grass, Daisy spec., Compass Plant, Corn Salad, Standing Cypress, Texas Grama, Little Bluestem,	Has good prairie species	No	No
119	Grassland	0.20	NA	NA	NA	NA	NA	NA	NA	NA	Purple Paintbrush, Bluebonnet, Texas Paintbrush, Roadside Gaura, Cloth-of-gold, Storksbill, Standing Cypress, Grama spec.,	NA	No	No
120	Grassland	0.46	Hackberry	NA	NA	NA	NA	NA	NA	Prickly Pear Cactus	Bushy Bluestem, Vervain spec., Sunflower, Johnson Grass, Corn Salad, Parsley, Thistle, Aster Spec., Cypress Spurge, Vetch spec	NA	No	No
121	Grassland	0.73	Sumac spec., Greenbriar, Western White Honeysuckle, Stretchberry	Mesquite	NA	NA	Cedar Elm	Ashe Juniper, Eastern Redcedar	NA	Prickly Pear Cactus	Burr Clover, Vetch spec., Thistle, Engelmann's Daisy, Dakota Mock Vervain, Carrot Spec., Wild Parsley, King Ranch Bluestem, Ten Petal Anemone, Ceanothus spec.	NA	No	No

Point Number	Habitat Type	Final Score	Berry Drupe	Legume Pod	Acorn	Nut Nutlike	Samara	Cone	Achene	All Others	Herbaceous Species	Notes	Trout Lily Present yes/No	Reverchon's Skurfpea Present yes/no
122	Grassland	0.37	NA	NA	NA	NA	NA	NA	NA	NA	Bluebonnet, Bastard Cabage, Engelmann's Daisy, Roadside Gaura, Crow Poison, Wild Parsley, Introduced Brome, Field Madder, Cloth-of-gold, Introduced Thistle, Moth Vervain, Vetch spec	NA	No	No
123	Grassland	0.92	Western Soapberry, Yaupon, Mustang Grape, Gum Bumelia, Virginia Creeper, Hackberry, Greenbriar	Honey Locust	Live Oak, Shumard Oak	NA	Cedar Elm	Ashe Juniper	NA	Prickly Pear Cactus	Bedstraw, Corn Salad, Wild Carrot, Geranium, Hedge Parsley, Wild Lettuce, Plantain, Germander, Wild Rye, Oxalis spp., Purple Top	Good understory	No	No
124	Riparian/B HF	0.62	Mistletoe, Grape spec., Hackberry, Greenbriar, Poison Ivy, Gum Bumelia,	Honey Locust	Red Oak, Live Oak Pecan		Winged Elm, Cedar Elm	NA	NA	unknown, Prickly Pear Cactus	Ten Petal Anemone, Chervil, Avens spec., Plantain spec., 2 grasses, Thistle, Mullein spec., Sunflower, Clover spec., Queen's Delight, Corn Salad, Bedstraw, Vervain Spec., Johnson Grass, Vetch spec	NA	No	No

## Attachment B: Benbrook Lake WHAP Point Photographs

Benbrook Lake #: 1

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 2

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 2A

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 3

Facing North



Facing East



Facing West



Facing South





Benbrook Lake #: 6

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 7

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 8

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 9

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 9A

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 10

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 11

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 12

Facing North



Facing East



Facing West



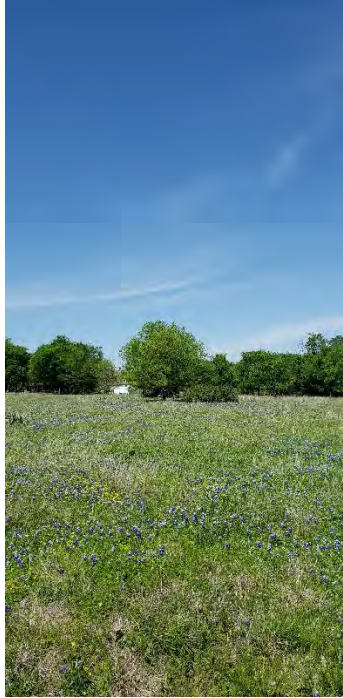
Facing South





Benbrook Lake #: 13

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 15

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 16

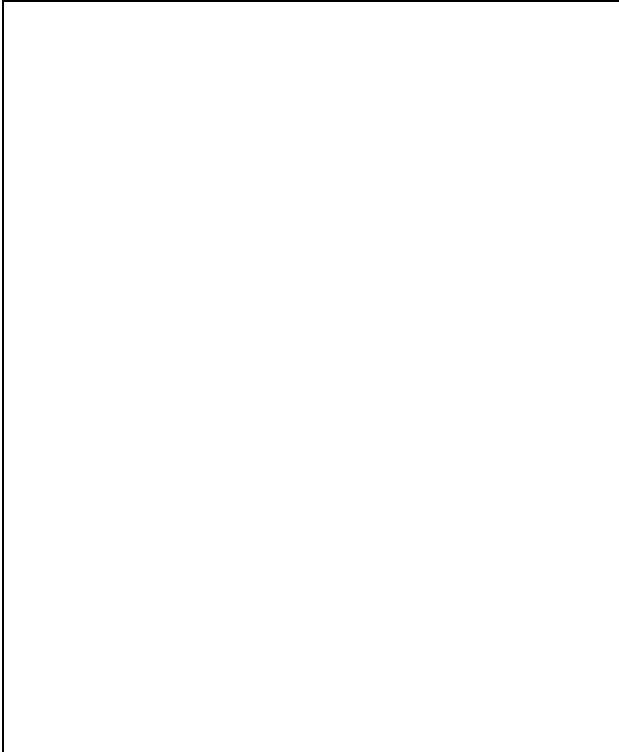
Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 17

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 18

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 19

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 20

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 22

Facing North



Facing East



Facing West



Facing South





Benbrook Lake #: 23

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 24

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 25

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 26

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 27

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 29

Facing North



Facing East



Facing West

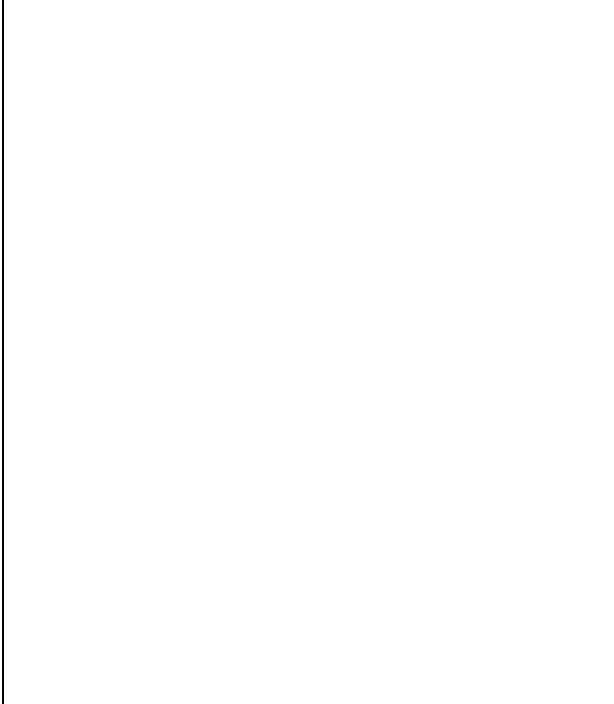


Facing South



Benbrook Lake #: 30

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 31

Facing North



Facing East



Facing West



Facing South





Benbrook Lake #: 32

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 33

Facing North



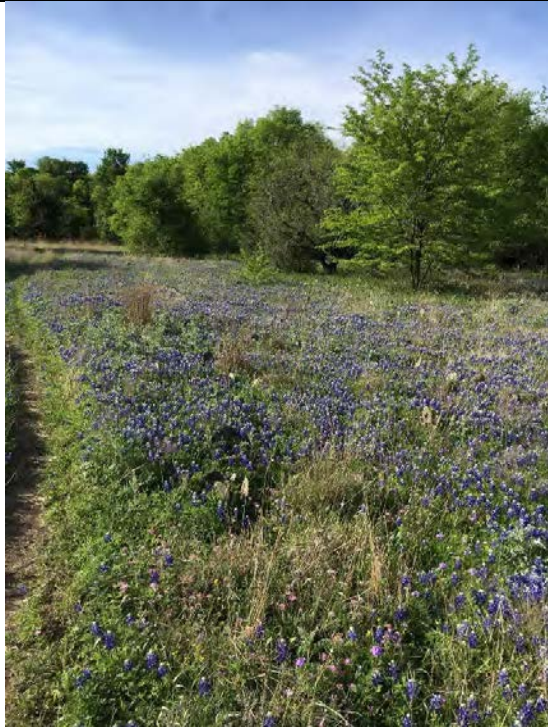
Facing East



Facing West



Facing South

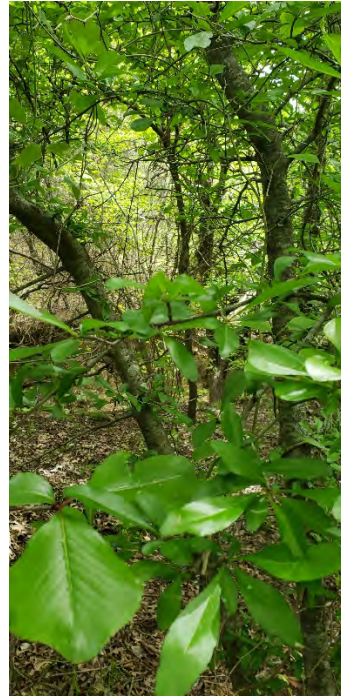


Benbrook Lake #: 35

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 37

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 38

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 41

Facing North



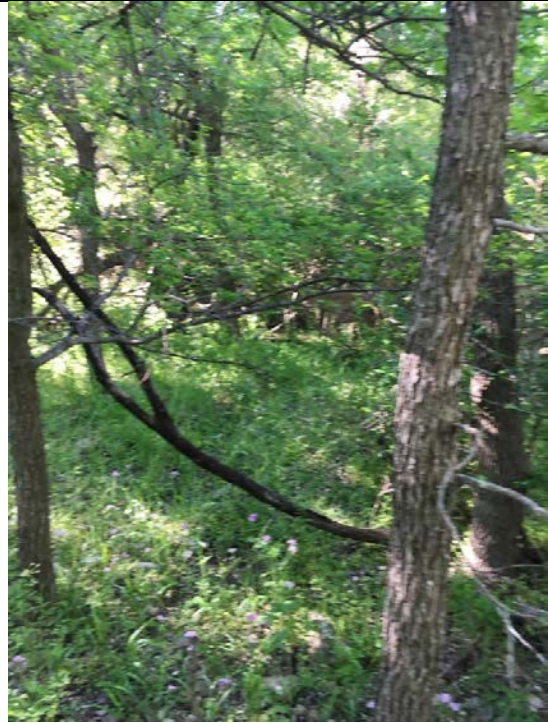
Facing East



Facing West



Facing South



Benbrook Lake #: 42

Facing North



Facing East



Facing West

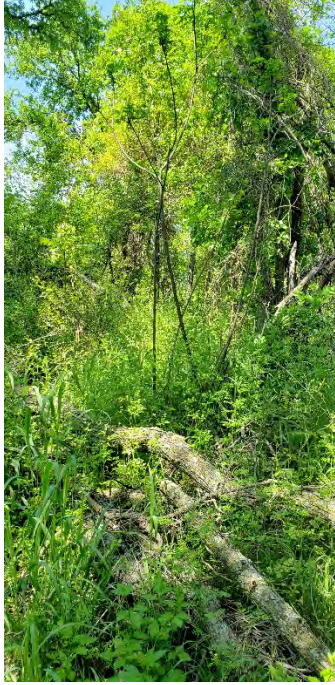


Facing South

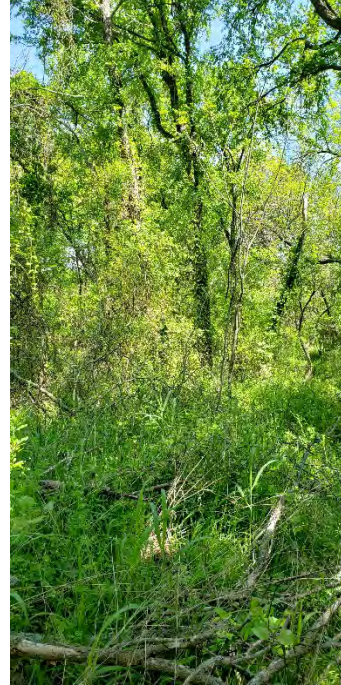


Benbrook Lake #: 43

Facing North



Facing East



Facing West



Facing South





Benbrook Lake #: 44

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 45

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 46

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 47

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 48

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 50

Facing North



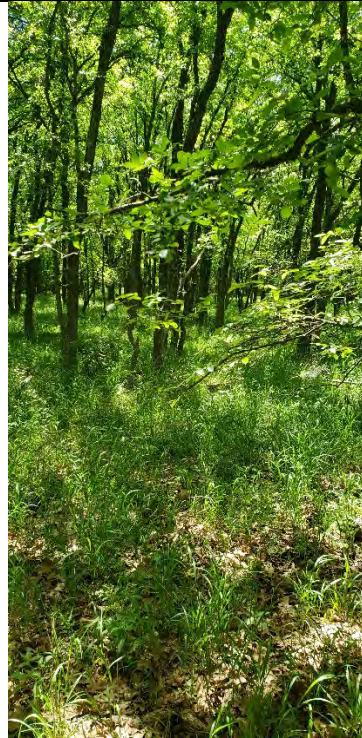
Facing East



Facing West



Facing South



Benbrook Lake #: 51

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 52

Facing North



Facing East



Facing West



Facing South





Benbrook Lake #: 53

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 54

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #:55

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #:57

Facing North



Facing East



Facing West



Facing South

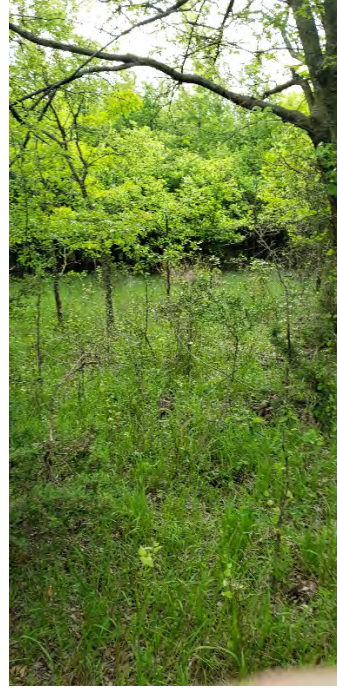


Benbrook Lake #:58

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #:59

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #:60

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #:61

Facing North



Facing East



Facing West



Facing South





Benbrook Lake #:62

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #:63

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #:64

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #:65

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #:66

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #:67

Only Picture



Benbrook Lake #:68

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #:70

Facing North



Facing East



Facing West



Facing South







Benbrook Lake #:71

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #:72

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #:73

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #:74

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #:75

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #:76

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #:77

Facing North



Facing East



Facing West



Facing South





Benbrook Lake #:78

Facing North



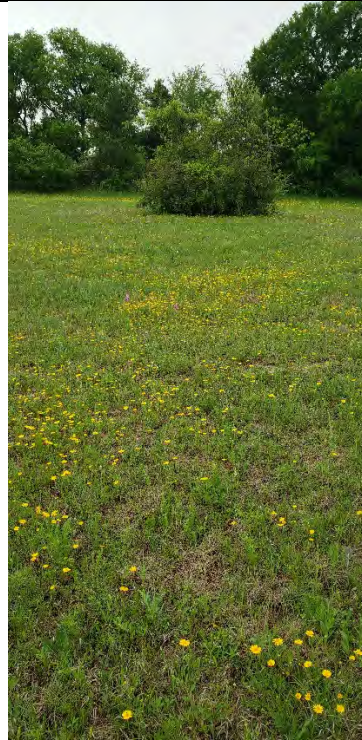
Facing East



Facing West



Facing South



Benbrook Lake #:79

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #:80

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #:81

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #:81A

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #:82

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #:83

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #:84

Facing North



Facing East



Facing West



Facing South





Benbrook Lake #:85

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #:86

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #:87

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #:88

Facing North



Facing East



Facing West



Facing South

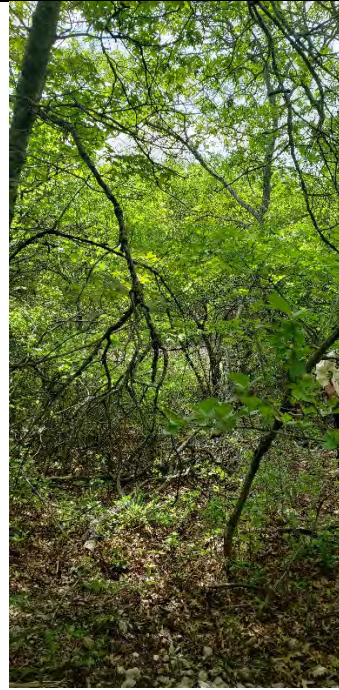


Benbrook Lake #:89

Facing North



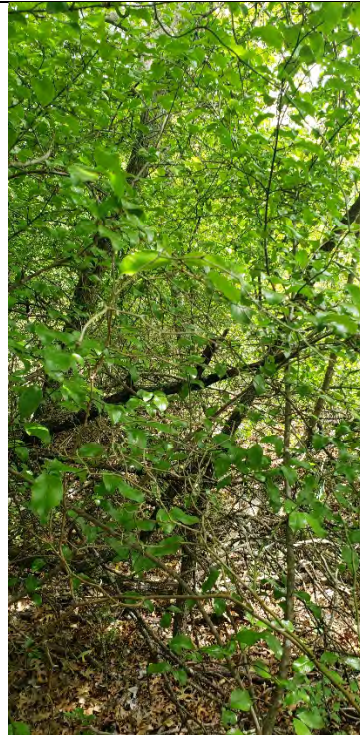
Facing East



Facing West



Facing South



Benbrook Lake #:90

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #:90A

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #:91

Facing North



Facing East



Facing West



Facing South





Benbrook Lake #:92

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #:93

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #:95

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #:96

Facing North



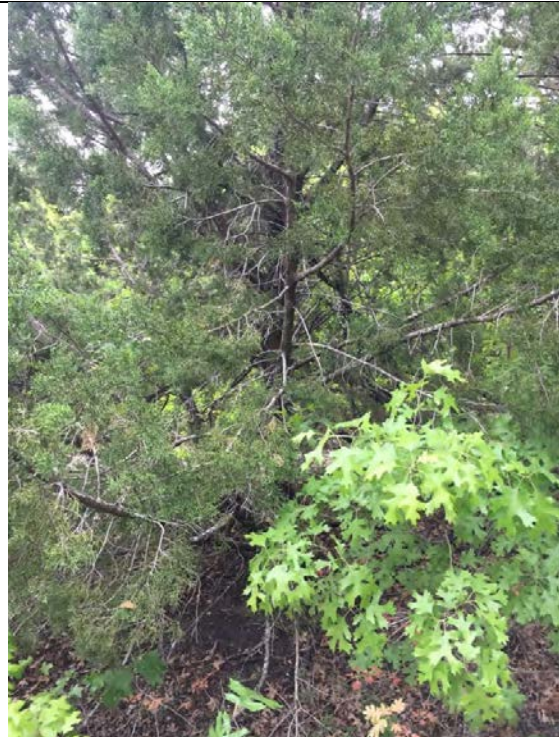
Facing East



Facing West



Facing South



Benbrook Lake #:97

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #:98

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #:99

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #:100

Facing North



Facing East



Facing West



Facing South





Benbrook Lake #:101

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #:102

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 103

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 104

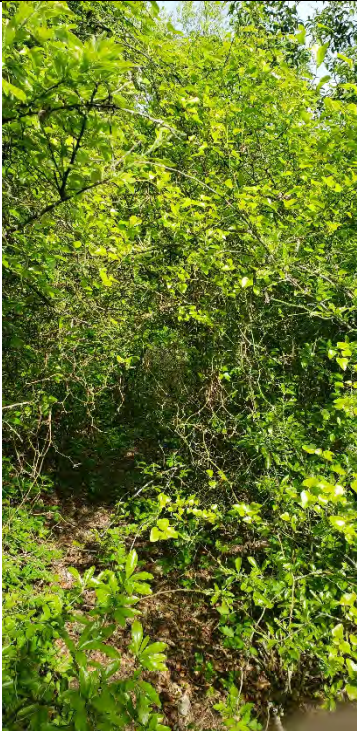
Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 105

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 106

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 107

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 107A

Facing North



Facing East



Facing West



Facing South





Benbrook Lake #: 108

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 109

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 110

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 111

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 112

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 113

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 114

Facing North



Facing East



Facing West



Facing South

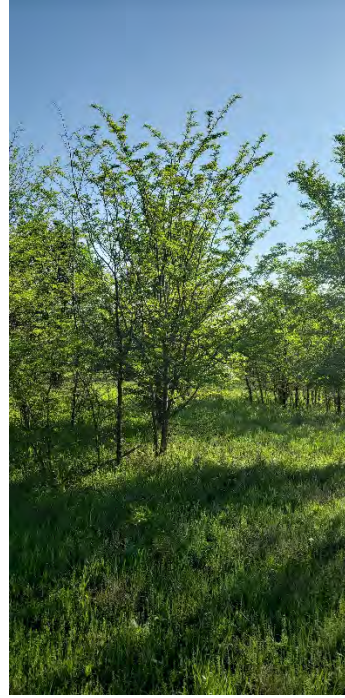


Benbrook Lake #: 115

Facing North



Facing East



Facing West



Facing South





Benbrook Lake #: 116

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 117

Facing North



Facing East



Facing West

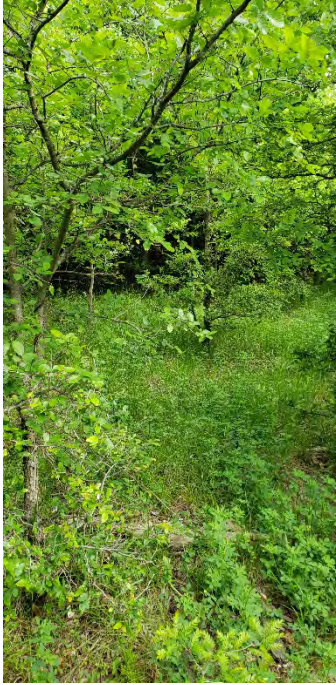


Facing South



Benbrook Lake #: 117A

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 118

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 119

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 120

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 121

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 122

Facing North



Facing East



Facing West



Facing South





Benbrook Lake #: 123

Facing North



Facing East



Facing West



Facing South



Benbrook Lake #: 124

Facing North



Facing East



Facing West



Facing South



**PRAIRIE SURVEY SUMMARY REPORT FOR BENBROOK LAKE  
TARRANT COUNTY, TEXAS**



**July 2020**



**US Army Corps  
of Engineers** ®  
Fort Worth District

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## Introduction

Prairie assessments were conducted within U.S. Army Corps of Engineers' (USACE) fee-owned property at Benbrook Lake on October 7-11, 2019, using a modification of the United States Department of Agriculture (USDA) Line-point intercept alternative (LIA) (Herrick et al. 2005). This surveying effort ended with the culmination of 17 separate points of data being collected. Prairie survey point locations were selected based on data obtained from the Wildlife Habitat Appraisal Procedure (WHAP) survey conducted at Benbrook Lake in April 2019 as well as conferred with representatives from the Natural Resources Conservation Service (NRCS) that best represent the prairies that may be in the greatest conservation need.

The purpose of this report is to describe prairie quality within the USACE Benbrook Lake fee-owned property in Tarrant County, Texas. This report is being prepared by the USACE Regional Planning and Environmental Center (RPEC) to provide prairie quality information and for long-term land management decisions and as well for the 2020 Benbrook Lake Master Plan Revision.

## Study Area

USACE fee owned property at Benbrook Lake, approximately 8,745 acres, is located within the Fort Worth metroplex in north central Texas. More specifically, the lake sits primarily between the cities of Fort Worth and Benbrook, Texas within the Cross Timbers ecoregion. Benbrook Lake lies on the Clear Fork of the Trinity River. The major tributaries to the Clear Fork are the South Fork, Bear Creek, Mustang Creek, Rock Creek and Squaw Creek. Downstream of the Benbrook Lake dam, the Clear Fork meanders through numerous low water dams until its confluence with the West Fork of the Trinity River.



## Methodology

An interagency team of NRCS and USACE natural resources specialists, biologists, and volunteers conducted the prairie surveys on October 7-11, 2019. A modification of USDA Line-point alternative (LIA) was used to analyze and describe the prairie conditions by using a similarity scoring index.

The similarity scoring index is based on the maximum number of species of plants that the 17 survey sites have in common with each other, which is 31 (9 sites). This number is then divided into each individual transect area survey site total species diversity number, which then gives the similarity score for that site.

### Line-point alternative (LIA) Procedures

The modified LIA requires evaluating species density and diversity present within an area of interest. For this project, a search area of 30ft from the 150 ft transect tape was surveyed to compile a list of plant species occurring at each site (transect area) and to complete the Benbrook Point Drop Form. Field data collected on the Point Drop Form at each site included collecting the following component data:

1. Distance from the 0ft mark?

2. What is the pen touching at this layer?
3. And pending on what is being touched, it can further ask what kind of soil, and what kind of plant? Then after answering what kind of plant, it will ask what specific species is present.
4. How tall is this layer?

The transect tape was laid out to capture the greatest degree of difference in topography, if the area was on relatively flat land then the transect tape was laid to sample the greatest degree in species diversity.



Field data collected on the Transect Area Form at each site included the following components:

1. GPS coordinates
2. North, East, South, and West photos
3. Layout of the transect tape on a map
4. What kind of topography does the transect lie on starting at the 0ft mark?
5. ID all the plants within 30ft of the 150ft transect, these are grouped into 5 different plant groups.

## Results and Discussion

From the analysis done for Figures 1-5, it was determined that the sites had:

- an average score of 0.83
- leaf litter the prominent cover for the base layer
- most points have 4 layers
- average height of the vegetation is 24.5 inches
- forbs constitute the greatest number of species

Because the scoring index is based on diversity, the points surveyed constitute some of the highest scoring prairies for Benbrook Lake, and there only 17 sites were surveyed, no correlation could be determined that would cause an increase and decrease in the similarity score as seen in Appendix A.

Figure 1. Similarity Score		
Average	Minimum	Maximum
0.83	0.55	1

<b>Figure 2. First Layer Cover Type Composition</b>	
<b>Cover Type</b>	<b>Percentage</b>
Exposed Soil	15%
Leaf Litter	56%
Plants (Alive)	28%
Rock (Broken)	1%

<b>Figure 3. Count of Drop Points With Various Number of Layers</b>	
<b>Layer</b>	<b>Count</b>
1 layer	22
2 layers	24
3 layers	47
4 layers	51
5 layers	29
6 layers	8
7 layers	6
8 layers	1



<b>Figure 4. Layer Height (in.)</b>			
	<b>Average</b>	<b>Minimum</b>	<b>Maximum</b>
1st layer	13.6	1	38
2nd layer	15.1	1	40
3rd layer	18.8	8	40
4th layer	24.5	7	50
5th layer	29.6	17	96
6th layer	27	18	33
7th layer	27.5	21	36
8th layer	20	20	20

<b>Figure 5. Transect Area Species Diversity</b>			
	<b>Average</b>	<b>Minimum</b>	<b>Maximum</b>
Grass	9.3	6	13
Cactus & Yucca Species Count	1.4	0	3
Forb Species Count	29	21	39
Shrub And Vine Species Count	1.1	0	4
Tree Species Count	3.3	1	6



## Summary

In summary, using the modification of USDA Line-point alternative (LIA) analyses, survey teams were able to sample the predetermined selected points throughout USACE Benbrook Lake fee-owned project lands. This resulted in an overall prairie evaluation that has revealed that the various specific characteristics of individual pocket prairies at Benbrook Lake.

## Recommendations

Even with planned and unplanned disturbances, there are numerous areas of valuable prairie habitat remaining within Benbrook Lake project lands.

Based on the results of the prairie survey efforts, USACE now has better prairie quality information. This information will promote better long-term land management decisions and as well assist in planning for the Benbrook Lake Master Plan Revision.

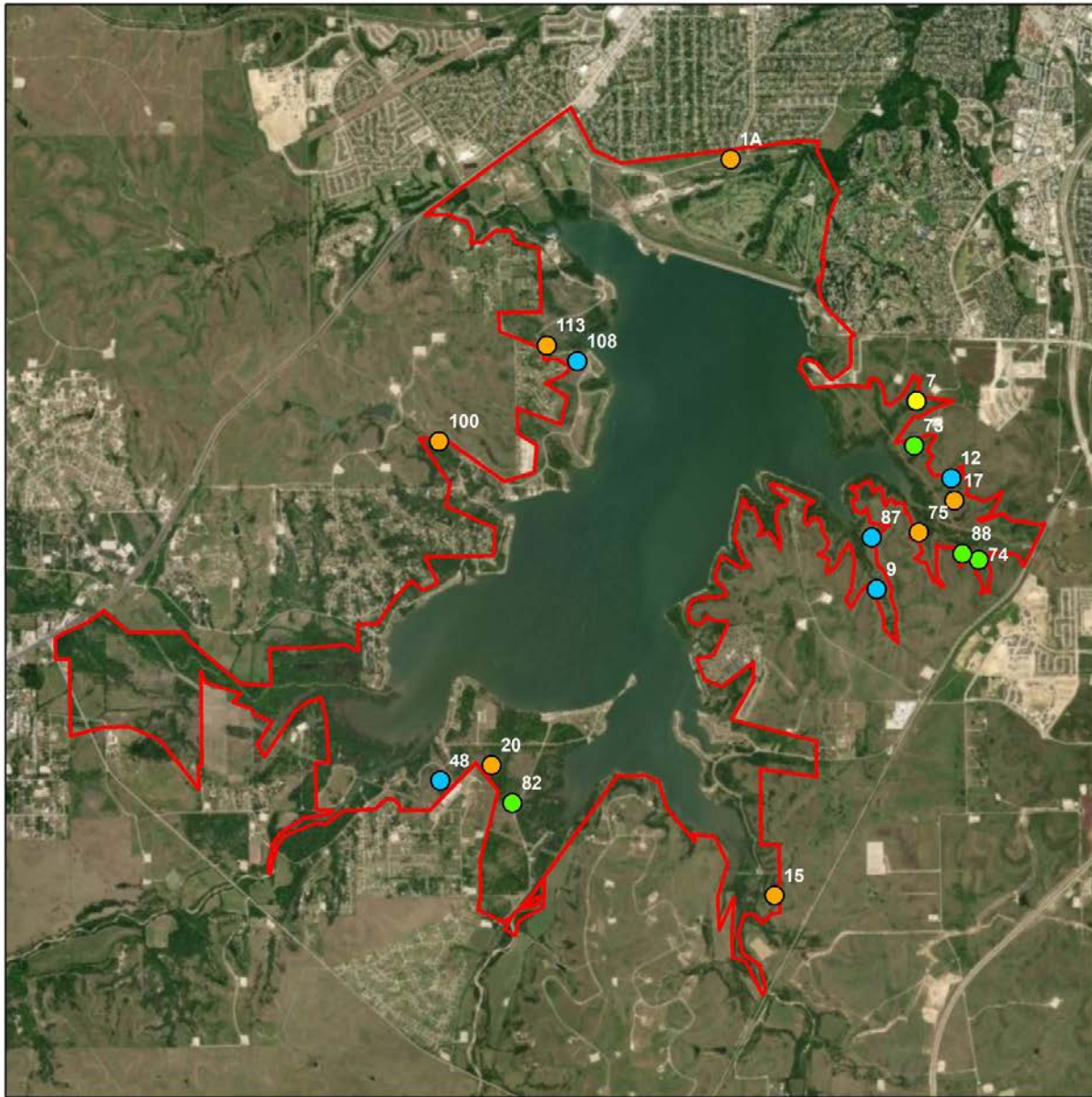


## References

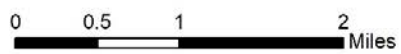
Herrick, Jeffrey E., Justin W. Van Zee, Kris M. Havstad, Laura M. Burkett, and Walter G. Whitford. 2005. "Monitoring Manual." In *Monitoring Manual for Grassland, Shrubland, and Savanna Ecosystems*, 2nd ed, 1: Core Me:1–200. Tucson, AZ: The University of Arizona Press



Appendix A: List of Possible Scoring Index Correlation Map and Figures.



**USACE Benbrook Lake Prairie Plant Similarity Score Range**



**Similarity Score Range**

- 0.50 - 0.70
- 0.71 - 0.80
- 0.81 - 0.90
- 0.91 - 1.00

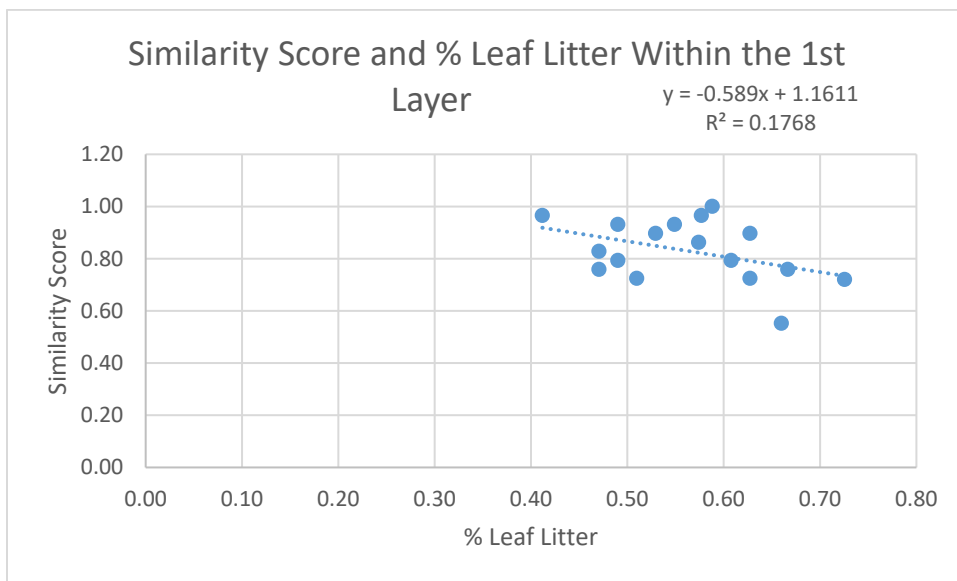
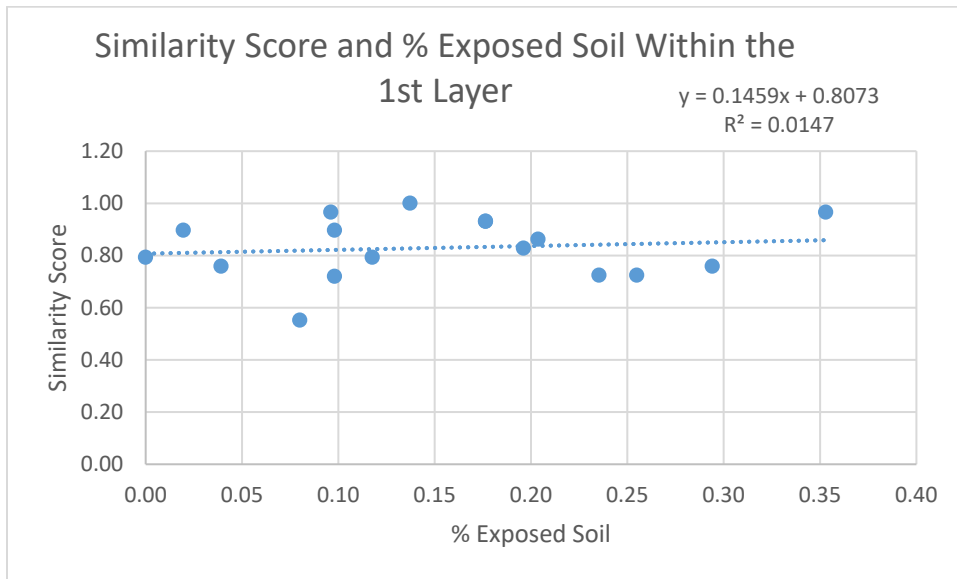
USACE Benbrook Lake Federal Fee Boundary

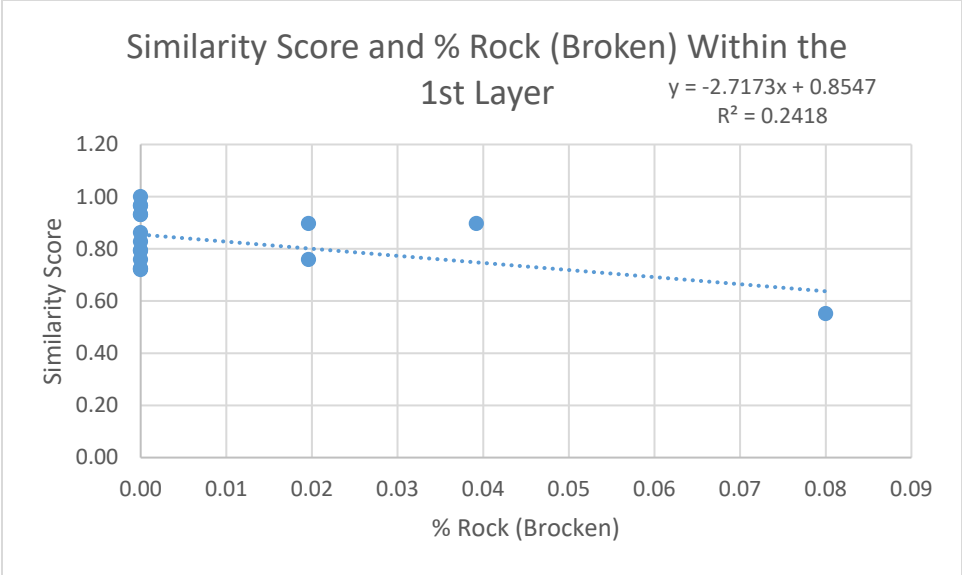
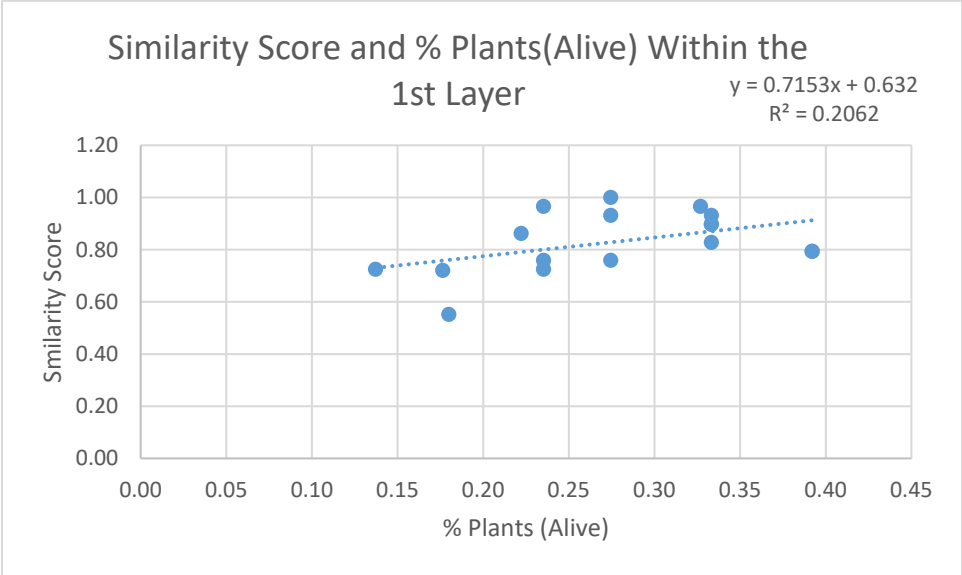


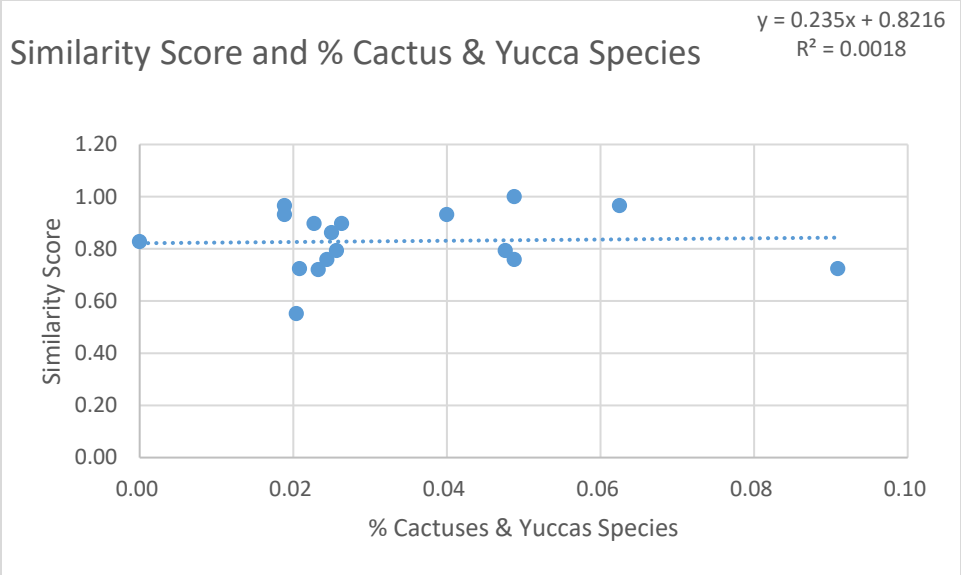
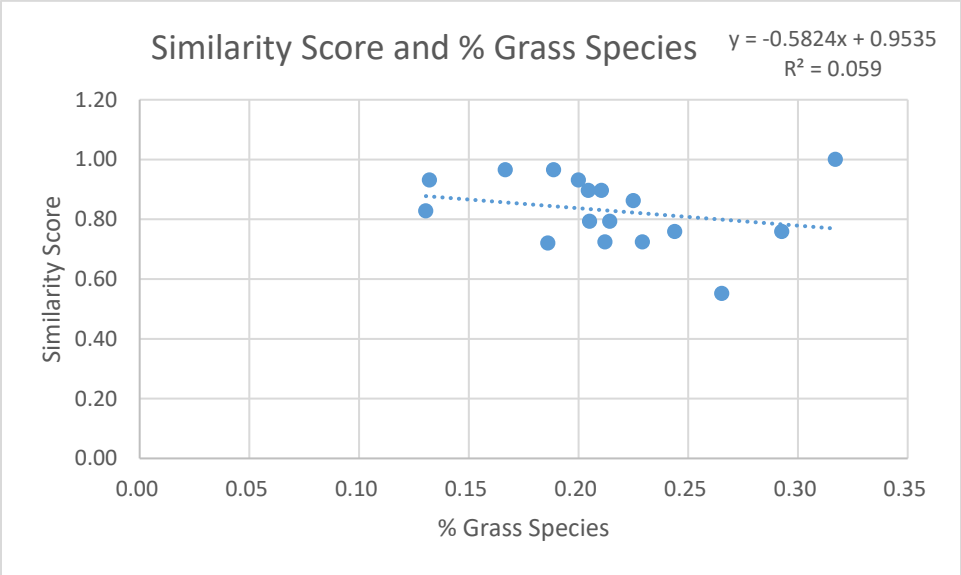
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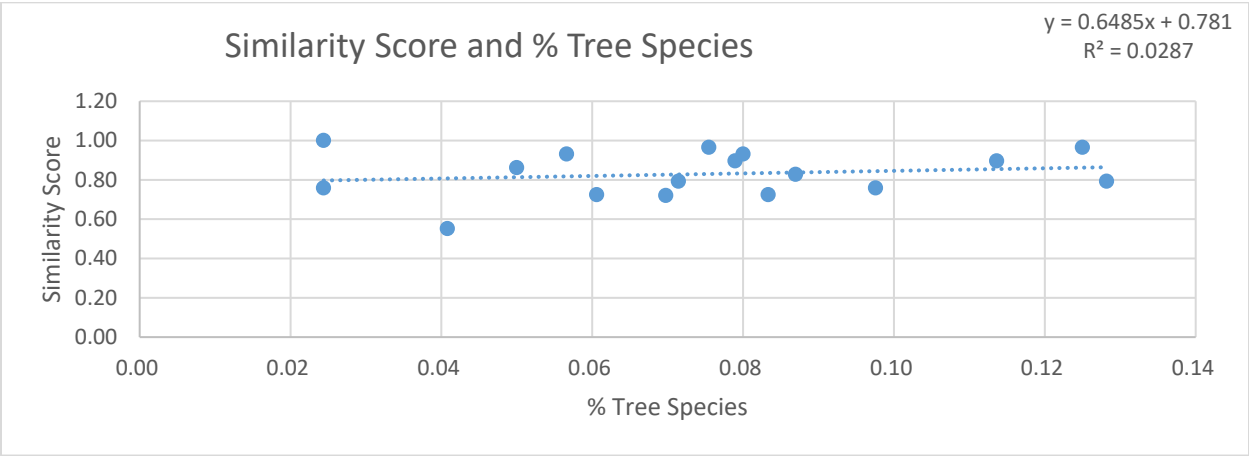
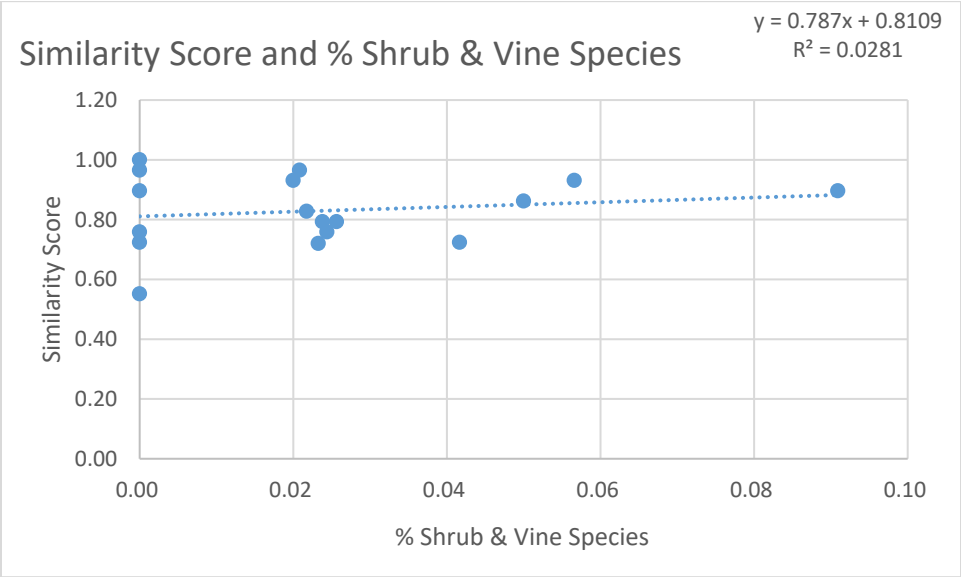
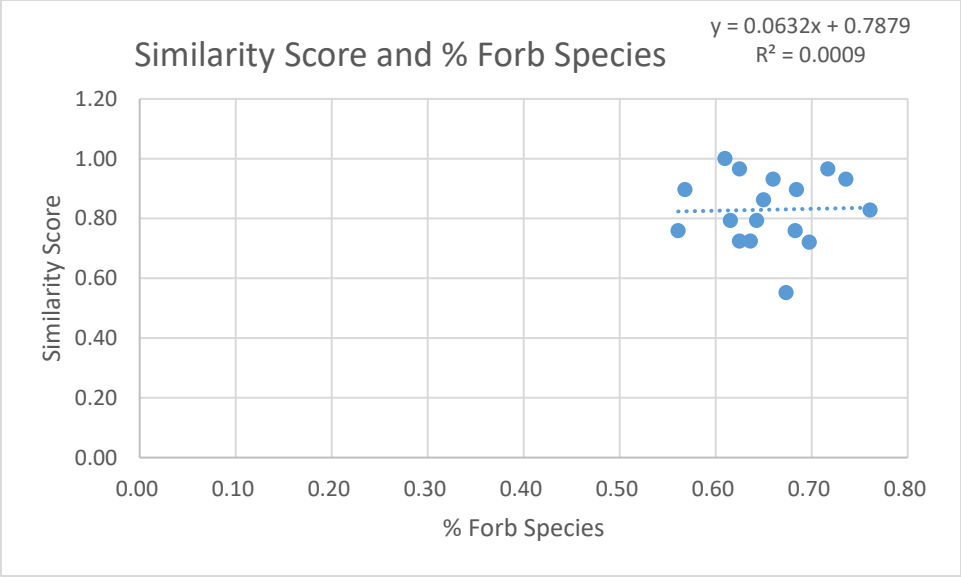


To determine if there is direct correlation between the similarity scores (independent variable) and various percent (%) of each given variable (dependent variable) occurrence, the slope of the fit line ( $y=$ ) was plotted. A steeper slope represents a more direct correlation, while a flatter slope less of a correlation. A degree of influence ( $R^2$ ) was determined to be able to rank each variable/correlation for comparison. The higher the number the more of a correlation between the given variable and the similarity score.











## Attachment A: Benbrook Lake Prairie Results Summary

Pt #	Distance from the Off mark	1st lyr cover type	Soil Type?	Plant type	Grass Spec.	Forbs spec	lyr hgt (in.) if last lyr	2nd lyr cover type	Plant type	Grass spec	Forbs spec	lyr hgt (in.) if last lyr	3rd lyr cover type	Plant type	Grass spec	Forbs spec	lyr hgt (in.) if last lyr	4th lyr plant type	Grass spec	Forbs spec	lyr hgt (in.) if last lyr	Similarity Index Score	
73	0	leaf litter						plants (aliv forb			Broomwee	15											
73	3	leaf litter																					
73	6	leaf litter																					
73	9	leaf litter																					
73	12	leaf litter																					
73	15	exposed sc loam						plants (aliv grass		Sideoats Grama			plants (aliv forbs			Wild Carro	8						
73	18	leaf litter																					
73	21	exposed sc loam																					
73	24	plants (alive)																					
73	27	plants (alive)																					
73	24	plants (alive)																					
73	27	exposed sc loam																					
73	30	leaf litter						plants (aliv forbs			Trailing Ratany/Prairie		plants (aliv forbs			IndianBlan	10						
73	33	leaf litter																					
73	36	leaf litter																					
73	39	exposed sc loam																					
73	39	exposed sc loam																					
73	42	leaf litter																					
73	45	leaf litter					1																
73	48	leaf litter																					
73	51	leaf litter																					
73	54	leaf litter																					
73	57	leaf litter																					
73	60	leaf litter						plants (aliv forbs			Indian Blanket/Blanke		plants (aliv grass		RescueBrome		forbs		WildCarrot	14			
73	63	leaf litter																					
73	66	exposed sc loam																					
73	69	leaf litter																					
73	72	plants (alive)																					
73	75	plants (alive)		forbs				Trailing Ratany/Prairie			Croton, Hotwort, Skur		plants (aliv forbs			Gaura/Gua	17						
73	78	leaf litter																					
73	81	leaf litter																					
73	84	exposed sc loam																					
73	87	plants (alive)																					
73	90	exposed sc loam						plants (aliv grass		Drummond's Dropseed			plants (aliv forbs			WildCarrot	14						
73	93	leaf litter																					
73	96	plants (alive)																					
73	99	plants (alive)																					
73	102	leaf litter																					
73	105	leaf litter						plants (aliv grass		Sideoats Grama			plants (aliv grass		Drummond'sDropseed		12						
73	108	leaf litter																					
73	111	leaf litter																					
73	114	leaf litter																					
73	117	leaf litter																					
73	120	exposed sc loam						plants (aliv grass		Drummond's Dropseed			plants (aliv forbs			WildCarrot	9						
73	123	plants (alive)																					
73	126	leaf litter																					
73	129	exposed sc loam																					
73	132	plants (alive)																					
73	135	plants (alive)		grass				Sideoats Grama					plants (aliv forbs		Trailing Ratany/Prairie		plants (aliv forbs		WildCarrot	13			
73	138	leaf litter																					
73	141	plants (alive)																					
73	144	exposed sc loam																					
73	147	leaf litter																					
73	150	leaf litter						plants (aliv grass		Sideoats Grama			plants (aliv grass		RescueBrome		grass		LittleBluestem	36			
Total Score																						0.86	

Pt #	Distance from the mark	1st lyr cover type	Soil Type?	Plant type	Grass Spec.	Forbs spec	lyr hgt (in.) if last lyr	2nd lyr cover type	Plant type	Grass spec	Forbs spec	lyr hgt (in.) if last lyr	3rd lyr cover type	Plant type	Grass spec	Forbs spec	lyr hgt (in.) if last lyr	4th lyr plant type	Grass spec	Forbs spec	lyr hgt (in.) if last lyr	5th lyr plant type	Forbs spec	lyr hgt (in.) if last lyr	Similarity Index Score
75	0	leaf litter						plants (aliv grass		Dropseeds/Cordgrass/Cord			Grass plants (aliv forb					grass				Japanese Brome	tree		96
75	3	plants (alive)		grass	Canada Wildrye																				
75	6	plants (alive)		grass	Little Bluestem																				
75	9	leaf litter																							
75	12	plants (alive)		grass	Dropseeds/Cordgrass/Cord																				
75	15	leaf litter						plants (aliv grass		Little Bluestem			plants (aliv grass		Canada Widrye			grass		Dropseeds/Cordgrass,				17	
75	18	plants (alive)		grass	Little Bluestem																				
75	21	plants (alive)		grass	Canada Wildrye																				
75	24	leaf litter																							
75	27	exposed sc clay loam																							
75	30	leaf litter						plants (aliv grass			Japanese Brome		plants (aliv forb			Wild Carro		22							
75	33	leaf litter																							
75	36	leaf litter																							
75	39	plants (alive)		grass	Indiangrass																				
75	42	leaf litter																							
75	45	plants (alive)		grass	Little Bluestem			plants (aliv forb			Wild Carro		30												
75	48	leaf litter																							
75	51	leaf litter																							
75	54	plants (alive)		grass	Little Bluestem																				
75	57	exposed sc clay loam																							
75	60	exposed sc clay loam						plants (aliv grass			Japanese Brome		plants (aliv forb			Indian Blanket/Blanke forb				Plantains		forb	Wild Carrots		17
75	63	exposed sc clay loam																							
75	66	leaf litter																							
75	69	leaf litter																							
75	72	leaf litter																							
75	75	plants (alive)		forb		unknown forb		plants (aliv grass		Dropseeds/Cordgrass/Cord			Grass plants (aliv forb			Leavenwor		17							
75	78	leaf litter																							
75	81	plants (alive)		forb		Croton, Hotwort, Skunkweed, etc.																			
75	84	exposed sc clay loam																							
75	87	exposed sc clay loam																							
75	90	plants (alive)		grass	Sideoats Grama			plants (aliv forb			Wild Carro		18												
75	93	exposed sc clay loam																							
75	96	leaf litter																							
75	99	leaf litter																							
75	102	leaf litter																							
75	105	exposed sc clay loam					1																		
75	108	leaf litter																							
75	111	leaf litter																							
75	114	exposed sc clay loam																							
75	117	exposed sc clay loam																							
75	120	exposed sc clay loam						plants (aliv grass		Dropseeds/Cordgrass/Cord			Grass plants (aliv forb			Gaura/Gua		11							
75	123	plants (alive)		cactuses & yuccas																					
75	126	exposed sc clay loam																							
75	129	leaf litter																							
75	132	exposed sc clay loam																							
75	135	exposed sc clay loam						plants (aliv forb			Gaura/Guara/Primros		plants (aliv grass			Japanese Brome		forb		Gaura/Gua				14	
75	138	leaf litter																							
75	141	leaf litter																							
75	144	exposed sc clay loam																							
75	147	leaf litter																							
75	150	leaf litter						plants (aliv forb			Gaura/Gua		6												
Total Score																								0.76	

Pt #	Distance from the Oft mark	1st lyr cover type	Soil Type?	Plant type	Grass Spec.	Forbs spec	Shrubs/vines spec	2nd lyr cover type	Plant type	Grass spec	Forbs spec	Shrubs/vines spec	3rd lyr cover type	Plant type	Grass spec	Forbs spec	Shrubs/vines spec	lyr hgt (in.) if last lyr	4th lyr plant type	Grass spec	Forbs spec	Shrubs/vines spec	lyr hgt (in.) if last lyr	5th lyr plant type	Grass spec	Forbs spec	lyr hgt (in.) if last lyr	Similarity Index Score		
74	0	leaf litter						plants (aliv forb)											11											
74	3	exposed sc clay loam																												
74	6	exposed sc clay loam																												
74	9	exposed sc clay loam																												
74	12	plants (alive)		forb			Gaura/Guara/Primrose/Sundrops/Pinkladies/False Gauras																							
74	15	leaf litter						plants (aliv grass)					Dropseeds/Cordgrass/Cord Grass plants (aliv forb)																	
74	18	leaf litter																												
74	21	leaf litter																												
74	24	exposed sc clay loam																												
74	27	leaf litter																												
74	30	plants (alive)		grass				Dropseeds/Cordgrass/Cord Grass plants (aliv forb)					Wild Carrots plants (aliv forb)																	
74	33	leaf litter																												
74	36	plants (alive)		grass				Dropseeds/Cordgrass/Cord Grass																						
74	39	leaf litter																												
74	42	plants (aliv)		grass				Sideoats Grama																						
74	45	plants (aliv)		grass				Sideoats Grama plants (aliv grass)					Japanese Brome plants (aliv forb)																	
74	48	exposed sc clay loam																												
74	51	leaf litter																												
74	54	leaf litter																												
74	57	plants (alive)						Dropseeds/Cordgrass/Cord Grass																						
74	60	exposed sc clay loam											plants (aliv forb)																	
74	63	exposed sc clay loam																												
74	66	leaf litter																												
74	69	leaf litter																												
74	72	plants (alive)		grass				Dropseeds/Cordgrass/Cord Grass																						
74	75	plants (alive)		grass				Dropseeds/Cordgrass/Cord Grass plants (aliv forb)																						
74	78	leaf litter																												
74	81	exposed sc clay loam																												
74	84	exposed sc clay loam																												
74	87	leaf litter																												
74	90	leaf litter											plants (aliv forb)																	
74	93	leaf litter																												
74	96	plants (alive)		grass				Little Bluestem																						
74	99	plants (alive)		grass				Sideoats Grama																						
74	102	plants (alive)		grass				Sideoats Grama																						
74	105	plants (alive)		forb				unknown forb plants (aliv grass)					Dropseeds/Cordgrass/Cord Grass plants (aliv forb)																	
74	108	leaf litter																												
74	111	plants (alive)		grass				Sideoats Grama																						
74	114	plants (alive)		grass				Dropseeds/Cordgrass/Cord Grass																						
74	117	plants (alive)		forb				unknown forb																						
74	120	leaf litter											plants (aliv grass)																	
74	123	plants (alive)		grass				Little Bluestem																						
74	126	leaf litter																												
74	129	plants (alive)		grass				Little Bluestem																						
74	132	leaf litter																												
74	135	leaf litter											plants (aliv grass)																	
74	138	exposed sc clay loam																												
74	141	leaf litter																												
74	144	leaf litter																												
74	147	leaf litter																												
74	150	leaf litter											plants (aliv forb)																	
Total Score																											0.83			

Pt #	Distance from the mark	1st lyr cover type	Soil Type?	Plant type	Grass Spec.	lyr hgt (in.) if last lyr	2nd lyr cover type	Plant type	Grass spec	Forbs spec	lyr hgt (in.) if last lyr	3rd lyr cover type	Plant type	Grass spec	Forbs spec	lyr hgt (in.) if last lyr	4th lyr plant type	Grass spec	Forbs spec	Tree spec	lyr hgt (in.) if last lyr	5th lyr plant type	Forbs spec	Shrubs/vines spec	lyr hgt (in.) if last lyr	Similarity Index Score
108	0	leaf litter					plants (aliv grass)		Dropseeds/Cordgrass/Cord			Grass plants (aliv forb)			Leavenworth	Eryngo	tree			Hercules C	42					
108	3	leaf litter																								
108	6	exposed sc clay loam																								
108	9	leaf litter																								
108	12	exposed sc clay loam																								
108	15	exposed sc clay loam					plants (aliv forb)			Aster Spec	15															
108	18	exposed sc clay loam																								
108	21	exposed sc clay loam																								
108	24	leaf litter																								
108	27	plants (alive)	grass		Purple Threeawn																					
108	30	exposed sc clay loam					plants (aliv forb)			Aster Spec	15															
108	33	exposed sc clay loam																								
108	36	plants (alive)	grass		Purple Threeawn																					
108	39	exposed sc clay loam																								
108	42	leaf litter																								
108	45	leaf litter					plants (aliv forb)			unknown forb		plants (aliv forb)			Gaura/Guara/Primros	grass	Fall Witchgrass				forb		Broomweed		18	
108	48	plants (alive)	grass		Seep Muhly																					
108	51	leaf litter																								
108	54	leaf litter																								
108	57	plants (alive)	grass		Seep Muhly																					
108	60	plants (alive)	grass		Seep Muhl	20																				
108	63	plants (alive)	grass		Seep Muhly																					
108	66	plants (alive)	grass		Seep Muhly																					
108	69	plants (alive)	grass		Seep Muhly																					
108	72	leaf litter																								
108	75	leaf litter					plants (aliv grass)		Seep Muhly			plants (aliv grass)		Scribner Panicum			forb			Wild Carrots		forb		Cuman Ragweed/Western		21
108	78	leaf litter																								
108	81	leaf litter																								
108	84	plants (alive)	grass		Seep Muhly																					
108	87	plants (alive)	grass		Seep Muhly																					
108	90	leaf litter					plants (aliv grass)		Seep Muhly			plants (aliv forb)			Wild Carrots		grass			Little Bluestem		11				
108	93	plants (alive)	grass		Seep Muhly																					
108	96	plants (alive)	grass		Seep Muhly																					
108	99	leaf litter																								
108	102	plants (alive)	grass		Little Bluestem																					
108	105	leaf litter					plants (aliv grass)		Seep Muhly			plants (aliv forb)			Japenese B		21									
108	108	leaf litter																								
108	111	plants (alive)	grass		Seep Muhly																					
108	114	leaf litter																								
108	117	plants (alive)	grass		Seep Muhly																					
108	120	plants (alive)	grass		Seep Muhl	14																				
108	123	leaf litter																								
108	126	plants (alive)	grass		Seep Muhly																					
108	129	leaf litter																								
108	132	leaf litter																								
108	135	leaf litter					plants (aliv grass)		Seep Muhly			plants (aliv forb)			Dotted Ga		15									
108	138	leaf litter																								
108	141	leaf litter																								
108	144	exposed sc clay loam																								
108	147	leaf litter																								
108	150	leaf litter					plants (aliv cactuses & yuccas)					plants (aliv grass)		Seep Muhly			12 forb			Wild Carrots		12				
Total Score																								0.93		

Pt #	Distance from the 0ft mark	1st lyr cover type	Soil Type?	Plant type	Grass Spec.	Forbs spec	2nd lyr cover type	Plant type	Grass spec	Forbs spec	lyr hgt (in.) if last lyr	3rd lyr cover type	Plant type	Grass spec	Forbs spec	Shrubs/vines spec	lyr hgt (in.) if last lyr	4th lyr plant type	Grass spec	Forbs spec	lyr hgt (in.) if last lyr	5th lyr plant type	Forbs spec	lyr hgt (in.) if last lyr	Similarity Index Score
88		0 rock (broken)					plants (aliv grass)		Little Bluestem			plants (aliv grass)		Dropseeds/Cordgrass/Cord Grass			13								
88		3 rock (broken)																							
88		6 exposed sc clay loam																							
88		9 exposed sc clay loam																							
88		12 leaf litter																							
88		15 exposed sc clay loam					plants (aliv forb)		Barbara's Buttons			plants (aliv grass)		Little Bluestem			13								
88		18 exposed sc clay loam																							
88		21 leaf litter																							
88		24 leaf litter																							
88		27 plants (alive)		forb					Gaura/Guara/Primrose/Sundrops/Pinkladies/False Gauras																
88		30 leaf litter					plants (aliv grass)		Dropseeds/Cordgrass/Cord Grass			plants (aliv grass)		Little Bluestem				forb		Texas Prairie Parsley		forb	Dotted Ga		23
88		33 exposed sc clay loam																							
88		36 plants (alive)		forb					Plantains																
88		39 leaf litter																							
88		42 plants (alive)		grass					Little Bluestem																
88		45 plants (alive)		grass			plants (aliv forb)			Gaura/Gu	18														
88		48 leaf litter																							
88		51 leaf litter																							
88		54 plants (alive)		grass					Little Bluestem																
88		57 leaf litter																							
88		60 plants (alive)		grass			plants (aliv grass)		Little Bluestem			plants (aliv forb)			White Heath Aster			grass		Little Bluestem				30	
88		63 leaf litter																							
88		66 plants (alive)		forb																					
88		69 plants (alive)		forb					Cuman Ragweed/Western Ragweed																
88		72 leaf litter																							
88		75 leaf litter					plants (aliv grass)		Little Bluestem			plants (aliv shrub/vine)				Brambles/Dewberry/	grass		Canada Wildrye			forb	American I		28
88		78 plants (alive)		grass					Little Bluestem																
88		81 leaf litter																							
88		84 leaf litter																							
88		87 plants (alive)		grass					Little Bluestem																
88		90 plants (alive)		grass			plants (aliv grass)		Little Bluestem			Dropseeds/Cordgrass/Cord Grass	plants (aliv shrub/vine)			Wild Mercury		grass		Scribner Panicum			forb	American I	36
88		93 leaf litter																							
88		96 leaf litter																							
88		99 leaf litter																							
88		102 plants (alive)		grass					Big Bluestem																
88		105 leaf litter					plants (aliv grass)		Little Bluestem																
88		108 plants (alive)		grass					Little Bluestem																
88		111 leaf litter																							
88		114 leaf litter																							
88		117 plants (alive)		grass					Little Bluestem																
88		120 leaf litter					plants (aliv grass)		Little Bluestem			plants	forb			Gaura/Guara/Primrose/Sundrop	grass		Scribner Panicum					12	
88		123 leaf litter																							
88		126 plants (alive)		grass					Little Bluestem																
88		129 plants (alive)		grass					Little Bluestem																
88		132 leaf litter																							
88		135 leaf litter					plants (aliv grass)		Dropseeds/Cordgrass/Cord Grass			plants (aliv forb)			unknown forb			grass		Little Bluestem				15	
88		138 leaf litter																							
88		141 leaf litter																							
88		144 leaf litter																							
88		147 plants (alive)		grass					Little Bluestem																
88		150 leaf litter					plants (aliv grass)		Dropseeds/Cordgrass/Cord Grass			plants (aliv forb)			Wild Carrots				forb		White Heath Aster		forb	American I	30

Total Score

0.9



Pt #	Distance from the 0ft mark	1st lyr cover type	Soil Type?	Plant type	Grass Spec.	Forbs spec	lyr hgt (in.) if last lyr	2nd lyr cover type	Plant type	Grass spec	Forbs spec	3rd lyr cover type	Plant type	Grass spec	Forbs spec	lyr hgt (in.) if last lyr	4th lyr plant type	Grass spec	Forbs spec	Shrubs/vines spec	lyr hgt (in.) if last lyr	5th lyr plant type	Grass spec	lyr hgt (in.) if last lyr	Similarity Index Score
17		0 leaf litter						1																	
17		3 leaf litter																							
17		6 plants (alive)		grass	Scribner Panicum																				
17		9 leaf litter																							
17		12 leaf litter																							
17		15 plants (alive)		grass	Little Bluestem		36																		
17		18 leaf litter																							
17		21 exposed sc loam																							
17		24 leaf litter																							
17		27 leaf litter																							
17		30 plants (alive)		grass	Sideoats Grama			plants (aliv forb)			Wild Carro	plants (aliv forb)			Asteraceae Spec.	25									
17		33 leaf litter																							
17		36 plants (alive)		forb		DottedGayfeather/BlazingStar																			
17		39 leaf litter																							
17		42 exposed sc loam																							
17		45 plants (alive)		grass	Little Bluestem			plants (aliv forb)			Blue Star/E	plants (aliv grass)		Little Bluestem			plants (aliv forb)			Broomwee		31	forb		
17		48 leaf litter																							
17		51 leaf litter																							
17		54 leaf litter																							
17		57 plants (alive)		grass	Little Bluestem																				
17		60 exposed sc loam						plants (aliv grass)		Little Bluestem		plants (aliv forb)					forb			Cuman Ragweed/Wes		40			
17		63 leaf litter																							
17		66 leaf litter																							
17		69 leaf litter																							
17		72 exposed sc loam																							
17		75 leaf litter						plants (aliv grass)		Sideoats Grama		plants (aliv grass)		Scribner Panicum			forb			Cuman Ragweed/Western Ragwe	grass		Little Blues	32	
17		78 leaf litter																							
17		81 leaf litter																							
17		84 leaf litter																							
17		87 exposed sc loam																							
17		90 leaf litter						plants (aliv grass)		Little Bluestem		plants (aliv forb)			Blue Sage/Salvia		grass		Little Bluestem			38			
17		93 plants (alive)		grass	Little Bluestem																				
17		96 leaf litter																							
17		99 leaf litter																							
17		102 exposed soil																							
17		105 leaf litter						plants (aliv grass)		Little Bluestem		plants (aliv forb)			Cuman Ragweed/West	23									
17		108 exposed sc loam																							
17		111 exposed sc loam																							
17		114 leaf litter																							
17		117 leaf litter																							
17		120 leaf litter						plants (aliv forb)			Asteraceae	plants (aliv grass)			Trailing Ratany/Prairie	27									
17		123 leaf litter																							
17		126 leaf litter																							
17		129 leaf litter																							
17		132 leaf litter																							
17		135 leaf litter						plants (aliv forb)			Cuman Raę	plants (aliv grass)			Japanese Brome	28									
17		138 exposed sc loam																							
17		141 exposed sc loam																							
17		144 exposed sc loam																							
17		147 exposed sc loam																							
17		150 leaf litter						plants (aliv grass)		Indiangrass		plants (aliv forb)			Cuman Ragweed/West	40									
Total Score																							0.72		



Pt #	Distance from the mark	1st lyr cover type	Soil Type?	Plant type	Grass Spec.	Forbs spec	lyr hgt (in.) if last lyr	2nd lyr cover type	Plant type	Grass spec	Forbs spec	lyr hgt (in.) if last lyr	3rd lyr cover type	Plant type	Grass spec	Forbs spec	lyr hgt (in.) if last lyr	4th lyr plant type	Grass spec	Forbs spec	lyr hgt (in.) if last lyr	5th lyr plant type	Forbs spec	Shrubs/vines spec	lyr hgt (in.) if last lyr	Similarity Index Score
9		0 exposed sc clay loam						leaf litter					1													
9		3 leaf litter																								
9		6 exposed sc clay loam																								
9		9 leaf litter																								
9		12 exposed sc clay loam																								
9		15 exposed sc clay loam						plants (aliv grass)		Little Bluestem			plants (aliv forb)			Gaura/Guara/Primros	grass			Japanese B				17		
9		18 leaf litter																								
9		21 leaf litter																								
9		24 plants (alive)		grass		Big Bluestem																				
9		27 leaf litter																								
9		30 plants (alive)		grass		Canada Wildrye		plants (aliv forb)			Noseburn		plants (aliv forb)			Amasonia	10									
9		33 leaf litter																								
9		36 leaf litter																								
9		39 leaf litter																								
9		42 plants (alive)		grass		Little Bluestem																				
9		45 plants (alive)		grass		Dropseeds/Cordgrass,		8																		
9		48 plants (alive)		grass		Big Bluestem																				
9		51 leaf litter																								
9		54 leaf litter																								
9		57 leaf litter																								
9		60 plants (alive)		grass		Little Bluestem		plants (aliv forb)			Indian Blanket/Blanke		plants (aliv forb)			Wild Carrots	grass		Little Bluestem					26		
9		63 leaf litter																								
9		66 exposed sc clay loam																								
9		69 exposed sc clay loam																								
9		72 exposed sc clay loam																								
9		75 exposed sc clay loam						plants (aliv grass)		Dropseeds/Cordgrass/Cord Grass		plants (aliv forb)				Wild Carrots	forb			GreenThre				16		
9		78 exposed sc clay loam																								
9		81 exposed sc clay loam																								
9		84 exposed sc clay loam																								
9		87 exposed sc clay loam																								
9		90 exposed sc clay loam						plants (aliv grass)		Purple Threeawn			plants (aliv forb)			GreenThread/Greentf	grass		Dropseeds/Cordgrass/Cord Grass	forb			Gaura/Guara/Primros		18	
9		93 exposed sc clay loam																								
9		96 exposed sc clay loam																								
9		99 plants (alive)		grass		Dropseeds/Cordgrass/Cord Grass																				
9		102 leaf litter																								
9		105 plants (alive)		grass		Dropseeds/Cordgrass/Cord Grass		plants (aliv grass)		Scribner Panicum		9														
9		108 exposed sc clay loam																								
9		111 exposed sc clay loam																								
9		114 plants (alive)		grass		Sideoats Grama																				
9		117 leaf litter																								
9		120 plants (alive)		forb		Nuttall's Sensitive-Bria		plants (aliv forb)			Blue Sage/Salvia		plants (aliv forb)			GreenThread/Greentf	forbs			Noseburn			forb		Broomwee	20
9		123 leaf litter																								
9		126 leaf litter																								
9		129 leaf litter																								
9		132 leaf litter																								
9		135 exposed sc clay loam						plants (aliv forb)			Hedeoma spec.		plants (aliv forb)			American E	20									
9		138 leaf litter																								
9		141 plants (alive)		grass		Canada Wildrye																				
9		144 leaf litter																								
9		147 leaf litter																								
9		150 plants (alive)		grass		Dropseeds/Cordgrass/Cord Grass		plants (aliv grass)		Canada Wildrye			plants (aliv grass)			Dropseeds/Cordgrass/Cord Grass	grass		Little Bluestem					22		
Total Score																								0.97		

Pt #	Distance from the 0ft mark	1st lyr cover type	Soil Type?	Plant type	Grass Spec.	Cactuses & yuccas spec	Forbs spec	Shrubs/vines spec	lyr hgt (in.) if last lyr	2nd lyr cover type	Plant type	Grass spec	Forbs spec	lyr hgt (in.) if last lyr	3rd lyr cover type	Plant type	Grass spec	Forbs spec	Shrubs/vines spec	lyr hgt (in.) if last lyr	4th lyr plant type	Forbs spec	Shrubs/vines spec	lyr hgt (in.) if last lyr	5th lyr plant type	Forbs spec	Shrubs/vines spec	lyr hgt (in.) if last lyr	6th lyr plant type	Forbs spec	lyr hgt (in.) if last lyr	Similarity Index Score				
87		0 plants (alive)		forb																																
87		3 leaf litter																																		
87		6 leaf litter																																		
87		9 exposed sc clay loam																																		
87		12 leaf litter																																		
87		15 plants (alive)		forb																																
87		18 leaf litter																																		
87		21 leaf litter																																		
87		24 leaf litter																																		
87		27 leaf litter																																		
87		30 plants (alive)		grass																																
87		33 leaf litter																																		
87		36 leaf litter																																		
87		39 leaf litter																																		
87		42 plants (alive)		grass		Little Bluestem																														
87		45 plants (alive)		grass		Little Bluestem			16																											
87		48 exposed sc clay loam																																		
87		51 leaf litter																																		
87		54 leaf litter																																		
87		57 exposed sc clay loam																																		
87		60 exposed sc clay loam																																		
87		63 plants (alive)		cactuses & yuccas		Prickly Pear Cactuses																														
87		66 exposed sc clay loam																																		
87		69 leaf litter																																		
87		72 exposed sc clay loam																																		
87		75 plants (alive)		grass																																
87		78 exposed sc clay loam																																		
87		81 leaf litter																																		
87		84 leaf litter																																		
87		87 exposed sc clay loam																																		
87		90 plants (alive)		grass		Little Bluestem																														
87		93 leaf litter																																		
87		96 leaf litter																																		
87		99 leaf litter																																		
87		102 leaf litter																																		
87		105 plants (alive)		grass		Dropseeds/Cordgrass/Cord Grass																														
87		108 leaf litter																																		
87		111 leaf litter																																		
87		114 leaf litter																																		
87		117 plants (alive)		shrub/vine																																
87		120 plants (alive)		forb																																
87		123 leaf litter																																		
87		126 leaf litter																																		
87		129 exposed sc clay loam																																		
87		132 leaf litter																																		
87		135 plants (alive)		grass		Little Bluestem																														
87		138 leaf litter																																		
87		141 leaf litter																																		
87		144 plants (alive)		grass		Carex/Sedge																														
87		147 leaf litter																																		
87		150 plants (alive)		grass		Carex/Sedge																														
Total Score																												0.93								

Pt #	Distance from the Oft mark	1st lyr cover type	Soil Type?	Plant type	Grass Spec.	Cactuses & yuccas spec	Forbs spec	Tree spec	2nd lyr cover type	Plant type	Grass spec	Forbs spec	3rd lyr cover type	Plant type	Grass spec	Forbs spec	lyr hgt (in.) if last lyr	4th lyr plant type	Forbs spec	lyr hgt (in.) if last lyr	5th lyr plant type	Forbs spec	lyr hgt (in.) if last lyr	6th lyr plant type	Forbs spec	7th lyr plant type	Forbs spec	lyr hgt (in.) if last lyr	Similarity Index Score	
15		0 plants (alive)		forb			American Basketflow		plants (ali\ grass		Sideoats Grama		plants (ali\ forb				Croton, Hotwort, Sku forb		DottedGay		27									
15		3 leaf litter																												
15		6 plants (alive)		grass		Little Bluestem																								
15		9 exposed s\ clay loam																												
15		12 plants (alive)		grass		Little Bluestem																								
15		15 leaf litter							plants (ali\ grass		Little Bluestem		plants (ali\ forb				GreenThread/Greent forb		DottedGayfeather/Bl forb				Indian Blai		18					
15		18 exposed s\ clay loam																												
15		21 exposed s\ clay loam																												
15		24 plants (alive)		grass		Dropseeds/Cordgrass/Cord Grass																								
15		27 plants (alive)		grass		Little Bluestem																								
15		30 leaf litter							plants (ali\ grass		Dropseeds/Cordgrass plants (ali\ forb						Croton, Hotwort, Sku forb		Trailing Ratany/Prairi forb				Japanese Brome		shrub/vine		forb	American Basketflo		24
15		33 leaf litter																												
15		36 leaf litter																												
15		39 exposed s\ clay loam																												
15		42 plants (alive)		grass																										
15		45 leaf litter							plants (ali\ grass		Dropseeds/Cordgrass plants (ali\ grass		Little Bluestem				15													
15		48 plants (alive)		grass		Dropseeds/Cordgrass/Cord Grass																								
15		51 exposed s\ clay loam																												
15		54 leaf litter																												
15		57 leaf litter																												
15		60 leaf litter							plants (ali\ forb			GreenThre plants (ali\ grass		Seep Muhly				forb		Gaura/Gu:		30								
15		63 plants (alive)		grass		Seep Muhly																								
15		66 leaf litter																												
15		69 leaf litter																												
15		72 leaf litter																												
15		75 plants (alive)		grass		Little Bluestem			plants (ali\ forb				Croton, Hc plants (ali\ forb					American Basketflow forb		Wild Carrc		22								
15		78 exposed s\ clay loam																												
15		81 leaf litter																												
15		84 exposed s\ clay loam																												
15		87 plants (alive)		grass		Little Bluestem																								
15		90 leaf litter							plants (ali\ grass		Seep Muhly		plants (ali\ forb				Blue Sage/Salvia		forb		New Jersey Tea/Inlan forb		Wild Carrots		forb	Indian Blai forb	Blue Star/Bluestar		31	
15		93 leaf litter																												
15		96 exposed s\ clay loam																												
15		99 exposed s\ clay loam																												
15		102 exposed s\ clay loam																												
15		105 leaf litter							plants (ali\ forb				New Jerse' plants (ali\ forb					GreenThread/Greent forb		Indian Blai		23								
15		108 plants (ali\ cactuses & yuccas				Prickly Pear Cactuses																								
15		111 leaf litter																												
15		114 leaf litter																												
15		117 leaf litter																												
15		120 leaf litter							plants (ali\ forb				unknown f plants (ali\ cactuses & yuccas				Prickly Pear Cactuses forb		Croton, Hotwort, Sku forb				GreenThread/Greent forb		Wild Carrc forb	Indian Blanket/Blan		21		
15		123 leaf litter																												
15		126 leaf litter																												
15		129 exposed s\ clay loam																												
15		132 leaf litter																												
15		135 exposed s\ clay loam							plants (ali\ forb				GreenThre plants (ali\ forb					Croton, Hotwort, Sku forb				18								
15		138 exposed s\ clay loam																												
15		141 leaf litter																												
15		144 leaf litter																												
15		147 plants (alive)										unknown forb																		
15		150 leaf litter							plants (ali\ grass		Seep Muhly		plants (ali\ forb					Croton, Hotwort, Sku forb		GreenThread/Greent forb			Indian Blai		18					
Total Score																											0.72			

Pt #	Distance from the mark	1st lyr cover type	Soil Type?	Plant type	Grass Spec.	Cactuses & yuccas spec	Forbs spec	lyr hgt (in.) if last lyr	2nd lyr cover type	Plant type	Grass spec	lyr hgt (in.) if last lyr	3rd lyr cover type	Plant type	Grass spec	Forbs spec	lyr hgt (in.) if last lyr	4th lyr plant type	Forbs spec	lyr hgt (in.) if last lyr	5th lyr plant type	Forbs spec	lyr hgt (in.) if last lyr	Similarity Index Score	
1A	0	leaf litter							plants (aliv grass)		Dropseed/Cordgrass/		plants (aliv grass)		Little Bluestem		40								
1A	3	exposed sc loam																							
1A	6	exposed sc loam																							
1A	9	plants (alive)		cactuses & yuccas		Yucca species																			
1A	12	leaf litter																							
1A	15	leaf litter							plants (aliv grass)		Little Bluestem		plants (aliv forb)			Wild Carro		22							
1A	18	leaf litter																							
1A	21	leaf litter																							
1A	24	leaf litter																							
1A	27	plants (alive)		grass		Little Bluestem																			
1A	30	leaf litter							plants (aliv grass)		Little Bluestem		plants (aliv forb)			Wild Carro		39							
1A	33	leaf litter																							
1A	36	leaf litter																							
1A	39	leaf litter																							
1A	42	leaf litter																							
1A	45	leaf litter							plants (aliv grass)		Little Bluestem		plants (aliv grass)			Japanese Brome		forb		Wild Carrots		forb	American E		27
1A	48	leaf litter																							
1A	51	exposed sc loam																							
1A	54	leaf litter																							
1A	57	leaf litter																							
1A	60	leaf litter							plants (aliv grass)		Big Blueste		24												
1A	63	leaf litter																							
1A	66	plants (alive)		grass		Little Bluestem																			
1A	69	leaf litter																							
1A	72	plants (alive)		grass		Little Bluestem																			
1A	75	leaf litter							plants (aliv grass)		Little Blues		40												
1A	78	leaf litter																							
1A	81	plants (alive)		grass		Little Bluestem																			
1A	84	leaf litter																							
1A	87	leaf litter																							
1A	90	leaf litter							plants (aliv grass)		Little Blues		25												
1A	93	leaf litter																							
1A	96	leaf litter																							
1A	99	exposed sc loam																							
1A	102	leaf litter																							
1A	105	leaf litter							plants (aliv grass)		Little Bluestem		plants (aliv forb)			Nuttall's Sensitive-Bria		forb		Dotted Gay		20			
1A	108	plants (alive)		grass		Little Bluestem																			
1A	111	leaf litter																							
1A	114	leaf litter																							
1A	117	leaf litter																							
1A	120	leaf litter							plants (aliv grass)		Little Bluestem		plants (aliv grass)		Sideoats Grama		8								
1A	123	plants (alive)		grass		Little Bluestem																			
1A	126	leaf litter																							
1A	129	leaf litter																							
1A	132	leaf litter																							
1A	135	leaf litter							plants (aliv grass)		Little Blues		28												
1A	138	leaf litter																							
1A	141	leaf litter																							
1A	144	plants (alive)		forb																					
1A	147	exposed sc loam																							
1A	150	plants (alive)		grass		Little Bluestem		7																	
Total Score																							0.72		



Pt #	Distance from the mark	1st lyr cover type	Soil Type?	Plant type	Grass Spec.	lyr hgt (in.) if last lyr	2nd lyr cover type	Plant type	Grass spec	Forbs spec	lyr hgt (in.) if last lyr	3rd lyr cover type	Plant type	Grass spec	Forbs spec	lyr hgt (in.) if last lyr	4th lyr plant type	Grass spec	Forbs spec	lyr hgt (in.) if last lyr	5th lyr plant type	Grass spec	Forbs spec	lyr hgt (in.) if last lyr	6th lyr plant type	Grass spec	Forbs spec	lyr hgt (in.) if last lyr	Similarity Index Score	
48		0 leaf litter																												
48		3 leaf litter					plants (aliv grass)		Little Bluestem			plants (aliv grass)		Dropseed/Cordgrass/Cord Grass			grass	Indiangrass				grass	Little Bluestem		40					
48		6 leaf litter																												
48		9 leaf litter																												
48		12 leaf litter																												
48		15 plants (alive)		grass			Dropseed/Cordgrass/i plants (aliv forb)					plants (aliv forb)					Wild Carrots	grass				Little Bluestem		34						
48		18 plants (alive)		grass			Dropseed/Cordgrass/Cord Grass																							
48		21 leaf litter																												
48		24 leaf litter																												
48		27 exposed sc clay loam																												
48		30 leaf litter					plants (aliv grass)		Dropseed/Cordgrass/Cord Grass			plants (aliv grass)		Little Bluestem			forb					Croton spp.		forb		Queen's Delight/Texa: forb		Green Thread/Gr	18	
48		33 leaf litter																												
48		36 exposed sc clay loam																												
48		39 leaf litter																												
48		42 exposed sc clay loam																												
48		45 leaf litter					plants (aliv grass)		Dropseed/Cordgrass/Cord Grass			plants (aliv forb)					Wild Carrots	forb				Gaura/Guara/Primros grass		Slim Tridens		28				
48		48 leaf litter																												
48		51 leaf litter																												
48		54 plants (alive)		grass			Dropseed/Cordgrass/Cord Grass																							
48		57 exposed sc clay loam																												
48		60 leaf litter					plants (aliv grass)		Dropseed/Cordgrass/Cord Grass			plants (aliv forb)					unknown	forb								Green Thread/Greent grass		Japanese Brome	22	
48		63 leaf litter																												
48		66 leaf litter																												
48		69 leaf litter																												
48		72 plants (alive)		grass			Seep Muhly																							
48		75 leaf litter					plants (aliv grass)		Little Bluestem			25																		
48		78 exposed sc clay loam																												
48		81 plants (alive)		grass			Dropseed/Cordgrass/Cord Grass																							
48		84 leaf litter																												
48		87 plants (alive)		grass			Seep Muhly																							
48		90 plants (alive)		grass			Little Bluestem					plants (aliv forb)					Broomweed	plants (aliv grass)								Japanese Brome	forb		Wild Carro	19
48		93 leaf litter																												
48		96 leaf litter																												
48		99 plants (alive)		grass			See Muhly																							
48		102 leaf litter																												
48		105 leaf litter					plants (aliv grass)		Little Bluestem			plants (aliv forb)					Queen's Delight/Texa: forb								Wild Carrots	grass	Little Bluestem		34	
48		108 leaf litter																												
48		111 leaf litter																												
48		114 leaf litter																												
48		117 leaf litter																												
48		120 leaf litter					plants (aliv grass)		Dropseed/Cordgrass/Cord Grass			plants (aliv forb)					unknown forb	forb								Wild Carro		12		
48		123 leaf litter																												
48		126 exposed sc clay loam																												
48		129 plants (alive)		grass			Dropseed/Cordgrass/Cord Grass																							
48		132 plants (alive)		grass			Little Bluestem																							
48		135 plants (alive)		grass			Little Bluestem					plants (aliv grass)					Dropseed/Cordgrass/Cord Grass	plants (aliv forb)												
48		138 exposed sc clay loam																												
48		141 plants (alive)		grass			Dropseed/Cordgrass/Cord Grass																							
48		144 leaf litter																												
48		147 plants (alive)		grass			Indiangrass																							
48		150 plants (alive)		grass			Little Blues					35																		
		Total Score																												

Pt #	Distance from the 0ft mark	1st lyr cover type	Soil Type?	Plant type	Grass Spec.	Forbs spec	lyr hgt (in.) if last lyr	2nd lyr cover type	Plant type	Grass spec	Forbs spec	3rd lyr cover type	Plant type	Grass spec	Forbs spec	4th lyr plant type	Grass spec	Forbs spec	lyr hgt (in.) if last lyr	5th lyr plant type	Grass spec	Forbs spec	lyr hgt (in.) if last lyr	6th lyr plant type	Grass spec	Forbs spec	lyr hgt (in.) if last lyr	7th lyr plant type	Grass spec	Forbs spec	lyr hgt (in.) if last lyr	8th lyr plant type	Forbs spec	lyr hgt (in.)	Similarity Index Score		
20	0	leaf litter																																			
20	3	plants (alive)		grass	Croton, Hotwort, Skunkweed, etc.			plants (aliv grass)		Dropseed/Cordgrass/t		plants (aliv forb)				Croton spp grass			Japanese Brome	forb				Dotted Gayfeather/Bl		forbs	Wild Carrots	grass	Silver Beardgrass/Silver Beard			36					
20	6	leaf litter																																			
20	9	leaf litter																																			
20	12	plants (alive)		grass	Little Bluestem																																
20	15	plants (alive)		grass	Little Bluestem		38																														
20	18	exposed sc clay loam																																			
20	21	plants (alive)		grass	Dropseed/Cordgrass/Cord Grass																																
20	24	leaf litter																																			
20	27	plants (alive)		grass	Dropseed/Cordgrass/Cord Grass																																
20	30	leaf litter						plants (aliv grass)		Dropseed/Cordgrass/t		plants (aliv forb)				Wild Carro grass			Purple Threewawn	forb				Dotted Gayfeather/Bl		grass	Little Bluestem						33				
20	33	leaf litter																																			
20	36	leaf litter																																			
20	39	plants (alive)		grass	Little Bluestem																																
20	42	plants (alive)		forb	Dotted Gayfeather/Blazing Star																																
20	45	leaf litter						plants (aliv grass)		Dropseed/Cordgrass/t		plants (aliv forb)				Croton spp grass			Purple Threewawn	grass				Little Bluestem													
20	48	leaf litter																																			
20	51	plants (alive)		grass	Little Bluestem																																
20	54	plants (alive)		grass	Dropseed/Cordgrass/Cord Grass																																
20	57	plants (alive)		grass	Dropseed/Cordgrass/Cord Grass																																
20	60	leaf litter						plants (aliv grass)		Purple Threewawn		plants (aliv grass)				Japanese B forb			Wild Carrots	forb				Dotted Gayfeather/Bl		grass	Slim Tridens							28			
20	63	leaf litter																																			
20	66	plants (alive)		forb	Dotted Gayfeather/ Blazing Star																																
20	69	exposed sc clay loam																																			
20	72	leaf litter																																			
20	75	leaf litter						plants (aliv grass)		Dropseed/Cordgrass/t		plants (aliv forb)				Plantains grass			Little Bluestem	25																	
20	78	plants (alive)		grass	Dropseed/Cordgrass/ Cord Grass																																
20	81	leaf litter																																			
20	84	leaf litter																																			
20	87	plants (alive)		grass	Dropseed/Cordgrass/Cord Grass																																
20	90	leaf litter						plants (aliv grass)		Dropseed/Cordgrass/t		plants (aliv grass)		Little Bluestem		forb			Wild Carrots	forb				Dotted Gayfeather/Bl		forb	Roadside C							32			
20	93	leaf litter																																			
20	96	leaf litter																																			
20	99	leaf litter																																			
20	102	plants (alive)		grass	Little Bluestem																																
20	105	leaf litter						plants (aliv forb)		Dotted Ga		plants (aliv grass)		Dropseed/Cordgrass/Cord G		forb			Green Thread/Greent	forb				Cuman Ragweed/Wes		forb	Bee Balms	grass	Little Bluestem					29			
20	108	leaf litter																																			
20	111	plants (alive)		grass	Dropseed/Cordgrass/Cord Grass																																
20	114	plants (alive)		grass	Little Bluestem																																
20	117	leaf litter																																			
20	120	leaf litter						plants (aliv forb)		Frogfruits/		plants (aliv grass)		Dropseed/Cordgrass/Cord G		forb			Plantains	forb				Croton, Hotwort, Skur		grass	Japanese Brome	forb			Wild Carrots	forb		Indian Blanket/Blank	20		
20	123	leaf litter																																			
20	126	exposed sc clay loam																																			
20	129	plants (alive)		grass	Scribner Panicum																																
20	132	leaf litter																																			
20	135	exposed sc clay loam						plants (aliv grass)		Dropseed/Cordgrass/t		plants (aliv forb)				Indian Blar forb			Wild Carrots	forb				Dotted Ga													
20	138	exposed sc clay loam																																			
20	141	plants (alive)		grass	Little Bluestem																																
20	144	exposed sc clay loam																																			
20	147	plants (alive)		grass	Little Bluestem																																
20	150	plants (alive)		grass	Dropseed/Cordgrass/Cord Grass			plants (aliv grass)		Little Bluestem		plants (aliv grass)				Japanese B forb			Trailing Rai	20																	
Total Score																														0.79							

Pt #	Distance from the 0ft mark	1st lyr cover type	Soil Type?	Plant type	Grass Spec.	2nd lyr cover type	Plant type	Grass spec	Forbs spec	3rd lyr cover type	Plant type	Grass spec	Forbs spec	lyr hgt (in.) if last lyr	4th lyr plant type	Grass spec	Forbs spec	lyr hgt (in.) if last lyr	5th lyr plant type	Grass spec	Forbs spec	lyr hgt (in.) if last lyr	6th lyr plant type	Forbs spec	7th lyr plant type	Grass spec	lyr hgt (in.) if last lyr	Similarity Index Score
82		0 plants (alive)		grass	Little Blues	plants (aliv grass		Dropseeds/Cordgrass,	plants (aliv forbs				Noseburn		forb		Queen's D	20										
82		3 plants (alive)		grass	Little Bluestem																							
82		6 plants (alive)		grass	Little Bluestem																							
82		9 plants (alive)		grass	Dropseeds/Cordgrass/Cord Grass																							
82		12 leaf litter																										
82		15 leaf litter				plants (aliv grass		Dropsee/Cordgrass/Ci	plants (aliv forbs				GreenThread/Greent	grass	Little Bluestem				28									
82		18 leaf litter																										
82		21 plants (alive)		grass	Little Bluestem																							
82		24 plants (alive)		grass	Dropseeds/Cordgrass/Cord Grass																							
82		27 leaf litter																										
82		30 leaf litter				plants (aliv grass		Dropseeds/Cordgrass,	plants (alive)				Queen'sDelight/Texas	grass	Little Bluestem				36									
82		33 plants (alive)		grass	Dropseeds/Cordgrass/Cord Grass																							
82		36 exposed sc clay loam																										
82		39 leaf litter																										
82		42 leaf litter																										
82		45 leaf litter				plants (aliv forb			Palafoxia	plants (aliv forbs			unknown forb		forb			Dotted Gayfeather/Bl	grass	Little Bluestem						40		
82		48 leaf litter																										
82		51 leaf litter																										
82		54 leaf litter																										
82		57 leaf litter																										
82		60 plants (alive)		grass	Dropseed/	plants (aliv forb			Wild Carro	plants (aliv forbs			Cuman Ragweed/Wes	grass	Little Bluestem				42									
82		63 plants (alive)		grass	Little Bluestem																							
82		66 plants (alive)		grass	Dropseed/Cordgrass/Cord Grass																							
82		69 leaf litter																										
82		72 leaf litter																										
82		75 leaf litter				plants (aliv grass		Purple Threeawn		plants (aliv forbs			Blue Sage/Salvia		forb			American Basketflow	forb			Wild Carrots		forb	Leavenwor	grass	Little Blues	24
82		78 plants (alive)		forb	Buckwheat/Buck Wheat																							
82		81 leaf litter																										
82		84 plants (alive)		grass	Little Bluestem																							
82		87 leaf litter																										
82		90 leaf litter				plants (aliv grass		Dropseeds/Cordgrass,	plants (aliv grass			Japanese Brome			forb			Wild Carro	15									
82		93 leaf litter																										
82		96 rock (broken)																										
82		99 leaf litter																										
82		102 leaf litter																										
82		105 plants (alive)		grass	Sideoats G	plants (aliv grass			Japanese E	plants (aliv forb																		
82		108 leaf litter													forb			Wild Carrots	grass	Purple Threeawn						21		
82		111 leaf litter																										
82		114 plants (alive)		grass	Dropseed/Cordgrass/Cord Grass																							
82		117 leaf litter																										
82		120 leaf litter				plants (aliv grass		Purple Threeawn		plants (aliv forb			Wild Carrots		forb			Indian Blar									20	
82		123 leaf litter																										
82		126 leaf litter																										
82		129 leaf litter																										
82		132 leaf litter																										
82		135 plants (alive)		grass	Purple Thr	plants (aliv forb			unknown f	plants (aliv forb			Queen's Delight/Texa	forb			Wild Carrots	grass	Little Bluestem							38		
82		138 leaf litter																										
82		141 leaf litter																										
82		144 leaf litter																										
82		147 plants (alive)		grass	Dropseed/Cordgrass/Cord Grass																							
82		150 plants (alive)		grass	Little Blues	plants (aliv grass		Dropseed/Cordgrass/i	plants (aliv forb				Wild Carro		26													
Total Score																										0.9		



Pt #	Distance from the 0ft mark	1st lyr cover type	Soil Type?	Plant type	Grass Spec.	lyr hgt (in.) if last lyr	2nd lyr cover type	Plant type	Grass spec	lyr hgt (in.) if last lyr	3rd lyr cover type	Plant type	Grass spec	Forbs spec	Shrubs/vines spec	Tree spec	4th lyr plant type	Grass spec	#REF!	Forbs spec	Shrubs/vines spec	Tree spec	lyr hgt (in.) if last lyr	Similarity Index Score
12	3	leaf litter																						
12	6	leaf litter																						
12	6	leaf litter																						
12	9	leaf litter																						
12	12	leaf litter																						
12	15	leaf litter					plants (aliv grass		Drummond's Dropsee		plants (aliv forbs			Queen'sDelight/TexasStillingia			grass	LittleBluestem						22
12	18	leaf litter																						
12	21	exposed sc loam																						
12	24	leaf litter																						
12	27	leaf litter																						
12	30	leaf litter					plants (aliv grass		Little Bluestem		plants (aliv grass		Rescue Brome				forbs			TrailingRatany/PrairieBur				19
12	33	leaf litter																						
12	36	plants (alive)		grass	Little Bluestem																			
12	39	plants (alive)		grass	Little Bluestem																			
12	42	leaf litter																						
12	45	leaf litter					plants (aliv grass		Little Bluestem		plants (aliv grass		LittleBluestem											
12	48	leaf litter																						
12	51	leaf litter																						
12	54	exposed sc loam																						
12	57	plants (alive)		grass	Dropseeds/Cordgrass/Cord Grass																			
12	60	leaf litter					plants (aliv grass		Little Bluestem		plants (aliv grass		Dropseeds/Cordgrass/CordGrass				tree				Hackberry,			27
12	63	plants (alive)		grass	Big Bluestem																			
12	66	leaf litter																						
12	69	plants (alive)		grass	Big Bluestem																			
12	72	leaf litter																						
12	75	leaf litter					plants (aliv grass		Little Blues		9													
12	78	plants (alive)		grass	Little Bluestem																			
12	81	plants (alive)		grass	Little Bluestem																			
12	84	leaf litter																						
12	87	exposed sc loam																						
12	90	plants (alive)		grass	Little Bluestem		plants (aliv grass		Little Blues		39													
12	93	exposed sc loam																						
12	96	leaf litter																						
12	99	plants (alive)		grass	Dropseeds/Cordgrass/Cord Grass																			
12	102	leaf litter																						
12	105	exposed sc loam					plants (aliv grass		Little Bluestem		plants (aliv forbs		Hedoma				grass	LittleBluestem						38
12	108	leaf litter																						
12	111	plants (alive)		grass	Little Bluestem																			
12	114	leaf litter																						
12	117	leaf litter																						
12	120	plants (alive)		grass	Little Blues		36																	
12	123	leaf litter																						
12	126	leaf litter																						
12	129	plants (alive)		grass	Big Bluestem																			
12	132	plants (alive)		grass	Big Bluestem																			
12	135	plants (alive)		grass	Big Bluestem		plants (aliv grass		Big Bluestem		plants (aliv forbs			DottedGayfeather/BlazingStar			grass	BigBluestem						45
12	138	leaf litter																						
12	141	plants (alive)		grass	Big Bluestem																			
12	144	leaf litter																						
12	147	plants (alive)		grass	Little Bluestem																			
12	150	plants (alive)		grass	Little Blues		35																	
Total Score																							0.97	

Pt #	Distance from the 0ft mark	1st lyr cover type	Soil Type?	Plant type	Grass Spec.	Forbs spec	lyr hgt (in.) if last lyr	2nd lyr cover type	Plant type	Grass spec	Forbs spec	lyr hgt (in.) if last lyr	3rd lyr cover type	Plant type	Forbs spec	lyr hgt (in.) if last lyr	4th lyr plant type	Forbs spec	lyr hgt (in.) if last lyr	Similarity Index Score	
7	0	plants (alive)		forbs		Gaura/Guara/Primros		plants (aliv grass)		Dropseeds/Cordgrass,		4									
7	3	plants (alive)		forbs		False pennyroyale															
7	6	leaf litter																			
7	9	exposed sc loam																			
7	12	plants (alive)		grass	Slim Tridens																
7	15	leaf litter					8														
7	18	leaf litter																			
7	21	leaf litter																			
7	24	leaf litter																			
7	27	leaf litter																			
7	30	leaf litter						plants (aliv forbs)		Plantains		2									
7	33	exposed sc loam																			
7	36	leaf litter																			
7	39	rock (broken)																			
7	42	leaf litter																			
7	45	leaf litter						plants (aliv forbs)		Croton, Hotwort, Skur			plants (aliv forbs)	Noseburn		forbs	Drummonc				9
7	48	plants (alive)		grass	Little Bluestem																
7	51	leaf litter																			
7	54	leaf litter																			
7	57	leaf litter																			
7	60	rock (broken)					1														
7	63	plants (alive)																			
7	66	leaf litter																			
7	69	plants (alive)		grass	Sideoats Grama																
7	72	leaf litter																			
7	75	leaf litter					1														
7	78	leaf litter																			
7	81	leaf litter																			
7	87	exposed sc loam																			
7	90	leaf litter					1														
7	93	leaf litter																			
7	96	rock (broken)																			
7	99	leaf litter																			
7	102	plants (alive)																			
7	105	leaf litter					1														
7	108	plants (alive)																			
7	111	leaf litter																			
7	114	rock (broken)						plants (aliv grass)		Drummond's Dropseed											
7	117	leaf litter																			
7	120	leaf litter					1														
7	123	plants (alive)																			
7	126	leaf litter																			
7	129	exposed sc loam																			
7	132	leaf litter																			
7	135	leaf litter					1														
7	138	leaf litter																			
7	141	leaf litter																			
7	144	leaf litter																			
7	147	leaf litter																			
7	150	leaf litter						plants (aliv grass)		Purple Threeawn			plants (aliv forbs)	Drummonc		9					
Total Score																				0.55	

Pt #	Trans Topo	Spec of Grass	# of grass spec	Spec of cactuses & yuccas?	# of Cactuses & yuccas spec	Spec of forbs	# of forb spec	Spec of shrubs & vines	# of shrub & vine spec	Spec of trees	# of Tree spec
9	no entry	Little Bluestem, Canada Wildrye, Dropseeds/Cordgrass/Cord Grass, Scribner Panicum, Sideoats Grama, Carex/Sedge, Indiangrass, Japanese Brome	8	Missouri Foxtail Cactus, Prickly Pear Cactuses, Yucca species	3	Leavenworth Eryngo, Wild Carrots, nettle species, Gaura/Guara/Primrose/Sundrops/Pinkladies/False Gauras, Texas Prairie Parsley, White Heath Aster, Saw-Leaf Daisy, Plantains, Dotted Gayfeather/Blazing Star, Queen's Delight/Texas Stillingia, Croton spp., Noseburn, Hedeoma spec., Purple Paintbrush, Blue Star/Bluestar, Green Thread/Greenthread, Buckweat/Buck Wheat, Nuttall's Sensitive-- Briar/Catclaw Briar, Blue Sage/Salvia, Engelmann's Daisy, Cuman Ragweed/Western Ragweed, Snakeherb, Knotweed, American Basketflower, White Rosinweed/Compass Plant/Rosin Weed, New Jersey Tea/Inland Ceanothus, Indian Blanket/Blanketflowers, Nightshades/Horsenettle, Drummond's Scullcap/Wright's Scullcap/Other Scull Caps, Broomweed	30	Roses	1	Hackberry/Sugarberry, Gum Bumelia/Gumbumelia/Bully, Honey Locust/Honeylocust, Hercules Club/Pricklyash/Toothache Tree, Elm/Cedar Elm/American Elm/Winged Elm, Plums	6
15	goes downhill	Little Bluestem, Dropseeds/Cordgrass/Cord Grass, Sideoats Grama, Scribner Panicum, Seep Muhly, Slim Tridens, Purple Threeawn	7	Missouri Foxtail Cactus, Prickly Pear Cactuses, Yucca species	3	Purple Coneflowers, Cuman Ragweed/Western Ragweed, 2 species of Gaura/Guara/Primrose/Sundrops/Pinkladies/False Gauras, Blue-eyed Grass, Green Thread/Greenthread, Standing cypress, Wild Carrots, Obi-won Canobia, Buckwheat/Buck Wheat, New Jersey Tea/Inland Ceanothus, Thistles, Milkweeds/Milk Weeds/Antelope Horns/Antelopehorns, Dotted Gayfeather/Blazing Star, Star Milkvine, Indian Blanket/Blanketflowers, Blue Star/Bluestar, American Basketflower, Queen's Delight/Texas Stillingia, Drummond's Scullcap/Wright's Scullcap/Other Scull Caps, Plantains	21	none	0	Gum Bumelia/Gumbumelia/Bully, Elm/Cedar Elm/American Elm/Winged Elm	2

Pt #	Trans Topo	Spec of Grass	# of grass spec	Spec of cactuses & yuccas?	# of Cactuses & yuccas spec	Spec of forbs	# of forb spec	Spec of shrubs & vines	# of shrub & vine spec	Spec of trees	# of Tree spec
20	on flat surface	Big Bluestem, Little Bluestem, Silver Beardgrass/Silver Beard Grass/Silver Bluestem, Dropseeds/Cordgrass/Cord Grass, Sideoats Grama, Scribner Panicum, Purple Threawn, King Ranch Bluestem/Yellow bluestem/KRB, Japanese Brome	9	Prickly Pear Cactuses, Yucca species	2	Thistles, Spurges/Sandmat/Sand Mat/Snow-on-the-Prairie/Mountain, Small Palafox, Groundcherries, Dotted Gayfeather/Blazing Star, Plantains, Agalinis spec., White Heath Aster, Bee Balms, Nuttall's Sensitive-Briar/Catclaw Briar, Texas Bull Nettle/Bullnetties, Milkweeds/Milk Weeds/Antelope Horns/Antelopehorns, American Basketflower, Noseburn, Gaura/Guara/Primrose/Sundrops/Pinkladies/False Gauras, Wild Carrots, (Croton, Hotwort, Skunkweed, etc.), Frogfruits/Frog Fruits, Indian Blanket/Blanketflowers, Hedeoma spec., Blue-eyed Grass, Cuman Ragweed/Western Ragweed, Gray Goldaster/Hoary False Goldaster, Rabbit Tobaccos/Evax, Barbara's Buttons, GreenThread/Greenthread, Texas Bindweed, Blue Star/Bluestar	27	Honeysuckles	1	Honey Mesquite, Gum Bumelia/Gumbumelia/Bully, Hercules Club/Pricklyash/Toothache Tree	3
48	goes uphill and plateaus out	Indiangrass, Big Bluestem, Little Bluestem, Scribner Panicum, Canada Wildrye, Dropseeds/Cordgrass/Cord Grass, Sideoats Grama, Seep Muhly, Hairy Grama, Carex/Sedge, Purple Threawn, Slim Tridens, Japanese Brome	13	Prickly Pear Cactuses, 2 Yucca species	2	Texas Skeleton Plant, (Croton, Hotwort, Skunkweed, etc.), Trailing Ratany/Prairie Bur, Texas Bull Nettle/Bullnetties, Green Thread/Greenthread, Buckwheat/Buck Wheat, Leavenworth Eryngo, Indian Blanket/Blanketflowers, Cuman Ragweed/Western Ragweed, American Basketflower, unknown forb, Nuttall's Sensitive-Briar/Catclaw Briar, Hedeoma spec., Sumpweed/Sump Weed/Annual Marsh Elder, White Heath Aster, Bee Balms, Gaura/Guara/Primrose/Sundrops/Pinkladies/False Gauras, Blue Star/Bluestar, Purple Paintbrush, Dotted Gayfeather/Blazing Star, Drummond's Scullcap/Wright's Scullcap/Other Scull Caps, Queen's Delight/Texas Stillingia, Plantains, Noseburn, Blue-eyed Grass, Barbara's Buttons	25	none	0	Elm/Cedar Elm/American Elm/Winged Elm	1

Pt #	Trans Topo	Spec of Grass	# of grass spec	Spec of cactuses & yuccas?	# of Cactuses & yuccas spec	Spec of forbs	# of forb spec	Spec of shrubs & vines	# of shrub & vine spec	Spec of trees	# of Tree spec
82	on flat surface	Little Bluestem, Big Bluestem, Sideoats Grama, Dropseeds/Cordgrass/Cord Grass, Hairy Grama, Silver Beardgrass/Silver Beard Grass/Silver Bluestem, Purple Threeawn, Japanese Brome	8	Prickly Pear Cactuses	1	Twinleaf senna, Symphyotrichum spec., Indian Blanket/Blanketflowers, Plantains, Texas Skeleton Plant, Drummond's Scullcap/Wright's Scullcap/Other Scull Caps, Buckwheat/Buck Wheat, Thistles, Blue-eyed Grass, Nuttall's Sensitive-Briar/Catclaw Briar, Broomweed, Leavenworth Eryngo, Palafoxia spec., Blue Sage/Salvia, Queen's Delight/Texas Stillingia, Cuman Ragweed/Western Ragweed, Obi-won Canobia, Wild Carrots, Hedeoma spec., Green Thread/Greenthread, Blue Star/Bluestar, Noseburn, Bee Balms, (Croton, Hotwort, Skunkweed, etc.), Purple Paintbrush, Dotted Gayfeather/Blazing Star	26	none	0	Honey Mesquite, Hackberry/Sugarberry, Elm/Cedar Elm/American Elm/Winged Elm	3
108	goes downhill	Seep Muhly, Purple Threeawn, Dropseeds/Cordgrass/Cord Grass, Hairy Grama, Fall Witchgrass, Silver Beardgrass/Silver Beard Grass/Silver Bluestem, Little Bluestem, Indiangrass, Scribner Panicum, Japanese Brome	10	Prickly Pear Cactuses, Yucca species	2	Green Thread/Greenthread, Twinleaf Senna, American Basketflower, Other Salvias, Triodanis spec., Queen's Delight/Texas Stillingia, Rabbit Tobaccos/Evax, Dotted Gayfeather/Blazing Star, (Croton, Hotwort, Skunkweed, etc.), Barbara's Buttons, Gaura/Guara/Primrose/Sundrops/Pinkladies/Fa lse Gauras, Leavenworth Eryngo, Wild Carrots, Nuttall's Sensitive-Briar/Catclaw Briar, Grasskiller, Perityle spec., Noseburn, Plantains, Bee Balms, Leavenworth Eryngo, Nuttall's Sensitive-Briar/Catclaw Briar, Grasskiller, Peristle spec., Noseburn, Plantains, Cuman Ragweed/Western Ragweed, Thistles, Indian Blanket/Blanketflowers, Blue Star/Bluestar, Texas Bindweed, Gaura/Guara/Primrose/Sundrops/Pinkladies/Fa lse Gauras, Illinois Tickclover/Tick-trefoil, unknown forb spec	33	Greenbriers/Greenbriers/Sawbrie rs	1	Hercules Club/Pricklyash/Toothache Tree, Elbowbush/Elbow Bush/Stretchberry, Hackberry/Sugarberry, Fragrant Sumac/Skunkbush	4
113	on flat surface	Indiangrass, Big Bluestem, Little Bluestem, Sideoats Grama, Seep Muhly, Johnsongrass/Johnson Grass, Carex/Sedge, Japanese Brome	8	Yucca species	1	American Basketflower, Late Boneset/Dogfennel, Prairie Upright Coneflower/Mexican Hat, Leavenworth Eryngo, White Heath Aster, Milkweeds/Milk Weeds/Antelope Horns/Antelopehorns, Bee Balms, Plantains, Hedeoma spec., Gaura/Guara/Primrose/Sundrops/Pinkladies/Fa lse Gauras, Cuman Ragweed/Western Ragweed, Noseburn, 2 species of Nightshades/Horsenettle, Wild Carrots, Canada Wildrye, Goldenrods, Dotted Gayfeather/Blazing Star, Maximilian Sunflower, Texas Prairie Parsley, Drummond's Scullcap/Wright's Scullcap/Other Scull Caps, Blue Sage/Salvia, Queen's Delight/Texas Stillingia	24	Fragrant Sumac/Skunkbush	1	2 species of Hackberry/Sugarberry, Hercules Club/Pricklyash/Toothache Tree, Elm/Cedar Elm/American Elm/Winged Elm	5

Pt #	Trans Topo	Spec of Grass	# of grass spec	Spec of cactuses & yuccas?	# of Cactuses & yuccas spec	Spec of forbs	# of forb spec	Spec of shrubs & vines	# of shrub & vine spec	Spec of trees	# of Tree spec
74	on flat surface	Big Bluestem, Little Bluestem, Sideoats Grama, Seep Muhly, Purple Threeawn, Switchgrass	6	none	0	(Croton, Hotwort, Skunkweed, etc.), Texas Prairie Parsley, Agalinis spec., Blue Sage/Salvia, Wild Carrots, Leavenworth Eryngo, Hedeoma spec., 2 species of Gaura/Guara/Primrose/Sundrops/Pinkladies/Fa lse Gauras, Indian Blanket/Blanketflowers, Bee Balms, unknown forb, Scribner Panicum, Virginia Wildrye, Sideoats Grama, Blue Star/Bluestar, Green Thread/Greenthread, Cuman Ragweed/Western Ragweed, Noseburn, Yellow Puff/Neptunia, Cobaea Penstemon/Beardtongue, White Heath Aster, Nuttall's Sensitive-Briar/Catclaw Briar, Plantains, 2 species of White Rosinweed/Compass Plant/Rosin Weed, Spurges/Sandmat/Sand Mat/Snow-on-the-Prairie/Mountain, Trailing Ratany/Prairie Bur, Queen's Delight/Texas Stillingia, Sumpweed/Sump Weed/Annual Marsh Elder, American Basketflower, Snakeherb, New Jersey Tea/Inland Ceanothus	35	Roses	1	Hackberry/Sugarberry, Honey Mesquite, Hercules Club/Pricklyash/Toothache Tree, Gum Bumelia/Gumbumelia/Bully	4
88	goes downhill	Scribner Panicum, Canada Wildrye, Sideoats Grama, Purple Threeawn, Little Bluestem, Dropseeds/Cordgrass/Cord Grass, Big Bluestem, Indiangrass, Seep Muhly	9	Yucca species	1	Barbara's Buttons, Hedeoma spec., Nightshades/Horsenettle, Dotted Gayfeather/Blazing Star, Nuttall's Sensitive-Briar/Catclaw Briar, New Jersey Tea/Inland Ceanothus, American Basketflower, (Croton, Hotwort, Skunkweed, etc.), Leavenworth Eryngo, Texas Prairie Parsley, 3 species of Gaura/Guara/Primrose/Sundrops/Pinkladies/Fa lse Gauras, Thistles, Indian Blanket/Blanketflowers, Noseburn, Plantains, Queen's Delight/Texas Stillingia, Agalinis spec., Trailing Ratany/Prairie Bur, Spurges/Sandmat/Sand Mat/Snow-on-the-Prairie/Mountain, Blue Star/Bluestar, Goldenrods, Common Mare's-tail	25	Elbowbush/Elbow Bush/Stretchberry, Poison Ivy, Brambles/Dewberry/Southern Dew Berry, Roses	4	Elm/Cedar Elm/American Elm/Winged Elm, Plums, Ashe juniper, Hackberry/Sugarberry, Hercules Club/Pricklyash/Toothache Tree	5

Pt #	Trans Topo	Spec of Grass	# of grass spec	Spec of cactuses & yuccas?	# of Cactuses & yuccas spec	Spec of forbs	# of forb spec	Spec of shrubs & vines	# of shrub & vine spec	Spec of trees	# of Tree spec
75	goes downhill	Scribner Panicum, Canada Wildrye, Sideoats Grama, Purple Threeawn, Little Bluestem, Indiangrass, Texas wintergrass/Winter Grass, Switchgrass, Phalaris spec., Silver Beardgrass/Silver Beard Grass/Silver Bluestem,	10	Prickly Pear Cactuses	1	Leavenworth Eryngo, Tickseed/Coreopsis, 2 species of Gaura/Guara/Primrose/Sundrops/Pinkladies/Fa lse Gauras, Wild Carrots, White Rosinweed/Compass Plant/Rosin Weed, New Jersey Tea/Inland Ceanothus, Tall Wild Mercury, Nuttall's Sensitive-Briar/Catclaw Briar, Blue Sage/Salvia, Dotted Gayfeather/Blazing Star, Indian Blanket/Blanketflowers, Purple Paintbrush, Cuman Ragweed/Western Ragweed, Saw-leaf Daisy, Spurges/Sandmat/Sand Mat/Snow-on-the-Prairie/Mountain, (Croton, Hotwort, Skunkweed, etc.), Broomweed, Other Salvias, White Heath Aster, Trailing Ratany/Prairie Bur, Thistles, Queen's Delight/Texas Stillingia, Snakeherb, Cobaea Penstemon/Beardtongue, Blue Star/Bluestar, Buckwheat/Buck Wheat	28	Roses	1	Elm/Cedar Elm/American Elm/Winged Elm	1
1A	no entry	Little Bluestem, Sideoats Grama, Big Bluestem, King Ranch Bluestem/Yellow bluestem/KRB, Purple Threeawn, Dropseeds/Cordgrass/Cord Grass, Texas wintergrass/Winter Grass, Japanese Brome	8	Yucca species	1	Scurf Pea/Scurfpea, Wild Carrots, Buckwheat/Buck Wheat, Bee Balms, Thistles, Blue Sage/Salvia, Asteraceae spec., Nuttall's Sensitive-Briar/Catclaw Briar, Blue Star/Bluestar, Dotted Gayfeather/Blazing Star, False Boneset, Sideoats Grama, Purple Paintbrush, Agalinis spec, Sagewort/Sagebrush/Wormwood/Sage Brush, Texas Skeleton Plant, Trailing Ratany/Prairie Bur, Little Mercury, Green Thread/Greenthread, Cobaea Penstemon/Beardtongue, Cuman Ragweed/Western Ragweed, Queen's Delight/Texas Stillingia, 2 species of Gaura/Guara/Primrose/Sundrops/Pinkladies/Fa lse Gauras, Sida spec., Other Salvias, Other Sunflowers including common sunflower/Sun Flowers, Scribner Panicum, American Basketflower	30	Elbowbush/Elbow Bush/Stretchberry	1	Gum Bumelia/Gumbumelia/Bully, Honey Mesquite, Hackberry/Sugarberry	3

Pt #	Trans Topo	Spec of Grass	# of grass spec	Spec of cactuses & yuccas?	# of Cactuses & yuccas spec	Spec of forbs	# of forb spec	Spec of shrubs & vines	# of shrub & vine spec	Spec of trees	# of Tree spec
17	goes uphill	Sideoats Grama, Little Bluestem, Scribner Panicum, Indiangrass, Canada Wildrye, Carex/Sedge, Silver Beardgrass/Silver Beard Grass/Silver Bluestem, Seep Muhly, Texas wintergrass/Winter Grass, Big Bluestem, Western Wheatgrass	11	Prickly Pear Cactuses	1	Buckwheat/Buck Wheat, Groundcherries, 2 species of Spurge/Sandmat/Sand Mat/Snow-on-the-Prairie/Mountain, American Basketflower, Dropseeds/Cordgrass/Cord Grass, Purple Paintbrush, Broomweed, Blue Star/Bluestar, Maximilian Sunflower, Dotted Gayfeather/Blazing Star, Cuman Ragweed/Western Ragweed, Indian Blanket/Blanketflowers, White Heath Aster, Nuttall's Sensitive-Briar/Catclaw Briar, Bee Balms, Low Wild Mercury, Tall Wild-mercury, Engelmann's Daisy, Agalinis spec., Germanders, (Croton, Hotwort, Skunkweed, etc.), Late Boneset/Dogfennel, Plantains, Milkweeds/Milk Weeds/Antelope Horns/Antelopehorns, Hedeoma spec., Mock Vervains/Mock Verbenas, Compassplant/Compass Plant, unknown forb	30	Greenbriers/Greenbriers/Sawbriers, Brambles/Dewberry/Southern Dew Berry	2	Gum Bumelia/Gumbumelia/Bully, Elm/Cedar Elm/American Elm/Winged Elm, Hercules Club/Pricklyash/Toothache Tree, Honey Mesquite	4
87	goes downhill	Little Bluestem, Dropseeds/Cordgrass/Cord Grass, Sideoats Grama, Scribner Panicum, Seep Muhly, Carex/Sedge, Japanese Brome	7	Prickly Pear Cactuses	1	Leavenworth Eryngo, 2 species of Gaura/Guara/Primrose/Sundrops/Pinkladies/Falsetopas, White Rosinweed/Compass Plant/Rosin Weed, Prairie Upright Coneflower/Mexican Hat, Indian Blanket/Blanketflowers, Drummond's Scullcap/Wright's Scullcap/Other Scull Caps, Queen's Delight/Texas Stillingia, Rabbit Tobaccos/Evax, Plantains, Nettle spec., Agalinis spec., Noseburn, Broomweed, 2 species of Blue Star/Bluestar, Leafy Mistletoe, Blue Sage/Salvia, (Croton, Hotwort, Skunkweed, etc.), Engelmann's Daisy, Cuman Ragweed/Western Ragweed, Obi-won Conobia, Dropseeds/Cordgrass/Cord Grass, Trailing Ratany/Prairie Bur, Nightshades/Horsenettle, Green Thread/Greenthread, New Jersey Tea/Inland Ceanothus, Carex/Sedge, Nuttall's Sensitive-Briar/Catclaw Briar, Snakeherb, Wild Carrots, Hedeoma spec., Twinleaf Senna, Bee Balms, American Basketflower, Purple Paintbrush, Buckwheat/Buck Wheat,	39	Elbowbush/Elbow Bush/Stretchberry, Fragrant Sumac/Skunkbush, Greenbriers/Greenbriers/Sawbriers	3	Elm/Cedar Elm/American Elm/Winged Elm, Cedar/Juniper, Hercules Club/Pricklyash/Toothache Tree	3



Pt #	Trans Topo	Spec of Grass	# of grass spec	Spec of cactuses & yuccas?	# of Cactuses & yuccas spec	Spec of forbs	# of forb spec	Spec of shrubs & vines	# of shrub & vine spec	Spec of trees	# of Tree spec
12	on flat surface	Little Bluestem, Big Bluestem, 2 species of Sideoats Grama, Dropseeds/Cordgrass/Cord Grass, Purple Threeawn, Texas wintergrass/Winter Grass, Carex/Sedge, Johnsongrass/Johnson Grass, Indiangrass, Japanese Brome	10	Prickly Pear Cactuses	1	Leavenworth Eryngo, 3 species of Gaura/Guara/Primrose/Sundrops/Pinkladies/Falset Gauras, Groundcherries, Tall Wild Mercury, 3 species of Hedeoma spec., American Basketflower, Sagewort/Sagebrush/Wormwood/Sage Brush, Noseburn, Asteraceae spec., Dotted Gayfeather/Blazing Star, Wild Carrots, Grindelia spec., Other Salvias, Green Thread/Greenthread, Spurges/Sandmat/Sand Mat/Snow-on-the-Prairie/Mountain, (Croton, Hotwort, Skunkweed, etc.), Indian Blanket/Blanketflowers, Scurf Pea/Scurfpea, Thistles, Cuman Ragweed/Western Ragweed, Tall Wildmercury, Low Ragweed, Drummond's Scullcap/Wright's Scullcap/Other Scull Caps, White Rosinweed/Compass Plant/Rosin Weed, Common Yarrow, Low Wild Mercury, Buckwheat/Buck Wheat, Nuttall's Sensitive-Briar/Catclaw Briar, Blue Sage/Salvia, Queen's Delight/Texas Stillingia, Trailing Ratany/Prairie Bur, Broomweed	38	none	0	Plums, Hackberry/Sugarberry, Hercules Club/Pricklyash/Toothache Tree, Elm/Cedar Elm/American Elm/Winged Elm	4
100	goes uphill	Big Bluestem, Indiangrass, Sideoats Grama, Little Bluestem, Dropseeds/Cordgrass/Cord Grass, Scribner Panicum, Canada Wildrye, Seep Muhly, Tall Grama, Hairy Grama, Carex/Sedge, Japanese Brome	12	Yucca species, Prickly Pear Cactuses	2	White Tridens/Purpletop Tridens, Leavenworth Eryngo, Dotted Gayfeather/Blazing Star, Horse Balm, Agalinis spec., Broomweed, American Basketflower, Plantains, Sagewort/Sagebrush/Wormwood/Sage Brush, Wild Carrots, Hedeoma spec., Cocklebur, Asteraceae spec., Thistles, Gray Goldaster/Hoary False Goldaster, Bee Balms, Other Salvias, Cuman Ragweed/Western Ragweed, Queen's Delight/Texas Stillingia, Wild Tall Mercury, Indian Blanket/Blanketflowers, Texas Yellow Star/Yellowstar, Green Thread/Greenthread	23	none	0	Western Soapberry, Elm/Cedar Elm/American Elm/Winged Elm, Cedar/Juniper, Plums	4

Pt #	Trans Topo	Spec of Grass	# of grass spec	Spec of cactuses & yuccas?	# of Cactuses & yuccas spec	Spec of forbs	# of forb spec	Spec of shrubs & vines	# of shrub & vine spec	Spec of trees	# of Tree spec
73	goes downhill	Sideoats Grama, Canadian Wildrye, Fall Witchgrass, Little Bluestem, Purple Threeawn, Dropseeds/Cordgrass/Cord Grass, Seep Muhly, Scribners Panicum, Silver Beardgrass/Silver Beard Grass/Silver Bluestem	9	Prickly Pear Cactuses	1	Leavenworth Eryngo, Drummond's Scullcap/Wright's Scullcap/Other Scull Caps, Wild Carrots, Plantains, Thistles, 2 species of Gaura/Guara/Primrose/Sundrops/Pinkladies/Falsetop Gauras, (Croton, Hotwort, Skunkweed, etc.), American Basketflower, Indian Blanket/Blanketflowers, Purple Paintbrush, Buckwheat/Buck Wheat, Noseburn, Trailing Ratany/Prairie Bur, Hedeoma spec., Engelmann's Daisy, Twinleaf senna, (Verbena, Vervain, Mock Vervain, Mock Verbena), Bee Balms, Blue Sage/Salvia, Dotted Gayfeather/Blazing Star, Mexican Sagewort/White Sagebrush/Wormwood, Velvet Bundleflower, Snailseeds, Queen's Delight/Texas Stillingia, White Heath Aster	26	Greenbriers/Greenbriers/Sawbriers, Poison Ivy	2	Elm/Cedar Elm/American Elm/Winged Elm, Cedar/Juniper	2
7	goes uphill	Buffalograss, Carex/Sedge, Dropseeds/Cordgrass/Cord Grass, Slim Tridens, Switchgrass, Texas Cup Grass/Cupgrass, King Ranch Bluestem/Yellow bluestem/KRB, Little Bluestem, Sideoats Grama, Silver Beardgrass/Silver Beard Grass/Silver Bluestem, Digitaria spec., Slim Tridens, Purple Threeawn	13	Prickly Pear Cactuses	1	American Basketflower, Black-eyed Susan, Buckwheat/Buck Wheat, (Croton, Hotwort, Skunkweed, etc.), Drummond's Scullcap/Wright's Scullcap/Other Scull Caps, Engelmann's Daisy, Flaxes/Meadow Flax/Meadowflax, Groundcherries, Indian Blanket/Blanketflowers, Milkweeds/Milk Weeds/Antelope Horns/Antelopehorns, Nightshades/Horsenettle, Other Salvias, Purple Paintbrush, Queen's Delight/Texas Stillingia, Texas Paintbrush, Thistles, White Tridens/Purpletop Tridens, Wild Carrots, 2 Senna spec., Broomweed, Japanese Brome Tragia spec., Grindelia spec., Texas Bindweed, Mimosa spec., Poppymallows/Poppy Mallows/Winecup Mallows, Prairie Upright Coneflower/Mexican Hat, Low Wild Mercury, Prostrate knotweed, 2 Hedeoma spec.	33	none	0	Hackberry/Sugarberry, Honey Mesquite	2

## Attachment B: Benbrook Lake Prairie Point Photographs

Benbrook Prairie Assessment #: 1A

Facing North



Facing East



Facing West



Facing South



Benbrook Prairie Assessment #: 9

Facing North



Facing East



Facing West



Facing South



Benbrook Prairie Assessment #: 12

Facing North



Facing East



Facing West



Facing South



Benbrook Prairie Assessment #: 15

Facing North



Facing East



Facing West



Facing South



Benbrook Prairie Assessment #: 17

Facing North



Facing East



Facing West



Facing South





Benbrook Prairie Assessment #: 20

Facing North



Facing East



Facing West



Facing South



Benbrook Prairie Assessment #: 48

Facing North



Facing East



Facing West



Facing South



Benbrook Prairie Assessment #: 74

Facing North



Facing East



Facing West



Facing South



Benbrook Prairie Assessment #: 75

Facing North



Facing East



Facing West



Facing South



Benbrook Prairie Assessment #: 82

Facing North



Facing East



Facing West



Facing South



Benbrook Prairie Assessment #: 87

Facing North



Facing East



Facing West



Facing South



Benbrook Prairie Assessment #: 88

Facing North



Facing East



Facing West



Facing South



Benbrook Prairie Assessment #: 100

Facing North



Facing East



Facing West



Facing South





Benbrook Prairie Assessment #: 108

Facing North



Facing East



Facing West



Facing South



Benbrook Prairie Assessment #: 113

Facing North



Facing East



Facing West



Facing South

