APPENDIX C – WILDLIFE DOCUMENTS

TRUST RESOURCES REPORT – USFWS

OFFICIAL SPECIES LIST – USFWS

LIST OF SGCN SPECIES

WHAP REPORT

United States Department of the Interior

FISH AND WILDLIFE SERVICE
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Phone: (817) 277-1100 Fax: (817) 277-1129
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In Reply Refer To: December 13, 2022
Project Code: 2023-0000107
Project Name: Cooper Lake MP Revision

Subject: 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.
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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.

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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.

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/library/collections/bald-and-golden-eagle-management). Additionally, wind energy projects should follow the wind energy guidelines (https://www.fws.gov/media/land-based-wind-energy-guidelines) for minimizing impacts to migratory birds and bats.

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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
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

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
2005 Ne Green Oaks Blvd
Suite 140
Arlington, TX 76006-6247
(817) 277-1100

Project Summary

Project Code: 2023-0000107
Project Name: Cooper Lake MP Revision
Project Type: Land Management Plans - NWR
Project Description: The Jim Chapman (Cooper) Lake and White Oak Creek Mitigation Area 2023 Master Plan (Delta and Hopkins counties, 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 Cooper and White Oak Creek Mitigation Area for the next 25 years.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@33.30808695,-95.69031516707754,14z

Counties: Delta and Hopkins counties, Texas

Endangered Species Act Species

There is a total of 4 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[1], 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.

Mammals

NAME	STATUS
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

Birds

NAME	STATUS
Piping Plover *Charadrius melodus* Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is **final** critical habitat for this species. Your location does not overlap the critical habitat. This species only needs to be considered under the following conditions: ▪ Wind Energy Projects Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot *Calidris canutus rufa* There is **proposed** critical habitat for this species. This species only needs to be considered under the following conditions: ▪ Wind Energy Projects Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus*	Candidate

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/9743

Critical habitats

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

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Golden-plover *Pluvialis dominica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Sep 1 to Jul 31
Chimney Swift *Chaetura pelagica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 25

NAME	BREEDING SEASON
Lesser Yellowlegs *Tringa flavipes* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Little Blue Heron *Egretta caerulea* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds Mar 10 to Oct 15
Prothonotary Warbler *Protonotaria citrea* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 1 to Jul 31
Red-headed Woodpecker *Melanerpes erythrocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

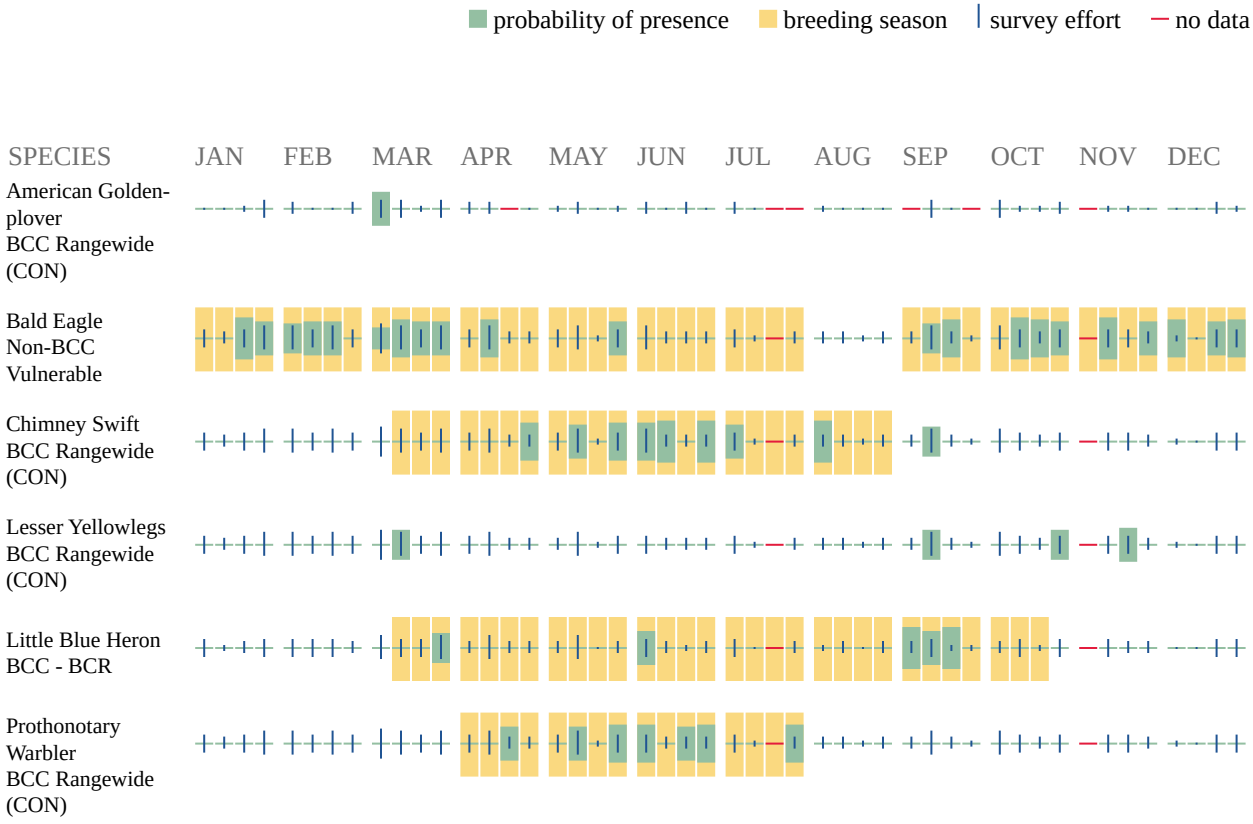
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

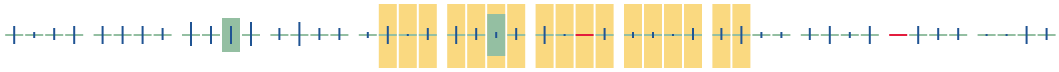
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Red-headed Woodpecker BCC Rangewide (CON)



Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?
Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects
For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?
If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report
The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

FRESHWATER FORESTED/SHRUB WETLAND

- PFO1/SS1A
- PFO1A
- PFO1/EM5A
- PFO5Fh
- PSS1Cx
- PSS1A
- PFO1Ch

FRESHWATER POND

- PUBFh
- PAB/UBHh
- PUSC
- PAB4F
- PUBHh
- PUBF

FRESHWATER EMERGENT WETLAND

- PEM1C
- PEM5A
- PEM5C
- PEM1/SS1C

RIVERINE

- R5UBH
- R2UBH
- R4SBC
- R5UBFx
- R2UBHx

LAKE

- L1UBHh

IPaC User Contact Information

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City: Fort Worth
State: TX
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Email paul.e.roberts@usace.army.mil
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United States Department of the Interior

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Phone: (817) 277-1100 Fax: (817) 277-1129
Email Address: arles@fws.gov

In Reply Refer To: December 13, 2022
Project Code: 2023-0000116
Project Name: White Oak Creek Mitigation Area MP Revision

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

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(817) 277-1100

Project Summary

Project Code: 2023-0000116
Project Name: White Oak Creek Mitigation Area MP Revision
Project Type: Land Management Plans - NWR
Project Description: The Jim Chapman (Cooper) Lake and White Oak Creek Mitigation Area 2023 Master Plan (Bowie, Cass, Morris, and Titus counties, 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 Cooper and White Oak Creek Mitigation Area for the next 25 years.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@33.299785299999996,-94.52453373926932,14z

Counties: Texas

Endangered Species Act Species

There is a total of 4 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[1], 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.

Mammals

NAME	STATUS
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

Birds

NAME	STATUS
Piping Plover *Charadrius melodus* Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is **final** critical habitat for this species. Your location does not overlap the critical habitat. This species only needs to be considered under the following conditions: ▪ Wind Energy Projects Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot *Calidris canutus rufa* There is **proposed** critical habitat for this species. This species only needs to be considered under the following conditions: ▪ Wind Energy Projects Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus*	Candidate

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/9743

Critical habitats

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

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Golden-plover *Pluvialis dominica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
American Kestrel *Falco sparverius paulus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9587	Breeds Apr 1 to Aug 31

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Sep 1 to Jul 31
Brown-headed Nuthatch *Sitta pusilla* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds Mar 1 to Jul 15
Chimney Swift *Chaetura pelagica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 25
Eastern Whip-poor-will *Antrostomus vociferus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Aug 20
Kentucky Warbler *Oporornis formosus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 20
Lesser Yellowlegs *Tringa flavipes* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Little Blue Heron *Egretta caerulea* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds Mar 10 to Oct 15
Prothonotary Warbler *Protonotaria citrea* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 1 to Jul 31
Red-headed Woodpecker *Melanerpes erythrocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week

months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

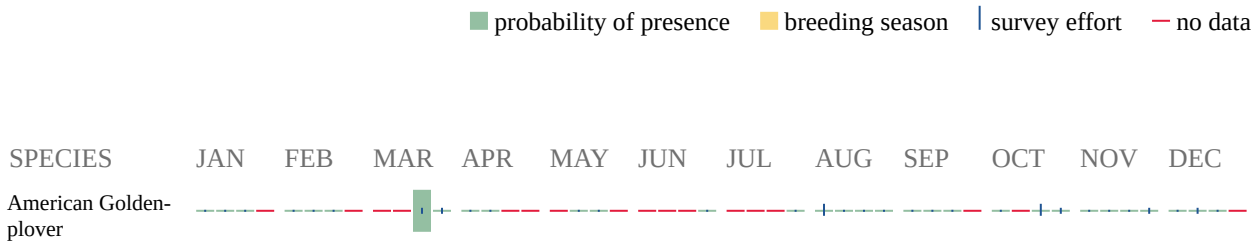
1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?
The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?
The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects
For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?
If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report
The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of

certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

Due to your project's size, the list below may be incomplete, or the acreages reported may be inaccurate. For a full list, please contact the local U.S. Fish and Wildlife office or visit https://www.fws.gov/wetlands/data/mapper.HTML

FRESHWATER POND

- Palustrine

IPaC User Contact Information

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CRTB RARE COMMUNITIES

Common Name	Scientific Name	G RANK	S RANK (Provisional)	ECOLOGICAL SYSTEM *added where relationship can be made at this scale*	ECOREGIONS (Note: other ecoregions are included for cross reference and conservation action coordination if needed)												Known COUNTIES	Endemic	Known PROTECTED AREAS	TERR	WETL	AQU	Comments
					CRTB	*EDPT*	*TBPR*	*ECPL*	*AZNM*	*CHIH*	*HIPL*	*SWTB*	*CGPL*	*WGCP*	*GCPM**	*STPL*							
American Sycamore - Arizona Walnut Woodland	Platanus occidentalis - Juglans major Woodland	G2G3	S3S3	Edwards Plateau Floodplain CES303.651	CRTB	EDPT											Bandera, Bell, Burnet, Comal, Gillespie, Hays, Kendall, Kinney, Kerr, Kimble, Lampasas, Real, Travis and Williamson	Y	Bull Creek and Barton Creek Parks (City of Austin), Hill Country SNA (Bandera), Kerr WMA (TPWD), Lost Maples SNA (TPWD), Love Creek Preserve (TNC) and South Llano River State Park (TPWD)		X		
Bur Oak - Shumard Oak Mixed Bottomland Forest	Quercus macrocarpa - Quercus shumardii - Chasmanthium latifolium Forest	G3?	S3?	South-Central Interior Large Floodplain CES202.705	CRTB		TBPR	ECPL									Anderson, Navarro, Red River and Tarrant	N		X			Newly described association (not in NatureServe). Probably in other North Texas counties.
Edwards Plateau Grotto	Adiantum capillus-veneris - (Thelypteris ovata var. lindheimeri, Thelypteris kunthii) Herbaceous Vegetation	G2G3	S2S3	Edwards Plateau Mesic Canyon CES303.038	CRTB	EDPT											Bandera, Bell, Bexar, Blanco, Hays, Comal, Edwards, Kendall, Medina, Kerr, Real, Travis, Uvalde, Val Verde and Williamson	Y	Balcones Canyonland Preserve (USFWS), Hamilton Pool (Travis) County Parks), Lost Maples SNA (TPWD) and Love Creek Preserve (TNC)		X		
Little Bluestem - (Yellow Indiangrass) - Tall Dropseed - Cusp Gayfeather Herbaceous Vegetation	Schizachyrium scoparium - (Sorghastrum nutans) - Sporobolus compositus var. compositus - Liatris mucronata Herbaceous Vegetation	GNR	S3	Southeastern Great Plains Tallgrass Prairie CES205.685	CRTB	EDPT											Bell, Blanco, Brown, Burnet, Callahan, Coleman, Comanche, Coryell, Eastland, Erath, Hamilton, Hays, Hill, Hood, Johnson, Lampasas, Mills, Somervell, Travis and Williamson	Y?	Fort Hood (DoD), Muse WMA (TPWD)	X			Widespread matrix vegetation, but many examples are degraded/disturbed
Mollisol Blackland Prairie	Schizachyrium scoparium - Andropogon gerardii - Sorghastrum nutans - Bifora americana Mollisol Herbaceous Vegetation	G1G2	G1G2	Texas Blackland Tallgrass Prairie CES205.684	CRTB												Cooke, Denton, Hood, Johnson, Montague, Parker, Somervell and Tarrant	Y	Cedar Hill State Park (TPWD), Bear Creek Ranch (Dixon Water Foundation)	X			This association should be defined with reference to Grand Prairie sites or split into multiple assns. Big bluestem is generally the most important nominal sp. (Eidson)
Southern Edwards Plateau Bigtooth Maple Canyon Forest	Acer grandidentatum - Quercus muehlenbergii - Quercus laceyi / Carex edwardsiana - Chaetopappa effusa Southern Edwards Plateau Forest	G2	S2	Edwards Plateau Mesic Canyon CES303.038	CRTB	EDPT											Bandera, Bell, Kendall, Kerr, Real and Uvalde	Y	Lost Maples SNA (TPWD) and Love Creek Preserve (TNC), Kronkosky Ranch (TPWD), Fort Hood (DoD), Bandera Conservation Bank	X			Also includes Acer grandidentatum - (Quercus muehlenbergii) / Carex edwardsiana Lampasas Cutplain Forest, a variant that occurs only in Bell County.
Southern Elm - Chinquapin Oak Forest	Ulmus (americana, rubra) - Quercus muehlenbergii Forest	GNR	S1S2?	Western Great Plains Floodplain CES303.678	CRTB		TBPR										Collin, Cooke, Dallas, Denton, Fannin, Grayson and Lamar	N	Caddo National Grasslands (USFS), Spring Creek Forest (City of Garland)	X			Needs better definition. Shumard oak may be a codominant sp. Probably another mesic woodland/"rich woods" association is needed in North Texas with elms, Shumard oak, redcedar in which chinquapin oak may not be present (e.g. Hunt County)

TBPR RARE COMMUNITIES

Common Name	Scientific Name	G RANK	S RANK (Provisional)	ECOLOGICAL SYSTEM *added where relationship can be made at this scale*	ECOREGIONS (Note: other ecoregions are included for cross reference and conservation action coordination if needed)												Known COUNTIES	Endemic	Known PROTECTED AREAS	TERR	WETL	AQU	Comments
					TBPR	*ECPL*	*CRTB*	*EDPT*	*WGCP*	*CGPL*	*GCPM*	*STPL*	*AZNM*	*CHIH*	*HIPL*	*SWTB*							
Bur Oak - Shumard Oak Mixed Bottomland Forest	Quercus macrocarpa - Quercus shumardii - Chasmanthium latifolium Forest	G3?	S3?	South-Central Interior Large Floodplain CES202.705	TBPR	ECPL	CRTB										Anderson, Navarro, Red River and Tarrant	N		X			Newly described association (not in NatureServe). Probably in other North Texas counties.
Eastern Gammagrass - (Switchgrass) Floodplain Herbaceous Vegetation	Tripsacum dactyloides - (Panicum virgatum) Herbaceous Vegetation	G1	S1	Texas Blackland Tallgrass Prairie CES205.684	TBPR	ECPL			WGCP								Austin, Delta, Franklin, Hopkins, Hunt, Smith, Titus and Tyler	Y?	Cowleech Prairie (TNC)		X		Newly defined association including prairies dominated by lowland gammagrass in frequently flooded bottomlands of E Tx. In examples in the upper Sabine watershed, P. virgatum is unimportant or absent. Though widely distributed, examples are rare and small in spatial extent. This community is unrelated to the Tripsacum dactyloides - Panicum virgatum - Sorghastrum nutans - Helianthus maximiliani Herbaceous Assn. and the gammagrass may be genetically distinct.
Eastern Gammagrass - Switchgrass - Yellow Indiangrass - Michaelmas-daisy Herbaceous Vegetation	Tripsacum dactyloides - Panicum virgatum - Sorghastrum nutans - Helianthus maximiliani Herbaceous Vegetation	G1	S1	Texas Blackland Tallgrass Prairie CES205.684	TBPR												Collin, Dallas, Delta, Fannin, Hunt, and Lamar	N	Clymer Meadow Preserve and Mathews Prairie (TNC), Parkhill Prairie (Collin County)	X			Needs better definition. Both T. dactyloides and P. virgatum have upland and lowland variants; this community includes sites which occur in an upland context. NatureServe description lists forbs such as H. maximiliani, Aster ericoides, Acacia angustissima var. hirta etc. which are broadly indicative of Tx blackland prairies; but high quality examples are better characterized by occurrence of "conservative" spps. such as Eryngium yuccifolium, Silphium spp. and other Helianthus spps. Existing remnants are diverse and variable.
Silveus' Dropseed - Longspike Tridens Herbaceous Vegetation	Sporobolus silveanus - Tridens strictus Herbaceous Vegetation	G1G2	S1S2	Texas Blackland Tallgrass Prairie CES205.684	TBPR												Bowie, Fannin, Franklin, Hopkins, Lamar, Rains and Titus	Y?	Tridens Prairie (TNC), Gambill Goose Refuge (City of Paris)	X			May not be distinct from the Sporobolus silveanus - Carex meadii Herbaceous Vegetation. G1G2 is probably appropriate combined rank.
Silveus' Dropseed - Mead's Sedge Herbaceous Vegetation	Sporobolus silveanus - Carex meadii Herbaceous Vegetation	G1	S1	Texas Blackland Tallgrass Prairie CES205.684	TBPR												Bowie, Fannin, Franklin, Hopkins, Lamar, Rains and Titus	Y?	Tridens Prairie (TNC), Gambill Goose Refuge (City of Paris)	X			
Southern Elm - Chinquapin Oak Forest	Ulmus (americana, rubra) - Quercus muehlenbergii Forest	GNR	S1S2?	Western Great Plains Floodplain CES303.678	TBPR		CRTB										Collin, Cooke, Dallas, Denton, Fannin, Grayson and Lamar	N	Caddo National Grasslands (USFS), Spring Creek Forest (City of Garland)	X			Needs better definition. Shumard oak may be a codominant sp. Probably another mesic woodland/"rich woods" association is needed in North Texas with elms, Shumard oak, redcedar in which chinquapin oak may not be present (e.g. Hunt County)
Upper West Gulf Coastal Plain Dry Calcareous (Blackland) Prairie	Schizachyrium scoparium - Sporobolus compositus - Fimbristylis puberula var. puberula Wooded Herbaceous Vegetation	G1G2	S1S2	West Gulf Coastal Plain Northern Calcareous Prairie CES203.377	TBPR												Fannin and Hunt	N	Caddo National Grasslands (USFS)	X			
Vertisol Blackland Prairie	Schizachyrium scoparium - Sorghastrum nutans - Andropogon gerardii - Bifora americana Vertisol Herbaceous Vegetation	G1G2	S1S2	Texas Blackland Tallgrass Prairie CES205.684	TBPR												Austin, Bastrop, Bell, Brazos, Burleson, Collin, Colorado, Dallas, Delta, Ellis, Fannin, Falls, Fayette, Franklin, Freestone, Grayson, Grimes, Hill, Hunt, Kaufman, Lavaca, Lee, Limestone, McLennan, Milam, Navarro, Robertson, Rockwall, Titus, Travis, Washington and Williamson	Y	Leonhardt Prairie (TNC), Kachina Prairie (Tx Land Conservancy easement), Peters Prairie and Riesel Prairie (NPAT)	X			Broadly defined; further definition might be warranted. Remnants are typically small and isolated. Examples in the Fayette Prairie subregion may include Paspalum plicatulum as a codominant and have other affinities with coastal prairies.

ECPL RARE COMMUNITIES

Common Name	Scientific Name	G RANK	S RANK (Provisional)	ECOLOGICAL SYSTEM *added where relationship can be made at this scale*	ECOREGIONS (Note: other ecoregions are included for cross reference and conservation action coordination if needed)												Known COUNTIES	Endemic	Known PROTECTED AREAS	TERR	WETL	AQU	Comments
					ECPL	*TBPR*	*WGCP*	*CRTB*	*GCPM**	*EDPT*	*AZNM*	*CHIH*	*HIPL*	*SWTB*	*CGPL*	*STPL*							
Bur Oak - Shumard Oak Mixed Bottomland Forest	Quercus macrocarpa - Quercus shumardii - Chasmanthium latifolium Forest	G3?	S3?	South-Central Interior Large Floodplain CES202.705	ECPL	TBPR		CRTB									Anderson, Navarro, Red River and Tarrant	N		X			Newly described association (not in NatureServe). Probably in other North Texas counties.
Central Texas Post Oak Ecoregion Hillside Seepage Slope	Rhynchospora macra - Sarracenia alata - Eleocharis equisetoides - Xyris scabrifolia - Xyris chapmanii Herbaceous Vegetation	G1	S1	West Gulf Coastal Plain Herbaceous Seep and Bog CES203.194	ECPL												Freestone and Leon	Y	No documented protected areas		X		Newly described by Singhurst and Bridges
Central Texas Post Oak Ecoregion Stream Valley Seepage Bog	Centella erecta - Rhexia mariana - Sarracenia alata - Rhynchospora chalarocephala - Polygala cruciata - Juncus trigonocarpus - Andropogon capillipes Herbaceous Vegetation	G1G2	S1S2		ECPL												Freestone, Houston, Leon and Robertson	Y	No documented protected areas		X		Newly described by Singhurst and Bridges
Curly Threeawn - Pickering's Dawnflower - Silver Croton - Little Bluestem Blowout Sandhill Vegetation	Aristida desmantha-Stylisma pickeringii ssp. patersonii-Croton argyranthemus-Schizachrium scoparium Herbaceous Vegetation	G2	S2	East-Central Texas Plains Xeric Sandyland CES205.897	ECPL												Anderson, Bastrop, Burleson, Freestone, Henderson, Lee, Leon, Milam, Robertson, Smith, Van Zandt and Wood	Y	Bastrop SP (TPWD), Yegua Knobs Preserve (Pines and Prairies Land Trust)	X			
Eastern Gammagrass - (Switchgrass) Floodplain Herbaceous Vegetation	Tripsacum dactyloides - (Panicum virgatum) Herbaceous Vegetation	G1	S1	Texas Blackland Tallgrass Prairie CES205.684	ECPL	TBPR	WGCP										Austin, Delta, Franklin, Hopkins, Hunt, Smith, Titus and Tyler	Y?	Cowleech Prairie (TNC)		X		Newly defined association including prairies dominated by lowland gammagrass in frequently flooded bottomlands of E Tx. In examples in the upper Sabine watershed, P. virgatum is unimportant or absent. Though widely distributed, examples are rare and small in spatial extent. This community is unrelated to the Tripsacum dactyloides - Panicum virgatum - Sorghastrum nutans - Helianthus maximiliani Herbaceous Assn. and the gammagrass may be genetically distinct.
Little Bluestem - Indiangrass - Prairie Bishop Alfisol Herbaceous Vegetation	Schizachyrium scoparium - Sorghastrum nutans - Bifora americana Alfisol Herbaceous Vegetation	G1G2	S1S2	Texas Blackland Tallgrass Prairie CES205.684	ECPL												Austin, Brazos, Burleson, Colorado, Fayette, Freestone, Grimes, Lavaca, Lee, Leon, Limestone, Madison, Robertson and Washington	Y	Fort Parker SP (TPWD)	X			
Little Bluestem - Narrowleaf Pinweed - Round Copperleaf Herbaceous Vegetation	Schizachyrium scoparium - Lechea tenuifolia - Acalypha radians Herbaceous Vegetation	G2G3	S2S3	East-Central Texas Plains Xeric Sandyland CES205.897	ECPL												Atascosa, Bastrop, Bexar, Caldwell, Guadalupe, Gonzales, Lee, Medina and Wilson	Y	Bastrop and Buescher State Park (TPWD)	X			
Live Oak - Post Oak Woodland	Quercus virginiana - Quercus stellata / Schizachyrium scoparium - Paspalum plicatulum Woodland	G3	S3	East-Central Texas Plains Post Oak Savanna and Woodland CES205.679	ECPL				GCPM								Austin, Burleson, Colorado, Gonzales, Lavaca, Lee, Waller and Washington	Y	No documented protected areas	X			This assn. may warrant more precise definition - nominal spps. are widespread. Includes a number of endemic plant spps.
Northern Texas Post Oak Stream Valley Pitcher Plant Bog	(Acer rubrum var. trilobum - Alnus serrulata) / Apios americana - Sarracenia alata - Symphyotrichum puniceum var. scabricaule - Rhynchospora chalarocephala - Juncus trigonocarpus Herbaceous Vegetation	G1G2	S1S2	West Gulf Coastal Plain Herbaceous Seep and Bog CES203.194	ECPL												Anderson, Henderson, Smith, Van Zandt and Wood	Y	Gus Engeling WMA (TPWD)		X		Newly described by Singhurst and Bridges
Oklahoma Acidic Hillside Seep	Dichanthelium scoparium - Boehmeria cylindrica / Sphagnum spp. - Polytrichum commune Herbaceous Vegetation	G2	S1	West Gulf Coastal Plain Herbaceous Seep and Bog CES203.194	ECPL												Lamar	N	Camp Maxey (DoD)		X		
Southern Texas Post Oak Ecoregion Seepage Slopes and Swales	Morella cerifera / Eleocharis tortilis - Helianthus angustifolius - Rhexia mariana - Triadenum virginicum - Eleocharis flavescens - Juncus validus Herbaceous Vegetation	G2	S2	West Gulf Coastal Plain Herbaceous Seep and Bog CES203.194	ECPL												Austin, Bastrop, Burleson, Colorado, Gonzales, Guadalupe, Grimes, Lee, Limestone, Milam, Robertson, Washington and Wilson	Y	Bastrop SP (TPWD), Yegua Knobs Preserve (Pines and Prairies Land Trust)		X		Newly described by Singhurst and Bridges
Southern Texas Post Oak Ecoregion Stream Terrace Escarpment Seepage Bog	Cyperus haspan - Fuirena squarrosa - Cirsium muticum - Cicuta maculata - Leersia virginica Herbaceous Vegetation	G1	S1	West Gulf Coastal Plain Herbaceous Seep and Bog CES203.194	ECPL												Gonzales and Guadalupe	Y	No documented protected areas		X		Newly described by Singhurst and Bridges
Texas Oakville Sandstone Savanna	Quercus stellata-Quercus fusiformis-Schizachyrium scoparium-Nolina lindheimeriana Savanna Vegetation	G1	S1		ECPL												Fayette	Y	Monument Hill SHP (TPWD)	X			Newly described by Singhurst
Texas Post Oak Savanna Oakville Sandstone Outcrop	Bouteloua spp. - Muhlenbergia capillaris - Physaria densiflora - Coryphantha missouriensis - Lygodesmia texana Herbaceous Vegetation	G1	S1		ECPL												Grimes	Y	No documented protected areas	X			
Texas Post Oak Savanna Quaking Muck Bog	Carex lurida - Andropogon glomeratus - Sarracenia alata - Symphyotrichum puniceum var. scabricaule - Doellingeria sericocarpoides Herbaceous Vegetation	G1G2	S1S2	West Gulf Coastal Plain Herbaceous Seep and Bog CES203.194	ECPL												Anderson, Freestone, Henderson, Robertson (possibly extirpated?), Van Zandt and Wood	Y	Gus Engeling WMA (TPWD)		X		Newly described by Singhurst and Bridges
Texas Southern Post Oak Sandhills	Quercus stellata-Dichanthelium (oligosanthes, nodatum)-Acalypha radians-Eriogonum multiflorum	G1G2	S1S2	East-Central Texas Plains Xeric Sandyland CES205.897	ECPL												Atascosa, Bastrop, Bexar, Caldwell, Gonzales, Guadalupe, Medina, and Wilson	Y	Neasloney WMA (TPWD)	X			

Taxon	SName	CName	USESA	SPROT	Endemic	GRank	SRank	SGCN	Description
Amphibian	Pseudacris	Strecker's chorus frog			N	G5	S3	Y	Terrestrial
Amphibian	Lithobates	southern crawfish frog			N	G4T4	S3	Y	Terrestrial
Birds	Plegadis ch	white-faced ibis		T	N	G5	S4B	Y	The county
Birds	Mycteria a	wood stork		T	N	G4	SHB,S2N	Y	The county
Birds	Elanoides f	swallow-tailed kite		T	N	G5	S2B	Y	The county
Birds	Haliaeetus	bald eagle			N	G5	S3B,S3N	Y	Found prim
Birds	Charadrius	piping plov	LT	T	N	G3	S2N	Y	The county
Birds	Leucophae	Franklin's gull			N	G5	S2N	Y	The county
Birds	Anthus spr	Sprague's pipit			N	G3G4	S3N	Y	The county
Birds	Peucaea ae	Bachman's sparrow		T	N	G3	S1B	Y	Open pine
Fish	Scaphirhyn	shovelnose	SAT	T	N	G4	S2	Y	Found only
Fish	Polyodon s	paddlefish		T	N	G4	S3	Y	Species occ
Fish	Hiodon alo	goldeye			N	G5	S3	Y	Restricted
Fish	Campostor	highland stoneroller			N	G4G5	SNR	Y	Rare, restri
Fish	Hybognath	Mississippi silvery minnow				G5	S4	Y	Found in ea
Fish	Notropis at	blackspot shiner			N	G4	S3	Y	Occurs fron
Fish	Notropis b	Red River shiner			N	G4	S3	Y	Red River b
Fish	Notropis ch	ironcolor shiner			N	G4	S3	Y	Found only
Fish	Notropis m	taillight shiner			N	G5	S1	Y	Restricted
Fish	Notropis p	chub shiner		T	N	G4	S2	Y	Brazos, Col
Fish	Notropis st	silverband shiner			N	G5	S4	Y	In Texas, fo
Fish	Macrhybop	silver chub			N	G5	S3	Y	Red River a
Fish	Erimyzon c	western creek chubsu		T	N	G5	S2S3	Y	Eastern Tex
Fish	Etheostom	orangebelly darter			N	G4	S3	Y	Streams, cr
Fish	Percina ma	blackside darter		T	N	G5	S1	Y	Restricted
Mammals	Myotis aus	southeastern myotis bat			N	G4	S3?	Y	Caves are r
Mammals	Perimyotis	tricolored bat			N	G3G4	S2	Y	Forest, woo
Mammals	Eptesicus f	big brown bat			N	G5	S5	Y	Any woode
Mammals	Lasiurus bo	eastern red bat			N	G3G4	S4	Y	Red bats ar
Mammals	Lasiurus ci	hoary bat			N	G3G4	S4	Y	Hoary bats
Mammals	Sylvilagus a	swamp rabbit			N	G5	S5	Y	Primarily fo
Mammals	Ondatra zil	muskrat			N	G5	S5	Y	Found in fr
Mammals	Ursus ame	black bear		T	N	G5	S3	Y	Generalist.
Mammals	Mustela fr	long-tailed weasel			N	G5	S5	Y	Includes br
Mammals	Spilogale p	eastern spotted skunk			N	G4	S1S3	Y	Generalist;
Mammals	Puma conc	mountain lion			N	G5	S2S3	Y	Generalist;
Reptiles	Macrochel	alligator snapping turt		T	N	G3	S2	Y	Aquatic: Pe
Reptiles	Terrapene	eastern box turtle			N	G5	S3	Y	Terrestrial:
Reptiles	Ophisaurus	slender glass lizard			N	G5	S3	Y	Terrestrial:
Reptiles	Phrynosom	Texas horned lizard		T	N	G4G5	S3	Y	Terrestrial:
Reptiles	Plestiodon	prairie skink			N	G5	S2	Y	The prairie
Reptiles	Crotalus ho	timber (canebrake) rattlesnake			N	G4	S4	Y	Terrestrial:
Reptiles	Sistrurus m	pygmy rattlesnake			N	G5	S2S3	Y	The pygmy
Insects	Bombus pe	American bumblebee				G3G4	SNR	Y	Habitat des
Plants	Quercus ar	Arkansas oak			N	G3	S1	Y	At the Cass
Plants	Thalictrum	Arkansas meadow-rue			N	G2Q	S2	Y	Mostly dec

Plants	Crataegus	Sutherland hawthorn	N	G5T3T4	S3	Y	In mesic sc

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Taxon	SName	CName	USESA	SPROT	Endemic	GRank	SRank	SGCN	Description
Amphibian	Desmogna	spotted dusky salamander			N	G5	S1	Y	This specie
Amphibian	Anaxyrus v	Woodhouse's toad			N	G5	SU	Y	Terrestrial
Amphibian	Pseudacris	Strecker's chorus frog			N	G5	S3	Y	Terrestrial
Amphibian	Lithobates	southern crawfish frog			N	G4T4	S3	Y	Terrestrial
Birds	Plegadis ch	white-faced ibis		T	N	G5	S4B	Y	The county
Birds	Mycteria a	wood stork		T	N	G4	SHB,S2N	Y	The county
Birds	Elanoides f	swallow-tailed kite		T	N	G5	S2B	Y	The county
Birds	Haliaeetus	bald eagle			N	G5	S3B,S3N	Y	Found prin
Birds	Charadrius	piping plov	LT	T	N	G3	S2N	Y	The county
Birds	Leucophae	Franklin's gull			N	G5	S2N	Y	The county
Birds	Anthus spr	Sprague's pipit			N	G3G4	S3N	Y	The county
Birds	Peucaea ae	Bachman's sparrow		T	N	G3	S1B	Y	Open pine
Fish	Polyodon s	paddlefish		T	N	G4	S3	Y	Species oc
Fish	Hybognath	Mississippi silvery minnow				G5	S4	Y	Found in e
Fish	Notropis a	blackspot shiner			N	G4	S3	Y	Occurs fro
Fish	Notropis cl	ironcolor shiner			N	G4	S3	Y	Found only
Fish	Notropis m	taillight shiner			N	G5	S1	Y	Restricted
Fish	Notropis sl	silverband shiner			N	G5	S4	Y	In Texas, fo
Fish	Pteronotrc	bluehead shiner		T	N	G3	S1	Y	Mainstem
Fish	Percina ma	blackside darter		T	N	G5	S1	Y	Restricted
Mammals	Myotis aus	southeastern myotis bat			N	G4	S3?	Y	Caves are r
Mammals	Perimyotis	tricolored bat			N	G3G4	S2	Y	Forest, wo
Mammals	Eptesicus f	big brown bat			N	G5	S5	Y	Any woode
Mammals	Lasiurus bo	eastern red bat			N	G3G4	S4	Y	Red bats a
Mammals	Lasiurus ci	hoary bat			N	G3G4	S4	Y	Hoary bats
Mammals	Corynorhir	Rafinesque's big-eared		T	N	G3G4	S2	Y	Historically
Mammals	Sylvilagus a	swamp rabbit			N	G5	S5	Y	Primarily fo
Mammals	Ondatra zil	muskrat			N	G5	S5	Y	Found in fr
Mammals	Ursus ame	black bear		T	N	G5	S3	Y	Generalist.
Mammals	Mustela fr	long-tailed weasel			N	G5	S5	Y	Includes br
Mammals	Spilogale p	eastern spotted skunk			N	G4	S1S3	Y	Generalist;
Mammals	Puma conc	mountain lion			N	G5	S2S3	Y	Generalist;
Reptiles	Macrochel	alligator snapping turt		T	N	G3	S2	Y	Aquatic: Pe
Reptiles	Terrapene	eastern box turtle			N	G5	S3	Y	Terrestrial:
Reptiles	Terrapene	western box turtle			N	G5	S3	Y	Terrestrial:
Reptiles	Ophisaurus	slender glass lizard			N	G5	S3	Y	Terrestrial:
Reptiles	Plestiodon	prairie skink			N	G5	S2	Y	The prairie
Reptiles	Cemophor	northern scarlet snake		T	N	G5	S4	Y	Terrestrial:
Reptiles	Crotalus ho	timber (canebrake) rattlesnake			N	G4	S4	Y	Terrestrial:
Crustacear	Orconecte	No accepted common name			N	G2	S2	Y	Streams of
Mollusks	Pleurobem	Louisiana pigtoe		T	N	G1G2	S1	Y	Occurs in s
Plants	Coreopsis i	goldenwave tickseed			N	G3	S3	Y	In deep sar
Plants	Prenanthe	barbed rattlesnake-root			N	G3	S3	Y	In east Tex
Plants	Amorpha l	smooth indigobush			N	G3?	S1	Y	Prairies, op
Plants	Amorpha p	panicled indigobush			N	G3	S3	Y	A stout shr
Plants	Astragalus	Soxman's milkvetch			N	G3	S3	Y	Primarily in

Plants	Quercus ar	Arkansas oak	N	G3	S1	Y	At the Cass
Plants	Crataegus	Nixon's dwarf hawthorn	Y	G1	S1	Y	Found in o
Plants	Trillium te	Texas trillium	N	G3	S3	Y	In or along
Plants	Cypripediu	Southern lady's-slipper	N	G3	S1	Y	Primarily r
Plants	Spiranthes	Texas ladies'-tresses	N	G1G2	S1	Y	Sandy soils

# Counties		
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Central	and North	254
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Taxon	SName	CName	USESA	SPROT	Endemic	GRank	SRank	SGCN	Description
Amphibian	Anaxyrus v	Woodhouse's toad			N	G5	SU	Y	Terrestrial
Amphibian	Pseudacris	Strecker's chorus frog			N	G5	S3	Y	Terrestrial
Amphibian	Lithobates	southern crawfish frog			N	G4T4	S3	Y	Terrestrial
Birds	Plegadis ch	white-faced ibis		T	N	G5	S4B	Y	The county
Birds	Mycteria a	wood stork		T	N	G4	SHB,S2N	Y	The county
Birds	Haliaeetus	bald eagle			N	G5	S3B,S3N	Y	Found prim
Birds	Laterallus j	black rail	LT	T	N	G3	S2	Y	The county
Birds	Charadrius	piping plov	LT	T	N	G3	S2N	Y	The county
Birds	Calidris can	rufa red kn	LT	T	N	G4T2	S2N	Y	The county
Birds	Leucophae	Franklin's gull			N	G5	S2N	Y	The county
Birds	Athene cur	western burrowing owl			N	G4T4	S2	Y	Open grass
Birds	Anthus spr	Sprague's pipit			N	G3G4	S3N	Y	The county
Birds	Calcarius o	chestnut-collared longspur			N	G5	S3	Y	Occurs in c
Mammals	Perimyotis	tricolored bat			N	G3G4	S2	Y	Forest, wo
Mammals	Eptesicus f	big brown bat			N	G5	S5	Y	Any woode
Mammals	Lasiurus bo	eastern red bat			N	G3G4	S4	Y	Red bats ar
Mammals	Lasiurus cir	hoary bat			N	G3G4	S4	Y	Hoary bats
Mammals	Sylvilagus a	swamp rabbit			N	G5	S5	Y	Primarily fo
Mammals	Ondatra zil	muskrat			N	G5	S5	Y	Found in fr
Mammals	Ursus ame	black bear		T	N	G5	S3	Y	Generalist.
Mammals	Mustela fre	long-tailed weasel			N	G5	S5	Y	Includes br
Mammals	Spilogale p	eastern spotted skunk			N	G4	S1S3	Y	Generalist;
Mammals	Puma conc	mountain lion			N	G5	S2S3	Y	Generalist;
Reptiles	Macrochel	alligator snapping turt	T		N	G3	S2	Y	Aquatic: Pe
Reptiles	Deirochely	western chicken turtle			N	G5T5	S2S3	Y	Aquatic an
Reptiles	Terrapene	eastern box turtle			N	G5	S3	Y	Terrestrial:
Reptiles	Terrapene	western box turtle			N	G5	S3	Y	Terrestrial:
Reptiles	Ophisaurus	slender glass lizard			N	G5	S3	Y	Terrestrial:
Reptiles	Phrynosom	Texas horned lizard		T	N	G4G5	S3	Y	Terrestrial:
Reptiles	Thamnoph	Texas garter snake			Y	G5T4	S1	Y	Terrestrial
Insects	Bombus pe	American bumblebee				G3G4	SNR	Y	Habitat des
Plants	Thalictrum	Arkansas meadow-rue			N	G2Q	S2	Y	Mostly dec
Plants	Carex shin	Shinner's sedge			N	G3	S2	Y	Occurs in d
Plants	Calopogon	Oklahoma grass pink			N	G2	S1S2	Y	Mesic, acic

# Counties		
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Taxon	SName	CName	USESA	SPROT	Endemic	GRank	SRank	SGCN	Description
Amphibian	Ambystom	eastern tiger salamander			N	G5	S3	Y	Terrestrial
Amphibian	Desmogna	spotted dusky salamander			N	G5	S1	Y	This specie
Amphibian	Anaxyrus v	Woodhouse's toad			N	G5	SU	Y	Terrestrial
Amphibian	Pseudacris	Strecker's chorus frog			N	G5	S3	Y	Terrestrial
Amphibian	Lithobates	southern crawfish frog			N	G4T4	S3	Y	Terrestrial
Birds	Plegadis ch	white-faced ibis		T	N	G5	S4B	Y	The county
Birds	Mycteria a	wood stork		T	N	G4	SHB,S2N	Y	The county
Birds	Elanoides f	swallow-tailed kite		T	N	G5	S2B	Y	The county
Birds	Haliaeetus	bald eagle			N	G5	S3B,S3N	Y	Found prin
Birds	Laterallus j	black rail	LT	T	N	G3	S2	Y	The county
Birds	Charadrius	piping plov	LT	T	N	G3	S2N	Y	The county
Birds	Calidris can	rufa red kn	LT	T	N	G4T2	S2N	Y	The county
Birds	Leucophae	Franklin's gull			N	G5	S2N	Y	The county
Birds	Athene cur	western burrowing owl			N	G4T4	S2	Y	Open grass
Birds	Anthus spr	Sprague's pipit			N	G3G4	S3N	Y	The county
Birds	Calcarius o	chestnut-collared longspur			N	G5	S3	Y	Occurs in c
Fish	Polyodon s	paddlefish		T	N	G4	S3	Y	Species occ
Fish	Hybognath	Mississippi silvery minnow				G5	S4	Y	Found in e
Fish	Notropis m	taillight shiner			N	G5	S1	Y	Restricted
Mammals	Myotis aus	southeastern myotis bat			N	G4	S3?	Y	Caves are r
Mammals	Perimyotis	tricolored bat			N	G3G4	S2	Y	Forest, wo
Mammals	Eptesicus f	big brown bat			N	G5	S5	Y	Any woode
Mammals	Lasiurus bo	eastern red bat			N	G3G4	S4	Y	Red bats a
Mammals	Lasiurus cir	hoary bat			N	G3G4	S4	Y	Hoary bats
Mammals	Sylvilagus a	swamp rabbit			N	G5	S5	Y	Primarily f
Mammals	Ondatra zil	muskrat			N	G5	S5	Y	Found in fr
Mammals	Ursus ame	black bear		T	N	G5	S3	Y	Generalist.
Mammals	Mustela fr	long-tailed weasel			N	G5	S5	Y	Includes br
Mammals	Spilogale p	eastern spotted skunk			N	G4	S1S3	Y	Generalist;
Mammals	Puma conc	mountain lion			N	G5	S2S3	Y	Generalist;
Reptiles	Macrochel	alligator snapping turt		T	N	G3	S2	Y	Aquatic: Pe
Reptiles	Deirochely	western chicken turtle			N	G5T5	S2S3	Y	Aquatic an
Reptiles	Terrapene	eastern box turtle			N	G5	S3	Y	Terrestrial:
Reptiles	Terrapene	western box turtle			N	G5	S3	Y	Terrestrial:
Reptiles	Ophisaurus	slender glass lizard			N	G5	S3	Y	Terrestrial:
Reptiles	Phrynosom	Texas horned lizard		T	N	G4G5	S3	Y	Terrestrial:
Insects	Bombus pe	American bumblebee				G3G4	SNR	Y	Habitat des
Mollusks	Pleurobem	Louisiana pigtoe		T	N	G1G2	S1	Y	Occurs in s
Plants	Symphyotr	rough-stem aster			N	G5T2	S1S2	Y	Relatively c

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WILDLIFE HABITAT APPRAISAL PROCEDURE (WHAP)

SUMMARY REPORT

JIM CHAPMAN LAKE AND WHITE OAK CREEK MITIGATION AREA MASTER PLAN

HOPKINS AND DELTA COUNTIES, TEXAS

December 2022

US Army Corps
of Engineers ®
Tulsa District

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Introduction

Habitat assessments were conducted at Jim Chapman (formerly Cooper) Lake and White Oak Creek Mitigation Area (WOCMA) on May 9-14, 2022, using the 1995 Texas Parks and Wildlife Department's (TPWD) Wildlife Habitat Appraisal Procedure (WHAP) TPWD. 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 97 WHAP points were surveyed (59 at Jim Chapman Lake and 37 at WOCMA), all within U.S. Army Corps of Engineers (USACE) fee boundary (Figures 1, 2, and 3).

The purpose of this report is to describe wildlife habitat quality within the USACE fee-owned property at Jim Chapman Lake in Hopkins and Delta Counties, Texas and WOCMA in Bowie, Cass, Morris, and Titus Counties. . This report wasprepared by the USACE Regional Planning and Environmental Center to provide habitat quality information and inform land classifications as part of the Jim Chapman Lake and WOCMA Master Plan revision process.

Study Area

USACE fee owned property at Jim Chapman Lake and WOCMA contains approximately 43,730 acres combined (Figure 1). Jim Chapman Lake is located on the South Sulphur River at rivel mile 29 and the dam site is approximately 2 miles southeast of Cooper, TX and 11 miles north of Sulphur Springs, TX along the Sulphur River. The dam, lake, and project area of Jim Chapman are located along the border of Hopkins and Delta Counties, Texas and are within the Northern Blackland Prairie ecoregion. WOCMA is located within Bowie, Cass, Morris, and Titus Counties, Texas within the East Central Texas Plains Floodplains and Low Terraces as well as South Central Plains Floodplains and Low Terraces ecoregions.

Figure 1. Vicinity Map for Jim Chapman Lake (Hopkins and Delta Counties, Texas)

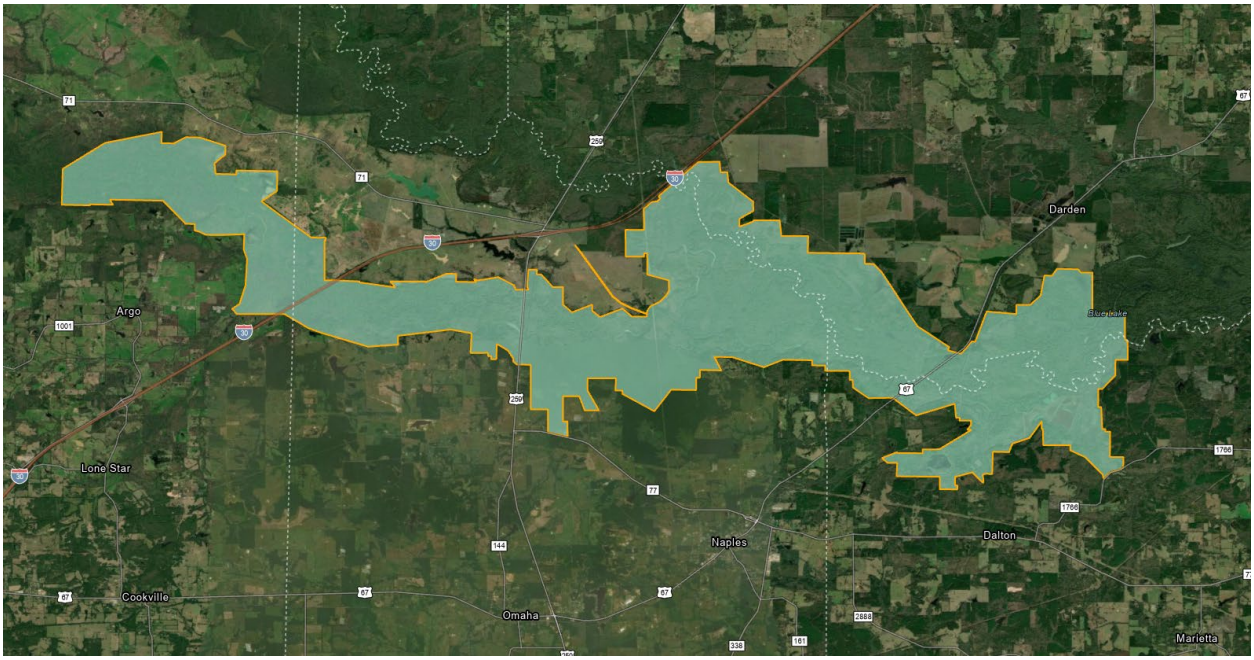

Figure 2. WOCMA (Bowie, Cass, Morris, and Titus Counties, Texas) Vicinity Map

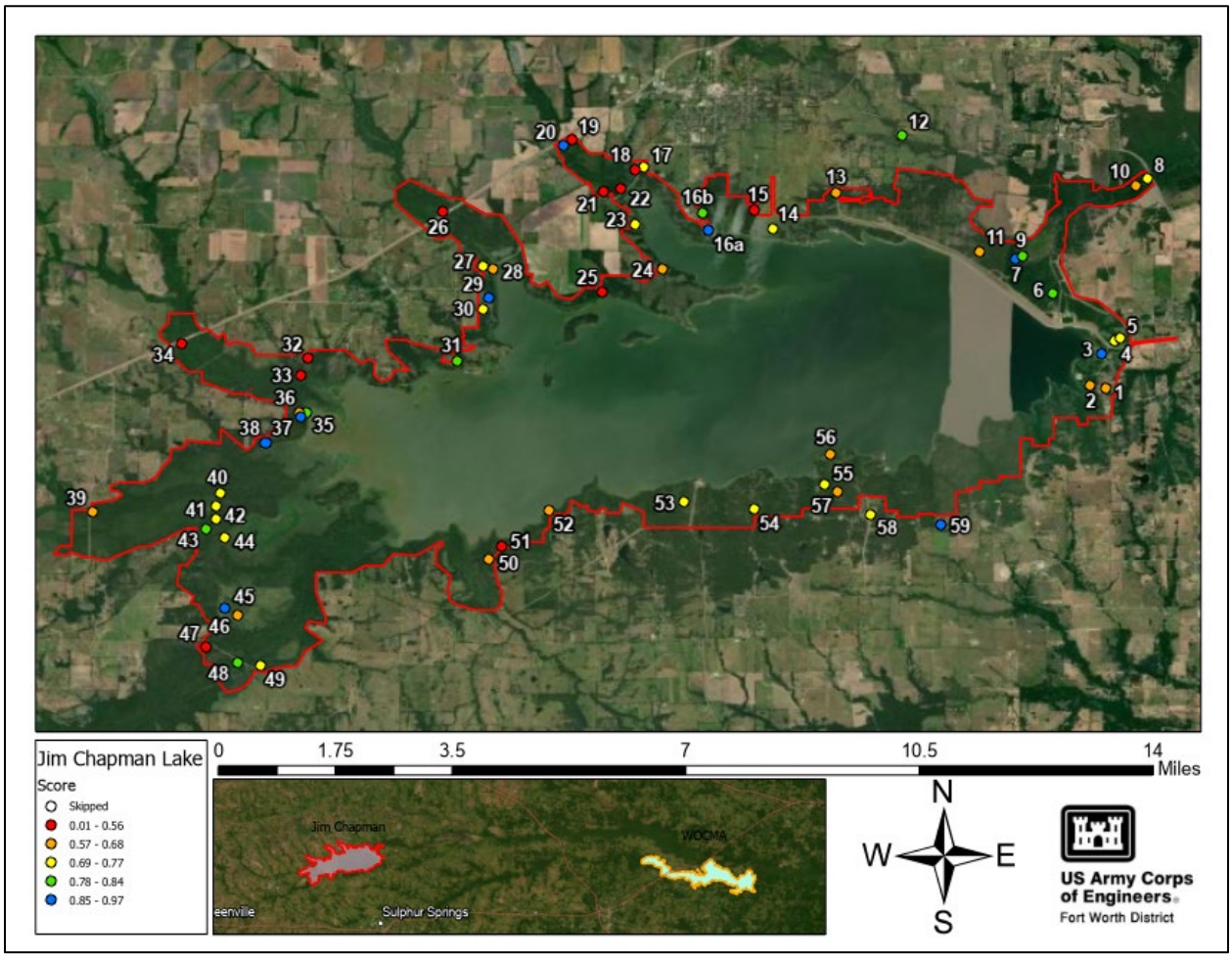

Figure 3. Distribution of WHAP Points within Jim Chapman Lake, located in Hopkins and Delta Counties, Texas

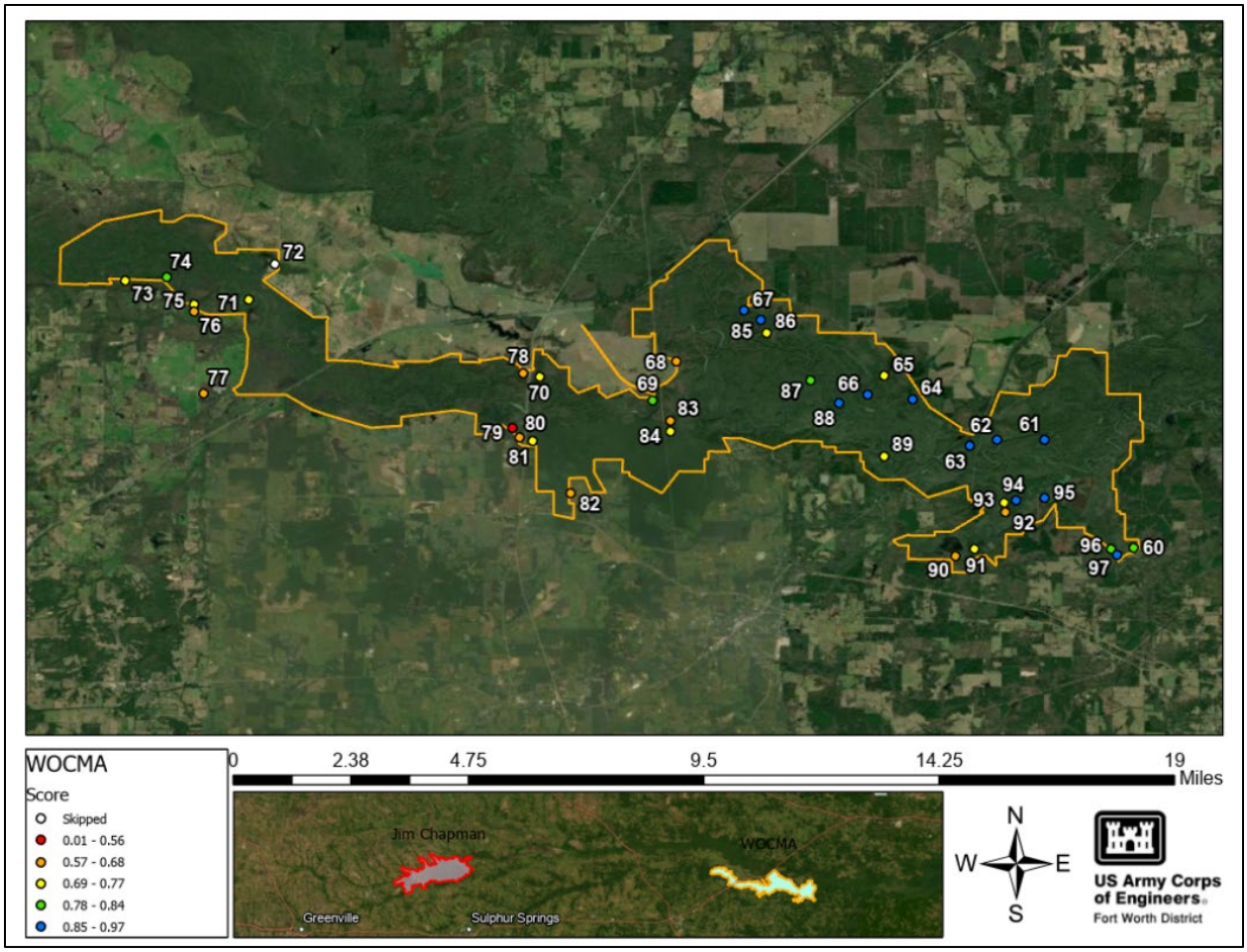

Figure 4 Distribution of WHAP Points within WOCMA, located in Bowie, Cass, Morris, and Titus Counties, Texas

Methodology

The WHAP team consisted of Justin Avery, Dalton Howell, Dwayne Hicks, Karen Hardin, Ricky Maxey, William Smith, Logan Lovelace, Joshua Quiring, Matthew Seavey, Cody Hammer, Brandon Childers, Cody Turner, Jeremy Mayhew, Martin Underwood, Elizabeth Knapp, Sylvester Rodriguez. The methodology includes evaluating representative sites of each cover type present within an area of interest. 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 (TPWD 1995). 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

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.

At each 0.1-acre plot evaluated, 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. The scores for each site can be found in Attachment A. Photographs were taken at each site and are included as Attachment B.

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 yield higher results 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. The Site Potential component has a maximum score of 0.25 points and 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: periodically support predominately hydrophytic vegetation, have 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 of the growing season 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 layers).

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 more than 12 feet tall, and very little additional structural components. To account for this, total scores for areas categorized as grasslands do not reflect the Vegetation Species Diversity component and makes the maximum score for Vertical Vegetation Stratification component as a value of 4 and Additional Structural Diversity component as 1.

These components regularly exclude grassland habitat from receiving the maximum score of 1.00 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 (including all non-riparian/BHF forests), grassland, and marsh habitats. The maximum value scores, shown in Table 1, were then used to normalize scores for habitats that are prevented from reaching the maximum WHAP score. This is 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. Habitat Cover Types and Maximum Total Scores

	Component Number								
Cover Type	1	2	3	4	5	6	7	7B	Maximum Total Score
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

Riparian/BHF habitats can achieve the maximum score, therefore, no normalization of scores were made for that habitat type. 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 riparian/BHF habitat was not normalized because it already can achieve the maximum score. 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

Jim Chapman Lake lies within the Blackland Prairie ecoregion (Level III). The Blackland Prairie ecoregion is characterized by the fertile black soils that is in the area consisting of big bluestem (*Andropogon gerardi*), little bluestem (*Schizachyrium scoparium*), Indian grass (*Sorghastrum nutans*), and switchgrass (*Panicum virgatum*). The soils in the prairie are fertile to produce food and forage crops. Average annual rainfall ranges from 28 to 40 inches. The soils are uniformly dark-colored alkaline clays and interspersed with acidic sandy loams. Crop production and cattle ranching are the primary agricultural industries within the ecoregion. Table 2 displays all habitats surveyed and the number of points surveyed within each respective habitat type.

White Oak Creek Mitigation Area is within both the Pineywoods and Post Oak Savanah ecoregios (Level III). The Pineywoods ecoregion is consist mostly of pines and oaks with rich bottomlands with tall hardwoods. The average annual rainfall rages from 36 to 50 inches. Soils are generally acidic and mostly pale to dark gray sands or sandy loams. The Post Oak Savanah consist with belts of oak forest crossing strips of prairie grassland. The average rainfall is around 28 to 40 inches per year. The upland soils are light colored, acidic sandy loam but the bottomland soils may be light brown to dark gray and acidic with sandy to clay textures.

Table 2. Survey Points per Habitat Type

Habitat Type	Points Surveyed
Riparian/BHF	49
Marsh	4
Upland Forest	33
Grassland	10
Total Points Surveyed	96

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: Jim Chapman Lake and White Oak Creek Mitigation Area WHAP Summary Results.

A total of 96 points were surveyed at Jim Chapman Lake and X points at WOCMA. Table 3 represents the Average, Minimum, and Maximum Scores and well as the number of habitats surveyed for each habitat type. As can be seen, Riparian/Bottomland Hardwood Forest (BHF) and Upland Forests had the greatest number of survey points (49 and 33 respectively). Point 72, located in the WOCMA, was skipped due to flooding and inaccessibility. A total of 4 upland forest sites, 10 grassland sites,Upland forest (4 sampled) and grassland (10 sampled) but abundant habitat types surveyed were the Riparian/BHF (49 sampled) habitat type as well as the Marsh (33 sampled) habitat type.

Riparian/BHF scores ranged from 0.39 to 0.96 while upland forest scores ranged from 0.48 to 0.93. There was a good mix of Upland and Bottomland habitat types in the Jim Chapman Lake/WOCMA selected boundarie. However, Marsh and Grassland habitat types were limited due to WHAP points being primarily in wooded areas away from the lake. Point 72 at White Oak Creek was located open water, causing no data being collected,

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

Habitat Type	Average Total	Maximum Total Score	Minimum Total Score	Number of Habitat Types Surveyed
Riparian/BHF	0.71	0.96	0.39	49
Upland Forest	0.73	0.96	0.48	33
Grassland	0.76	0.97	0.60	10
Marsh	0.82	0.92	0.63	4

Figure 4 and Figure 5 shows the range of total scores for all points surveyed (96 sampled) as well as the 1 additional point that was skipped due to inaccessibility and received a score of 0.. Overall, marsh and grassland habitats exhibited the highest average total score (0.82 and 0.76), due to those habitat types being less frequent.

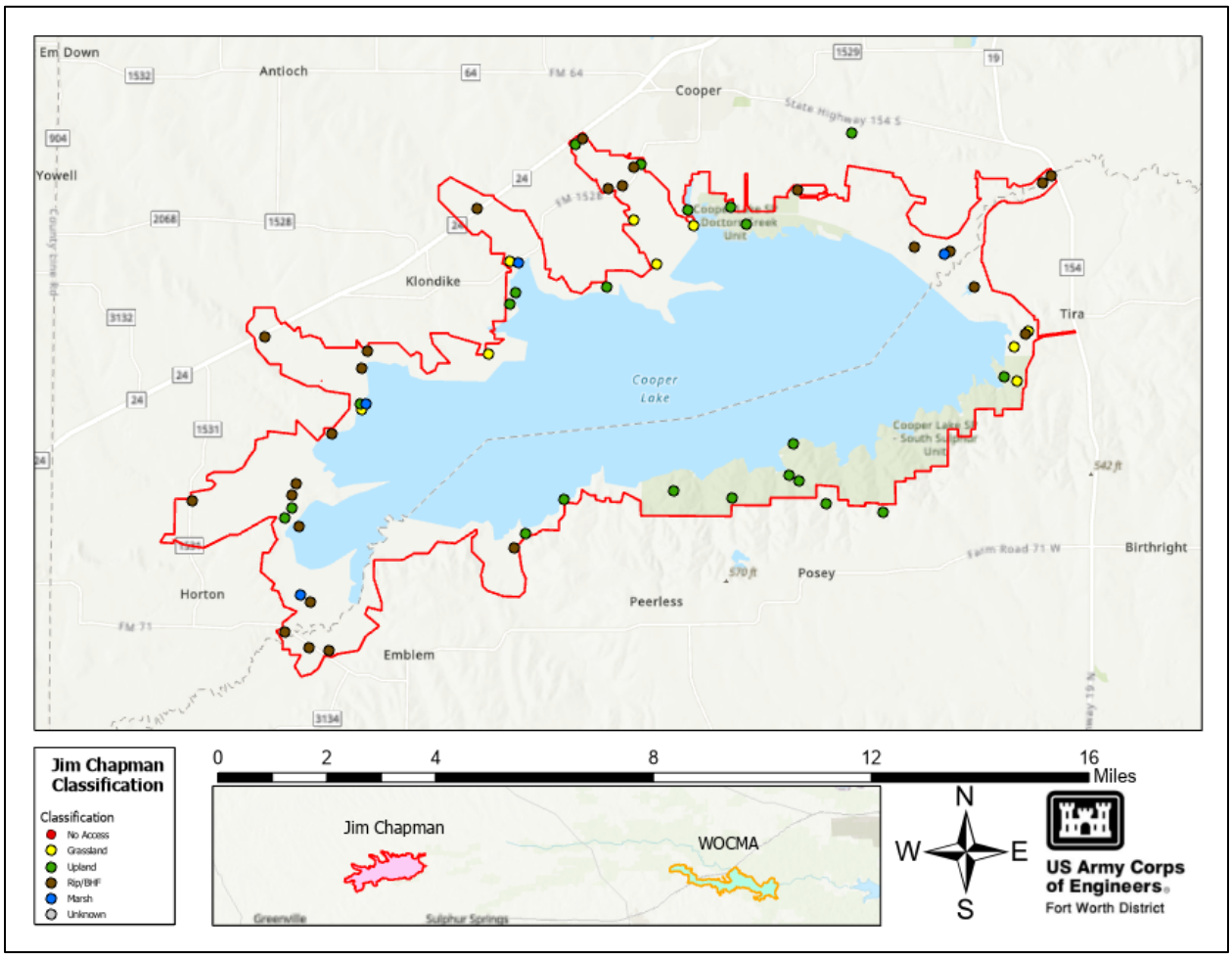

Figure 5 Habitat Types Present in Jim Chapman Lake, located in Hopkins and Delta Counties, Texas

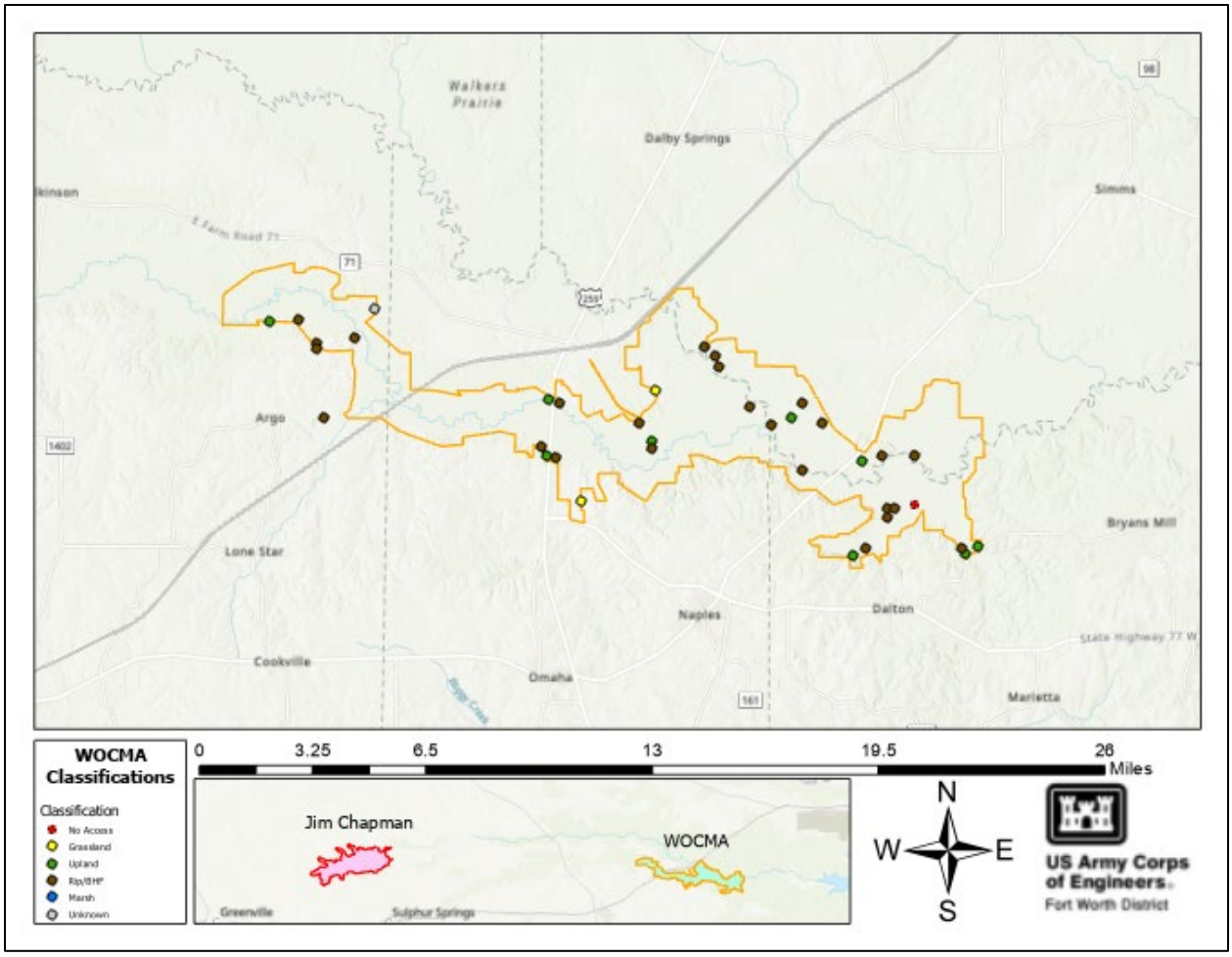

Figure 6. Habitat Types Present in WOCMA, located in Bowie, Cass, Morris, and Titus Counties, Texas

Beyond vegetative diversity, the three major metrics within the WHAP scoring criteria that allocate points are for 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
Riparian/BHF	19.41	11.39	13.63
Upland Forest	12.82	10.09	11.21
Grassland	11.50	4.30	10.00
Marsh	25	7.5	11.25

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. The predominate thick soil surface layer that is common within Jim Chapman Lake and White Oak Creek Mitigation Area is the main factor that upland forest and grassland sites scored high in average site potential. WHAP sites with maximum site potential are shown in Figure 6.

Successional stage refers to the age of the vegetative community. Older, mature forests and climax prairies, score higher than younger pole stands or disturbed grasslands because they provide more diverse forage, cover, and niche habitats. These scores are expected to increase across the habitats, except in areas that may not have the soil types to support hydrophytic vegetation or 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. Current and past agricultural and forestry practices have significantly influenced the region's remaining habitat composition.

Recommendations

Even with unplanned disturbances, there are several areas with valuable wildlife habitat remaining on USACE fee-owned property at Jim Chapman Lake. Habitat management efforts by the USACE has proven effective in maintaining quality wildlife habitat around the lake.

The survey data suggest that most of the points were Riparian/BHF and Upland Forest habitat types (Figure 2). The survey data also suggest that the upland forest site has some points slightly above the maximum site potential score. Higher scoring points of 0.71 – 0.97 tend to be away from roads and/or construction, while the lower scoring points tend to be closer to roads and highways.

Sites with low WHAP scores (0.01 – 0.68) and overall low Site Potential have minimal potential for improvement. . Thus, management actions to improve these sites will likely achieve minimal results.

Conversely, areas with relatively low total WHAP scores between 0.51 – 0.70, but high Site Potential scores have the greatest potential for improvement. Management actions targeting native species diversity through habitat manipulation (e.g. prescribed fire, invasive species control, etc.) will likely result in more diverse, higher quality wildlife habitat.

Based on the results of the WHAP survey efforts, areas to consider for Wildlife Management or Environmentally Sensitive Areas land classifications include those areas with highest maximum scores (0.71 – 0.97). The planning team for the Jim

Chapman Lake and WOCMA Master Plan revision will consider these 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.

Texas Parks and Wildlife Department (TPWD). 1995. Wildlife Habitat Appraisal Procedure (WHAP). Last revised January 12, 1995. Retrieved from https://tpwd.texas.gov/publications/pwdpubs/media/pwd_rp_w7000_0145.pdf

TPWD. 2012A. Texas Conservation Action Plan 2012 – 2016: Cross Timbers Handbook. Editor, Wendy Connally, Texas Conservation Action Plan Coordinator. Austin, Texas.

TPWD. 2012B. Texas Conservation Action Plan 2012-2016: Texas Blackland Prairies Handbook. Editor, Wendy Connally, Texas Conservation Action Plan Coordinator. Austin, Texas.

TPWD. 2020. Landscape Ecology Program: Ecological Mapping Systems. Retrieved from https://tpwd.texas.gov/landwater/land/programs/landscape-ecology/ems/

Attachment A: Jim Chapman Lake WHAP Results Summary

Attachment B: Jim Chapman Lake and WOCMA WHAP Point Photographs

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Jim Chapman Lake #: 2	

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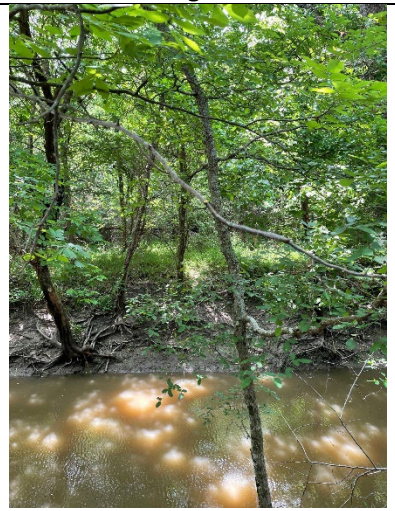	

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	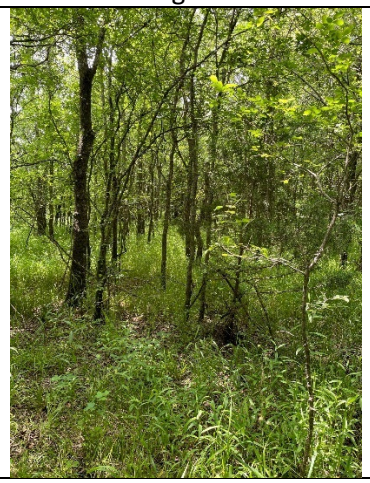

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	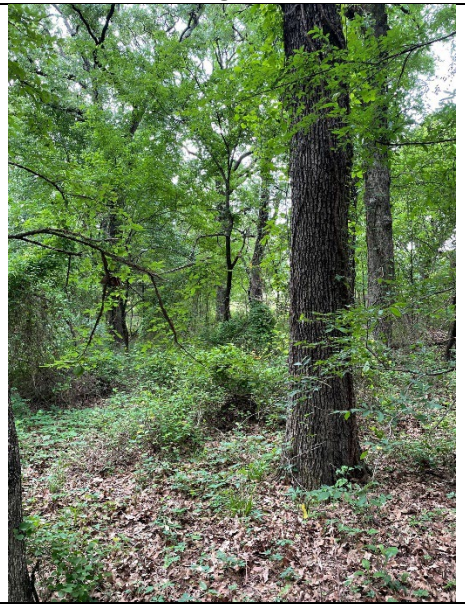

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	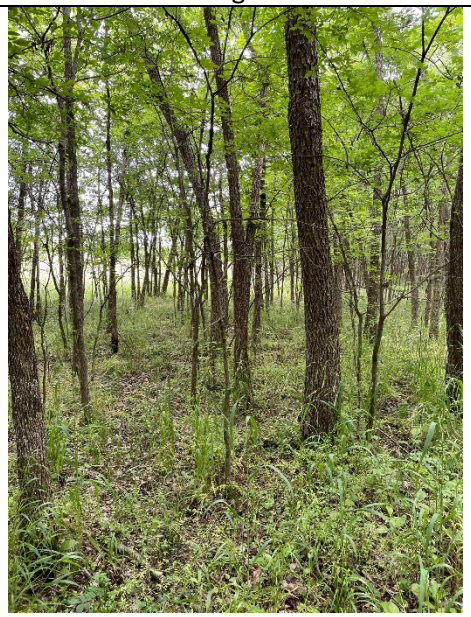
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	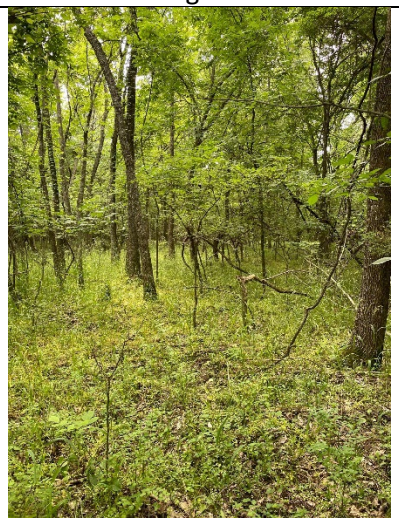

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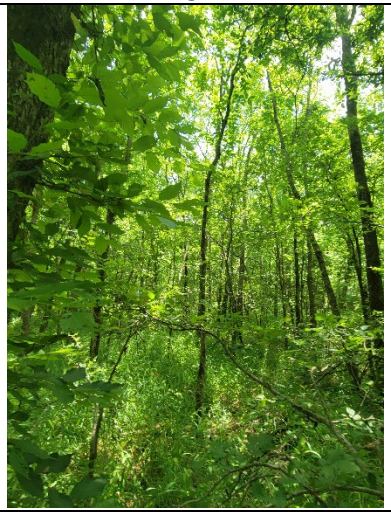	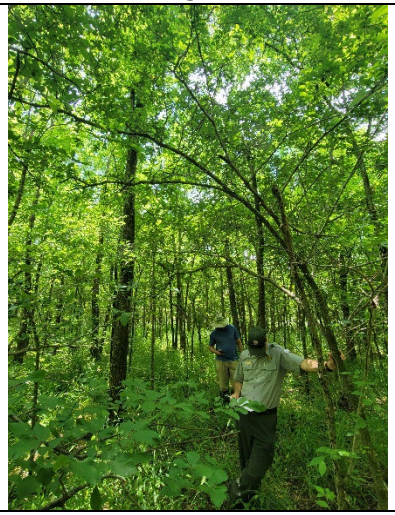

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	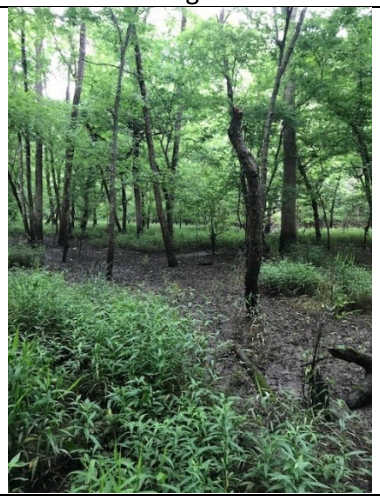
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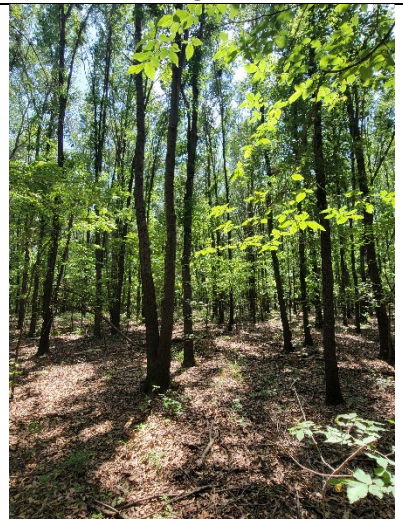	

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	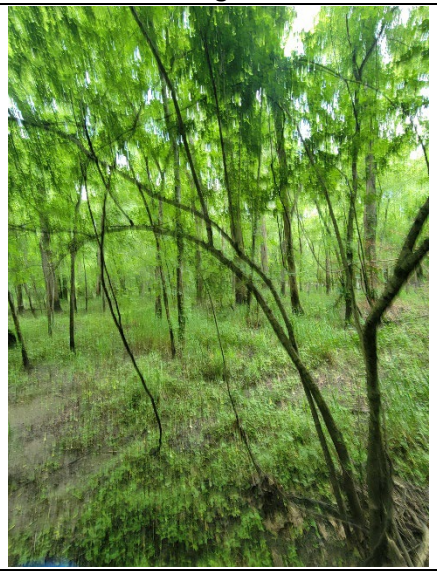
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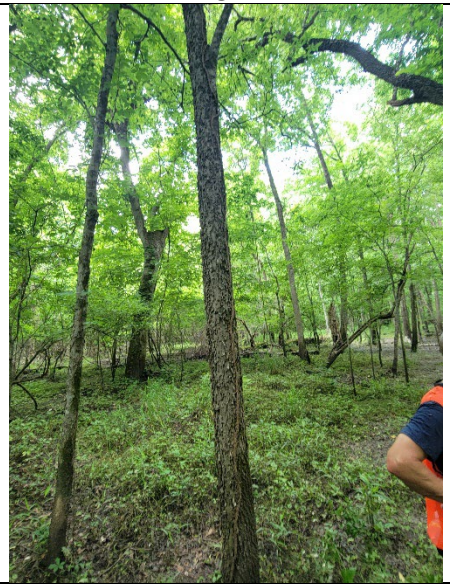	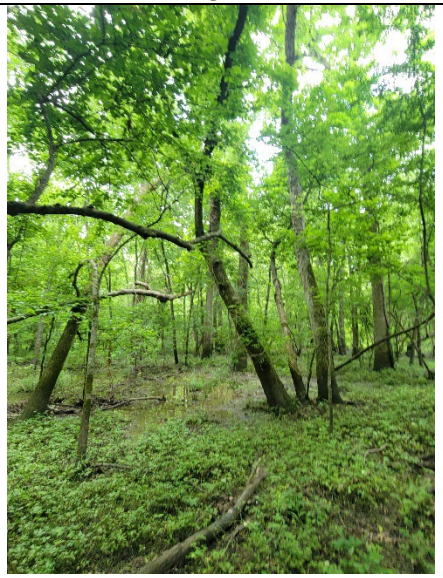

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	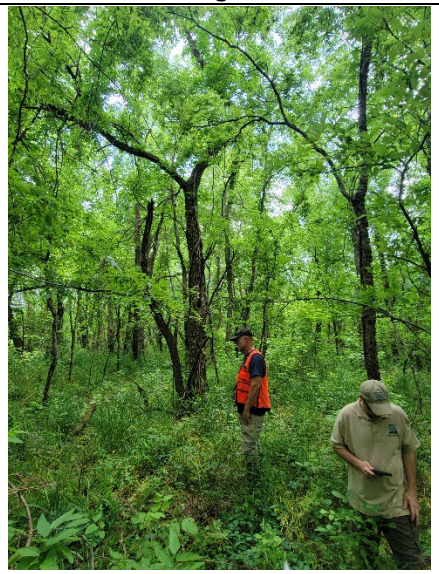
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	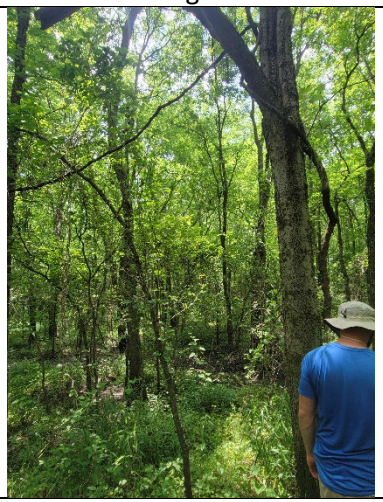
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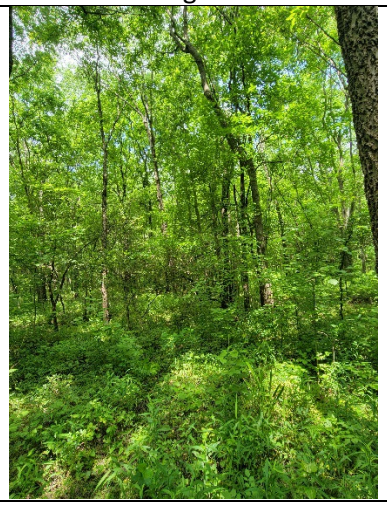
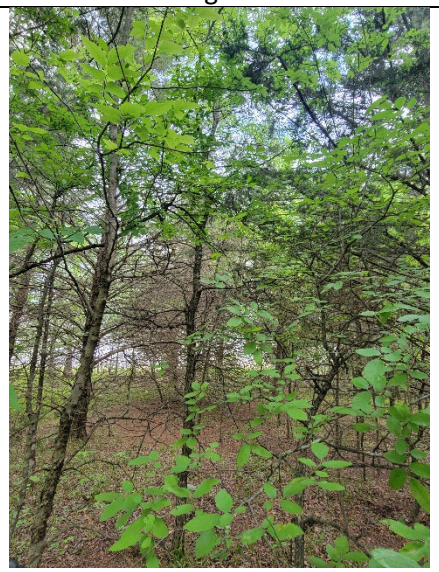
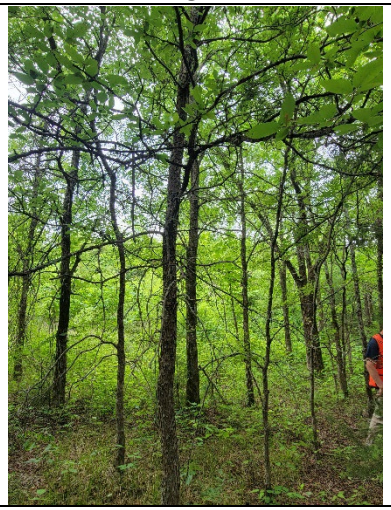
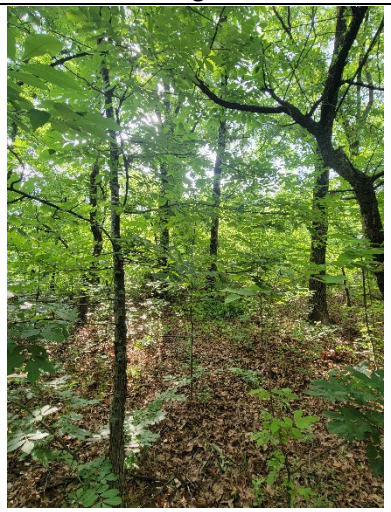
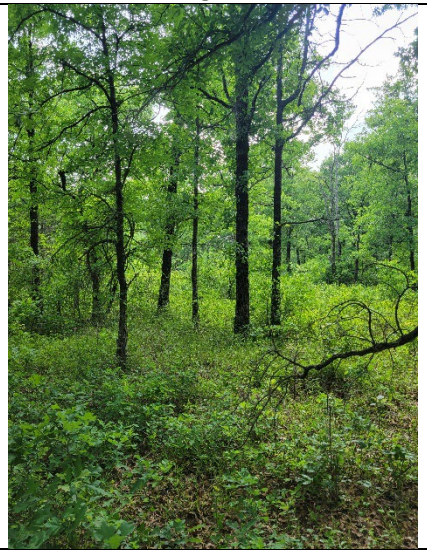
	

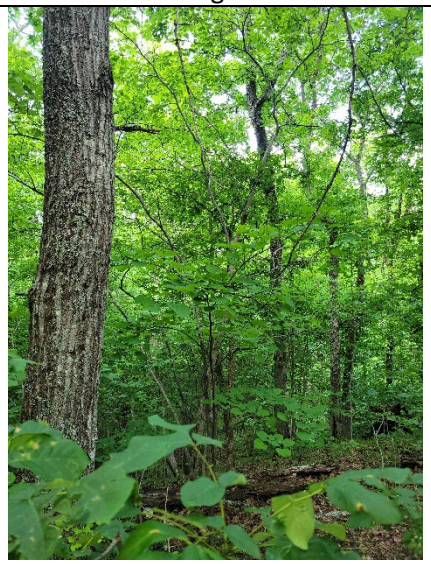
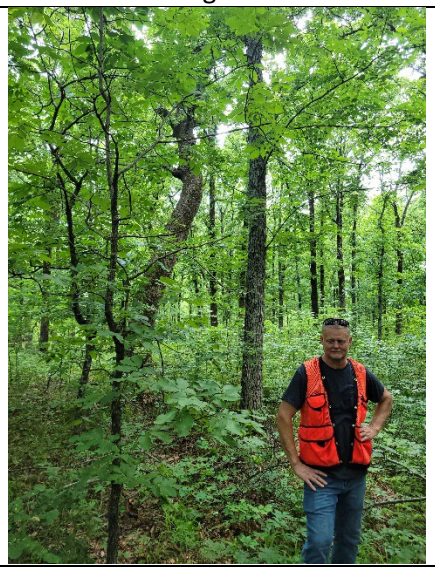
Jim Chapman Lake #: 50	
Facing North	Facing East
	
Facing West	Facing South
	

Jim Chapman Lake #: 51	
Facing North	Facing East
	
Facing West	Facing South
	

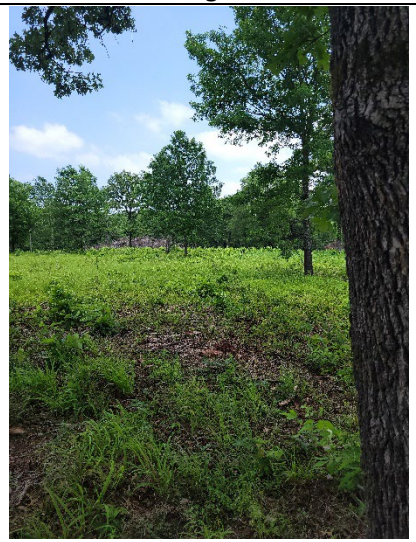
Jim Chapman Lake #: 52	
Facing North	Facing East
	
Facing West	Facing South
	

Jim Chapman Lake #: 53	
Facing North	Facing East
	
Facing West	Facing South
	

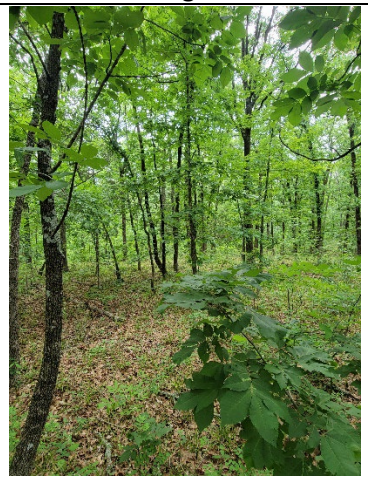
Jim Chapman Lake #: 54	
Facing North	Facing East
	
Facing West	Facing South
	

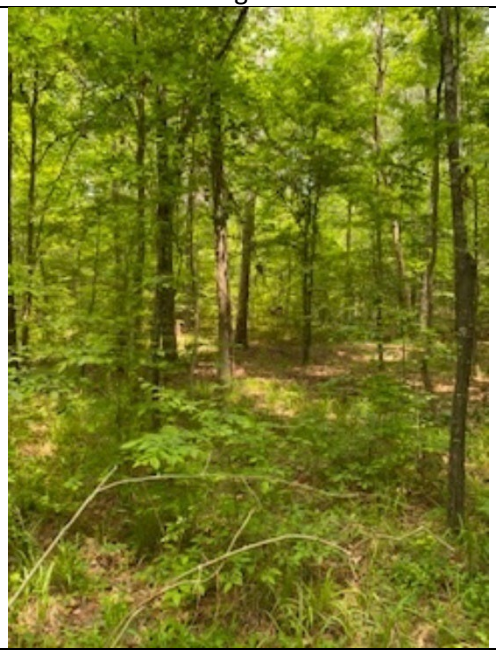
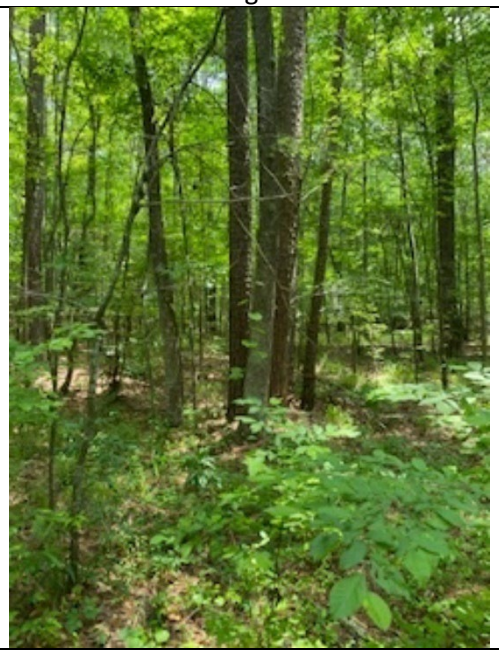
Jim Chapman Lake #: 55	
Facing North	Facing East
	
Facing West	Facing South
	

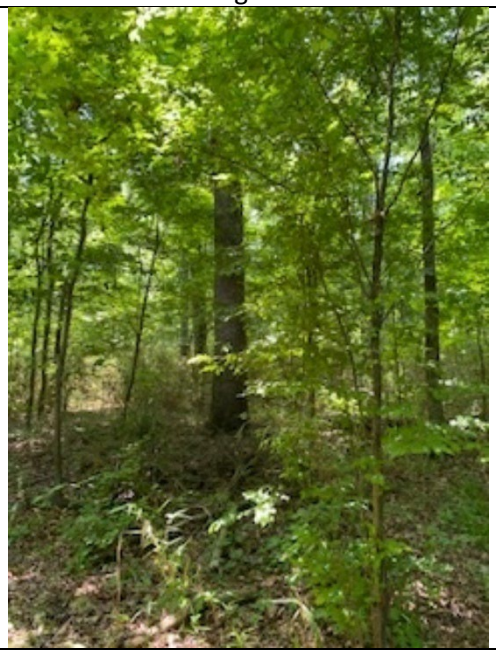
Jim Chapman Lake #: 56	
Facing North	Facing East
	
Facing West	Facing South

Jim Chapman Lake #: 57	
Facing North	Facing East
	
Facing West	Facing South
	

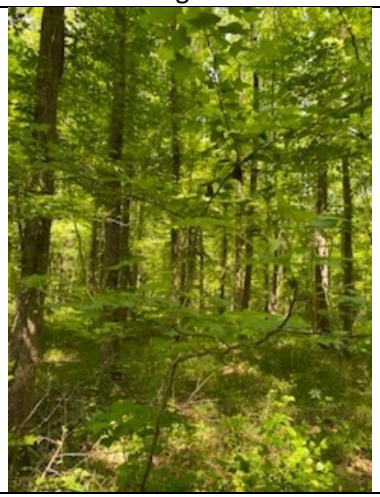
Jim Chapman Lake #: 58	
Facing North	Facing East
	
Facing West	Facing South
	

Jim Chapman Lake #: 59	
Facing North	Facing East
	
Facing West	Facing South
	

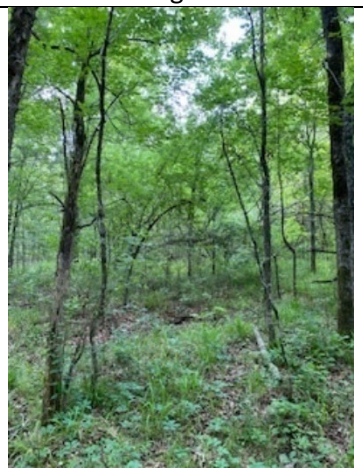
WOCMA Lake #: 60	
Facing North	Facing East
	
Facing West	Facing South
	

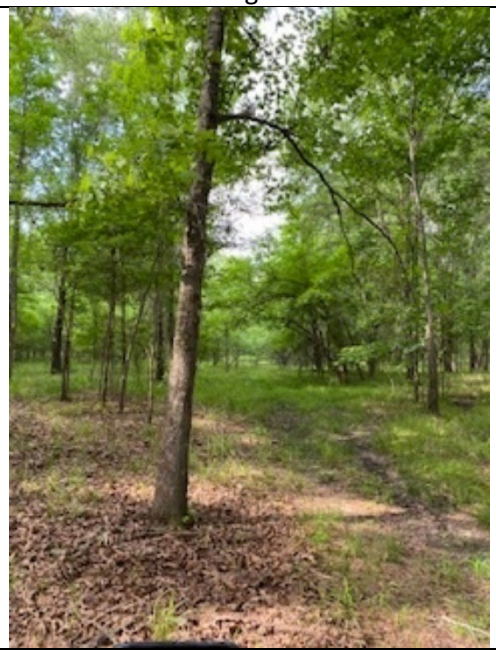
WOCMALake #: 61	
Facing North	Facing East
	
Facing West	Facing South
	

WOCMALake #: 62	
Facing North	Facing East
	
Facing West	Facing South
	

WOCMA Lake #: 63	
Facing North	Facing East
	
Facing West	Facing South
	

WOCMA Lake #: 64	
Facing North	Facing East
	
Facing West	Facing South
	

WOCMA Lake #: 65	
Facing North	Facing East
	
Facing West	Facing South
	

WOCMA Lake #: 66	
Facing North	Facing East
	
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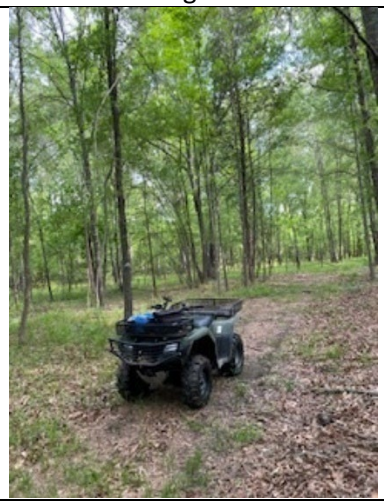
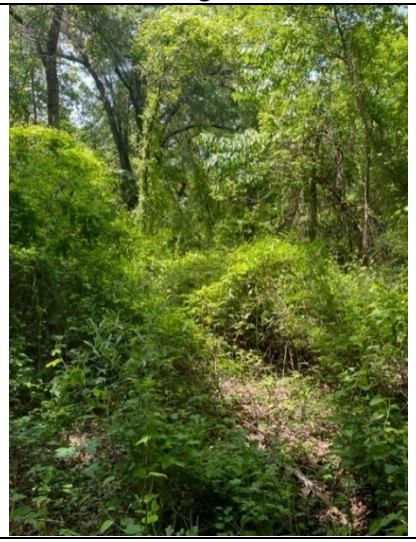
	

WOCMA Lake #: 67	
Facing North	Facing East
	
Facing West	Facing South
	

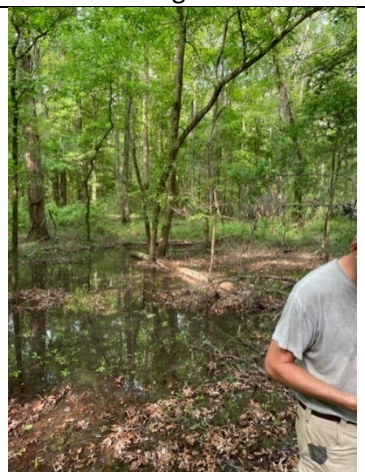
WOCMA Lake #: 68	
Facing North	Facing East
	
Facing West	Facing South
	

Jim Chapman Lake #: 69	
Facing North	Facing East
	
Facing West	Facing South
	

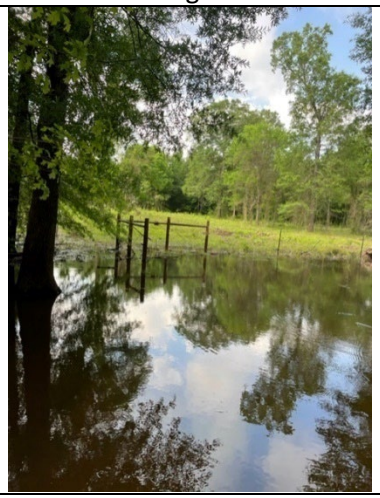
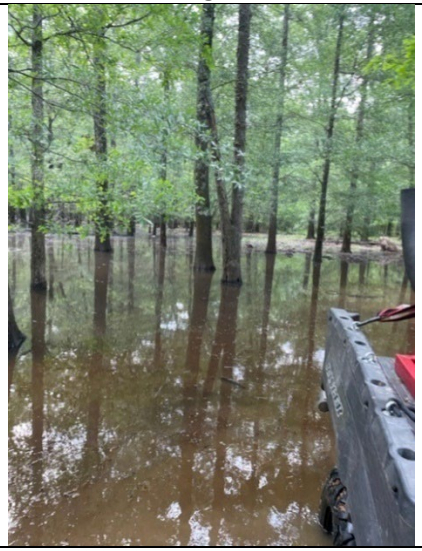
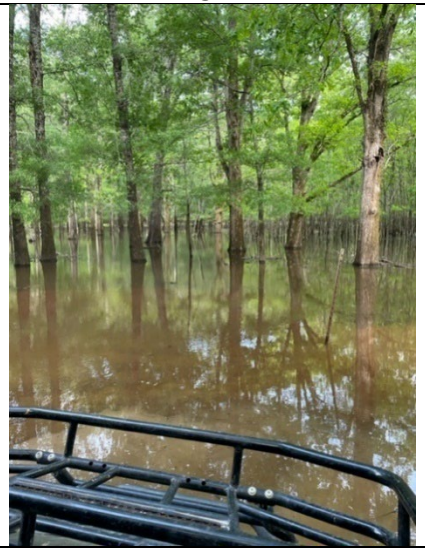
WOCMA Lake #: 70	
Facing North	Facing East
	
Facing West	Facing South
	

WOCMA Lake #: 71	
Facing North	Facing East
	
Facing West	Facing South
	

WOCMA Lake #: 73	
Facing North	Facing East
	
Facing West	Facing South
	

WOCMA Lake #: 74	
Facing North	Facing East
	
Facing West	Facing South
	

WOCMA Lake #: 75	
Facing North	Facing East
	
Facing West	Facing South
	

WOCMA Lake #: 76	
Facing North	Facing East
	
Facing West	Facing South
	

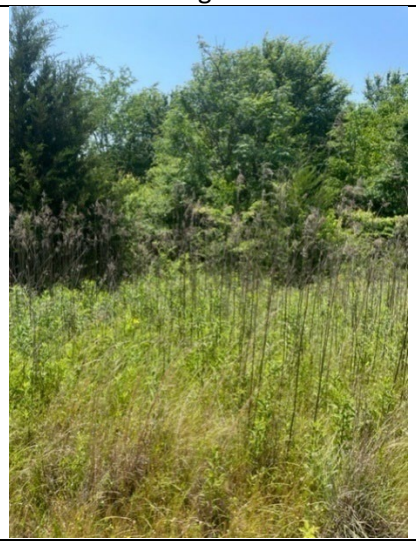
WOCMA Lake #: 77	
Facing North	Facing East
	
Facing West	Facing South
	

WOCMA Lake #: 78	
Facing North	Facing East
	
Facing West	Facing South
	

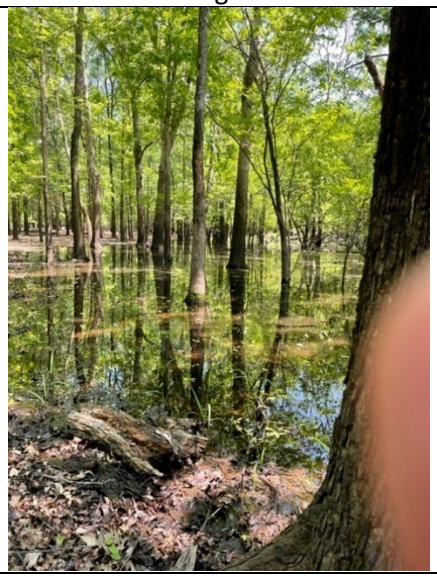
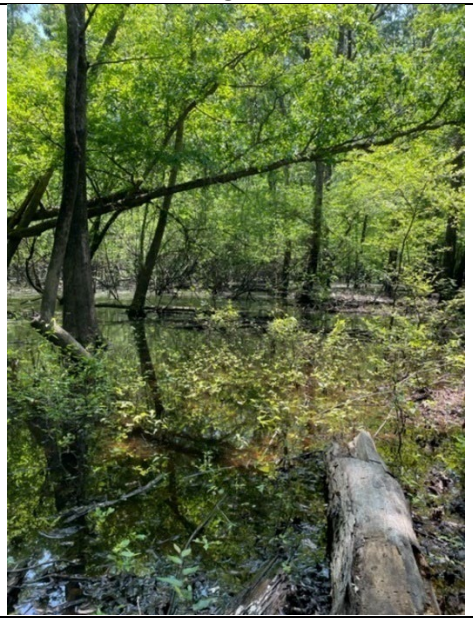
WOCMA Lake #: 79	
Facing North	Facing East
	
Facing West	Facing South
	

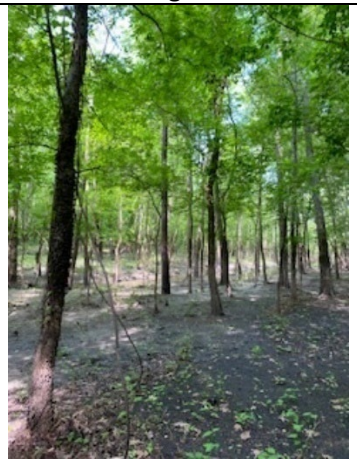
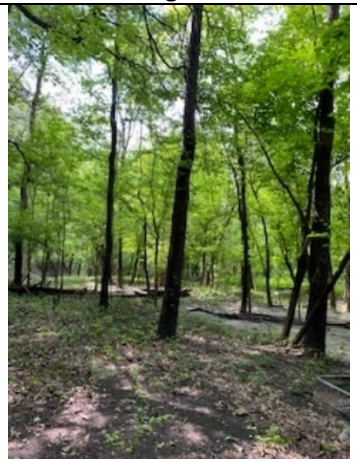
WOCMA Lake #: 80	
Facing North	Facing East
	
Facing West	Facing South
	

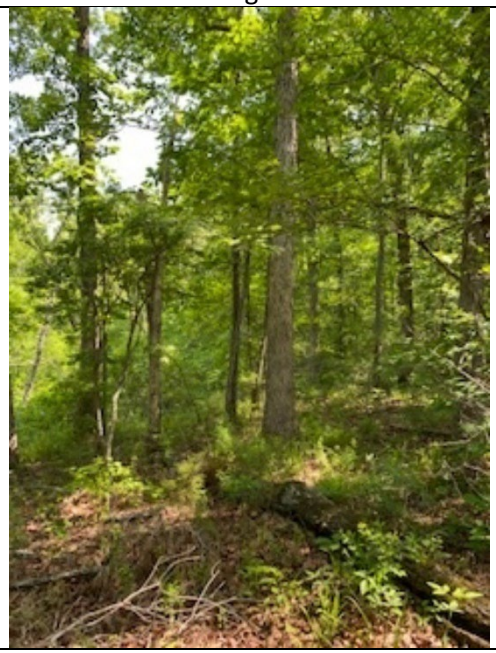
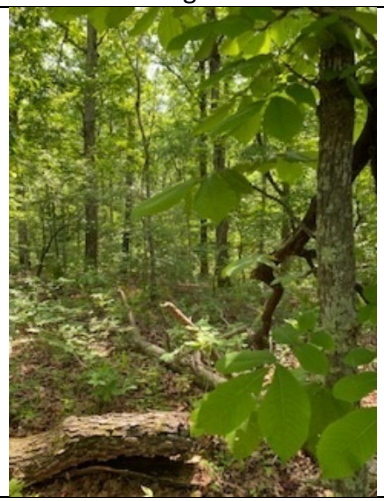
WOCMA Lake #: 81	
Facing North	Facing East
	
Facing West	Facing South
	

WOCMALake #: 82	
Facing North	Facing East
	
Facing West	Facing South
	

WOCMA Lake #: 83	
Facing North	Facing East
	
Facing West	Facing South
	

WOCMA Lake #: 84	
Facing North	Facing East
	
Facing West	Facing South
	

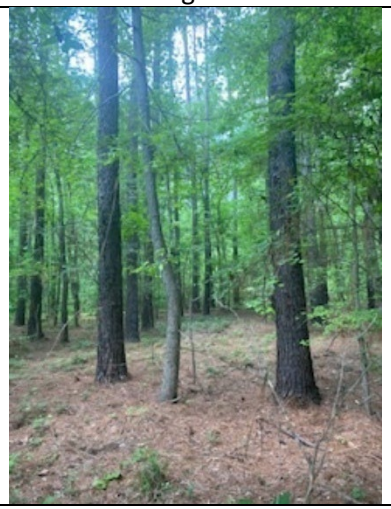
WOCMA Lake #: 85	
Facing North	Facing East
	
Facing West	Facing South
	

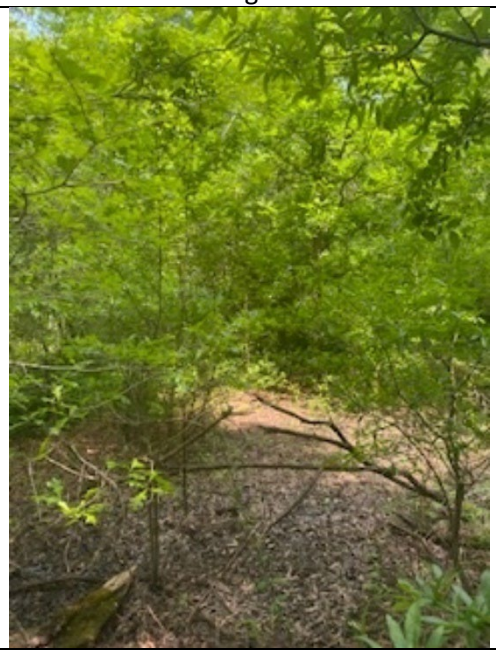
WOCMA Lake #: 86	
Facing North	Facing East
	
Facing West	Facing South
	

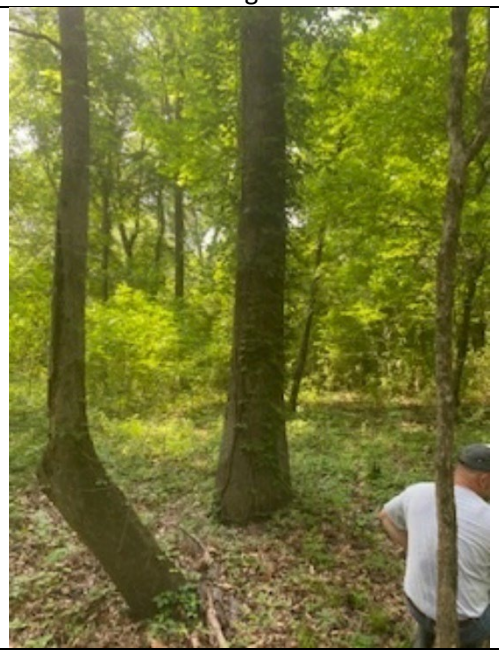
WOCMA Lake #: 87	
Facing North	Facing East
	
Facing West	Facing South
	

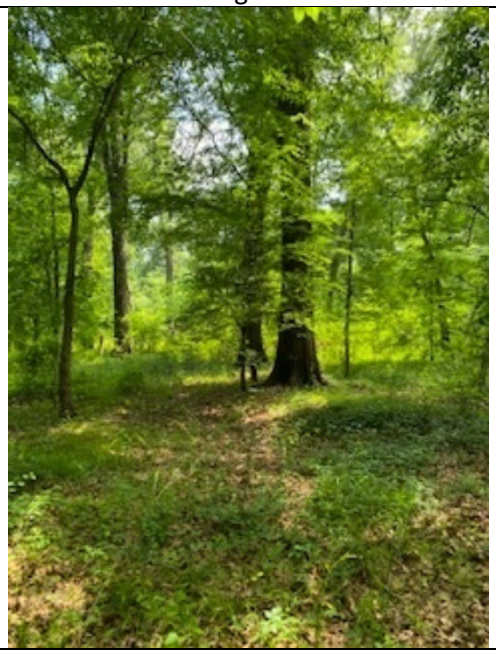
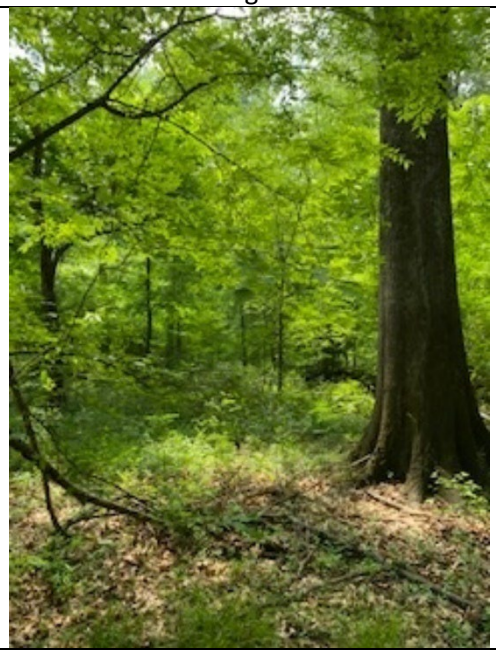
WOCMA Lake #: 88	
Facing North	Facing East
	
Facing West	Facing South
	

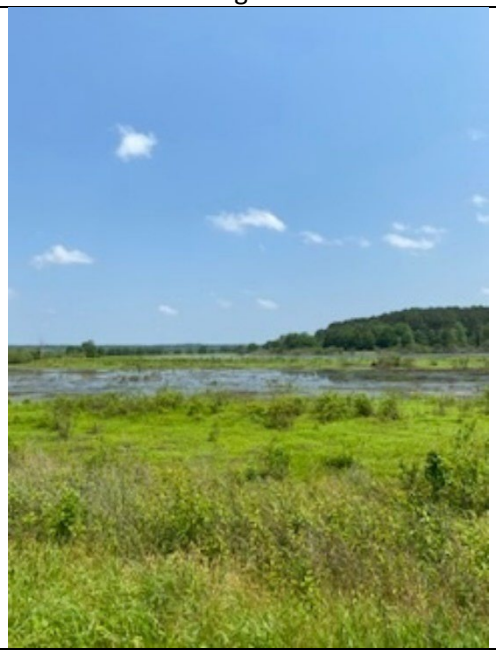
WOCMA Lake #: 90	
Facing North	Facing East
	
Facing West	Facing South
	

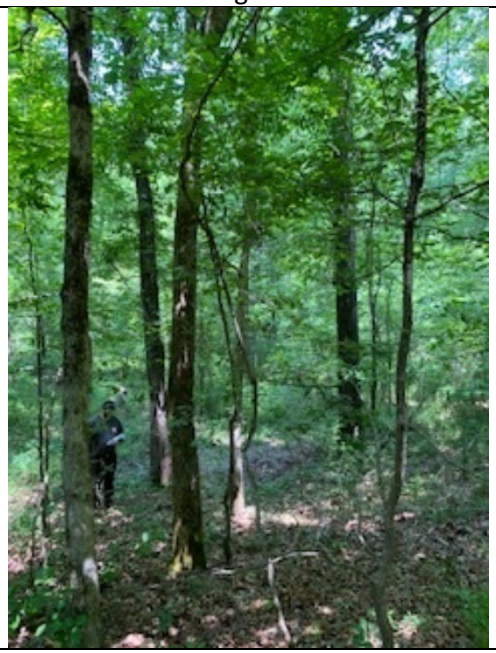
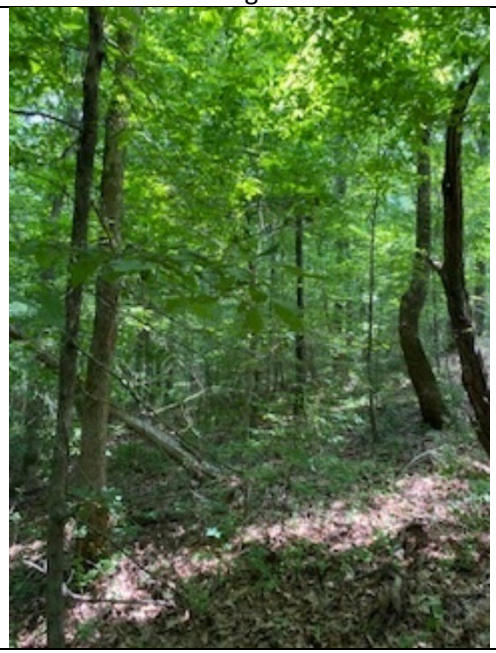
WOCMA Lake #: 91	
Facing North	Facing East
	
Facing West	Facing South
	

WOCMA Lake #: 92	
Facing North	Facing East
	
Facing West	Facing South
	

WOCMA Lake #: 93	
Facing North	Facing East
	
Facing West	Facing South
	

WOCMA Lake #: 94	
Facing North	Facing East
	
Facing West	Facing South
	

WOCMA Lake #: 95	
Facing North	Facing East
	
Facing West	Facing South
	

WOCMA Lake #: 96	
Facing North	Facing East
	
Facing West	Facing South
	

WOCMA Lake #: 97	
Facing North	Facing East
	
Facing West	Facing South