

Project Title:

Fuel-Free Geologic Compressed Air Energy Storage From Renewable Power

Task # 1 -3 Deliverable Report

For:

New Technology Implementation Grant Program

582-11-13126-3225

Submitted by:

**David Marcus, President
General Compression, Inc.**

November 25, 2011

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by the State of Texas
through a Grant from the Texas Commission on Environmental Quality*

Table of Contents

ABSTRACT/EXECUTIVE SUMMARY	3
INTRODUCTION / BACKGROUND	3
Task 2.....	5-7
Task 3.....	8-9
SUMMARY	10

Abstract/Executive Summary

General Compression intends to install a second-generation, commercial 2 MW advanced compressed air energy storage system utilizing a fuel free, near-isothermal compressor/expander at an existing geological salt cavern in West Texas. General Compression additionally plans to install and integrate a 3.0MW or equivalent wind turbine alongside the GCAES™ compressor/expander technology to demonstrate our ability to use wind to provide firm dispatchable power (including peak, intermediate and baseload) and ancillary services to the Texas electrical grid. This project will allow for a minimum of 500 MWh of energy storage at an installed cost of approximately \$15/kWh (or \$24/kWh including the wind turbine), and will provide the necessary foundation to allow for the wide-scale ramp up to hundreds of thousands of megawatt hours of energy storage throughout Texas.

Introduction / Background

General Compression has developed a near-isothermal compressor/expander module that will allow the construction of utility-scale storage projects from a minimum of 2W to over 1,000 MW in power rating and over 300 hours of storage. The General Compression Advanced Energy Storage (“GCAES”) project enables renewable generators to output energy to almost any power curve required by a customer. These modules use electricity as an input, either from intermittent renewable generators such as wind turbines and solar arrays, or from off-peak grid generators. The projects require no fuel to turn the air into power, lowering operating and permitting costs compared to other compressed air energy storage technologies and expanding the number of potential project sites. GCAES units feature a round-trip electrical efficiency of 75% and an installed cost of between \$800-\$1,000/kW. The projects are targeted at increasing the value of renewables, eliminating curtailment, enhancing transmission utilization, and making dispatchable renewable power available to customers, thus making it possible for renewables to displace coal or natural gas on the grid and significantly reduce total state-wide emissions. Projects can be built in remote areas, allowing renewables to more completely utilize remote transmission lines. General Compression plans to partner with utilities and developers of wind farms, existing underground storage facilities, transmission lines, etc. to develop integrated wind/storage projects. Standalone storage projects can also be built within urban power constraint areas, where peak/off-peak power arbitrage opportunities are highest because of the difficulty of siting new generation and transmission. The compressed air is stored in geologic formations and then expanded on demand to convert it to electric power. Value is created by absorbing power when it is not required by customers and generating power when it is. Unlike conventional compressed air energy storage projects, no fuel is burned when air is expanded and power is generated.

GCAES projects are responsive enough to be eligible in various markets for their ability to provide spinning reserves, capacity, voltage support, frequency regulation, etc. GCAES

projects do not have gas line connections, air pollutant or CO2 emissions, radioactive risks, or coal ash containment. They are ideally suited to areas where conventional power projects cannot receive air permits.

Project Objectives / Technical Approach

General Compression has eight operational goals and objectives for this project:

- 1) Build and install a commercial unit of the General Compression Advanced Energy Storage at a demonstration facility being developed jointly between General Compression and ConocoPhillips.
- 2) Integrate the GCAES system into an existing cavern formation at the demonstration facility.
- 3) Build and install approximately 3 to 10 MW of wind turbines at the same site.
- 4) Integrate electricity generation from the wind turbine into the GCAES system for optimal delivery of wind power to the grid.
- 5) Provide and maintain energy storage and generation services to supply power to the Texas electrical grid over multiple timeframes.
- 6) Work with the Bureau of Economic Geology at the University of Texas ("BEG") to develop the test protocol to analyze the function of the GCAES unit and the wind turbine together as a project so that they respond to appropriate market signals.
- 7) Work with BEG to analyze the further integration of renewables into the electrical grid throughout the state of Texas in order to support the reduction of emissions and create opportunities for existing and future clean energy industry expansion within the state.
- 8) Reduce emissions by displacing baseload power generated from fossil fuels with renewable resources thus improving overall air quality in the state of Texas.

Tasks

Project objective(s) from Grant Activities (Scope of Work)

1.1.1. The PERFORMING PARTY is the technology holder for the General Compression Advanced Energy Storage (GCAES) system, a compressed air energy storage technology. ConocoPhillips Company (COP), a partner in agreement with PERFORMING PARTY under a Memorandum of Understanding (MOU), is the co-owner of the overall project site that includes an existing geologic salt cavern. PERFORMING PARTY is responsible for ensuring COP acquires full ownership of the overall project site. PERFORMING PARTY will execute a facilities agreement with COP to install the GCAES at the specific project site that includes an existing geologic salt cavern. PERFORMING PARTY will purchase 3 megawatt (MW) of wind turbine(s) from a selected vendor. The PERFORMING PARTY will be responsible for the delivery, installation, and commissioning of 3-MW of wind turbine(s). PERFORMING PARTY will integrate the GCAES and 3-MW of wind turbine(s) so that wind generation captured by the 3-MW of wind turbine(s) is stored by the GCAES. PERFORMING PARTY will establish a grid interconnection so that energy stored by the GCAES and wind generation captured by the 3-MW wind turbine(s) is delivered to the electric grid.

1.2 The objectives for this work are:

1.2.1. Installation of GCAES and integration with 3MW of wind turbine(s) at the specific project site or an adjacent site that includes an existing geologic salt cavern in West Texas, allowing a minimum of 500 megawatt-hours (MWh) of stored, renewable energy to be delivered to the grid.

1.3 TCEQ reserves the right to reject any deliverable that is materially inconsistent with the project as proposed in the grant application.

TASK 2

Secure necessary permits to install and operate the GCAES at the specific project site and 3-MW of wind turbine(s) at specific project site or an adjacent site. **(from Grant Activities (Scope of Work))**

TASK 2 Deliverables:

General Compression and project partner ConocoPhillips have commissioned a number of fatal flaw and feasibility studies in connection with securing the necessary permits to site, construct and operate the GCAES technology, integrated with a repurposed salt cavern and electrically interconnected to the local utility. GC is currently working to secure the necessary permits for Wind Integration phase of the demonstration project.

Objectives vs. Results

GC and project partner and site host ConocoPhillips have secured the necessary Federal, State and Industry standard permits for preparing, constructing and operating the GCAES technology electrically interconnected with the local utility and a repurposed salt cavern. Specifically:

- The studies necessary to initiate GCAES assembly and construction of the BOP have been commissioned and approved. URS Fatal Flaw Analysis Report submitted as ***Confidential/Proprietary***.
- Interconnection Facilities Construction Agreement with Lea County being submitted as ***Confidential/Proprietary***
- Tetra Tech conducted a field investigation and survey at the Gaines Station site to provide guidance for our design and construction. The Tetra Tech Geotech Survey is being submitted as ***Confidential/Proprietary***.
- The permitting process to install and operate wind turbine(s) on or near the project site has been initiated and is currently underway. GC and COP have hired an environmental consultant URS. <http://www.urscorp.com/index.php> of Austin, Texas to perform a Wind Integration Fatal Flaw Analysis and obtain the necessary regulatory approvals to integrate (~3MW) of Wind Turbines with the GCAES demonstration project in Gaines, TX. The URS Wind Fatal Flaw Analysis Report submitted as ***Confidential/Proprietary***.
- RES Americas has been selected as the project's Wind EPC and has initiated an ALTA Study and GC is currently in negotiations on the EPC contract. RES Americas has thus far issued a Limited Notice to Proceed for the ALTA Survey and WT site selection process.
- The permit to repurpose the existing geological salt cavern from liquid hydro-carbon service to Compressed Air Energy Service ("CAES") have been applied for and granted by the Texas Railroad Commission.

TASK 2 deadline(s) from Grant Activities (Scope of Work)

2.2.2. Schedule: (Deadline) The PERFORMING PARTY shall complete this task within 4 months of the signed Notice to Proceed Date as issued by the TCEQ, The signed Limited Notice to Proceed was sent to General Compression on July 25, 2011. Therefore, the Task 2 deadline is November 25, 2011.

Task 2: Details or attachment of final results/deliverables (submitted separately as "Confidential/Proprietary": inform applicant and seek AB opinion before releasing)

GCAES/Site Construction

- Tetra-Tech Geotechnical Engineering Investigation ConocoPhillips Company ASP Energy storage project survey
- URS Fatal Flaw Analysis for Natural and Cultural Resources Evaluation
- URS ALTA Site Survey
- Electrical Interconnect Agreement with Lea County Electric Cooperative

Cavern:

- Rule 97 Permit to create, operate and maintain an underground compressed air energy storage facility

- **Cavern work-over picture (below)**



Wind Turbine:

- URS Fatal Flaw Analysis Compressed Air Energy Storage and Wind Farm Project Report

Task 2: Technical and commercial viability of the proposed approach

N/A

Task : 2 Scope for future work

N/A

Task 2 Intellectual Properties/Publications/Presentations

Does not apply to the Task 2 deliverable

TASK 3

Specific project site preparation **(from Grant Activities (Scope of Work))**

TASK 3 Deliverables:

General Compression, project partner ConocoPhillips, EPC firm Waldron Engineering and Cavern EPC Lonquist and CO have successfully planned, funded and executed specific development plans to prepare the demonstration site. Specifically:

Constructing the project site, BOP, building and related infrastructure to support the integration of GCAES technology and operation of the demonstration project.

Repurposing an existing salt cavern to Compressed Air Energy Storage Service and successfully integrate with GCAES technology.

Objectives vs. Results

Description of how work described for Task(s) was completed

- Waldron Engineering ConocoPhillips and General Compression managed the process with site construction schedule and reporting; Waldron Closeout Suretrack Schedule being submitted as "***Confidential/Proprietary***".
- Lonquist developed Railroad Commission of Texas, Oil and Gas Division cavern Permit application and plan to create, operate, and maintain and an underground compressed air energy storage facility by repurposing an existing salt cavern for air service. The TRRC Rule 97 permit application is being submitted as ***Confidential/Proprietary***".

Task 3 deadline(s) from Grant Activities (Scope of Work)

2.3.3. Schedule: (Deadline) The PERFORMING PARTY shall complete this task within 4 months of the signed Notice to Proceed Date as issued by the TCEQ, The signed Limited Notice to Proceed was sent to General Compression on July 25, 2011. Therefore, the Task 3 deadline is November 25, 2011.

Task 3: Details or attachment of final results/deliverables (submitted separately as “Confidential/Proprietary”: inform applicant and seek AB opinion before releasing”)

GCAES/Site Construction:

- Site Construction Waldron Engineering Suretrack Construction Plan and Schedule

Cavern:

- Rule 97 Texas Rail Road Commission Permit Application

Technical and commercial viability of the proposed approach

N/A

Scope for future work

(Suggestions for future work, regardless of funding source)

Intellectual Properties/Publications/Presentations

Does not apply to this Task 3 deliverable.

Summary/Conclusions

- Task 2 and Task 3 deliverables are completed except for permits and site preparation related to wind integration.
- The GCAES machine is expected to be mechanically complete by the week of Dec 12, 2011.
- POC endurance testing to achieve 950 operating hours on the GCAES design is on-going.

Based on the documents provided here and separately as “***Confidential/Proprietary***”: ***inform applicant and seek AB opinion before releasing*** GC believes that we have satisfied all requirements for Task 1, 2 and 3, except for deliverables related to the wind integration permitting and site preparation. GC is currently pursuing a wind permitting process with Environmental Consultant URS and site selection and preparation with Wind EPC Renewable Energy Systems - America. GC continues to move forward with completing Task 4 and 5 objectives before receiving the Notice to Proceed to pursue Tasks 6 and 7.

END OF TASK 1-3 REPORT



UNITED STATES DEPARTMENT OF COMMERCE
National Telecommunications and
Information Administration
Washington, D.C. 20230

APR 26 2012

Mr. Frank O'Brien
COMSEARCH
19700 Janelia Farm Blvd.
Ashburn, VA 20147

Re: Gaines Cavern Project: Lea County, NM and Gaines County, TX

Dear Mr. O'Brien:

In response to your request on February 22, 2012, the National Telecommunications and Information Administration provided to the federal agencies represented in the Interdepartment Radio Advisory Committee (IRAC) the plans for the Gaines Cavern Wind Energy Project, located in Lea County, New Mexico and Gaines County, Texas.

After a 45+ day period of review, no agencies had issues with turbine placement in this area.

While the IRAC agencies did not identify any concerns regarding radio frequency blockage, this does not eliminate the need for the wind energy facilities to meet any other requirements specified by law related to these agencies. For example, this review by the IRAC does not eliminate any need that may exist to coordinate with the Federal Aviation Administration concerning flight obstruction.

Thank you for the opportunity to review these proposals.

Sincerely,

Edward M. Davison
Deputy Associate Administrator
Office of Spectrum Management



Mail Processing Center
 Federal Aviation Administration
 Southwest Regional Office
 Obstruction Evaluation Group
 2601 Meacham Boulevard
 Fort Worth, TX 76137

Aeronautical Study No.
 2012-WTW-1847-OE

Issued Date: 03/02/2012

David Marcus
 Texas Dispatchable Wind 1, LLC
 9597 Jones Road #747
 Houston, TX 77065

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure: Wind Turbine S1
 Location: Hobbs, TX
 Latitude: 32-41-18.80N NAD 83
 Longitude: 103-03-44.87W
 Heights: 3572 feet site elevation (SE)
 489 feet above ground level (AGL)
 4061 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be completed and returned to this office any time the project is abandoned or:

- At least 10 days prior to start of construction (7460-2, Part I)
- Within 5 days after the construction reaches its greatest height (7460-2, Part II)

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 09/02/2013 unless:

- (a) extended, revised or terminated by the issuing office.
- (b) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates , heights, frequency(ies) and power . Any changes in coordinates , heights, and frequencies or use of greater power will void this determination. Any future construction or alteration , including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (405) 954-5189. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2012-WTW-1847-OE.

Signature Control No: 158907790-159931880

Brenda Mumper
Specialist

(DNE)



March 28, 2012

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Executive Director

Mr. Joe Kuebler
URS Corporation
P O Box 201088
Austin, TX 78720-1088

RE: General Compression's Gaines Station Wind/Compressed Air Storage
Project, Gaines County, Texas

Dear Mr. Kuebler:

Texas Parks and Wildlife Department (TPWD) has received the request for information regarding the study area for the above-referenced wind power/compressed air project. TPWD staff has reviewed the information provided and offers the following information, comments, and recommendations regarding this project.

The proposed site is located less than 0.3 mile east of the New Mexico State line and approximately 3 miles east of Hobbs, New Mexico. Please note that TPWD does not maintain detailed information about natural resources or managed areas outside of Texas. Please contact the New Mexico Department of Game and Fish regarding potential impacts to natural resources located near the project in New Mexico.

Project Description

The proposed project entails coupling a wind turbine to a facility that would store energy in the form of compressed air in an existing salt cavern. The salt cavern was previously used to store natural gas but would be repurposed for this project. The top of the cavern is located approximately 2,400 feet below the surface, and the pressure in the cavern is related to the hydrostatic head of a brine pit on the project site. The site is owned by Conoco Phillips and sits next to an existing pumping station. The compressor/expander has already been constructed and will undergo testing for several months. In summer or early fall of 2012, one 2-megawatt wind turbine would be constructed. This is a demonstration project so one turbine would be built initially, but the ultimate off-taker will determine the final number of turbines. General Compression has contracted with URS Corporation (URS) to do an environmental site assessment and biological resource study on the proposed site.

Mr. Joe Kuebler
Page Two
March 28, 2012

Guidelines

The attached *Draft TPWD Voluntary Recommendations for Wind Energy Development* are provided to promote the continued responsible development of wind facilities across the state. These guidelines are intended to enable Texas to develop its wind resources in a manner that minimizes adverse impacts to the wildlife, habitats, and natural resources of Texas through proper pre-project risk assessment, good project design and operation, and effective adaptive management practices.

Federal Laws

Migratory Bird Treaty Act (MBTA)

The MBTA prohibits taking, attempting to take, capturing, killing, selling/purchasing, possessing, transporting, and importing of migratory birds, their eggs, parts and nests, except when specifically authorized by the Department of the Interior. Rare and protected birds shown on the TPWD Annotated County List of Rare Species for Gaines County (discussed below), as well as other birds protected by the MBTA, could occur as residents or migrants in the project area. Displacement of birds and edge effects could occur as a result of wind power development, and studies to evaluate the level of these effects would help determine if these impacts would be significant.

TPWD generally recommends a minimum of two years of pre-construction avian surveys focused during migratory periods in appropriate habitat. However, TPWD understands that the timeline for this project will not allow extended bird surveys. URS will be doing monthly point counts for birds at five locations around the proposed turbine.

Recommendation: For the timeframe allowed and due to the limited turbine construction proposed (one turbine), TPWD believes the proposed scope of avian surveys will provide an adequate estimation of diurnal bird use and occurrence in the project area. TPWD recommends that information obtained during pre-project assessments be used in the design of the project to avoid adverse impacts to birds to the greatest extent feasible.

Mr. Joe Kuebler
Page Three
March 28, 2012

TPWD recommends a minimum of two years of post-construction bird fatality surveys. TPWD recommends that General Compression consider incorporating potential modifications into the operational plan for this site, should bird fatalities be found to be above the national average.

TPWD recommends the development and implementation of an Avian Protection Plan for any transmission lines associated with the project. Electrical collection systems should be buried when feasible, and bird flight diverter markings should be installed when overhead collection lines are used. Raptor protection measures such as adequate conductor spacing, perch guards and insulated jumper wires should also be used whenever overhead transmission lines are present. For additional information, please see the attached *TPWD Recommendations for Electrical Transmission/Distribution Line Design and Construction* and the guidelines published in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* and the *Avian Protection Plan Guidelines*.

In a meeting with URS and General Compression on December 20, 2011, TPWD recommended that avian point count locations include an assessment of potential bird use of the brine pit in the project area. TPWD is concerned that the brine pit may attract birds to the site due to the lack of available surface water nearby. In addition to potential collisions with the turbine and blades, birds using brine pits with hypersaline water can ingest the brine and die from sodium toxicity or can suffer chronic effects, especially with no source of freshwater nearby. During cooler temperatures, sodium crystallizes on the feathers of birds landing in these pits. The sodium crystals destroy the feathers' thermoregulatory and buoyancy functions causing the bird to die of hypothermia or from drowning. Please visit <http://www.fws.gov/mountain-prairie/contaminants/contaminants1b.html> for additional information regarding salt toxicity in birds.

Recommendation: If resident or migratory birds are observed using the brine pit, TPWD recommends URS and General Compression consider the movement patterns of these birds when siting the proposed wind turbine. Regardless of whether the birds would be at risk of colliding with the turbine, TPWD recommends the brine pit be rendered harmless to migratory birds and other wildlife using netting and/or fencing to prevent access to the pit. Attached is a copy of the Texas Administrative Code, Title 16, Part 1, Chapter 3, Rule 3.22 regarding the protection of birds.

Mr. Joe Kuebler
Page Four
March 28, 2012

As stated above, only one turbine would be built initially, but the ultimate off-taker will determine the final number of turbines. TPWD notes that the environmental evaluation performed by URS and therefore TPWD's review of this project is based on the construction of one turbine.

Recommendation: Prior to the construction of additional turbines, TPWD recommends the ultimate off-taker perform additional bird surveys and coordination with this agency to assess risk and determine recommended mitigation strategies. Results of the post-construction fatality surveys should be provided to the ultimate off-taker for consideration in risk analysis.

State Laws

Parks and Wildlife Code, Section 68.015

Section 68.015 of the Parks and Wildlife Code regulates state-listed species. Please note that there is no provision for take (incidental or otherwise) of state-listed species. A copy of *TPWD Guidelines for Protection of State-Listed Species*, which includes a list of penalties for take of species, is attached for your reference. State-listed species may only be handled by persons with a scientific collection permit obtained through TPWD. For more information on this permit, please contact the Wildlife Permits Office at (512) 389-4647.

Sparse vegetation consisting of grass, cactus, and scattered brush possibly found in the project area could potentially support the state-listed threatened Texas horned lizard (*Phrynosoma cornutum*). An additional indication of suitable habitat for this species is the presence of its primary food source, the Harvester ant (*Pogonomyrmex* sp.). Texas horned lizards are generally active in this part of Texas from mid-April through September. At that time of year, they may be able to avoid slow (less than 15 miles per hour) moving equipment. The remainder of the year, this species hibernates only a few inches underground and they will be much more susceptible to earth moving equipment and compaction.

Recommendation: TPWD recommends avoiding disturbance of the Texas horned lizard and colonies of the Harvester ant during clearing and construction. TPWD recommends a biological monitor be present during

Mr. Joe Kuebler
Page Five
March 28, 2012

construction to try to relocate Texas horned lizards if found. If the presence of a biological monitor during construction is not feasible, state-listed threatened species observed during construction should be allowed to safely leave the site.

A mixture of cover, food sources, and open ground is important to the Texas horned lizard and Harvester ant. Disturbed areas within suitable habitat for the Texas horned lizard should be revegetated with site-specific native, patchy vegetation rather than sod-forming grasses.

Texas Natural Diversity Database (TXNDD)

No records of rare, threatened or endangered species have been documented within 5 miles of the study area in the TXNDD. However, please note that absence of TXNDD information in an area does not imply that a species is absent from that area. Given the small proportion of public versus private land in Texas, the TXNDD does not include a representative inventory of rare resources in the state. Although it is based on the best data available to TPWD regarding rare species, the data from the TXNDD do not provide a definitive statement as to the presence, absence or condition of special species, natural communities, or other significant features within your project area. These data are not inclusive and **cannot be used as presence/absence data**. They represent species that could potentially be in your project area. This information cannot be substituted for on-the-ground surveys. The TXNDD is updated continuously. As the project progresses and for future projects, please request the most current and accurate information at txndd@tpwd.state.tx.us.

Recommendation: Please review the TPWD county list of rare and protected species for Gaines County, as rare species in addition to those discussed above could be present depending upon habitat availability. These lists are available online at http://www.tpwd.state.tx.us/landwater/land/maps/gis/ris/endangered_species/. If during construction, the project area is found to contain rare species, natural plant communities, or special features, TPWD recommends that precautions be taken to avoid impacts to them. The USFWS should be contacted for species occurrence data, guidance, permitting, survey protocols, and mitigation for federally listed species. For the USFWS rare species lists by county please visit <http://www.fws.gov/southwest/es/EndangeredSpecies/lists/>.

Mr. Joe Kuebler
Page Six
March 28, 2012

As stated above, TPWD does not maintain detailed information, including information regarding threatened and endangered species, outside of Texas. TPWD recommends URS contact the New Mexico Department of Game and Fish for information regarding rare species within the general project area in New Mexico.

Determining the actual presence of a species in a given area depends on many variables including daily and seasonal activity cycles, environmental activity cues, preferred habitat, transiency and population density (both wildlife and human). The absence of a species can be demonstrated only with great difficulty and then only with repeated negative observations, taking into account all the variable factors contributing to the lack of detectable presence. If encountered during construction, measures should be taken to avoid impacting wildlife.

Bats

Fatality studies done at existing wind farms indicate that the fatality rate for bats in Texas may be higher than the national average. This is concerning to TPWD as well as Bat Conservation International (BCI). Bats represent over one quarter of the world's mammals and therefore are significant to overall biological diversity. Bats provide vital ecological services; they are key seed dispersers, pollinators, and predators of insects and are as important by night as birds are by day. They play a critical economic role by protecting crops and reducing the use of pesticides. Brazilian free-tailed bats (*Tadarida brasiliensis*) are estimated to have an annual average value of \$741,000 to the cotton industry in just an eight county region in south-central Texas. Bats also provide economic benefit to local communities through tourism; millions of dollars are spent in Austin alone.

In northwestern Texas, bats roost or hibernate in gypsum caves, crevices, overhangs, old Cliff Swallow (*Petrochelidon pyrrhonota*) nests, and manmade structures. Based on the information provided, these features do not appear to be present on the project site, and TPWD has no precise information regarding locations of bat roosts or hibernacula in or near the study area in Texas. However, research indicates that bats can travel over 50 miles on nightly foraging trips, so migratory bats as well as bats roosting in the general area may occur on the project site. Also, as stated above, TPWD does not maintain information regarding bat roosts or hibernacula in nearby New Mexico.

Mr. Joe Kuebler
Page Seven
March 28, 2012

Recommendation: TPWD recommends URS contact New Mexico Game and Fish to determine if any bat roosts or hibernacula have been documented near the project.

TPWD generally recommends a minimum of one year of pre-construction bat surveys focused during migratory periods in appropriate habitat to determine baseline bat use in the area. However, as stated above, TPWD understands that the timeline for this project will not allow a full year of bat surveys prior to construction. A bat/bird detector has been installed at the project site, and URS plans to move the bat microphone to rotor elevation as soon as logistics at the site allow.

Recommendation: For the timeframe allowed and due to the limited turbine construction proposed (one turbine), TPWD believes the proposed scope of bat surveys will provide an adequate pre-construction estimation of bat use and occurrence in the project area. TPWD recommends that information obtained during pre-project assessments be used in the design of the project to avoid adverse impacts to bats to the greatest extent feasible.

TPWD recommends a minimum of two years of post-construction bat fatality surveys. TPWD recommends that General Compression consider incorporating potential modifications into the operational plan for this site, should bat fatalities be found to be above the national average.

As stated above, only one turbine would be built initially, but the ultimate off-taker will determine the final number of turbines. TPWD notes that the environmental evaluation performed by URS and therefore TPWD's review of this project is based on the construction of one turbine.

Recommendation: Prior to the construction of additional turbines, TPWD recommends the ultimate off-taker perform additional bat surveys and coordination with this agency to assess risk and determine recommended mitigation strategies. Results of the post-construction fatality surveys should be provided to the ultimate off-taker for consideration in risk analysis.

Mr. Joe Kuebler
Page Eight
March 28, 2012

Vegetation

Based on a review of the TPWD Vegetation Types of Texas (1984) and as seen on the attached map, the following vegetation types are found in the project area or within 5 miles:

- Crops
- Havard shin oak (*Quercus havardii*) - Mesquite (*Prosopis glandulosa*)
Brush

Based on a review of recent aerial photography of the project site, the compressor/expander was constructed in a previously disturbed area, and the turbine location is in the corner of an irrigated agricultural area. Removal of native vegetation as a result of the footprint of the proposed project should be minimal.

Recommendation: If remnants of native vegetation exist in the project area, TPWD recommends that the removal of that vegetation for the construction of towers, roads, and transmission lines be minimized to the extent feasible. Unavoidable removal of vegetation should be mitigated by revegetating disturbed areas with site specific plant species where feasible. The replacement of native plants will help control erosion, provide habitat for wildlife, and provide native species an opportunity to compete with undesirable, non-native, invasive plant species. A list of native plant species that can be tailored to fit the site requirements can be developed at <http://tpid.tpwd.state.tx.us/>.

Water Resources

Seminole Draw is mapped within 5 miles of the project site. However, as seen on the attached recent aerial photography, this ephemeral drainage has been converted to irrigated cropland. No other significant water features are mapped or observable within 5 miles of the project in Texas. However, water features may be present near the project in New Mexico.

Recommendation: TPWD recommends URS review U.S. Geological Survey topographic maps, aerial photography, and other available spatial data to determine if water resources are located nearby in New Mexico. If water resources would be impacted as a result of the proposed project, TPWD recommends URS contact the U.S. Army Corps of Engineers pursuant to the Clean Water Act.

Mr. Joe Kuebler
Page Nine
March 28, 2012

All water resources and associated floodplains, riparian corridors, and wetlands in the study area provide valuable wildlife habitat and should be protected to the maximum extent possible. Necessary waterway crossings by access roads and transmission lines should be made perpendicular to the channels to minimize disturbance of riparian habitat. Natural buffers contiguous to any wetlands or aquatic systems should remain undisturbed to preserve wildlife cover, food sources, and travel corridors. During construction, trucks and equipment should use existing bridge or culvert structures to cross creeks where possible. Destruction of inert microhabitats in waterways such as snags, brush piles, fallen logs, creek banks, pools, and gravel stream bottoms should be avoided, as these provide habitat for a variety of fish and wildlife species and their food sources.

Measures should be taken to ensure that activities that could adversely impact water quality are avoided and/or minimized. TPWD recommends the implementation of measures to prevent pollutants including sediment disturbed during construction from reaching water resources in the project area. Storm water controls should be properly installed prior to construction and regularly monitored to ensure they are functioning correctly.

Survey Data

TPWD asks that wind power development companies consider sharing the results of the pre- and post-construction surveys with this agency so that the information can be reviewed in combination with data from other sites to determine if trends or patterns are developing within wildlife populations in Texas as a result of wind power development. This information may also help determine if the recommendations provided are beneficial in minimizing the impacts of siting and operation of wind farms on the fish and wildlife resources. TPWD is not interested in the raw survey data from individual sites, but would appreciate a copy of the reports that summarize that data. If it is preferable to the developer, the survey information could be provided in an aggregated form or on a county level.

Mr. Joe Kuebler
Page Ten
March 28, 2012

I appreciate the opportunity to provide preliminary input on this project. Please contact me at (512) 389-4579 or Kathy Boydston at (512) 389-4638 if you have any questions.

Sincerely,

A handwritten signature in blue ink that reads "Julie C. Wicker". The signature is written in a cursive style with a large initial 'J'.

Julie C. Wicker
Wildlife Habitat Assessment Program
Wildlife Division

JCW:16950

Attachments (6)

**Texas Parks and Wildlife Department
Voluntary Recommendations for Wind Energy Development**

February 2008

I. INTRODUCTION

The following Voluntary Recommendations for Wind Energy Development (herein referred to as Recommendations) were developed by Texas Parks and Wildlife Department and do not necessarily represent the opinions of the wind industry or non-governmental organizations.

The purpose of these recommendations is to establish best management practices (BMP) for development of wind energy in Texas, promote the continued responsible development of wind facilities across the state, and enable Texas to develop its wind resources in a manner that minimizes adverse impacts to wildlife, habitats and natural resources of Texas through proper pre-project risk assessment, good project design and operation, and effective adaptive management practices.

II. BACKGROUND

Texas became the number one state in the U.S. for installed wind energy capacity in 2006. Texas citizens and their elected officials strongly support the continued expansion of wind generation to supply an increasing portion of the State's electric generation portfolio for many reasons, including:

- wind energy is an inexhaustible natural resource, and greater utilization of wind energy promotes Texas energy independence, directly offsetting the need for mining of lignite coal in Texas and other types of coal elsewhere, and decreasing the need for transportation of such fossil fuels by rail and truck, thereby reducing harmful impacts on wildlife, the environment, and human health caused by such activities
- wind turbines, once constructed and operational, consume no fuel and have no air emissions, directly decreasing the emissions of mercury, CO₂, NO_x, SO_x and other harmful emissions associated with combustion-generated power, which contribute to global warming and adversely impact all wildlife and humans
- wind turbines consume no water and emit no wastewater, helping conserve Texas' scarce water resources for wildlife and human consumption and preserving the purity of Texas groundwater and surface waters, to the benefit of Texas wildlife and humans

As the State adds new transmission infrastructure to support additional wind energy resources, the parties involved in developing these Recommendations recognize the importance of responsible development, construction, operation and eventual re-powering or potential decommissioning of wind projects.

These Recommendations are intended to ensure wildlife and habitats are protected throughout the project life by encouraging and facilitating continued responsible practices and promoting development of wind resources in a manner that minimizes adverse impacts on Texas wildlife.

III. RECOMMENDATIONS

Mitigation measures are recommended to occur in four general stages:

- A. The first stage involves project siting and development, where mitigation should focus on avoiding and/or reducing potential adverse impacts of a site before the facility is constructed.
- B. The second stage is construction where careful planning should avoid important habitat and reduce disturbance by conducting construction at appropriate times of year when practicable, and away from sensitive habitat areas.
- C. The third stage is operations, where measures should be implemented to minimize ongoing impacts.
- D. The fourth stage is the decommissioning stage at the end of the project's useful life, where restoration measures should be implemented to return the project area largely to its pre-construction state in accordance with landowner requests and contracts.

A. DEVELOPMENT PHASE BMP

1. Developers will collaborate early in the process with qualified expert consultants and relevant regulatory agencies to identify potential environmental concerns, such as the presence of Federal and State listed endangered and threatened species, wetlands, archeological and historical sites and similar issues, and to ensure compliance with all applicable laws and regulations, such as the Endangered Species Act, the Migratory Bird Treaty Act and all Texas laws governing the protection of threatened and endangered species. Developers will use qualified local expert consultants with specialized knowledge of local conditions when available and appropriate.

2. Developers or their consultants will contact TPWD Wildlife Habitat Assessment Program to gather information about habitat or the presence of sensitive species in a proposed project area.

3. Prior to construction, developers should contact TPWD to obtain a list of qualified experts with relevant expertise for specific project areas, if available. Information should be shared with such experts subject to signed confidentiality agreements.

4. Developers will, in collaboration with consultants and agencies, develop appropriate measures to assess the significance of such issues for a given project site, and appropriate means to minimize adverse impacts. Such assessments may include studies on archeological and cultural resources, navigable waterways and wetlands delineation, a Phase 1 environmental site assessment, and similar analysis appropriate for specific projects. For avian and other wildlife species, such assessment measures include pre-construction monitoring surveys, literature surveys, and may include raptor nest surveys, radar monitoring and similar approaches as appropriate for individual projects, and in consideration of the level of pre-existing development in the region.

5. Developers will collect appropriate and pertinent information suitable for identifying the risk of potential impacts of the project on wildlife and habitat. This information would include avian use surveys conducted for a minimum of a twelve month period that take into consideration factors associated with region and habitat and designed to capture species, occurrence and abundance during all four seasons of the year. These studies are to be conducted on representative areas of the site that are expected to include wind turbines, unless not necessary due to availability of sufficient studies which have already been completed for other projects or phases in the region. Information should be collected that considers the following issues as appropriate:

- Identify avian use of a project area by species;
- Understand potential impacts from construction and operation of the proposed site;
- Determine seasonal variation, if any; and
- Collect data to aid in the analysis of impacts such as topographic features and weather conditions.

6. In areas of significant identified raptor activity, a minimum of one raptor nest survey is recommended to be conducted during breeding season and up to within 1-mile of proposed wind turbines location when possible and where appropriate to determine the location and species of active nests potentially disturbed by construction activities, and to identify active and potentially active nest sites with the highest likelihood of impacts from the operation of the wind plant.

7. There is not a consensus on which methodology is effective in predicting bat impacts for pre-construction studies. Wind energy representatives commit to continue to work with bat organizations and scientists to implement methodologies to assess potential bat mortality at prospective wind project locations in sensitive areas. In areas of known bat concentrations or near sensitive bat habitat, information should be collected that considers the following issues as appropriate:

- Seasonal patterns of abundance and use of a prospective site by bats; and
- Roosting areas and daily movement patterns.

8. If existing information suggests the probable occurrence of state and/or federal threatened or endangered species or their habitat on the project site, focused surveys may be recommended by the project's consultants and/or relevant regulatory agencies during the appropriate season to determine the presence or likelihood of presence of the species. For listed species, US Fish & Wildlife Service survey protocols should be followed, if available.

9. Preconstruction assessments may use existing information from comparable projects in comparable habitats within the same region for the relevant issues of concern. Preconstruction assessments should be compared with post construction monitoring data to assess the effectiveness of the guidelines.

10. Turbines should be located in consideration of topographic features that serve to concentrate birds or wildlife at particular areas within the site if determined during pre-construction assessment, or mitigation should be provided that addresses significant impacts.

11. Use of disturbed lands, if feasible, should be considered for priority siting (i.e. developed, cultivated, or otherwise disturbed by road or other development) unless these areas exhibit high use by birds or other wildlife species that are likely to be adversely affected by wind projects.

B. CONSTRUCTION PHASE BMP

1. Use reputable construction contractors and subcontractors, and adhere to best practices in wind project construction.

2. During construction, avoid areas of high risk potential to birds, or other species of concern that are likely to be adversely affected

3. Use tubular towers and avoid creating perching spots on wind turbines.

4. Electrical collection systems between turbines should be buried when feasible and environmentally sound, and bird flight diverter markings used where appropriate when overhead collection lines are used.

5. Use raptor protection measures such as adequate conductor spacing, perch guards and insulated jumper wires.

6. Limit substation and other associated facility pads to as small an area as is practical.

7. Ensure appropriate replacement of topsoil to the surface post-construction and use of best practices to minimize erosion.

8. Locate linear facilities (such as collector cable routes, transmission line routes, or access roads) in or adjacent to existing disturbed corridors or in areas of low habitat value in order to minimize habitat fragmentation and degradation;

9. When feasible, use existing surface roads and align roads to limit habitat fragmentation and erosion;
10. Use pilot warning and obstruction avoidance lighting as recommended by the FAA;
11. Avoid permanently installed upward-firing lighting for substation and O&M building lighting, when possible.
12. Stormwater runoff management plans should be developed to comply with stormwater runoff management plan requirements and all other applicable laws and regulations relating to stormwater.

C. OPERATIONS PHASE BMP

1. Post vehicle speed limits to minimize avian and wildlife mortality.
2. Follow construction, reduction of project road rights-of-way to extent practical and consistent with safety needs and code requirements and the requests of the landowner.
3. Revegetate reclaimed project road rights-of-way with appropriate site-specific native species, unless otherwise directed by the landowner based on prior land use, and properly maintain such rights-of-way in accordance with recommendations of qualified environmental consultants.
4. Implement 12 months of post-construction carcass studies that account for searcher efficiency and scavenging. The duration and intensity of such studies will vary by region, project and various factors such as site sensitivity and pre construction determination of bird and wildlife density, and pre existing information from comparable projects in comparable habitats for the relevant species of concern.

D. DECOMMISSIONING PHASE BMP

1. Developers will commit, as addressed in the landowner agreements, to removal of turbines, towers and all above-ground equipment, and proper disposal of same, through recycling where possible.
2. Remove foundations to an appropriate depth, consistent with local conditions and land uses, and properly dispose of same through recycling where possible in accordance with landowner requests and agreements. To the extent possible, return the project site to its pre-construction condition through filling in foundation excavations, and reseeding with appropriate native species, unless otherwise directed by landowner.

3. Remediation of Recognized Environmental Conditions at the Project Site (*e.g.*, lubricant leaks, etc) caused by the wind facility or its operation.

E. PROSPECTIVE USE OF BMPs

Wind representatives and other stakeholders are cognizant of the fact that developers must place turbine orders and other long-lead equipment orders well in advance of the expected delivery dates for such equipment, and will have invested significant sums, time and effort in development of projects prior to adoption of these BMPs. Nothing herein is intended, nor should be construed, to suggest that projects already under development and with construction timelines dictated by equipment orders already placed, should be in any way delayed or impacted by wind representative's endorsement of these BMPs. It is expected that these BMPs will serve as a tool to help facilitate the continuation of responsible wind project development in Texas. Therefore, it is expected these BMPs to be effective for all projects that reach commercial operations date ("COD") after December 31, 2008.

DRAFT

TITLE 16

ECONOMIC REGULATION

PART 1

RAILROAD COMMISSION OF TEXAS

CHAPTER 3

OIL AND GAS DIVISION

RULE §3.22

Protection of Birds

(a) If an operator who maintains a tank or pit does not take protective measures necessary to prevent harm to birds, the operator may incur liability under federal and state wildlife protection laws. Federal statutes, such as the Migratory Bird Treaty Act, provide substantial penalties for the death of certain species of birds due to contact with oil in a tank or pit. These penalties may include imprisonment. State statutes also protect certain species of birds. The Railroad Commission of Texas (commission) is cooperating with federal and state wildlife authorities in their efforts to protect birds.

(b) An operator must screen, net, cover, or otherwise render harmless to birds the following categories of open-top tanks and pits associated with the exploration, development, and production of oil and gas, including transportation of oil and gas by pipeline:

(1) open-top storage tanks that are eight feet or greater in diameter and contain a continuous or frequent surface film or accumulation of oil; however, temporary, portable storage tanks that are used to hold fluids during drilling operations, workovers, or well tests are exempt;

(2) skimming pits as defined in §3.8 of this title (relating to Water Protection) (Statewide Rule 8); and

(3) collecting pits as defined in §3.8 of this title (relating to Water Protection) that are used as skimming pits.

(c) If the commission finds a surface film or accumulation of oil in any other pit regulated under §3.8 of this title (relating to Water Protection), the commission will instruct the operator to remove the oil. If the operator fails to remove the oil from the pit in accordance with the commission's instructions or if the commission finds a surface film or accumulation of oil in the pit again within a 12-month period, the commission will require the operator to screen, net, cover, or otherwise render the pit harmless to birds. Before complying with this requirement, the operator will have a right to a hearing upon request. In addition to the enforcement actions specified by this subsection, the commission may take any other appropriate enforcement actions within its authority.

Source Note: The provisions of this §3.22 adopted to be effective September 1, 1991, 16 TexReg 2523; amended to be effective November 1, 1991, 16 TexReg 4737.

[Next Page](#)

[Previous Page](#)

[List of Titles](#)

[Back to List](#)

These site sensitivity tables are not part of the Recommendations for Wind Energy Development. These tables are provided by Texas Parks and Wildlife Department to assist in assessing the level of sensitivity (use) of the site for birds and bats, and recommended pre and post construction survey times, depending on the potential level of use by these species. These tables may or may not be supported by individual wind industry developers.

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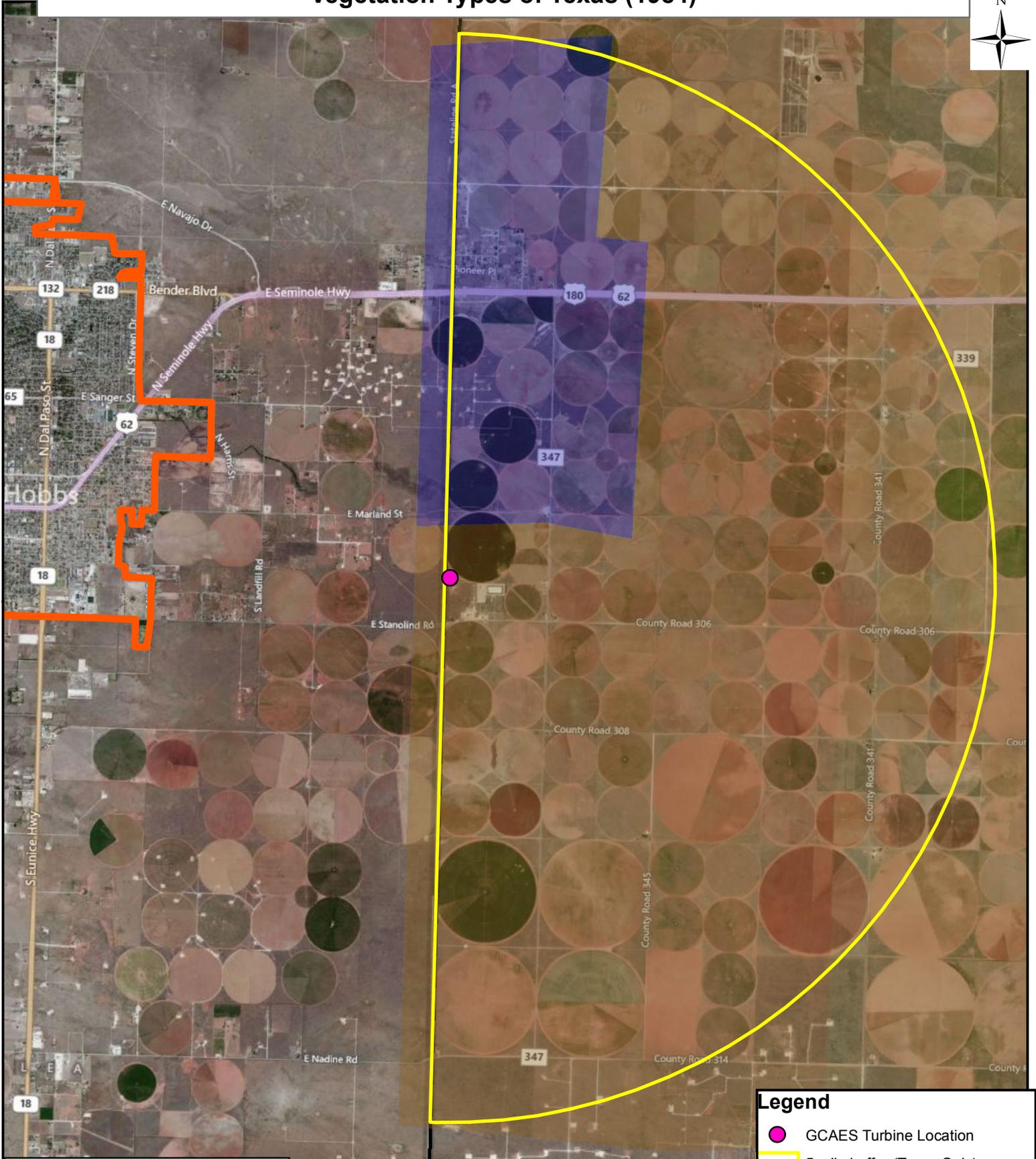
Table 1. Site sensitivity for birds.

Bird usage sensitivity	Criteria	Pre-construction Monitoring Minimum Recommendations	Post-construction Monitoring Minimum Recommendations
Very High	* major migratory corridor; presence of known populations of lekking galliform species (<i>Tympanuchus cupido attwateri</i> , <i>T. pallidicinctus</i>)	* avoid if possible ** consult with relevant state and federal agencies to develop plans for avoidance and/or mitigation; minimum three years studies of usage	* minimum three years studies of usage
	* breeding and/or wintering habitat for state or federally-listed T&E species	* consult with relevant state and federal agencies to develop plans for avoidance and/or mitigation; minimum three years studies of usage by T&E species	* minimum three years studies of usage by T&E species
	* in or adjacent to area of known high concentrations of bird usage (such as recognized important bird areas or other designated wilderness areas, aggregations of colonial-nesting waterbirds)	* minimum three years pre-construction surveys to determine specific areas and flight paths of high use - avoid these areas; if not avoidable, then avoid site	* minimum three years post-construction mortality surveys; minimum two years BACI design usage surveys to determine displacement impact
High	* known migratory flyway for raptors, waterfowl, shorebirds, etc.	* minimum two years surveys encompassing three spring and three fall months	* minimum three years post-construction mortality surveys during migratory periods
	* area of potential occupation by lekking species	* minimum two years pre-construction surveys focusing on spring months and consultation/coordination with appropriate state wildlife professional	* minimum two years post-construction mortality surveys
	* potential migratory path for state or federal listed threatened/endangered species	* minimum two years focused surveys during migratory periods in appropriate habitats	* minimum two years post-construction mortality surveys during migratory periods in appropriate habitats
	* area of high concentrations of breeding/foraging raptors	* minimum two years raptor nesting surveys and site usage surveys - alter site layout to minimize potential risk	* minimum two years post-construction mortality surveys during all periods when raptors present
	* rare and/or declining habitat for suite of imperiled species	* focused surveys of presence and usage of particular habitat; avoidance/mitigation of vulnerable species habitat	* minimum two years post-construction mortality surveys
Medium	* area of periodic importance as a migratory stopover (such as flooded agriculture, songbird fallout sites, etc.)	* minimum two years with surveys focused around periods of potential high usage	* minimum two years post-construction mortality surveys focused around periods of potential high usage
Low	* area of no known migratory movements of significance or high bird concentrations	* minimum one year bird usage surveys to gather information on bird assemblages by season	* minimum one year post-construction mortality surveys

Table 2. Site sensitivity for bats.

Sensitivity	Criteria	Pre-construction Monitoring Minimum Recommendations	Post-construction Monitoring Minimum Recommendations
Very High	<ul style="list-style-type: none"> * Site is ≤ 50 km from known maternity colonies in the Texas Hill Country (see attached map), or 1 km from a known significant hibernacula or significant maternity roost in caves, abandoned mines, or karst topography in other regions. 	<ul style="list-style-type: none"> * Avoid if possible . * Minimum 2 years of pre-construction data from April through October will be required to inform site plan and help determine high risk period(s). 	<ul style="list-style-type: none"> * Post-construction monitoring during the core season when bats are active (i.e., April – October) for at minimum the first 2 years of wind turbine operation. * Post-construction monitoring may be reduced (e.g., reduced to July 1st – October 30th, if limited mortality is evident) or continued beyond 2 years (e.g., if substantial mortality is observed) based on the outcome of the monitoring, and in consultation with the TPWD.
High	<ul style="list-style-type: none"> * Site is ≤ 10 km from a known significant hibernacula, significant maternity roost or swarming/feeding site. * Site is ≤ 1 km from a shoreline of a major waterbody (e.g., areas that could potentially act as migration corridors or channelling features). * Site is ≤ 1 km from riparian habitat or other wetland features that serve as drinking and feeding sites, or from potential hibernacula habitat features (e.g. caves, abandoned mines, karst topography) * Site is located in forested habitat. 	<ul style="list-style-type: none"> * Minimum 1 year of pre-construction data from April through October will be required to inform site plan and help determine high risk period(s). 	<ul style="list-style-type: none"> * Post-construction monitoring during the core season when bats are active (i.e., April – October) for the first 2 years of wind turbine operation. * Post-construction monitoring may be reduced (e.g., reduced to July 1st – October 30th, if limited mortality is evident) or continued beyond 2 years (e.g., if substantial mortality is observed) based on the outcome of the monitoring, and in consultation with the TPWD.
Medium	<ul style="list-style-type: none"> * Site is ≤ 50 km from a known significant hibernacula, significant maternity roost, or swarming/feeding site. * Site is ≤ 5 km from riparian habitat or other wetland features that serve as drinking and feeding sites, or from potential hibernacula habitat features (e.g. caves, abandoned mines, karst topography) * Site is ≤ 5 km from a shoreline of major waterbodies * Site is located on landscape level linear habitat features (e.g., escarpments, ridges).** * Site is ≤ 5 km from forested habitat. 	<ul style="list-style-type: none"> * Minimum one year of pre-construction data from April through October will be required to inform site plan and help determine high risk period(s). IF data are available from similar existing sites, pre-construction monitoring may not be required. 	<ul style="list-style-type: none"> * Post-construction monitoring during the core season when bats are active (i.e., April – October) for minimum the first year of wind turbine operation. IF existing data from nearby or similar facilities indicate low spring/early summer fatalities, then monitoring may be adjusted to July through October. * Post-construction monitoring may be continued beyond 1 year (e.g., if substantial mortality is observed) based on the outcome of the monitoring, and in consultation with the TPWD.
Low	<ul style="list-style-type: none"> * Site does not contain any of the criteria listed above and/or has no recognized bat conservation features. 	<ul style="list-style-type: none"> * One year preconstruction survey July –October to develop relationships between pre-construction usage and post-construction mortality. 	<ul style="list-style-type: none"> * One year of post-construction monitoring from April through October. If existing data from nearby or similar facilities indicate low spring/early summer fatalities, then monitoring may be adjusted to July through October. * Post-construction monitoring may be continued beyond 1 year (e.g., if substantial mortality is observed) based on the outcome of the monitoring, and in consultation with the TPWD.

General Compression's Gaines Station Wind/Compressed Air Storage Project Vegetation Types of Texas (1984)



Legend

-  GCAES Turbine Location
-  5 mile buffer (Texas Only)
-  City Limits (New Mexico)

Vegetation Types of Texas (1984)

-  Crops
-  Harvard shin oak - Mesquite Brush

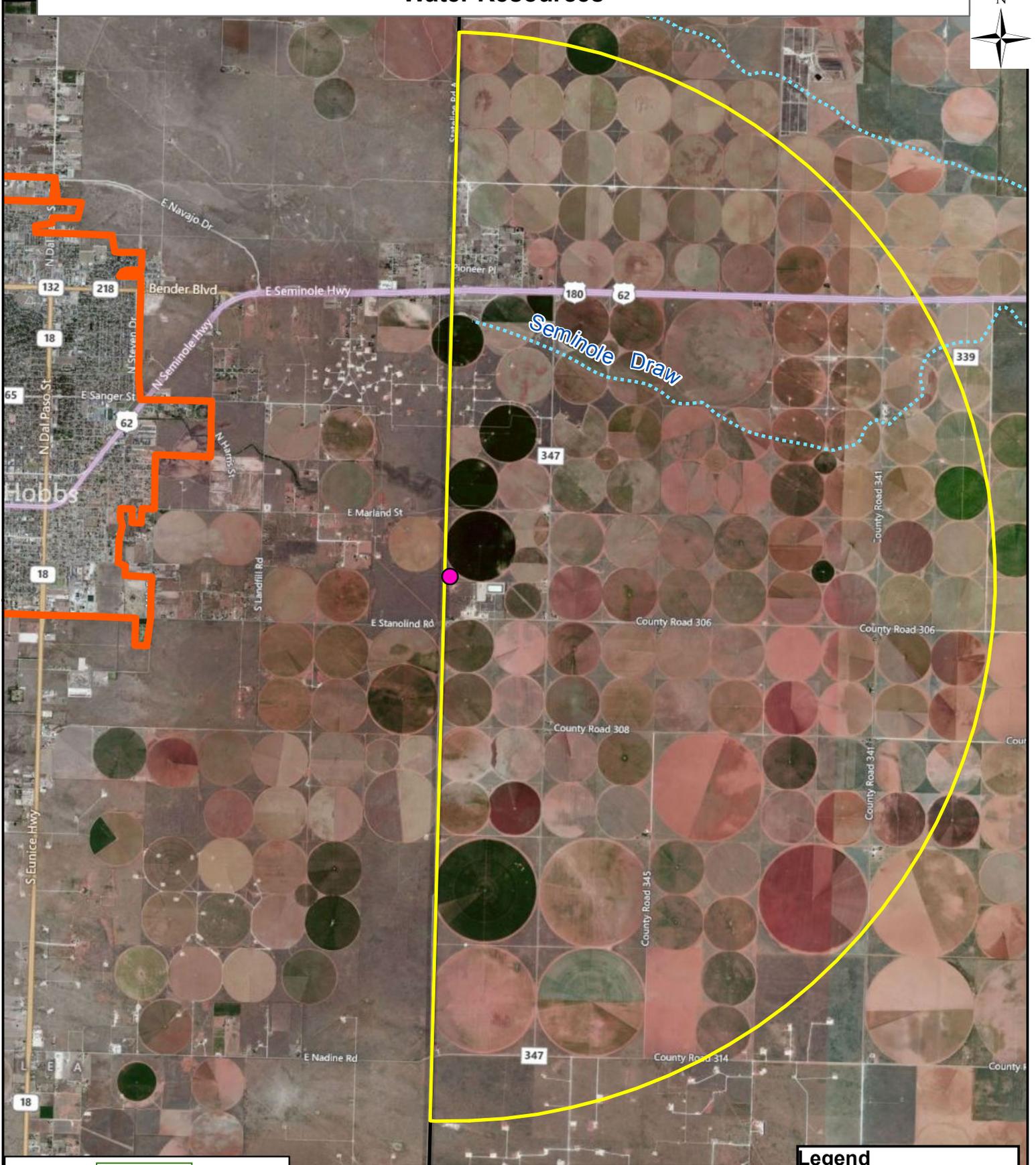


Life's better outside.®

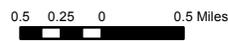


12 March 2012
Map compiled by the Texas Parks and Wildlife Department, Wildlife Habitat Assessment Program. No claims are made to the accuracy of the data or to the suitability of the data to a particular use.

General Compression's Gaines Station Wind/Compressed Air Storage Project Water Resources



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12 March 2012
 Map compiled by the Texas Parks and Wildlife Department, Wildlife Habitat Assessment Program. No claims are made to the accuracy of the data or to the suitability of the data to a particular use.

Legend

- GCAES Turbine Location
- 5 mile buffer (Texas Only)
- City Limits (New Mexico)
- Rivers and Streams

Protection of State-Listed Species
Texas Parks and Wildlife Department Guidelines

Protection of State-Listed Species

State law prohibits any take (incidental or otherwise) of state-listed species. State-listed species may only be handled by persons possessing a **Scientific Collecting Permit** or a **Letter of Authorization** issued to relocate a species.

- **Section 68.002 of the Texas Parks and Wildlife (TPW) Code** states that species of fish or wildlife indigenous to Texas are endangered if listed on the United States List of Endangered Native Fish and Wildlife or the list of fish or wildlife threatened with statewide extinction as filed by the director of Texas Park and Wildlife Department. Species listed as Endangered or Threatened by the Endangered Species Act are protected by both Federal and State Law. The State of Texas also lists and protects additional species considered to be threatened with extinction within Texas.
- **Animals** - Laws and regulations pertaining to state-listed endangered or threatened animal species are contained in **Chapters 67 and 68 of the Texas Parks and Wildlife (TPW) Code** and **Sections 65.171 - 65.176 of Title 31 of the Texas Administrative Code (TAC)**. State-listed animals may be found at **31 TAC §65.175 & 176**.
- **Plants** - Laws and regulations pertaining to endangered or threatened plant species are contained in **Chapter 88 of the TPW Code** and **Sections 69.01 - 69.9 of the TAC**. State-listed plants may be found at **31 TAC §69.8(a) & (b)**.

Prohibitions on Take of State Listed Species

Section 68.015 of the TPW Code states that no person may capture, trap, take, or kill, or attempt to capture, trap, take, or kill, endangered fish or wildlife.

Section 65.171 of the Texas Administrative Code states that except as otherwise provided in this subchapter or **Parks and Wildlife Code, Chapters 67 or 68**, no person may take, possess, propagate, transport, export, sell or offer for sale, or ship any species of fish or wildlife listed by the department as endangered or threatened.

"Take" is defined in **Section 1.101(5) of the Texas Parks and Wildlife Code** as:

"Take," except as otherwise provided by this code, means collect, hook, hunt, net, shoot, or snare, by any means or device, and includes an attempt to take or to pursue in order to take.

Penalties

The penalties for take of state-listed species (**TPW Code, Chapter 67 or 68**) are:

- 1ST Offense = Class C Misdemeanor:
\$25-\$500 fine
- One or more prior convictions = Class B Misdemeanor
\$200-\$2,000 fine and/or up to 180 days in jail.
- Two or more prior convictions = Class A Misdemeanor
\$500-\$4,000 fine and/or up to 1 year in jail.

Restitution values apply and vary by species. Specific values and a list of species may be obtained from the TPWD Wildlife Habitat Assessment Program.