NATURAL RESOURCES ASSESSMENT

PROPOSED ASTRO SITE
MISSISSIPPI COUNTY, ARKANSAS

ENERCON PROJECT NUMBER: NEPA0632

Prepared For:

Mississippi County
Arkansas Economic Development
4701 Memorial Drive
Blytheville, AR 72315

Prepared By:

Heath Garner
Senior Ecologist/Project Manager

Reviewed By:

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February 26, 2016

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1.0 INTRODUCTION

The Mississippi County, Arkansas Economic Development Foundation (the Client) contracted with Enercon Services, Inc. (ENERCON) of Oklahoma City, Oklahoma to prepare a project natural resources review package and perform a threatened and endangered (T&E) species habitat assessment on an approximately 670-acre tract of land proposed for development in Mississippi County, Arkansas (Figure 1). The proposed project is known as the Astro Site and will be developed in conjunction with Mississippi County Arkansas Economic Development.

1.1 Project Location

The proposed project area is mapped on United States Geological Survey (USGS) Keiser, AR (7.5-minute series) topographic quadrangle. Coordinates for the approximate center of the project area are 35.708581 x -90.035098 (NAD 83). Legal description of the site is Parts of Sections 28, 29, 32, and 33, Township 13 North, Range 10 East. The project action area is approximately 670 acres in size (project study area). The project area is located approximately two (2) miles west of the town of Osceola, in Mississippi County, Arkansas (Figure 1). This part of Mississippi County is primarily characterized by row crop agricultural fields with numerous channelized drainages. The Mississippi River is located three miles east of the proposed project area, and the Tyronza River is located 3.5 miles west of the project area. Representative site photographs are included as Attachment 1.

1.2 Project Description

The proposed project is to develop the site for industrial use. The proposed project area is currently comprised of agricultural fields with herbaceous vegetated drainages (Figures 2 and 3). This proposed facility design and construction plan is not currently available; however, the construction will not require vegetation clearing or deforestation and will be within row crop agricultural fields.

Although the site is currently nearly level, land grading, cut and fill will be required for structural engineering integrity, stormwater drainage, and road bed construction. As a result, over 1,000,000 cubic yards of soil will likely be displaced as part of the construction and grading plan. This will be completed using tractors and dirt pans, bulldozers, and track-mounted excavators and will include the excavation of sediment and stormwater detention ponds, as well as the relocation of several existing channelized drainages on site.

Stormwater drainage ditches and detention ponds are not expected to accumulate sediment. However, temporary sediment and detention pond areas used during construction may receive sediment with runoff. Accumulated fine sediments will be removed from these ponds when approaching 50% capacity. Removed sediment will be redistributed onsite and incorporated into construction grading activities.

1.3 Ecological Setting

The proposed project area is located in the Northern Pleistocene Valley Trains subset of the Mississippi Alluvial Plain ecoregion of Arkansas (73b). The Northern Pleistocene Valley Trains subset is a flat to irregular alluvial composed of sand to gravelly glacial outwash overlain by alluvium. These outwash deposits were transported by past courses of the Mississippi River. Sand sheets are largely lacking, and the area has little local relief or stream incision. Elevations tend to be slightly higher than adjoining St. Francis Lowlands (73c). Natural vegetation varies with site characteristics. Oaks (*Quercus* spp.) are more prevalent within 73b than surrounding 73a (Northern Holecene Meander Belts) and 73d (Northern Backswamps), with sugarberry (*Celtis occidentalis*), green ash (*Fraxinus pennsylvanica*), pecan (*Carya illinoinensis*), and cottonwood (*Populus deltoides*) also present (Woods et al., 2004).

2.0 GENERAL SITE DESCRIPTION

The proposed project area is comprised primarily of precision leveled or graded row crop agricultural fields with narrow, channelized agricultural drainages. While the floodplain associated with the Mississippi River is located immediately east of the site, it is not directly associated with the hydrology within the project site. Offsite industrial stormwater runoff, agricultural drainage, and rainfall are the primary contributors of hydrology on the proposed project site. Drainage is primarily towards the west with all ditches and swales eventually draining into Ditch No. 44 that bisects the site east-west, or Ditch No. 43 that flows east-west along the northern boundary of the project area (See Figure 2).

2.1 Vegetation and Community Types

The proposed project study area is comprised of the following community types:

Row Crop Agricultural Field: This habitat experiences significant disturbance at least twice per year with spring tillage prior to planting and again during fall harvest. Row crop agricultural fields comprise approximately 614.7 acres (92%) of the project study area. The majority of this community type was planted in corn (*Zea mays*) or rice (*Oryza sativa*) and had already been harvested at the time of the site visit (Photograph 1).

Intermittent Agricultural Drainage: Dominant vegetation in this community type is dominated by herbaceous species with scattered woody species. Vegetation including Johnson grass (*Sorghastrum halepense*), spiny pigweed (*Amaranthus spinosus*), switchcane (*Arundinaria tecta*), and giant ragweed (*Ambrosia trifida*), with scattered sugarberry, and black willow (*Salix nigra*) saplings. Stream bottoms are largely bare soils with limited herbaceous vegetation below the ordinary high water mark (OHWM). Despite excavated depths of up to 10 feet below

grade, drainages rarely maintain flows greater than 18 inches deep (Photograph 2). Intermittent agricultural drainage areas occupy 9.3 acres (0.014%) of the project study area.

The remaining land cover within the project area (45.0 acres) consists of agricultural field roads and improved highway or city (Osceola) maintained roads. These features are raised above grade with vegetated slopes and associated roadside drainages that are maintained by mowing and/or herbicide throughout the year.

2.2 Project Area Soils

The project area is comprised of the following soil map units: Sharkey-Steele complex, Tunica silty clay, and Steele Loamy Sand (Figure 4). Spatial data and other information regarding soils were obtained via NRCS Web Soil Survey (WSS) for Mississippi County and the Official Soil Series Description website (NRCS, 2016). Although these soils are mapped along historic contours of the site, the precision leveling and grading activities of the agricultural fields on the project area have blended most of the mapped soils into a folded, uniform soil type within each distinct field. All mapped soil types within the project area are hydric soils or soils with a potential for hydric inclusions (Table 1). Despite the hydric status of soils, no wetlands were observed on the project area.

Table 1: Soils Table

SERIES NAME (SYMBOL)	DRAINAGE CLASS	HYDRIC RATING	DESCRIPTION
Sharkey-Steel Complex (Sm)	Poorly-Moderately Drained	Yes	Linear and Concave Slopes, Found on Backswamps, Moderate-High Available Water Capacity
Tunica Silty Clay (Tu)	Poorly Drained	Yes	Convex and Concave Slopes, Found on Backswamps, High Available Water Capacity
Steele Loamy Sand (So)	Moderately Well Drained	Yes	Sandy and Clayey River Deposits, Found on Level to Undulating Areas of Flood Plains, Moderate Available Water Capacity

3.0 THREATENED, ENDANGERED, AND CANDIDATE SPECIES

The Endangered Species Act (ESA) of 1973 prohibits “take” (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, relocate, or collect or attempt to engage in any such conduct) of any federally listed threatened or endangered species. Habitat modification or degradation that results in death or injury to federally protected species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering is also prohibited. Administration and enforcement of the ESA are the responsibilities of the US Fish and Wildlife Service (USFWS).

ENERCON conducted literature and database reviews as well as an onsite assessment of the project area to identify potential impacts to listed species and/or their habitat. In order to determine which species could possibly occur in or near the project area, ENERCON obtained an official species and critical habitat list from the USFWS Information, Planning, and Conservation System (IPaC) website for the project study area (USFWS, 2016) (Attachment 2). Additionally, ENERCON conducted a database review through the Arkansas Natural Heritage Commission (ANHC) and USFWS for documented occurrence records, and status of rare or sensitive plant and animal species in Mississippi County. The database output is included as Attachment 3 and utilized for this report.

Based on the review of federal and state databases it was determined that four (4) federally listed endangered species and one (1) federally listed threatened species are known to occur near or in the project area in Mississippi County (Table 2). No ESA-defined critical habitat has been designated for any the species listed as potentially occurring within Mississippi County.

The onsite assessment was conducted January 19, 2016 by Heath Garner. Our onsite assessment consisted of attempts to observe individuals of listed species or sign indicating their presence (including but not limited to tracks, scat, relict shells, and nests). We also assessed plant community structure and composition, as well as edaphic and hydrologic factors of the site in order to identify potential habitats for the various species considered.

Table 2: Federally Listed Species for the Project Study Area

SPECIES	FEDERAL STATUS	HABITAT REQUIREMENTS	STATUS OF SPECIES IN PROJECT STUDY AREA
BIRDS			
Piping Plover (*Charadrius melodus*)	T	Migratory stopover habitat includes sparsely vegetated sandy or gravelly shorelines and islands associated with major river systems.	No migratory stopover habitat was observed within the immediate project area.
Interior Least Tern (*Sterna antillarum*)	E	Nesting and loafing habitat includes islands or sandbars along major rivers, mostly clear of vegetation and with shallow water nearby for fishing.	No suitable foraging, loafing, or nesting habitat was observed within the immediate project area.
CLAMS			

SPECIES	FEDERAL STATUS	HABITAT REQUIREMENTS	STATUS OF SPECIES IN PROJECT STUDY AREA
Fat Pocketbook (*Potamilus capax)*	E	Habitat includes sand, mud, and fine gravel bottoms of large rivers in water ranging in depth from a few inches to eight feet.	No suitable habitat was observed within the project study area. No known populations in project area.
Scaleshell Mussel *(Leptodea leptodon)*	E	Habitat includes sand and gravel bottoms in medium-sized and large rivers with stable channels and good water quality.	No suitable habitat was observed within the project study area. No known populations in project area.
FISHES			
Pallid Sturgeon (*Scaphirhynchus albus)*	E	Habitat includes bottoms of large, silty rivers at a diversity of depths and velocities formed by braided channels, sand bars, sand flats and gravel bars.	No suitable habitat was observed within the project study area. No known populations in project area.
T = Threatened, E = Endangered			

None of the species listed in Table 2 were observed in the project study area at the time of the site visit. Species fact sheets are included as Attachment 4 of this document. An ESA Species Conclusions Table is included as Attachment 5 of this document.

The **piping plover**, a migratory shorebird species that generally occupies drier portions of broad sandy expanses along rivers and reservoirs with sparse vegetation. Piping plovers usually do not nest in Arkansas and would most likely only use this region of Arkansas for brief stopover periods during migration.

Determination of Effects: No suitable habitat for the piping plover was observed in the project study area. **Direct** effects are not likely to occur from the proposed project because the project area is located inland from the Mississippi River, with no exposed beach or shoreline within the immediate project area that could provide foraging or loafing grounds for the piping plover. **Indirectly** and **cumulatively**, the proposed project is not likely to affect the species or their habitat because the species migrates through the state for only a short duration annually. This project will have **no effect** the piping plover.

The **interior least tern** (*Sterna antillarum*) inhabits sparsely vegetated sand and gravel bars with adjacent open reaches of river, broad sandy areas, or salt plains. In Arkansas, interior least terns nest along most of the larger rivers.

Determination of Effects: The least tern is known to occur near the project location, however no suitable habitat was observed in the project study area. **Direct** effects are not likely to occur from the proposed project because the project area is located inland from the Mississippi River, with no exposed beach, shoreline, or sandbar within the immediate project area that could provide foraging, loafing or nesting grounds for the interior least tern. **Indirectly** and **cumulatively**, the proposed project is not likely to affect the species or its habitat. This project will have **no effect** on the interior least tern.

The **fat pocketbook**, a freshwater mussel, generally occupies sandy, muddy, and fine gravel bottoms of large rivers. The fat pocketbook is only known to occur in the lower Wabash and Ohio rivers, and in the lower Cumberland River.

Determination of Effects: The fat pocketbook is not known to occur at or near the project location. The project area is within the Tyronza River Watershed. Therefore, **direct** effects are not likely to occur as the only known populations of fat pocketbook are found in the above-mentioned sections of rivers, which are located approximately 300 miles northeast of the project area. **Indirectly** and **cumulatively**, the proposed project is not likely to affect the species or their habitat. This project will have **no effect** on the fat pocketbook.

The **scaleshell mussel**, a small freshwater mussel, inhabits medium-sized and large rivers, with scattered populations in the Mississippi River Basin in Arkansas, Missouri, and Oklahoma.

Determination of Effects: The scaleshell mussel is not known to occur at or near the project location. **Direct** effects are not likely to occur as the scaleshell mussel has only been represented by a small number or a single specimen from a handful of streams in Arkansas during extensive mussel surveys. This species has not been observed in the mainstem of the Mississippi River in the last 25 years and the streams where the specimens have been observed are not in the vicinity of the project area. **Indirectly** and **cumulatively**, the proposed project is not likely to affect the species or its habitat due to the fact that this species has not been reported in the vicinity of the project area and the tributaries where it has been reported are both distant and support extremely low densities. This project will have **no effect** on the scaleshell mussel.

The **pallid sturgeon**, a freshwater fish species, inhabits the bottoms of large, turbid rivers – most commonly the Missouri and Mississippi Rivers and some tributaries. The pallid sturgeon is one of the rarest fish of the Missouri and Mississippi River basins. However, when present, the species tends to select main channel habitats in the Mississippi River.

Determination of Effects: Although not common, the pallid sturgeon is believed to be widely distributed in the Mississippi River, downstream from the mouth of the Missouri River. The project area is over 3 miles inland from a Recovery Priority Management Area (RPMA);

therefore, no **direct** effects are anticipated from proposed project construction. **Indirectly** and **cumulatively**, the proposed project is not likely to affect the species or its habitat. This project will have **no effect** on the pallid sturgeon.

3.1 Additional Protected Species Evaluated

The **bald eagle** (*Haliaeetus leucocephalus*) was Federally delisted on August 8, 2007. However, bald eagles continue to receive protection from the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA). Though the same level of protection is not provided, the eagle remains protected from "take" of their offspring, eggs, parts, or nests. The MBTA and BGEPA are enforced by the USFWS.

Bald eagles require large trees or cliffs near water with abundant fish for breeding and reproduction. They congregate near open water in tall trees for spotting prey and night roosts for sheltering (USFWS, 2007). No bald eagles or eagle nests were observed at the time of the site visit. The proposed project area, which is located approximately 3 miles (1.6 km) inland from the Mississippi River, has no mature trees large enough to support eagle nests or roosting areas; therefore, bald eagles are not expected to utilize the proposed project area during any part of their life cycle. While migratory individuals may pass through or over the project area on a seasonal basis, no adverse impacts to bald eagles are expected from the proposed project.

4.0 RARE OR SENSITIVE SPECIES AND HABITATS

4.1 Rare or Sensitive Species

Review of the ANHC rare or declining species and communities' database was completed by ENERCON on February 23, 2016. A total of 28 animal species, and four (4) plant species were listed. The database report is Attachment 3 of this report. The annual soil disturbance and routine herbicide application during the growing season on virtually all of the project area limits the existence of any of the listed plant species. However, aquatic habitats (intermittent drainage ditches/streams) may provide seasonal habitat for two vertebrate species listed as rare or declining by the ANHC. This includes the mole salamander (*Ambystoma talpoideum*), and eastern spadefoot toad (*Scaphiopus holbrookii*). Additionally, the herbaceous vegetation dominated habitats along the slopes of these intermittent streams could support the eastern harvest mouse (*Reithrodontomys humulis*); also listed as rare or declining in Mississippi County, Arkansas by the ANHC. Despite the listing of these species as rare or declining by the ANHC, no regulatory framework exists prohibiting the take of any of these species or associated habitats.

4.2 Rare or Sensitive Habitats

Two (2) rare natural communities/special elements (Lower Mississippi River bottomland depression and colonial nesting sites for waterbirds) were listed by the ANHC database. Forested wetlands or herbaceous wetland depressions do not exist on the project area. Likewise, no large ribbon streams supporting sand bars or open shorelines, exist on the project area either. Therefore, these listed rare or sensitive habitats/communities will not be affected on the project area.

5.0 LITERATURE CITED

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LIST OF PREPARERS

Heath Garner, M.S., Senior Biologist/Environmental Scientist, Enercon Services, Inc., Oklahoma City, Oklahoma. Mr. Garner holds a B.S. degree in Wildlife Management, and an M.S. degree in Biology (Wildlife Ecology). He has 19 years of experience in wetland evaluations, ecological field studies, wildlife research, wildlife management, wetland and wildlife mitigation, geographic information systems (GIS), endangered species issues, and regulatory compliance.

Erica McLamb, Senior Biologist, Enercon Services, Inc., Oklahoma City, Oklahoma. Ms. McLamb holds a B.S. degree in Marine Biology and has 9 years of experience in wetland evaluations, threatened and endangered species issues/Section 7 Consultations, Section 404 permitting, and natural system investigations.

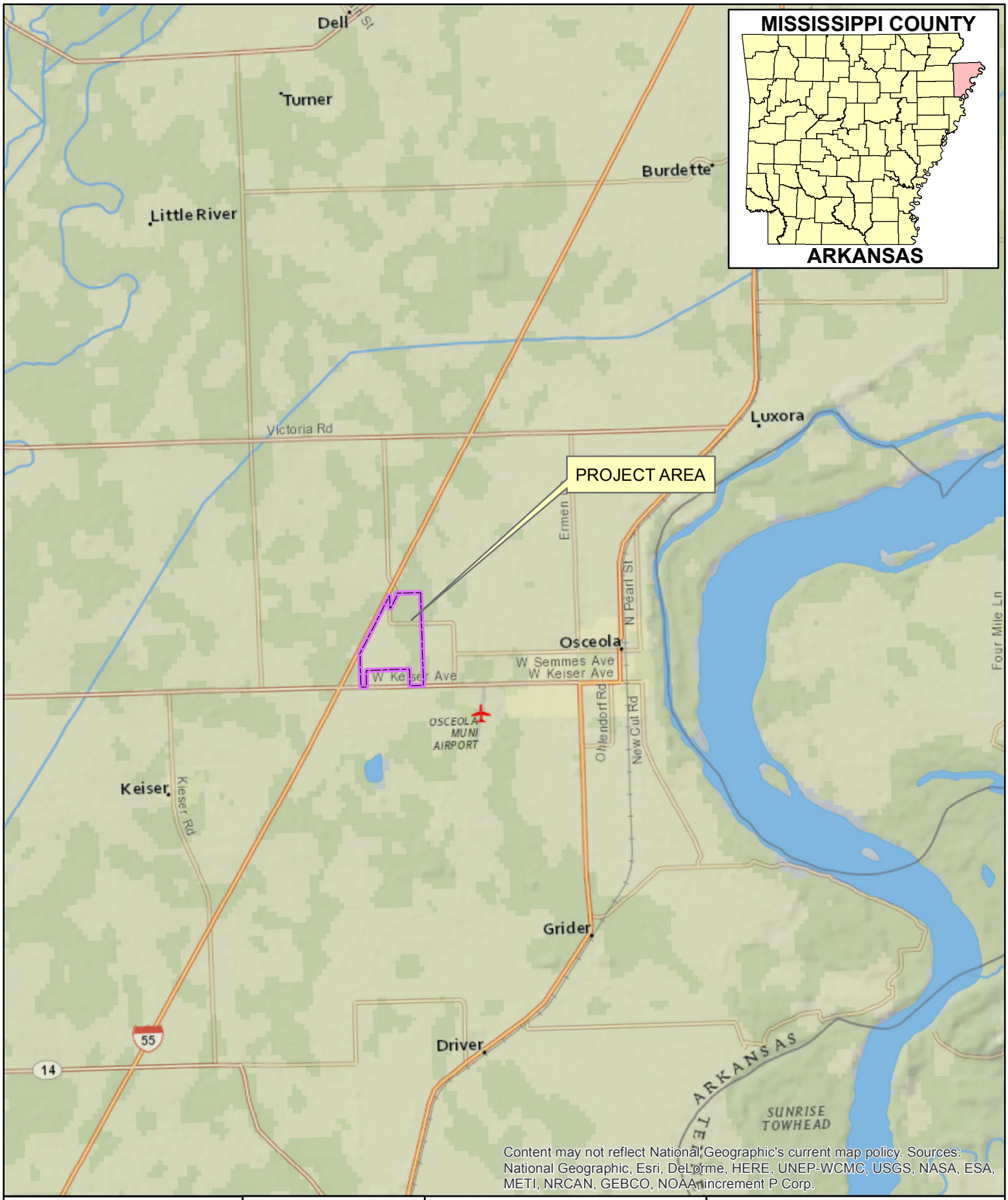


Figure 1. Site Vicinity Map

ENERCON

Drawn by: H. Garner

Date: 2/15/2016

Astro Site
Natural Resource Assessment
Mississippi County, Arkansas

Projection: NAD83 UTM Zone 15 North

Astro Site Project Area

N

0 5,000 10,000 20,000 Feet

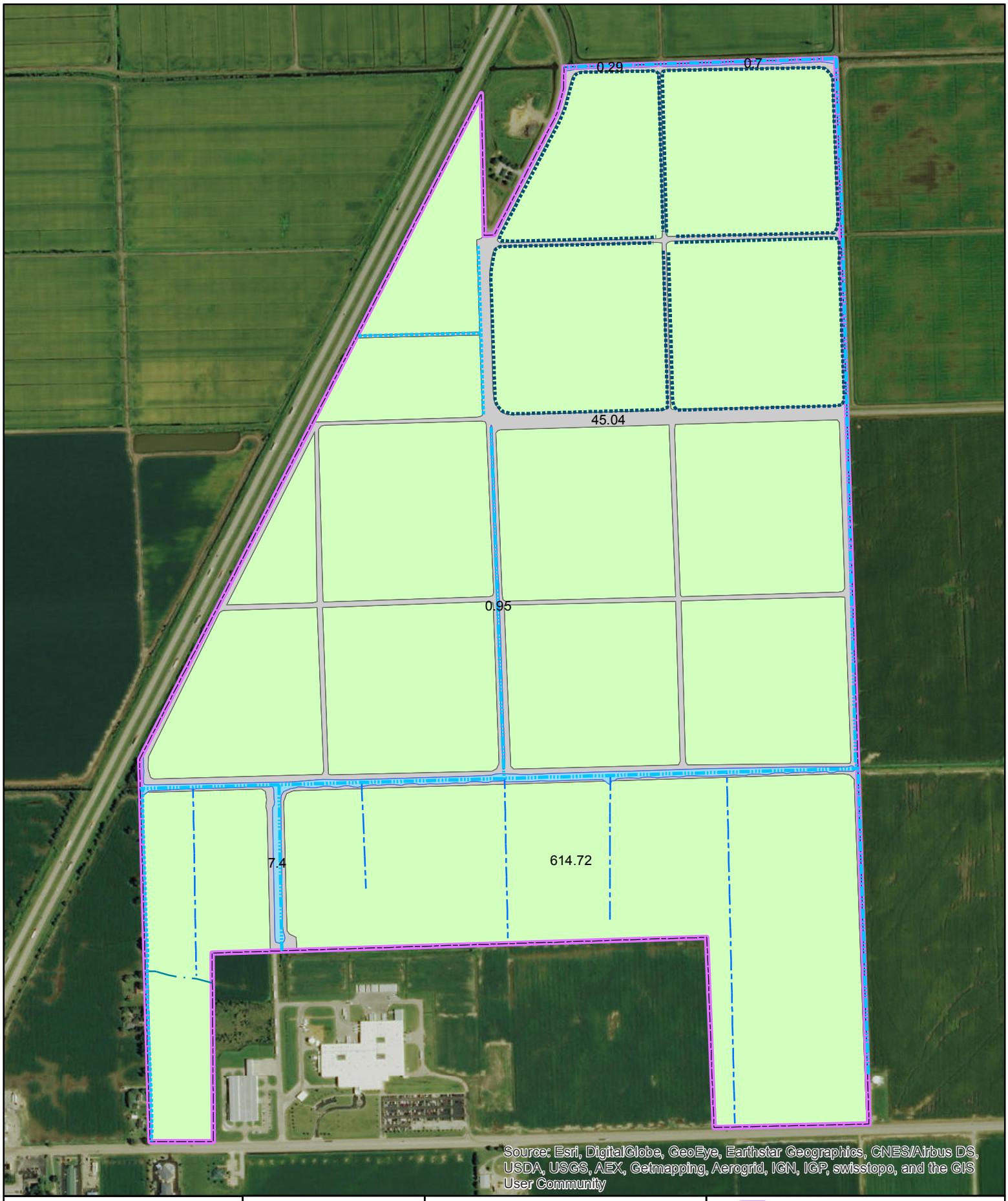


Figure 2. Habitat Map

ENERCON

Drawn by: H. Garner

Date: 2/15/2016

Astro Site
Natural Resource Assessment
Mississippi County, Arkansas

Projection: NAD83 UTM Zone 15 North

Astro Site Project Area
Habitats
Intermittent Stream
Roadways
Row-crop Agriculture
Streams
Ephemeral
Field Ditch
Intermittent
PTO Field Drain
Swale

N

0 450 900 1,800 Feet

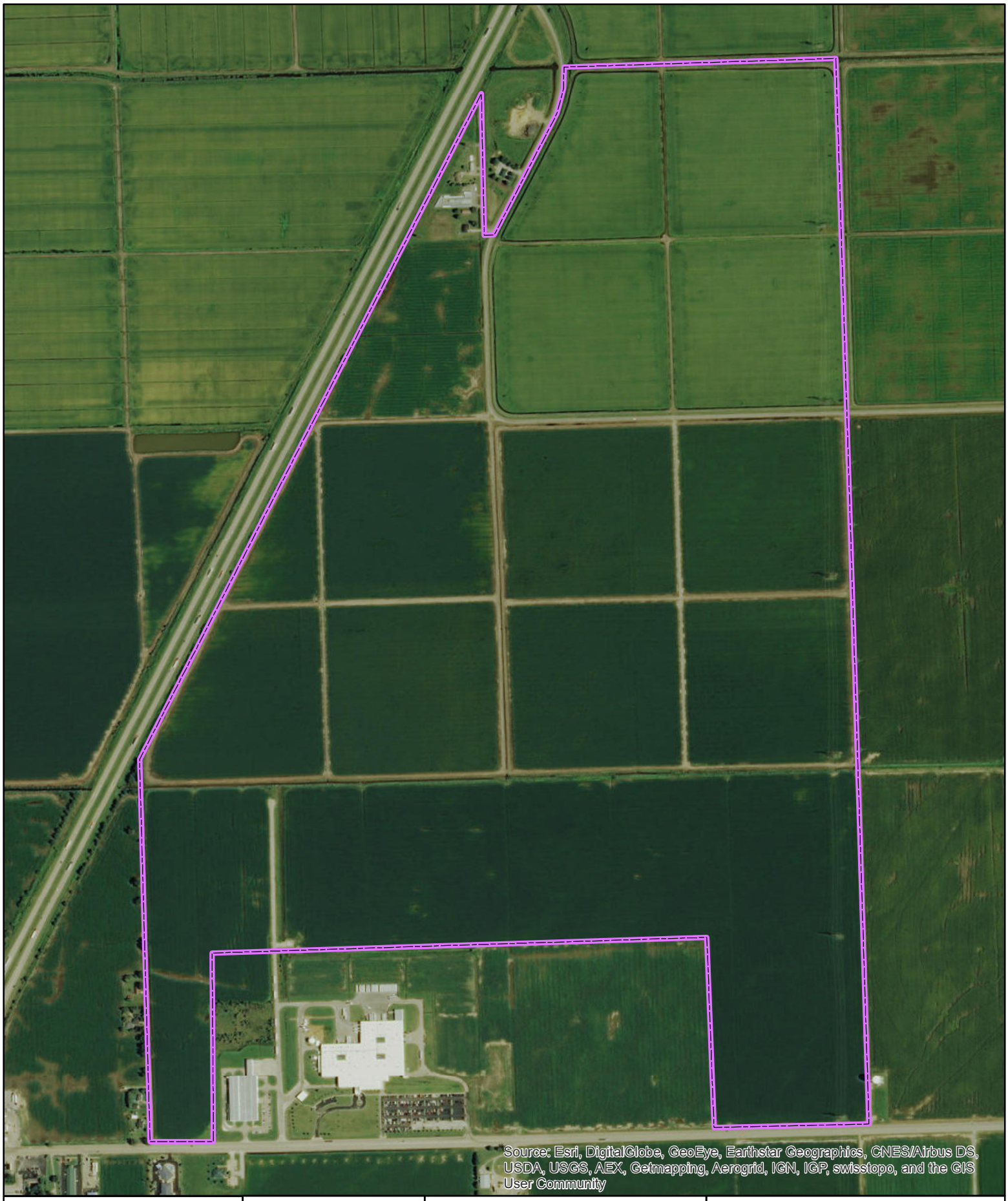


Figure 3. Site Map (based on ESRI World Imagery aerial)

ENERCON

Drawn by: H. Garner

Date: 2/15/2016

Astro Site
Natural Resource Assessment
Mississippi County, Arkansas

Projection: NAD83 UTM Zone 15 North

Astro Site Project Area

N

0 450 900 1,800 Feet

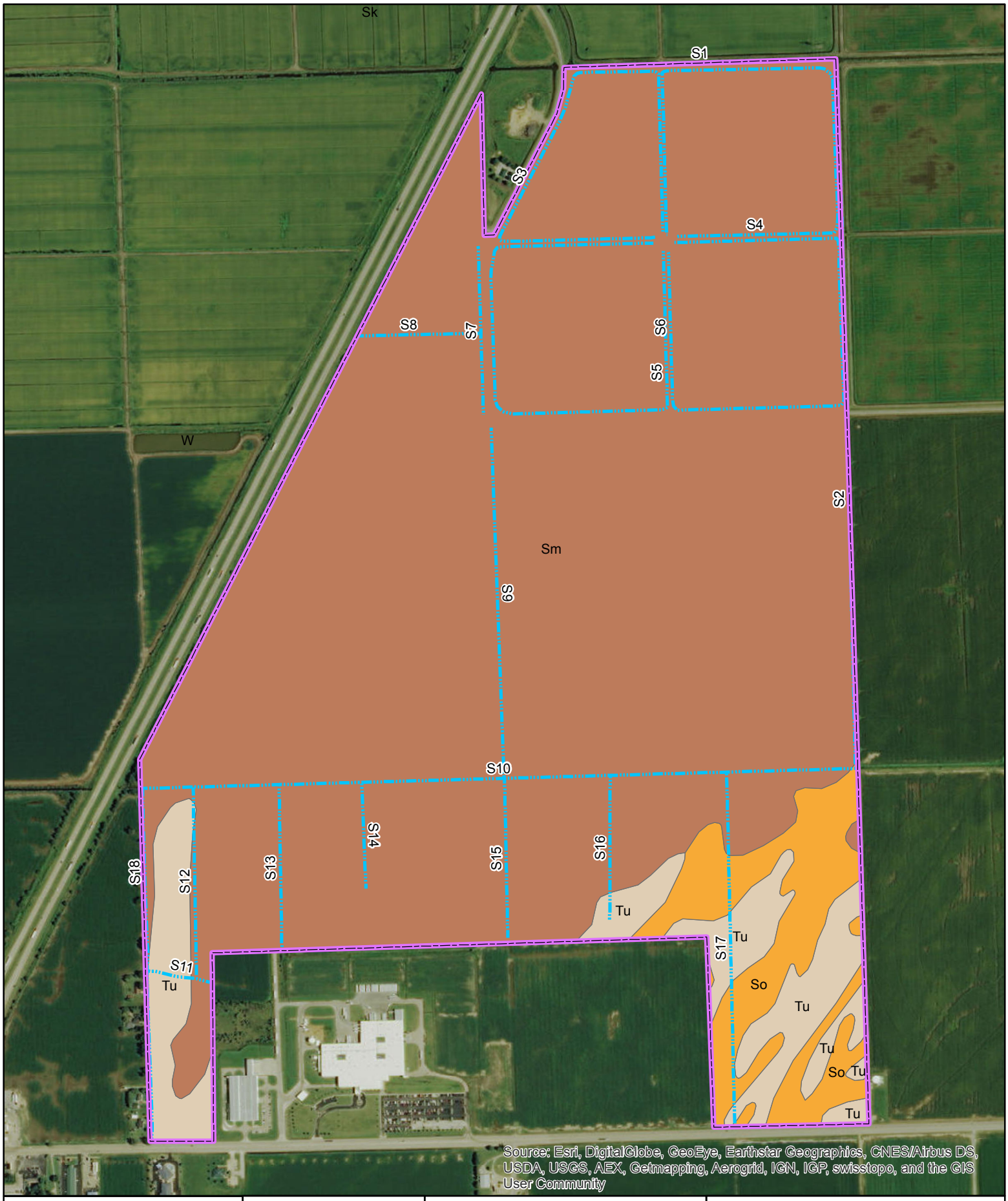


Figure 4. USDA NRCS mapped soils

ENERCON

Drawn by: H. Garner

Date: 2/15/2016

Astro Site
Natural Resources Assessment
Mississippi County, Arkansas

Projection: NAD83 UTM Zone 15 North

Area of Delineation
Streams

USDA Mapped Soils
Sm (Sharkey-Steele)
So (Steele Loamy Sand)
Tu (Tunica Silty Clay)

N

0 0.075 0.15 0.3 Miles

ATTACHMENT 1

Representative Site Photographs

SITE PHOTOGRAPHS

Photo 1. Typical row-crop agricultural field on the project area

Photo 2. Typical intermittent channelized stream on the project area (Ditch No. 44; facing west)

Photo 3. Typical unimproved farm road bisecting the project area and surrounding agricultural fields

Photo 4. Typical fallow area along slopes of intermittent drainages within the project area

ATTACHMENT 2

USFWS Official ESA Species List

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Arkansas Ecological Services Field Office
110 SOUTH AMITY SUITE 300
CONWAY, AR 72032
PHONE: (501)513-4470 FAX: (501)513-4480
URL: www.fws.gov/arkansas-es

Consultation Code: 04ER1000-2016-SLI-0309 January 22, 2016
Event Code: 04ER1000-2016-E-00120
Project Name: Astro Site

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

To Whom It May Concern:

The enclosed species list identifies endangered, threatened, proposed, and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by 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.*). **This letter only provides an official species list and technical assistance; if you determine that listed species and/or designated critical habitat may be affected by the proposed project, even if the effect is wholly beneficial, consultation with the Service will be necessary.**

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 sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found on our website.

Please visit our website at http://www.fws.gov/arkansas-es/IPaC/home.html for species-specific guidance to avoid and minimize adverse effects to federally endangered, threatened, proposed, and candidate species. Our web site also contains additional information on species life history and habitat requirements that may be useful in project planning.

If your project involves in-stream construction activities, oil and natural gas

infrastructure, road construction, transmission lines, or communication towers, please review our project specific guidance at http://www.fws.gov/arkansas-es/IPaC/ProjSpec.html.

The karst region of Arkansas is a unique region and we have specific guidance to conserve sensitive cave-obligate and bat species. **Please visit http://www.fws.gov/arkansas-es/IPaC/Karst.html to determine if your project occurs in the karst region and to view karst specific-guidance.** Proper implementation and maintenance of best management practices specified in these guidance documents is necessary to avoid adverse effects to federally protected species and often avoids the more lengthy formal consultation process.

If your species list includes any mussels, Northern Long-eared Bat, Indiana Bat, Yellowcheek Darter, Red-cockaded Woodpecker, or American Burying Beetle, your project may require a presence/absence and/or habitat survey prior to commencing project activities. Please check the appropriate species-specific guidance on our website to determine if your project requires a survey. We strongly recommend that you contact the appropriate staff species lead biologist (see office directory or species page) prior to conducting presence/absence surveys to ensure the appropriate level of effort and methodology.

Under the ESA, it is the responsibility of the Federal action agency or its designated representative to determine if a proposed action "may affect" endangered, threatened, or proposed species, or designated critical habitat, and if so, to consult with the Service further. Similarly, it is the responsibility of the Federal action agency or project proponent, not the Service, to make “no effect” determinations. If you determine that your proposed action will have “no effect” on threatened or endangered species or their respective critical habitat, you do not need to seek concurrence with the Service. Nevertheless, it is a violation of Federal law to harm or harass any federally-listed threatened or endangered fish or wildlife species without the appropriate permit.

Through the consultation process, we will analyze information contained in a biological assessment that you provide. If your proposed action is associated with Federal funding or permitting, consultation will occur with the Federal agency under section 7(a)(2) of the ESA. Otherwise, an incidental take permit pursuant to section 10(a)(1)(B) of the ESA (also known as a habitat conservation plan) is necessary to harm or harass federally listed threatened or endangered fish or wildlife species. In either case, there is no mechanism for authorizing incidental take “after-the-fact.” For more information regarding formal consultation and HCPs, please see the Service's Consultation Handbook and Habitat Conservation Plans at www.fws.gov/endangered/esa-library/index.html#consultations.

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 ECOS-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 ECOS-IPaC system by completing the same process used to receive the enclosed list.

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

United States Department of Interior
Fish and Wildlife Service

Project name: Astro Site

Official Species List

Provided by:

Arkansas Ecological Services Field Office
110 SOUTH AMITY SUITE 300
CONWAY, AR 72032
(501) 513-4470
http://www.fws.gov/arkansas-es

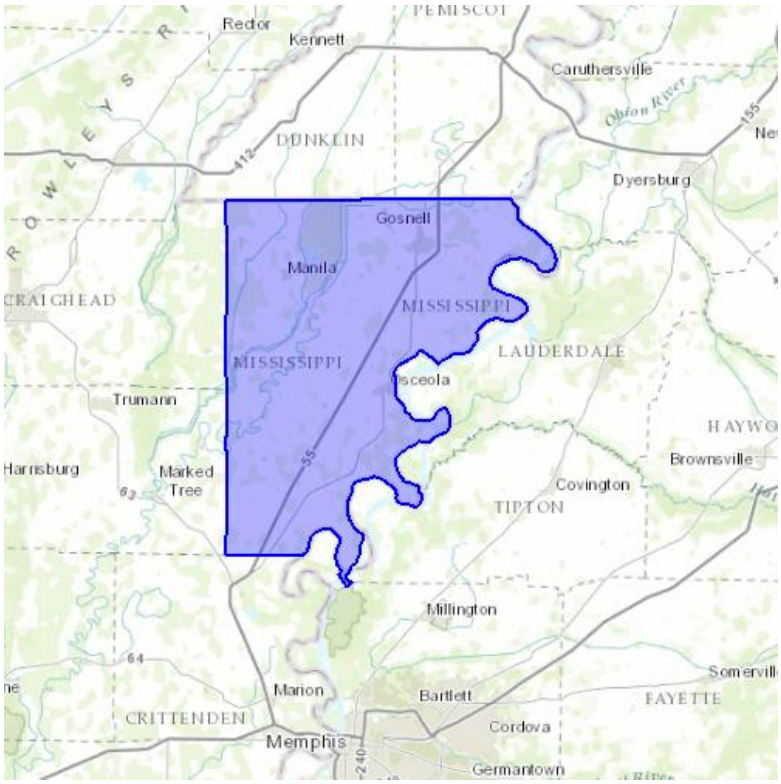
Consultation Code: 04ER1000-2016-SLI-0309
Event Code: 04ER1000-2016-E-00120

Project Type: DEVELOPMENT

Project Name: Astro Site
Project Description: Potential Industrial Development Project west of Osceola, AR

Please Note: The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by' section of your previous Official Species list if you have any questions or concerns.

Project Location Map:



Project Coordinates: The coordinates are too numerous to display here.

Project Counties: Mississippi, AR

Endangered Species Act Species List

There are a total of 5 threatened or endangered species on your 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. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

Birds	**Status**	**Has Critical Habitat**	**Condition(s)**
Least tern *(Sterna antillarum)* Population: interior pop.	Endangered		
Piping Plover *(Charadrius melodus)* Population: except Great Lakes watershed	Threatened	Final designated	
Clams			
Fat pocketbook *(Potamilus capax)* Population: Entire	Endangered		
Scaleshell mussel *(Leptodea leptodon)*	Endangered		
Fishes			
Pallid sturgeon *(Scaphirhynchus albus)* Population: Entire	Endangered		

Critical habitats that lie within your project area

There are no critical habitats within your project area.

ATTACHMENT 3

USFWS Trust Resources Report & ANHC Database Review Table

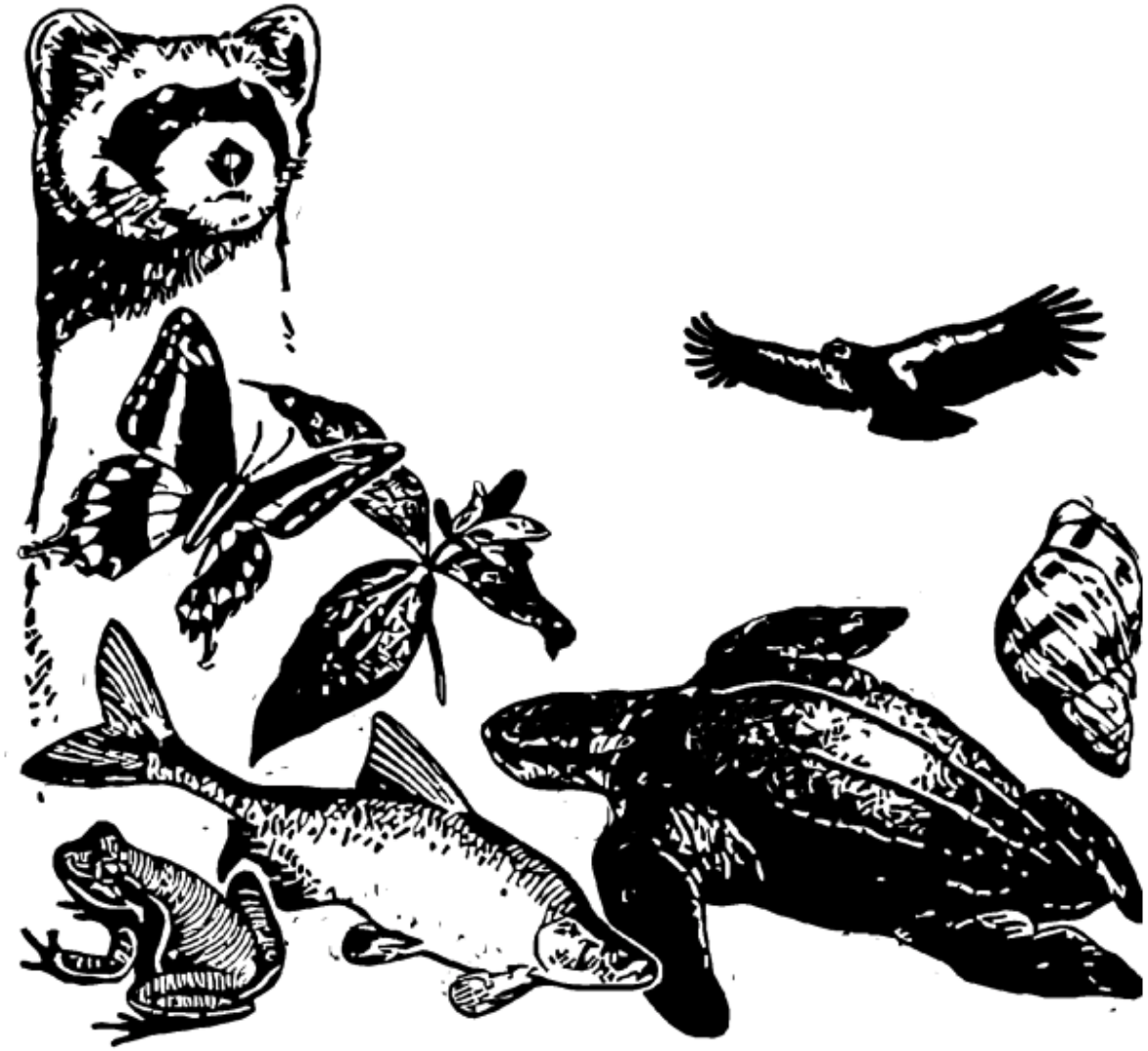
U.S. Fish & Wildlife Service

Astro Site

IPaC Trust Resource Report

Generated January 22, 2016 02:53 PM MST, IPaC v2.3.2

This report is for informational purposes only and should not be used for planning or analyzing project level impacts. For project reviews that require U.S. Fish & Wildlife Service review or concurrence, please return to the IPaC website and request an official species list from the Regulatory Documents page.



IPaC - Information for Planning and Conservation (https://ecos.fws.gov/ipac/): A project planning tool to help streamline the U.S. Fish & Wildlife Service environmental review process.

US Fish & Wildlife Service

IPaC Trust Resource Report

NAME

Astro Site

LOCATION

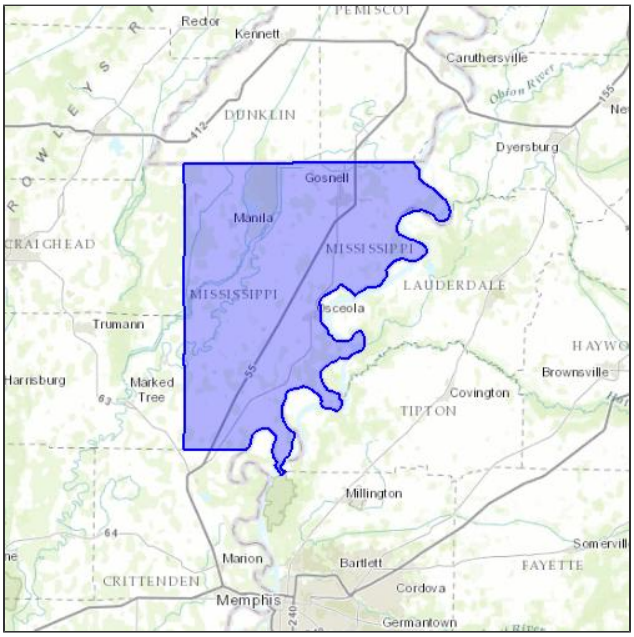
Mississippi County, Arkansas

DESCRIPTION

Potential Industrial Development Project west of Osceola, AR

IPAC LINK

https://ecos.fws.gov/ipac/project/KSZ6O-MS6SB-A2DGC-2RWKI-KVMP44



U.S. Fish & Wildlife Contact Information

Trust resources in this location are managed by:

Arkansas Ecological Services Field Office
110 South Amity Suite 300
Conway, AR 72032-8975
(501) 513-4470

Endangered Species

Proposed, candidate, threatened, and endangered species are managed by the Endangered Species Program of the U.S. Fish & Wildlife Service.

This USFWS trust resource report is for informational purposes only and should not be used for planning or analyzing project level impacts.

For project evaluations that require FWS concurrence/review, please return to the IPaC website and request an official species list from the Regulatory Documents section.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency.

A letter from the local office and a species list which fulfills this requirement can only be obtained by requesting an official species list from the Regulatory Documents section in IPaC.

The list of species below are those that may occur or could potentially be affected by activities in this location:

Birds

Least Tern Sterna antillarum — Endangered

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B07N

Piping Plover Charadrius melodus — Threatened

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B079

Clams

Fat Pocketbook Potamilus capax — Endangered

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=F00T

Scaleshell Mussel Leptodea leptodon — Endangered

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=F00W

Fishes

Pallid Sturgeon Scaphirhynchus albus — Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=E06X

Critical Habitats

There are no critical habitats in this location

Migratory Birds

Birds are protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

Any activity which results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish and Wildlife Service (1). There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures.

Additional information can be found using the following links:

- Birds of Conservation Concern
  http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Conservation measures for birds
  http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Year-round bird occurrence data
  http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/akn-histogram-tools.php

The following species of migratory birds could potentially be affected by activities in this location:

Bald Eagle Haliaeetus leucocephalus — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B008

Bell's Vireo Vireo bellii — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0JX

Chuck-will's-widow Caprimulgus carolinensis — Bird of conservation concern
Season: Breeding

Dickcissel Spiza americana — Bird of conservation concern
Season: Breeding

Fox Sparrow Passerella iliaca — Bird of conservation concern
Season: Wintering

Kentucky Warbler Oporornis formosus — Bird of conservation concern
Season: Breeding

Le Conte's Sparrow Ammodramus leconteii — Bird of conservation concern
Season: Wintering

Least Bittern Ixobrychus exilis — Bird of conservation concern
Season: Breeding

Least Tern Sterna antillarum — Bird of conservation concern
Season: Breeding

Loggerhead Shrike Lanius ludovicianus — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0FY

Mississippi Kite Ictinia mississippiensis — Bird of conservation concern
Season: Breeding

Orchard Oriole Icterus spurius — Bird of conservation concern
Season: Breeding

Painted Bunting Passerina ciris — Bird of conservation concern
Season: Breeding

Prairie Warbler Dendroica discolor — Bird of conservation concern
Season: Breeding

Prothonotary Warbler Protonotaria citrea — Bird of conservation concern
Season: Breeding

Red-headed Woodpecker Melanerpes erythrocephalus — Bird of conservation concern
Year-round

Rusty Blackbird Euphagus carolinus — Bird of conservation concern
Season: Wintering

Sedge Wren Cistothorus platensis — Bird of conservation concern
Seasons: Wintering, Migrating

Short-eared Owl Asio flammeus — Bird of conservation concern
Season: Wintering
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HD

Swainson's Warbler Limnothlypis swainsonii — Bird of conservation concern
Season: Breeding

Willow Flycatcher Empidonax traillii — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0F6

Wood Thrush Hylocichla mustelina — Bird of conservation concern
Season: Breeding

Worm Eating Warbler Helmitheros vermivorum — Bird of conservation concern
Season: Breeding

Refuges

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

This location overlaps all or part of the following National Wildlife Refuges:

Big Lake National Wildlife Refuge

21,963.92 acres

PHONE (870) 564-2429

ADDRESS
2274 Highway 18
Manila, AR 72442

http://www.fws.gov/refuges/profiles/index.cfm?id=43515

Chickasaw National Wildlife Refuge

10,707.28 acres

PHONE (731) 635-7621

ADDRESS
C/o West Tennessee Refuges
309 North Church Street Federal Building Room 201
Dyersburg, TN 38024

http://www.fws.gov/refuges/profiles/index.cfm?id=42526

Wetlands in the National Wetlands Inventory

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.

DATA LIMITATIONS

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

DATA EXCLUSIONS

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

DATA PRECAUTIONS

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Wetland data is unavailable at this time.

MENU

ARKANSAS NATURAL HERITAGE COMMISSION
(/)

An Agency of the Department of Arkansas Heritage

(http://www.arkansasheritage.com)

SPECIES SEARCH BY COUNTY RESULTS

Back to search form (/Research-and-Data/rare-species-search)

MISSISSIPPI COUNTY

Name	Federal Status	State Status	Global Rank	State Rank
Animals - Invertebrates				
Cicindela lepida (http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Cicindela+lepida) (little white tiger beetle)	-	INV	G3G4	S2S3
Lucanus elaphus (http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Lucanus+elaphus) (giant stag beetle)	-	INV	G3G5	S2
Pleurobema rubrum (http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Pleurobema+rubrum) (pyramid pigtoe)	-	INV	G2G3	S2
Potamilus capax (http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Potamilus+capax) (fat pocketbook)	LE	SE	G2	S1
Quadrula apiculata (http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Quadrula+apiculata) (southern mapleleaf)	-	INV	G5	S2
Toxolasma lividum (http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Toxolasma+lividum) (purple lilliput)	-	INV	G3Q	S2

Uniomerus declivis (http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Uniomerus+declivis) (tapered pondhorn)	-	INV	G5Q	S2
Uniomerus tetralasmus (http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Uniomerus+tetralasmus) (pondhorn)	-	INV	G5	S2
Villosa lienosa (http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Villosa+lienosa) (little spectaclecase)	-	INV	G5	S3
Animals - Vertebrates				
Ambystoma talpoideum (http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Ambystoma+talpoideum) (mole salamander)	-	INV	G5	S3
Chrysemys dorsalis (http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Chrysemys+dorsalis) (southern painted turtle)	-	INV	G5	S3
Cycleptus elongatus (http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Cycleptus+elongatus) (blue sucker)	-	INV	G3G4	S2
Egretta tricolor (http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Egretta+tricolor) (Tricolored Heron)	-	INV	G5	S3B, S3N
Haliaeetus leucocephalus (http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Haliaeetus+leucocephalus) (Bald Eagle)	-	INV	G5	S2B, S4N
Hiodon alosoides (http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Hiodon+alosoides) (goldeye)	-	INV	G5	S2?
Hybognathus placitus (http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Hybognathus+placitus) (plains minnow)	-	INV	G4	SX
Limnothlypis swainsonii (http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Limnothlypis+swainsonii) (Swainson's Warbler)	-	INV	G4	S3B
Macrhybopsis meeki (http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Macrhybopsis+meeki) (sicklefin chub)	-	INV	G3	SNR
Myotis austroriparius (http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Myotis+austroriparius) (southeastern myotis)	-	INV	G3G4	S3
Nerodia cyclopion (http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Nerodia+cyclopion) (Mississippi green watersnake)	-	INV	G5	S3
Pandion haliaetus (http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Pandion+haliaetus) (Osprey)	-	INV	G5	S1B, S4N
Platygobio gracilis (http://www.natureserve.org/explorer/servlet/NatureServe?	-	INV	G5	S1?

searchName=Platygobio+gracilis) (flathead chub)				
Polyodon spathula (http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Polyodon+spathula) (paddlefish)	-	INV	G4	S2?
Regina grahamii (http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Regina+grahamii) (Graham's crayfish snake)	-	INV	G5	S2
Reithrodontomys humulis (http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Reithrodontomys+humulis) (eastern harvest mouse)	-	INV	G5	S2
Scaphiopus holbrookii (http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Scaphiopus+holbrookii) (eastern spadefoot)	-	INV	G5	S2
Scaphirhynchus albus (http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Scaphirhynchus+albus) (pallid sturgeon)	LE	SE	G2	S1
Sternula antillarum athalassos (http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Sternula+antillarum+athalassos) (Interior Least Tern)	LE	SE	G4T2Q	S2B
Plants - Vascular				
Carex normalis (http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Carex+normalis) (spreading oval sedge)	-	INV	G5	S1
Leitneria floridana (http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Leitneria+floridana) (corkwood)	-	INV	G3	S3
Mentha arvensis (http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Mentha+arvensis) (wild mint)	-	INV	G5	S1
Mimulus ringens var. ringens (http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Mimulus+ringens+var.+ringens) (Allegheny monkey-flower)	-	INV	G5T5	S1S2
Special Elements - Natural Communities				
Lower Mississippi River Bottomland Depression	-	INV	GNR	SNR
Special Elements - Other				
Colonial nesting site, water birds	-	INV	GNR	SNR

(http://www.deltaculturalcenter.com)

(http://www.arkansasheritage.com)

(http://www.historicarkansas.org)

(http://www.mosaictemplarscenter.com)

(http://www.oldstatehouse.com)

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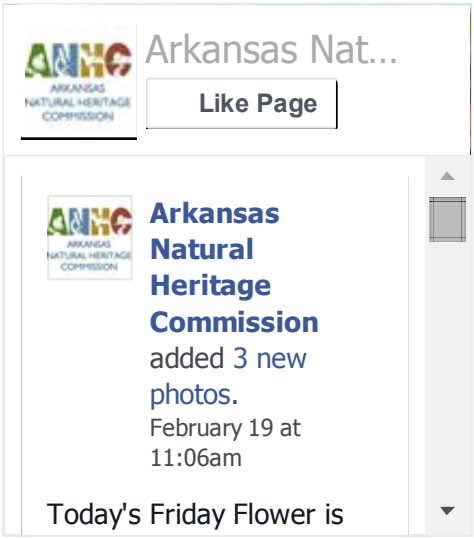

ABOUT

The Arkansas Natural Heritage Commission (ANHC) focuses on science-based conservation to protect our state's biological diversity. As the central repository for data on rare plants and animals and natural communities in Arkansas, we work to provide up-to-date information for sound and timely conservation decisions.

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ATTACHMENT 4

ESA Species Fact Sheets

FACT SHEET

SCALESHELL MUSSEL (*Leptodea leptodon*)

Species Information

Status: Endangered (50 CFR Part 17; October 9, 2001) (USFWS, 2001). Critical habitat has not been designated.

Description: The shell is typically one to four inches, elongate, and very thin and compressed. The anterior end is rounded; the posterior end in males is bluntly pointed. In females, the periostracum forms a wavy, fluted extension of the shell posteriorly. The dorsal margin is straight; the ventral margin is gently rounded. Umbos are small and low, about even with the hinge line. The beak sculpture is compressed and inconspicuous and consists of four or five double-looped ridges. The periostracum is smooth, yellowish green or brown, with numerous faint green rays. The pseudocardinal teeth are reduced to a small thickened ridge. The lateral teeth are moderately long; two long, indistinct lateral teeth occur in the left valve, one fine tooth in the right. The beak cavity is very shallow or absent. The nacre is pinkish white or light purple and highly iridescent (USFWS, 1998).

Life History: The life cycle of the scaleshell, like most freshwater mussels, is unusual and complex. Their eggs develop into microscopic larvae (glochidia) within the gills of the female. The female discharges its glochidia into the river where they must attach to gills or fins of a fish to continue developing. Each mussel species has specific fish species (host fish) that are needed by the glochidia to develop. It appears that scaleshell be other species. Glochidia continue growing on the fish and transform into juveniles. After a few weeks, they drop off, land on the river bottom, and continue maturing into adults (USFWS, 2004).

Habitat: Scaleshell live in medium-sized and large rivers with stable channels and good water quality. They bury themselves in sand and gravel on the bottom with only the edge of their partially-opened shells exposed. As river currents flow over them, they siphon particles out of the water for food such as plant debris, plankton, and other microorganisms. The roles of scaleshell in river ecosystems are as food for wildlife like muskrats, otters, and raccoons and as filters which improve water quality (USFWS, 2004).

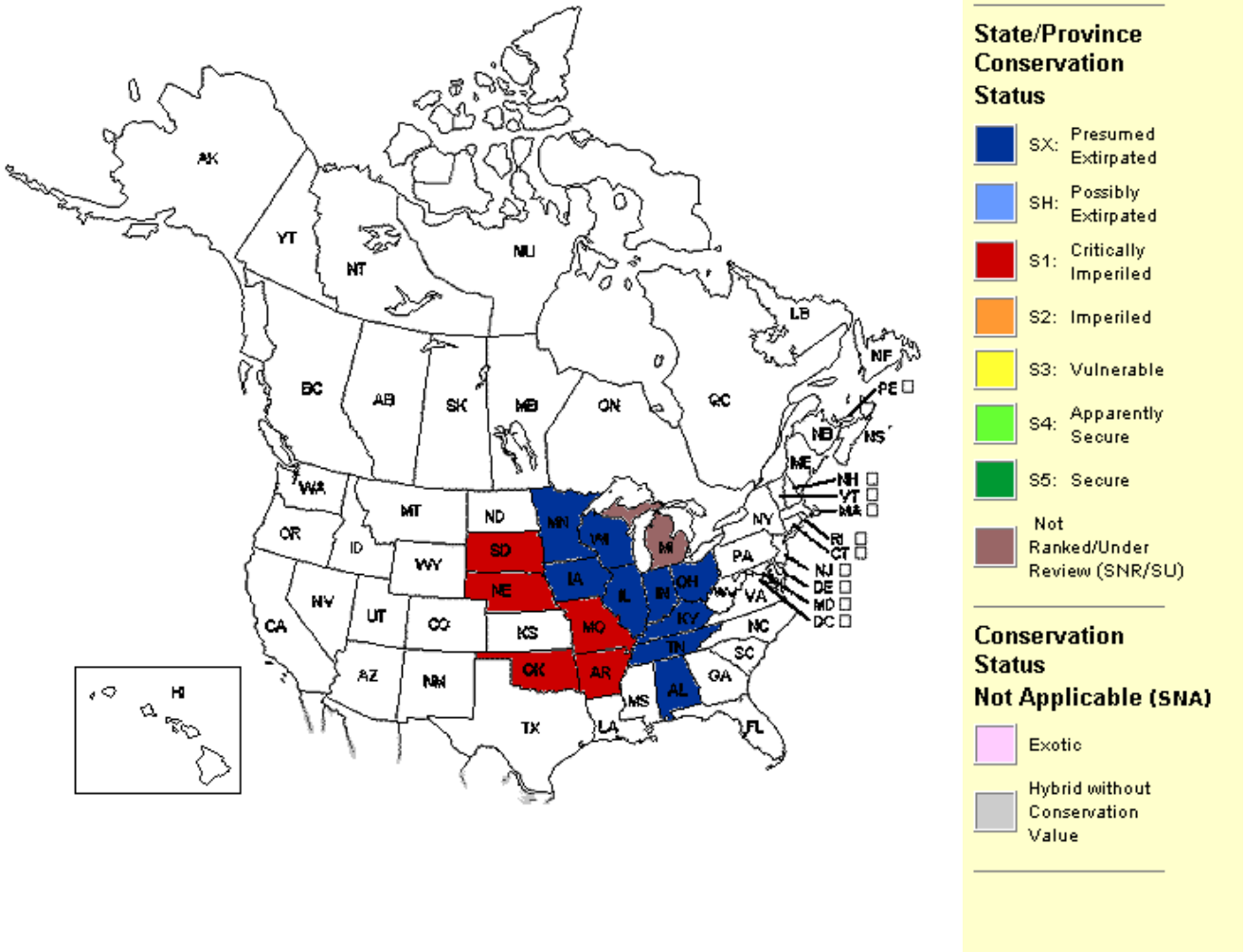
Although always somewhat rare, *L. leptodon* apparently was not habitat limited. According to published accounts, the species occupied a wide variety of habitat types. For example,

FACT SHEET

Buchanan (1980, 1994) and Gordon (1991) reported *L. leptodon* from riffle areas with substrate assemblages of gravel, cobble, boulder, and occasionally mud or sand. Oesch (1984) considered *L. leptodon* a typical riffle species, occurring only in clear, unpolluted water with good current. Conversely, Call (1900), Goodrich and Van der Schalie (1944), and Cummings and Mayer (1992) reported collections from muddy bottoms of big rivers. The unifying characteristic appears to be an intact system with good water quality. This is consistent with the current distribution of *L.* leptodon. Most extant populations are restricted to river stretches that support a high diversity of freshwater mussels (Buchanan 1980, Harris 1992) and that have maintained relatively good water quality.

Scaleshell mussels historically occurred across most of the eastern United States. During the last 50 years, this species has become increasingly rare and its range reduced. Of the 55 historical populations, 14 remain scattered within the Mississippi River basin in Arkansas, Missouri, and Oklahoma (USFWS, 2004).

Distribution and Range Map



References

Buchanan, A.C. 1980. Mussels (Naiades) of the Meramec River basin. Missouri Department of Conservation. Aquatic Series 17. 76p.

Buchanan, A.C. 1994. A survey of the freshwater mussels of the lower Gasconade River. Report for U.S. Army of Corps of Engineers, Kansas City District, 700 Federal Building, Kansas City, MO 64106.

Call, R.E. 1900. A descriptive illustrated catalogue of the Mollusca of Indiana. Indiana Department of Geology and Natural Resources Annual Report 24:335-535.

Cummings, K.S., and C.A. Mayer. 1992. Field guide to freshwater mussels of the Midwest. Illinois Natural History Survey Manual 5. 194p.

Goodrich, C. and H. Van Der Schalie. 1944. A revision of the Mollusca of Indiana. Am. Midl. Nat. 32:257-326.

Gordon, M.E. 1991. Species accounts for Cumberland elktoe (Alasmidonta atropurpurea), Cumberlandian combshell (Epioblasma brevidens), oyster mussel (Epioblasma capsaeformis), rough rabbitsfoot (Quadrula cylindrica strigillata), and purple bean (Villosa perpurpurea). Unpublished report to The Nature Conservancy. 75p. United States Fish and Wildlife Service (USFWS). 1998. Leptodea leptodon (Scaleshell Mussel) Rangewide Status Assessment.

Harris, J.L. 1992. Survey of the freshwater mussels (Mollusca: Unionidae) of the South Fourche LaFave River and major tributaries. Unpublish manuscript. 19 pp + appendices.

Oesch, R.D. 1984. Missouri naiades: A guide to the mussels of Missouri. Missouri Department of Conservation, Jefferson City, Missouri. 270p.

United States Fish and Wildlife Service (USFWS). August 2004. Endangered Species Facts, Scaleshell Mussel, *Leptodea leptodon*.

United States Fish and Wildlife Service (USFWS). October 9, 2001. Determination of Endangered Status for the Scaleshell Mussel. Federal Register 50 Part 17, Vol. 66, No. 195: 51322-51339.

FACT SHEET

PIPING PLOVER (*Charadrius melodus*)

Species Information

Status: Endangered in the watershed of the Great Lakes, threatened in the remainder of its range (50 FR 50726; December 11, 1985) (USFWS, 1985). Critical habitat has not been designated.

Description: The Piping Plover is a small, stocky shorebird about 7 inches long with a wingspan of about 15 inches. Adults have a sand-colored upper body, white undersides, and orange legs throughout the year. A white rump, which is visible in flight, distinguishes this species from other small plovers. During the breeding season, adults acquire a dark narrow breast band, a dark strip across the forehead, and a black-tipped orange bill. The breast band is sometimes incomplete, especially in females. Juveniles are similar to nonbreeding adults in appearance (TPWD, 2010).

Life History: Piping Plovers spend about 3 to 4 months on their breeding grounds in the northern United States and southern Canada, including St. Pierre and Miquelon off the coast of Newfoundland. They begin arriving from the wintering areas in mid-April. Courtship behavior includes aerial flights, digging of several nest scrapes, and ritualized stone tossing. Piping Plovers are monogamous, but mate-switching may occur both during the breeding season and between years (TPWD, 2010).

Plover nests are shallow depressions in the sand, frequently lined with small pebbles or shell fragments. The nest cups are about an inch deep and 2.5 inches in diameter. Females lay 4 eggs, which are gray to pale sand-colored with a few dark spots. The eggs blend almost perfectly with the sand, making them very difficult to see. Both parents incubate the eggs for about 27 days. Most adults raise only one brood per year, and occasionally they will renest if their nest is destroyed (TPWD, 2010).

Eggs begin to hatch from late May to mid-June. The chicks can feed themselves within hours after hatching. Both parents attend the young. Broods generally remain on the nesting territory, expanding their movements as they mature or are disturbed. The young are able to fly about 30 to 35 days after hatching. Females commonly leave broods when the young are 14 to 20 days of age, but males often remain with them until after they have reached flight age (TPWD, 2010).

The Piping Plover's activity (home range) during the breeding season is limited to the section of lakeshore or beach on which the nest is located. Both adults defend an area (territory) surrounding the nest against intruders. This territory sometimes includes their foraging area. Plovers in some areas defend both nesting and feeding territories. Piping Plovers commonly nest in association with Least Terns, Arctic Terns, Common Terns, Killdeer and American Avocets. Adults begin migrating south from the breeding grounds by July or early August. Adult females begin leaving the breeding grounds first,

followed by adult males. Juveniles leave a few weeks later, and most are gone by late August. Although little is known of their migration, it is believed that they generally migrate non-stop from the breeding grounds to the wintering grounds (TPWD, 2010).

Piping Plovers generally begin arriving on the Texas coast in mid-July. The number of plovers appears to increase on the Texas coast through October. Plovers begin migrating towards the breeding grounds in late February. Most birds are gone from Texas by mid May, although a few birds can be found along the coast year round. Birds found on the Texas coast during the breeding season may be adults, but are non-breeders. When the plovers are on the wintering grounds, the numbers of plovers that are detected is generally correlated with seasonal high tides. Seasonal high tides cover extensive flats that would otherwise be available to the birds during periods of low tide, pushing foraging plovers into areas that are more visible to the public and researchers (TPWD, 2010).

On the wintering grounds, the diet of the Piping Plover consists of marine worms, flies, beetles, spiders, crustaceans, mollusks, and other small marine animals and their eggs and larvae. Plovers are visual predators. Therefore, they feed primarily during the day, but may also feed at night, during full moons. They often run short distances, pausing to stare at the sand with a slightly tilted head, before picking a food item from the substrate. Plovers feed most aggressively during the falling tide, when the availability of exposed mud flats is greatest. When foraging on tidal flats, Piping Plovers are often observed in flocks. These flocks are sometimes large (200 or more birds), but are usually much smaller (5-30 birds). When foraging on beaches, individual plovers are usually distributed along the beach at intervals, and occasionally have aggressive encounters with other shorebirds or other members of their own species (TPWD, 2010).

When not feeding, plovers rest and preen. Piping Plovers roost on beaches, in wash-over passes, or on tidal flats, often near the areas where they forage. They usually roost in spots somewhat sheltered by driftwood, accumulations of seaweed or sea grass, other debris, or small dunes. Plovers often roost together in small flocks. When roosting, Piping Plovers can be very difficult to see (TPWD, 2010).

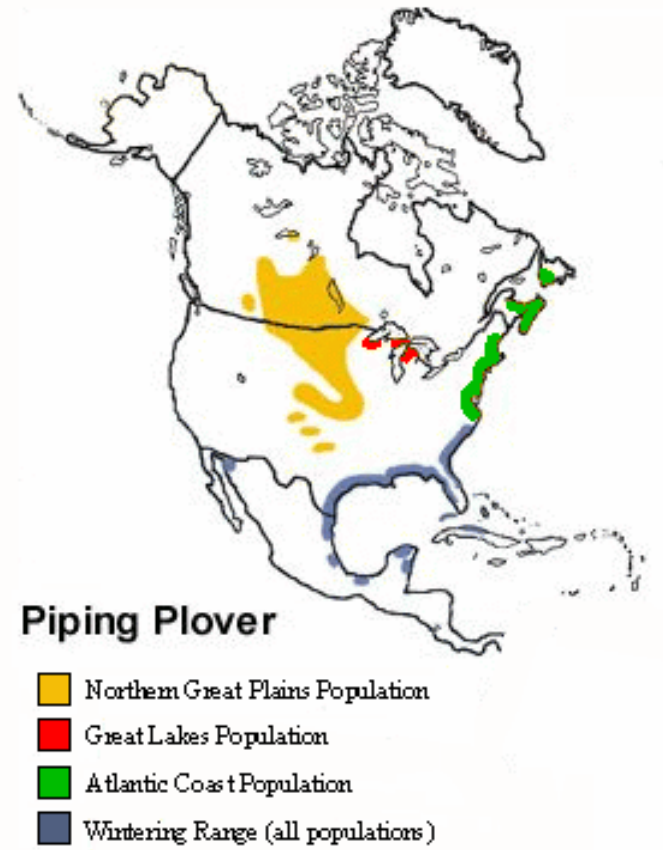
During the wintering period on the Texas coast, Piping Plovers are often seen with other shorebirds. These associated species include the Snowy, Semipalmated, Wilson's, and Black-bellied Plovers; American Oystercatcher, American Avocet, Willet, Marbled Godwit, Ruddy Turnstone, Sanderling, Dowitchers, Dunlin, and Sandpipers (TPWD, 2010).

Habitat: Piping Plovers nest on sandy beaches along the ocean or lakes. Along rivers, Piping Plovers use the bare areas of islands or sandbars. They also nest on the pebbly mud of interior alkali lakes and ponds. Birds nesting on gravel have higher reproductive success than those nesting on alkali (USFWS, 1992). Piping Plovers spend more than 70% of the year on the wintering grounds. Winter habitat includes beaches, sand flats, mudflats, algal mats, emergent sea grass beds, wash-over passes, and very small dunes where seaweed (*Sargassum*) or other debris has accumulated sand (TPWD, 2010).

Distribution: Historically, Piping Plovers bred along the Atlantic Coast, on the Northern Great Plains, and around the Great Lakes. Piping Plovers winter along the southern Atlantic and Gulf coasts, and in the Bahamas and West Indies (USFWS, 1992). Spoil islands along the Intracoastal Waterway are used by wintering plovers. Texas is estimated to winter more than 35% of the known population of Piping

Plovers (TPWD, 2010). Piping Plovers migrate through Oklahoma each spring and fall. Although drastically reduced, remnant populations occur throughout their historic range (USFWS, 1992).

Distribution and Range Map



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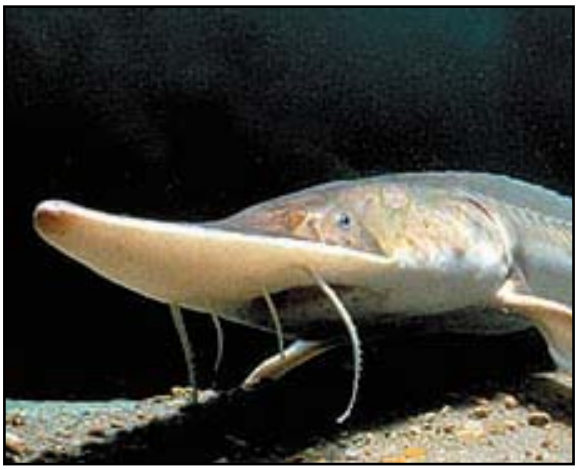
FACT SHEET

PALLID STURGEON (*Scaphirhynchus albus*)

Species Information



Status: Endangered (55 FR 36641; September 6, 1990) (USFWS, 1990). Critical habitat has not been designated. The Final Recovery Plan was released November 7, 1993.

Description: Pallid sturgeons have a unique dinosaur-like appearance. They have a flattened snout, long slender tail and are armored with lengthwise rows of bony plates instead of scales. Their mouth is toothless and positioned under the snout for sucking small fishes and invertebrates from the river bottom. Pallid sturgeons can weigh up to 80 pounds and reach lengths of 6 feet, whereas the closely related shovelnose sturgeon rarely weighs more than 8 pounds. The back and sides of pallid sturgeons are grayish-white versus the brown color of the shovelnose sturgeons (USFWS, 2010).

Life History: Sexual maturity for males is estimated to be 7-9 years, with 2-3 year intervals between spawning. Females are not expected to not reach sexual maturity until 7-15 years, with up to 10-year intervals between spawning. Pallid sturgeons are long lived, with individuals perhaps reaching 50 years of age (USFWS, 2010).

Habitat: Pallid sturgeons evolved and adapted to living close to the bottom of large, silty rivers with natural a hydrograph. Their preferred habitat has a diversity of depths and velocities formed by braided channels, sand bars, sand flats and gravel bars (USFWS, 2010).

Distribution: Today, pallid sturgeons are scarce in the upper Missouri River above Ft. Peck Reservoir; scarce in the Missouri and lower Yellowstone Rivers between Ft. Peck Dam and Lake Sakakawea; very scarce in the other Missouri River reservoir reaches; scarce in the Missouri River downstream of Gavins Point Dam; scarce but slightly more common in the Mississippi and Atchafalaya Rivers; absent from other tributaries (USFWS, 2010).

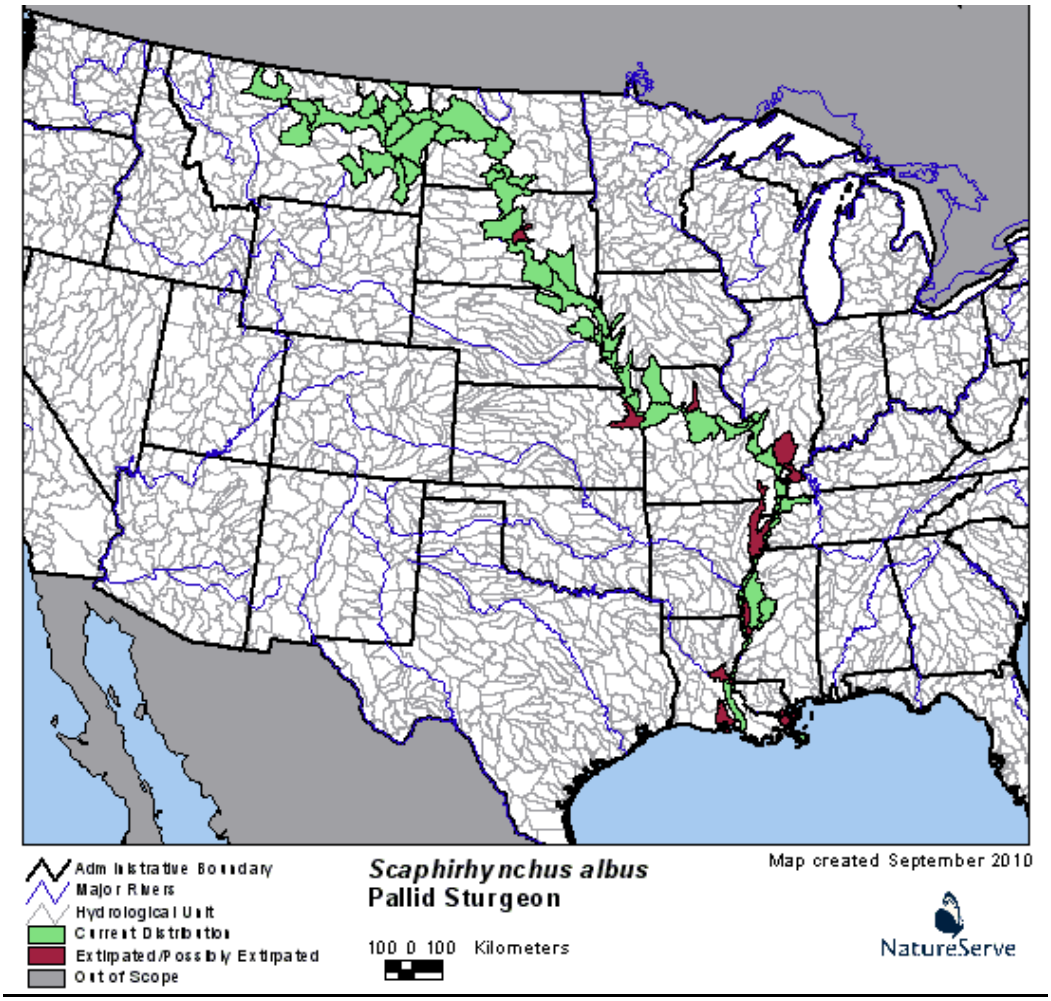
Reasons for Decline: All of the 3,350 miles of riverine habitat within the pallid sturgeon's range have been adversely affected by man. Approximately 28% has been impounded, which has created unsuitable lake-like habitat; 51% has been channelized into deep, uniform channels; the remaining 21% is downstream of dams which have altered the river's hydrograph, temperature and turbidity. Commercial fishing and environmental contaminants may have also played a role in the pallid sturgeon's decline (USFWS, 2010).

Recovery Activities: In 1997, through the combined effort of two Fishery Assistance offices, two National Fish Hatcheries, one Ecological Services office, and two State game and fish departments (North Dakota and Montana), two female and three male pallid sturgeons were spawned. Spawning pallid sturgeons from the upper Missouri River had been attempted since 1988, but to no avail.

FACT SHEET

Currently, approximately 5,000 young pallid sturgeons are being reared at Gavins Point NFH. In August, 1998, the Fish and Wildlife Service and state game and fish departments from North Dakota and Montana will stock up to 1,500 of these fish in two areas; at sites near the Missouri and Yellowstone River confluence, and in the Missouri River upstream of Ft. Peck Reservoir in Montana. This release will be the first under a multi-agency 6-year plan to augment doomed adult populations. Since pallid sturgeons do not reach maturity and spawn for several years, we must stock now so that we have adults in the wild as habitats are restored. Without artificial propagation in hatcheries and subsequent population augmentation, this population will likely be extirpated. The juvenile pallid sturgeon we stock under this plan will be the founder population for recovery (USFWS, 2010).

Distribution and Range Maps



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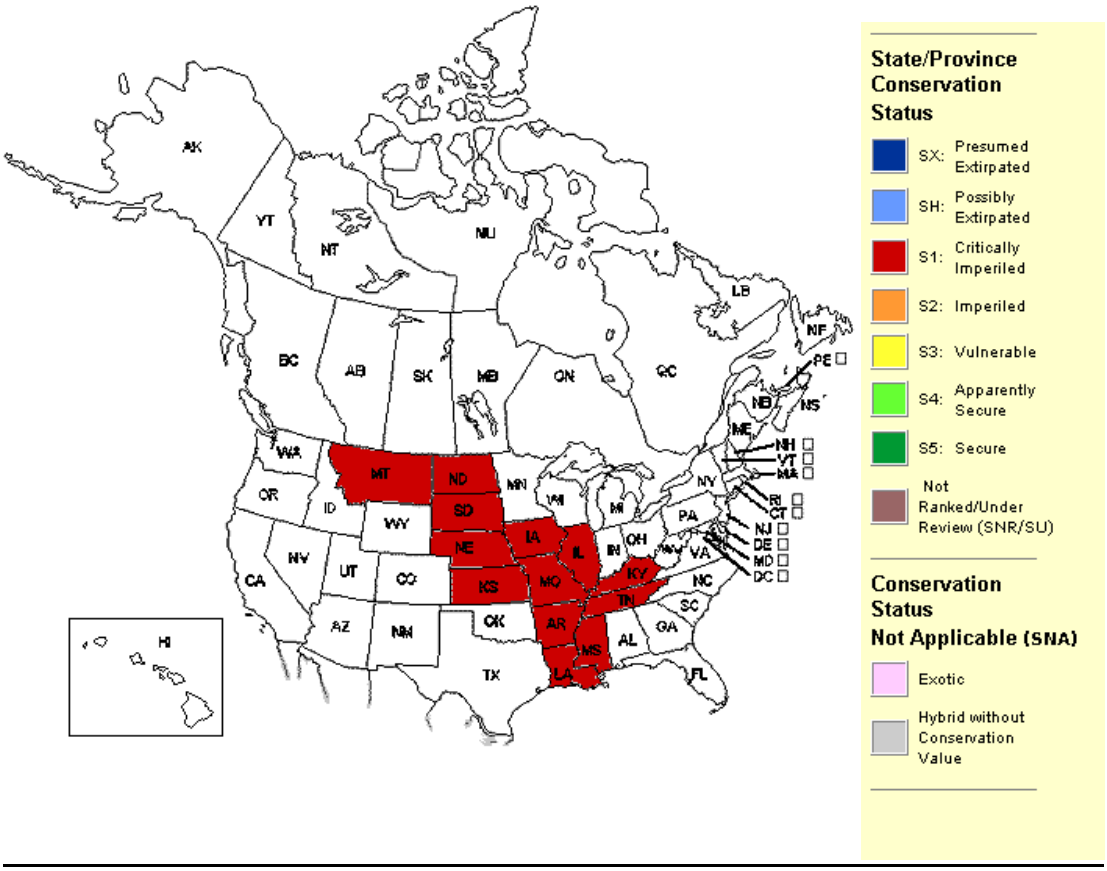

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FACT SHEET

INTERIOR LEAST TERN (*Sterna antillarum*)

Species Information

Status: Endangered (50 FR 21784; May 28, 1985) (USFWS, 1985). Critical habitat has not been designated. The Final Recovery Plan was released in 1990.

Description: The interior least tern is the smallest member of the tern family with a wingspan of 20 inches and is typically 8 to 10 inches in length. They have a grayish back and wings, and snowy white undersides. Least terns can be distinguished from all other terns by their combination of a black crown, white forehead, and a variable black-tipped yellow bill (USFWS, 1992). During breeding, the least tern has a black cap ending at a white forehead with a short white eye stripe and a yellow bill with a black tip. Its back is light gray and its underside is white. The wings have a black leading edge. In non-breeding plumage, the least tern has a black eye stripe extending to the back of the head, white top of the head, and a black bill. The juvenile interior least tern has U-shaped marks across the back and resembles the non-breeding adult (Cornell Lab of Ornithology, 2010).

Life History: Interior least terns arrive at breeding sites from late April to early June where they typically spend four to five months. Pairs go through an elaborate courtship period that includes courtship feedings and a variety of postures and vocalizations. Least terns nest in small colonies on exposed salt flats, river sandbars, or reservoir beaches (USFWS, 1992). Nests can be as close as 10 feet but are often 30 feet or more apart. The nest is a shallow depression in an open, sandy area, gravelly patch, or exposed flat. Small twigs, pieces of wood, small stones or other debris usually occur near the nest. Egg-laying begins in late May, with the female laying 2 to 3 eggs over a period of 3 to 5 days. The eggs are pale to olive buff and speckled or streaked with dark purplish-brown, chocolate, or blue-gray markings. Both parents incubate the eggs, with incubation lasting about 20 to 22 days. The chicks hatch within one day of each other and remain in the nest for about a week. As they mature, they begin to wander from the nest, seeking shade and shelter in clumped vegetation and debris. Chicks are capable of flight within 3 weeks, but the parents continue to feed them until fall migration. Least terns will renest until late July if clutches or broods are lost (TPWD, 2009).

Activities of the interior least tern during the breeding season are limited to the portion of river near the nesting site. Nesting adults defend an area surrounding the nest (territory) against intruders, and terns within a colony will defend any nest within that colony. When defending a territory, the incubating bird will fly up giving an alarm call, and then dive repeatedly at the intruder (TPWD, 2009).

The breeding season is usually complete by late August. Prior to migration, the terns gather at staging areas with high fish concentrations. They gather to rest and eat prior to the long flight to southern wintering grounds. Low, wet sand or gravel bars at the mouths of tributary streams and floodplain

wetlands are important staging areas. Interior least terns often return to the same breeding site, or one nearby, year after year (TPWD, 2009).

Nesting success of terns at a particular location varies greatly from year to year. Because water levels fluctuate and nesting habitats such as sandbars and shorelines change over time, the terns are susceptible to habitat loss and frequent nest and chick loss (TPWD, 2009).

Channelization, irrigation, and the construction of reservoirs and pools have contributed to the elimination of much of the tern's natural nesting habitat in the major river systems of the Midwest. Discharges from dams built along these river systems pose additional problems for the birds nesting in the remaining habitat. Before rivers were altered, summer flow patterns were more predictable. The nesting habits of the least tern evolved to coincide with natural declines in river flows. Today, flow regimes in many rivers differ greatly from historic regimes. High flow periods may now extend into the normal nesting period, thereby reducing the availability of quality nest sites and forcing terns to nest in less than optimum locations. Extreme fluctuations can inundate potential nesting areas, flood existing nests, and dry out feeding areas (TPWD, 2009).

Historical flood regimes scoured areas of vegetation, providing additional nesting habitat. However, diversion of river flows into reservoirs has resulted in encroachment of vegetation and reduced channel width along many rivers, thereby reducing sandbar habitat. Reservoirs also trap much of the sediment load, limiting formation of suitable sandbar habitat (TPWD, 2009).

Rivers are often the focus of recreational activities. For inland residents, sandbars are the recreational counterpart of coastal beaches. Activities such as fishing, camping, and ATV use on and near sandbar habitat are potential threats to nesting terns. Even sand and gravel pits, reservoirs, and other artificial nesting sites receive a high level of human use. Studies have shown that human presence reduces reproductive success, and human disturbance remains a threat throughout the bird's range (TPWD, 2009).

Water pollution from pesticides and irrigation runoff is another potential threat. Pollutants entering rivers upstream and within breeding areas can adversely affect water quality and fish populations in tern feeding areas. Least Terns are known to accumulate contaminants that can affect reproduction and chick survival. Mercury, selenium, DDT derivatives, and PCBs have been found in least terns throughout their range at levels warranting concern, although reproductive difficulties have not been observed (TPWD, 2009).

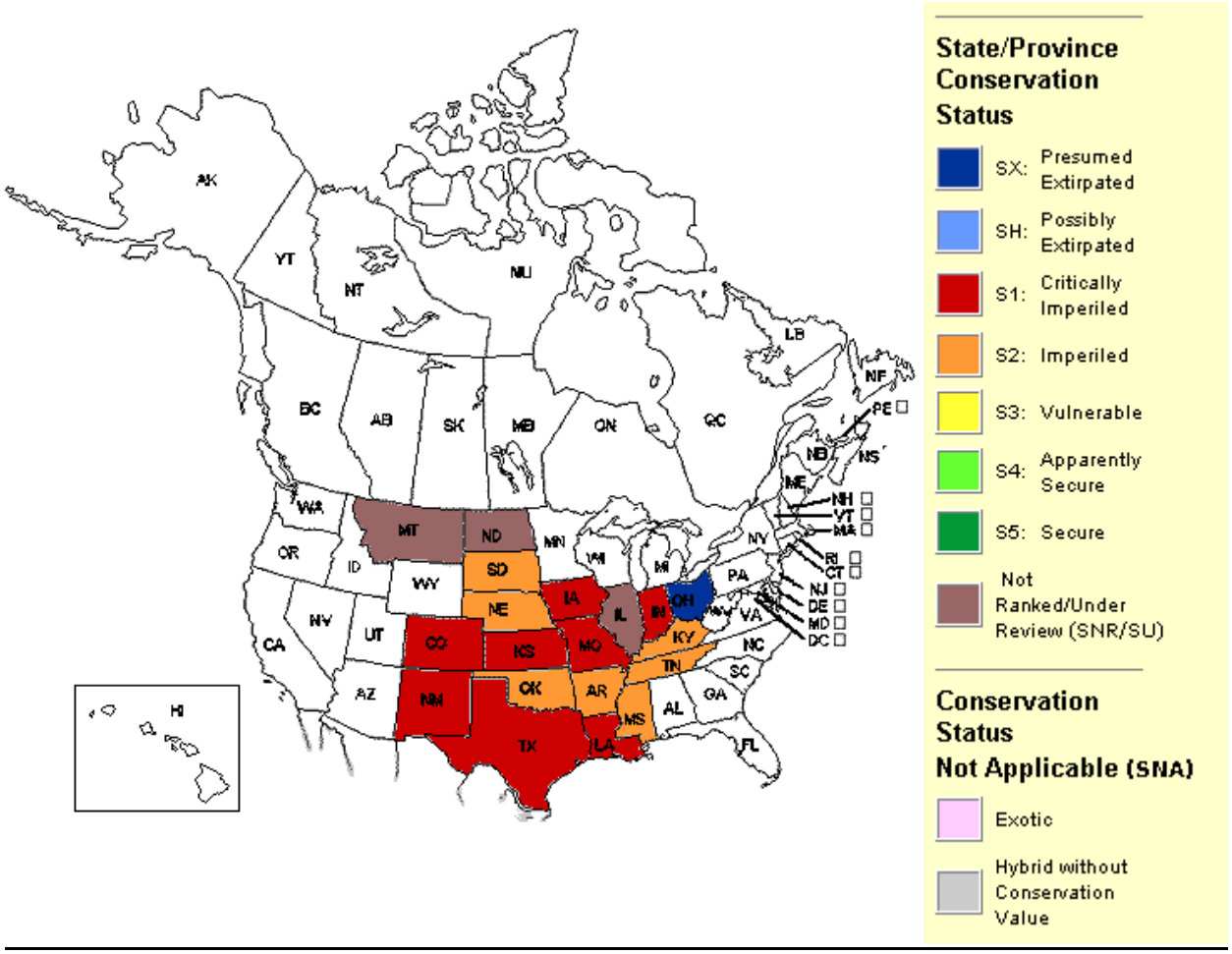
Finally, too little water in some river channels may be a common problem that reduces the birds' food supply and increases access to nesting areas by humans and predatory mammals. Potential predators include coyotes, gray foxes, raccoons, domestic dogs and cats, raptors, American Crows, Great Egrets, and Great Blue Herons (TPWD, 2009).

Habitat: Interior least terns favor islands or sandbars along the southern coasts of the United States and up the major river systems for nesting. For reproductive success, the sand must be mostly clear of vegetation and water levels low enough to prevent inundation of nests. Least terns are piscivorous and prefer shallow water for foraging (USFWS, 1992).

FACT SHEET

Distribution: The historic distribution of the interior least tern was the major river systems of the Midwestern United States. These rivers included the Red, Rio Grande, Arkansas, Missouri, Ohio, and Mississippi river systems. Currently, they occur as small remnant colonies throughout their former range. In Oklahoma, interior least terns nest along most of the larger rivers, as well as at the Salt Plains National Wildlife Refuge near Jet, Oklahoma. Interior least terns winter in South America (USFWS, 1992).

Distribution and Range Maps



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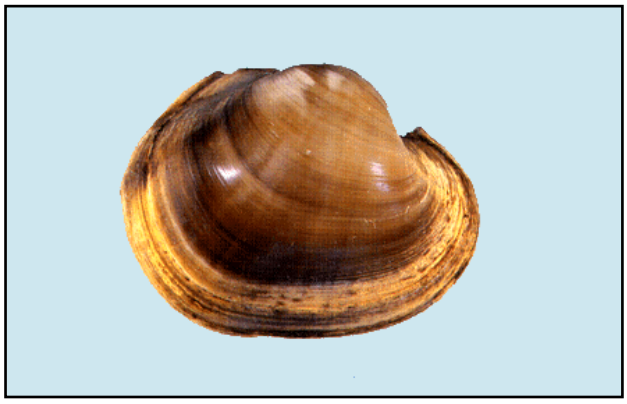
FACT SHEET

FAT POCKETBOOK (*Potamilus capax*)

Species Information

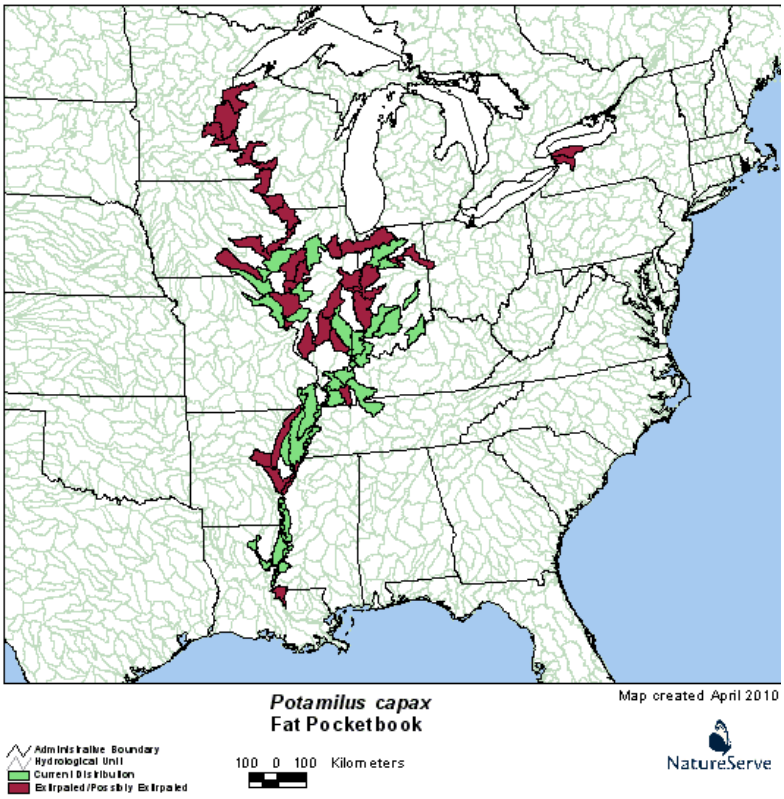


Status: Federally-listed as an endangered species for Dunklin County, Missouri (USFWS, 2012). The Missouri Department of Conservation (MDC) considers this mussel to be a species of conservation concern (SCC). Dunklin County is documented to be an extant location (seen within the last 25 years) for the fat pocketbook (MDC, 2000).

Description: This mussel species resembles a lady's old-fashioned pocketbook and is approximately 5 inches in length (MDC, 2000). The shell is round to somewhat oblong, greatly inflated, and thin (young) to moderately thick (adults). Anterior and posterior ends are rounded. The umbos are greatly inflated, elevated, and turned inward. A small posterior wing is present in young mussels. The surface is usually smooth and very shiny. The periostracum is rayless, yellow, yellowish tan, or olive, and becomes dark brown in older individuals (INHS, 2012).

Habitat: Historically, fat pocketbooks lived in sand and mud substrates of slow-moving waters of large rivers. Presently, its largest populations occur in dredged ditches of the Missouri Bootheel and northeastern Arkansas. The freshwater drum is the only known suitable host fish for the fat pocketbook (MDC, 2000).

Distribution: See distribution and range maps.



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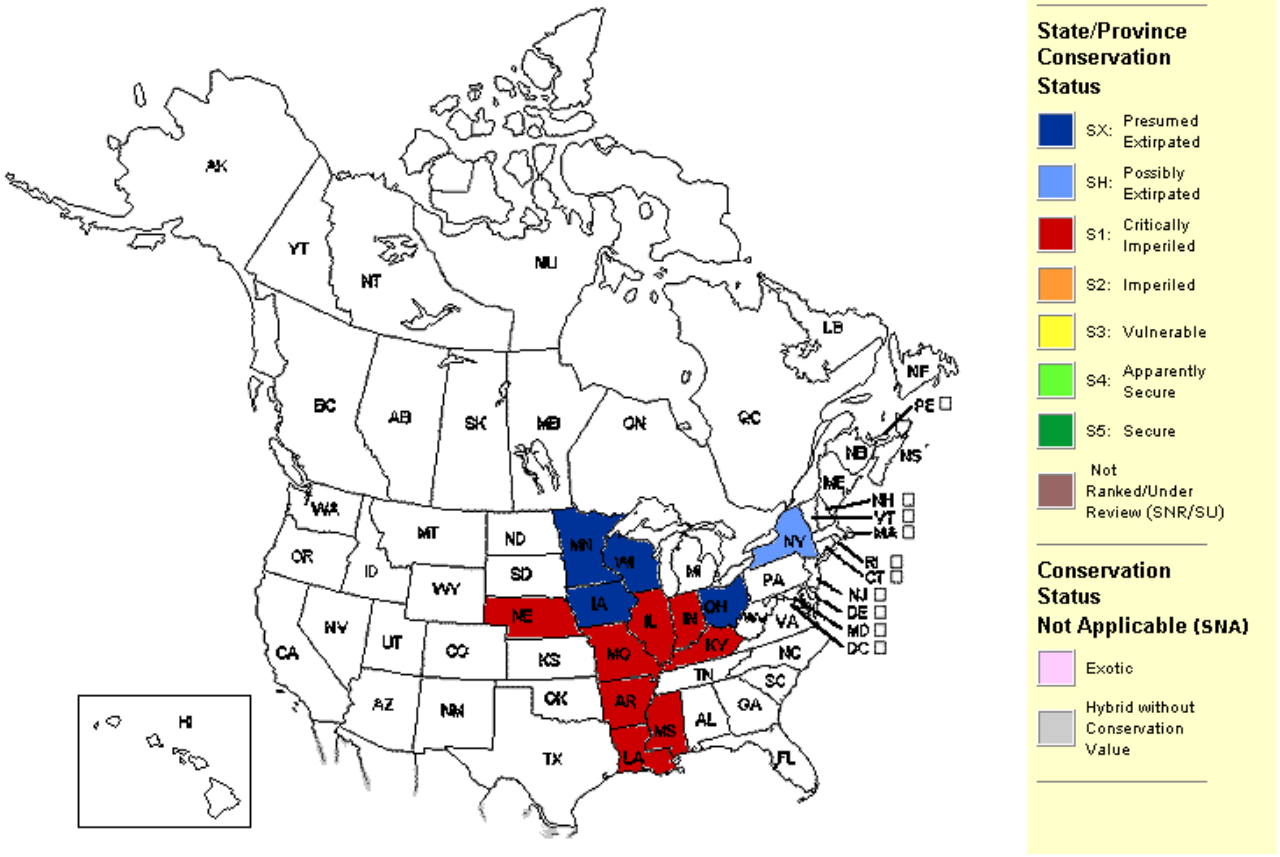

References

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ATTACHMENT 5

ESA Species Conclusion Table

Species Conclusions Table

Project Name: Proposed Astro Site– Mississippi County, AR

Date: February 22, 2016

Species / Resource Name	Conclusion	ESA Section 7	Notes / Documentation
Piping Plover (*Charadrius melodus*)	No Suitable Habitat Present; Species Potentially Present	No Effect	USFWS, 1992 No foraging habitat present on project area. Only spring and fall migrant.
Interior Least Tern (*Sterna antillarum*)	No Suitable Habitat Present; Species Potentially Present	No Effect	USFWS, 1992 No foraging or nesting habitat present on project area, but is located nearby.
Fat Pocketbook (*Potamalis capax*)	No Suitable Habitat Present; Species Not Present	No Effect	USFWS, 2013 No suitable riverine habitat present on project area
Scaleshell Mussel (*Leptodon leptodon*)	No Suitable Habitat Present; Species Not Present	No Effect	USFWS, 2013 No suitable riverine habitat present on project area
Pallid Sturgeon (*Nicrophorus americanus*)	No Suitable Habitat Present; Species Not Present	No Effect	USFWS, 2007 No suitable riverine habitat present on project area