

Prairie Dog Management Plan for the Lubbock Land Application Site

The following facts and priorities have been used to guide plan development, understanding that the primary purpose of the Lubbock Land Application Site (LLAS) is effluent disposal, and that prairie dog conservation and management by the City of Lubbock (COL) are secondary and voluntary actions:

1. Recapture center pivots areas;
2. ~~Minimize impacts to burrowing owls; Discourage and prevent future migration of prairie dogs into center pivot areas;~~
3. ~~Minimize impacts to burrowing owls; Discourage and prevent future migration of prairie dogs into center pivot areas;~~ and,
4. To the extent possible in accordance with item 1.above, manage non-priority areas of the LLAS for the benefit of native wildlife resources.

1. Recapture center pivot areas – plow only one center pivot at a time.

- 1.1. Identification of active burrowing owl (BO) mounds through ground survey of LLAS. Also, employ city-owned and operated burrowing owl camera to assist in confirming owl presence/absence (i.e., flag active BO mound).
 - Phase 1 (Dec 12-Dec 17): Llano Estacado Audubon Society (LEAS) initial ground survey and mound flagging. Also, train Trustees for active BO mound identification. Provide monetary compensation for LEAS for performing the BO survey.
 - Phase 2 (Dec 18-Jan 15): City of Lubbock, Trustees, and City-contracted biologist continue with ground surveys, use of owl burrow probe camera (City-owned and operated), and mound flagging
- 1.2. Cover all unoccupied holes
 - Phase 1 (Dec 12-Dec 17): City of Lubbock and Trustees during initial LEAS ground survey
 - Phase 2 (Dec 18-Jan 15): City of Lubbock and Trustees during *Phase 2* identification of burrowing owl mounds (see 1.1 above)
- 1.3. Capture and relocate prairie dogs (PDs) in center pivot areas. Once PDs are removed, fill hole immediately.
 - Dec 18-Jan 15: Volunteer relocators (potentially including Lynda Watson, Joe Bill Rogers, and City-authorized volunteers). City funding is not available for relocation efforts.
- 1.4. Placement of City-owned one-way burrowing owl doors for 2-4 days (time may be shortened if a mechanism is added to the owl doors to provide proof that the owl has left the burrow); then removal of door and filling of hole
 - Dec 18-Jan 15: City of Lubbock and Trustees during *Phase 2* identification of burrowing owl mounds (see 1.1 above)
- 1.5. Construct and place raptor perches (approx. 20 ft in height, with optional cross beam for raptor perching); perches could be constructed with City-owned (i.e., LP&L) utility poles placed strategically at edges of center pivot areas currently without adjacent utility poles to discourage prairie dog expansion into unwanted areas.
 - Dec 23-Jan 15: City of Lubbock
- 1.6. Plowing, discing, and planting of irrigated center pivot areas only; avoid plowing the corners and other currently non-irrigated areas of the LLAS unless necessary for improvements to PD habitat in non-irrigated areas;

Jan 15-Feb 7: City of Lubbock**2. (Change to 3rd Priority) Discourage and prevent future migration of prairie dogs in center pivot areas**

2.1. Take Center Pivot 24 out of production entirely due to prairie dog density (impossible to effectively remove/kill p. dogs and remove Burrowing Owls). Doing so would free up the exclusionary devices for high-density areas (especially Center Pivot 18.). CP 24 is too complex to manage with the resources the City has currently.

2.2. Maintain disturbance levels in center pivot areas (i.e., plowing and discing efforts) that are sufficient to prevent or discourage re-entry by prairie dogs.

2.2.2.3. Construction and placement of artificial prairie dog barrier fence (e.g., silt fence) as a barrier to prairie dog entrance into center pivot points.

Feb 8 (begin): City of Lubbock, and Trustees. Artificial barrier design and construction guidelines are dependent upon choice of barrier material. See attached Guidelines for general construction information (Appendix 1).

2.3.2.4. City to plant and maintain row crops and hay operations per recommendations of water balance consultants (anticipate sudan hay, sorghum and corn). A combination of haying and crop removal will be employed. Interim measure to establishment of permanent barriers (see 2.4 below) would be to leave a minimum of 10 feet of standing crop as visual barrier. Optimal would be 8 to 12 feet of crop.

2.4.2.5. Establish permanent vegetative barriers. USFWS, TPWD, and other potential cooperators will provide technical assistance, materials and funding. Guidelines for permanent vegetative barriers are found in Appendix 2.

2.5.2.6. Encourage prairie dog predator use of the land; continue construction of raptor perches and/or nesting platforms (see 1.5 above). Lubbock County is home to several well-known prairie dog predators, the Ferruginous Hawk, Golden Eagle, Red-tailed Hawk, and Swainson's Hawk. Added benefit is provision of bird watching areas.

2.6.2.7. If prairie dogs re-enter the center pivot areas, it should be understood that they will be removed immediately. The first option is relocation by non-COL personnel (trained volunteers or professionals paid by others) within 48 hours of detection in the center pivot area; if relocation cannot be conducted within that time frame other removal measures, including lethal means, will need to be employed. Prairie dogs removed by live trapping and relocation will be moved to suitable habitats off the LLAS.

2.7.2.8. Limit on-site mowing of non-irrigated areas of LLAS to prevent prairie dog migration into areas they are unwanted (e.g., reservoir area).

3. (Change to second priority). Minimize impacts to burrowing owls

See above sections 1.1, 1.2 and 1.4.

4. Future ~~Potential~~ Actions

4.1. Outside the center pivots: enhance, manage and subsequently maintain populations of native species, including, but not limited to: birds, mammals, reptiles (e.g., Texas Horned Lizard), amphibians, insects, and shortgrass native prairie plant species. [Submit animal list from Jill.]
 4.1.1. Water the corner areas while dispersing a small amount of seed (to fulfill TCEQ effluent requirements). This will prepare the area for 1) the influx and maintenance of prairie dogs during and after plowing under the center pivots has taken place and 2) will reduce the prairie dogs' efforts to return into the center pivot areas.

4.2. Monitor the site quarterly (four times a year) by a qualified biologist to determine changes in wildlife use and populations (which could be accomplished by professionals [TPWD or USFWS employees] or volunteers experienced in wildlife identification [e.g. Audubon Society members]).

4.2.4.3. Develop an education plan for promoting prairie dog management at the LLAS

4.2.1.4.3.1. Establish an observation area where individuals may come to view both the prairie dogs and the burrowing owls.

4.2.2.4.3.2. Partner with local schools to provide outdoor educational opportunities.

4.2.3.4.3.3. Have an educational program spotlighting the role of water treatment within a community. Discuss some of the alternatives a municipality may choose from when determining the best plan for water treatment. Explain how the LLAS works to schools and other visitors

5. Funding Options (see details in Appendix 3)

5.1. US Fish and Wildlife Service (Partners for Wildlife program)

5.2. Texas Parks and Wildlife Department (Landowner Incentive Program)

5.3. Other Potential Cooperators (National Fish and Wildlife Foundation)

APPENDIX 1

Artificial Visual Barrier Options for Containment and Exclusion of Prairie Dogs

With information synthesized from, but not limited to, the following:

- 1) *"Confining Prairie Dogs with Visual Barriers"*
[http://www.ci.boulder.co.us/openspace/nature/pdogs_management.htm]
- 2) *"Prairie Dog Visual Barrier Setup Guidelines"* [City of Fort Collins Natural Resources Department]
- 3) *"Preliminary Specifications for Development of Visual Barriers to Control Directional Spread of Black-tailed Prairie Dogs"* [Gene T. Miller, TPWD]

Introduction

Visual barriers help control the directional spread of prairie dog colonies by providing a physical boundary that prairie dogs are hesitant to cross. Although barriers are not a complete solution to the problem of confining prairie dogs to specific areas, they are an important component of an effective and integrated prairie dog management program. In concert with other techniques, visual barriers can provide a humane and passive means of controlling prairie dogs. Visual barriers are most commonly: 1) artificial (e.g., vertical vinyl material, weed barrier fabric, snow fence, hay bales, suspended burlap, wire mesh fence), 2) vegetation (e.g., windrowed evergreen species such as Rocky Mountain juniper, deciduous shrub species such as aromatic sumac and Four-wing saltbush, tall grass, tall agricultural crops), or 3) a combination of both.

In order to be effective the following items should be kept in mind:

1. Visual barriers are not effective when family units (coteries) are split by the barrier. When connected burrows can be found on both sides of the barrier, the prairie dogs will continue to use the underground system of tunnels and burrows regardless of the fabric barrier.
2. Visual barriers are most effective in situations where the areas prairie dogs are contained in provide sufficient forage. Under these conditions, the prairie dogs are less likely to seek out areas for expansion.
3. Prairie dogs appear to respond to holes where light can pass through the visual barrier by clawing and chewing at the fabric of an artificial barrier. Therefore, no light passage should be allowed along the bottom edge, along the seams or as a result of holes in the fabric. Proper installation and subsequent maintenance should prevent this. Holes in the fabric may be patched with duct tape and seams may be re-worked or sealed with tape. The lower 6 inches of the fabric should be buried to form a "light-tight" seal.
4. Artificial barriers are often installed near property lines, although an individual landowner may want to contain or exclude prairie dogs on a particular surface on his/her property (thus not necessarily following property lines). Select barrier locations by considering the property line, existing topography, and current and planned vegetation in the containment and exclusion areas.
5. If possible, containment and exclusion areas should be separated with a modest "prairie dog-free buffer zone" (approximately 50 feet in width). Prairie dogs should be removed from the buffer zone and it should be managed as a prairie dog-free area. Coteries should not be split by the buffer zone.

The construction of artificial visual barriers is not formal or standard; methods will likely continue to change as we gain experience. The following methods have been successfully implemented at several locations (such as the cities of Fort Collins and Boulder, CO) and are currently the most "tried and effective" technique. The basic techniques are similar, although some modifications have been made. In addition, options for horizontal barriers, native vegetation (woody plants, tall grasses, wildflowers), and predator enhancement (terrestrial and avian) should be considered.

CITY OF FORT COLLINS Construction of vertical and horizontal artificial barriers (see attached figure)

- FC1. Erect an olive-colored vinyl barrier that is 36 inches tall with a grommet every 3 feet on both the top and bottom. If necessary, a 3-inch trench can be formed to place the bottom of the vinyl into. Remember, light cannot show through under the barrier when work is completed.
- A. If a trench is used, caution should be given to not trample the excavated soil because it will be reused to backfill the bottom of the barrier.
 - B. If a trench is not used, backfill material needs to be onsite and used to place along the soil surface and the bottom of the barrier (like a bead of caulking).

- FC2. The support structure for the artificial barrier is constructed using 5-foot wooden posts, t-posts, and smooth wire.
- C. Place wooden posts at both the beginning and end of the structure, and every 100 feet between.
 - D. Install wooden posts to form a 3-foot wide H-post configuration. This configuration is further strengthened using smooth wire that is tightened from the top corner of each post to the bottom of the other, thus forming an X.
 - E. Place t-posts every 100 feet from the 1st H-post to the last H-post, facing the knobs away from the side that the barrier will be attached to.
- FC3. Stretch smooth wire from one end of the support structure to the other at the height of the barrier to be installed
- F. Wrap the wire around the end wooden post, and staple it with fencing staples.
 - G. Attach the wire to the t-post using fencing ties.
- FC4. Attach the vinyl barrier to the support structure **on the windward side**.
- H. Attach the top of the vinyl barrier to the wire using hog rings or plastic tie-wraps at each grommet.
 - I. Secure the bottom of the vinyl barrier with heavy landscaping pins at each grommet to anchor it to the ground before backfilling.

CITY OF BOULDER Construction of vertical artificial vinyl barriers onto existing fences

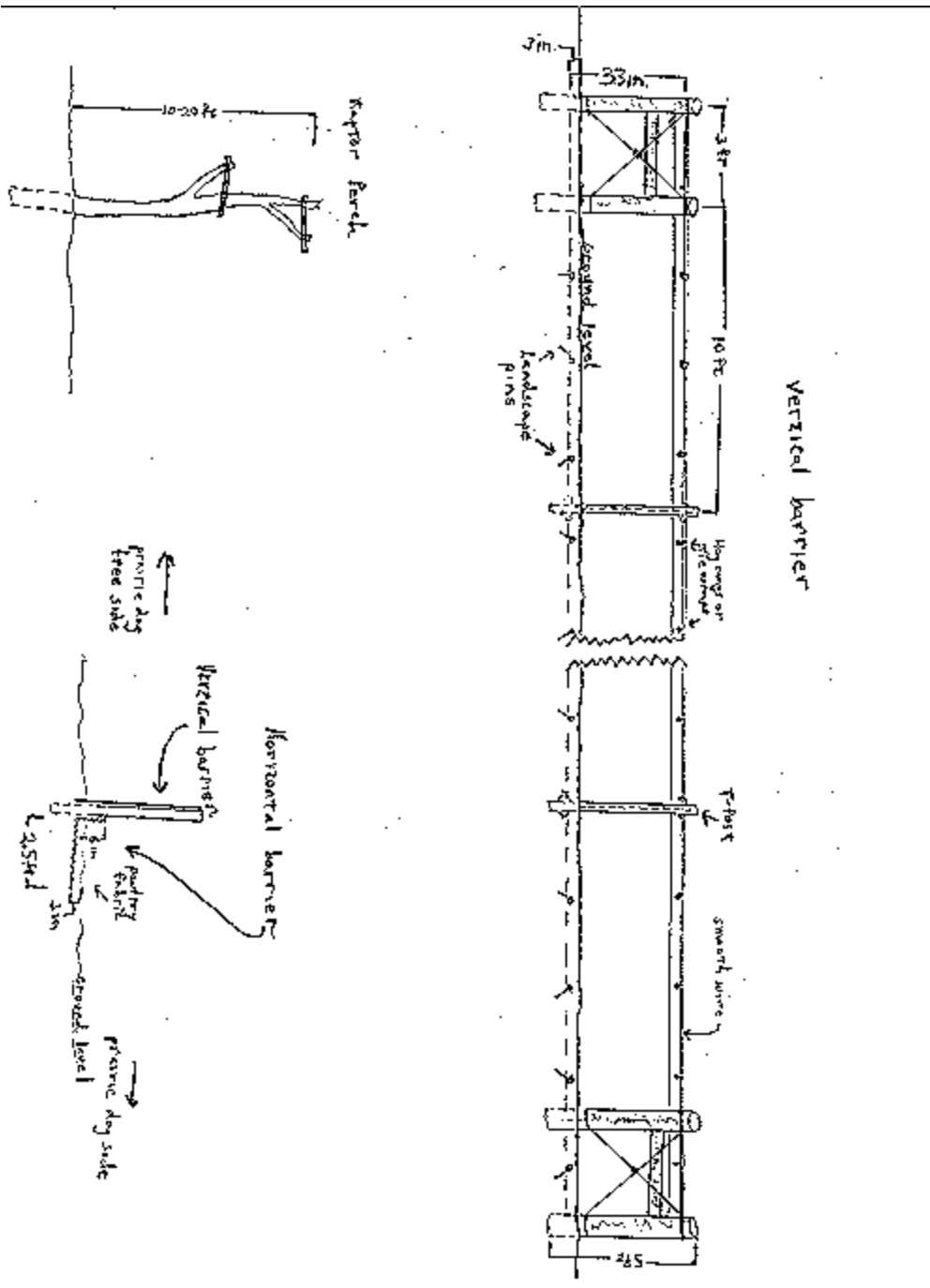
- B1. Excavate a narrow (width of a Pulaski blade) shallow (approximately 6 inches) trench in the soil directly under the strands of the existing fence. This can be done with a pick or pick-maddock in most areas. Be careful not to hit the fence wire while using the tools to prevent unpredictable recoil of the tool from fence wires. Put the excavated material on the side of the fence where you will have access to it once the barrier is in place as you will need to bury the fabric. In cases where the fence has not yet been constructed, a trencher can be used to excavate the furrow.
- B2. Unroll a length of visual barrier material along the fence line. You may need to cut the material if there is no available wooden post at the end of the roll, or if you are unable to stretch the material to an adjacent wooden post. Next, unroll a strand of high tensile fence (HTF) wire which will be used as the anchor wire along the bottom of the barrier. Smooth braided wire can also be used, but does not work as well. The wire should be at least six to ten feet longer than the piece of visual barrier material. The extra wire is necessary for attaching both ends to wooden posts.
- B3. Attach the smooth wire to the beginning and ending wooden posts. Then stretch the wire with a fence stretcher tool until it is fairly taut and secure the wire to the posts as close as possible to the bottom of the trench.
- B4. Measure the height of the visual barrier when it is attached to the smooth wire in the trench. If no existing strand is available at the top or within one inch of the top of the fabric, it will be necessary to place a strand of HTF wire at the right height. Secure the HTF to two end posts, but do not staple the wire to the correct height on the wooden support posts until Step 7. Seldom is a wire at "just the right height". In most cases it is preferable to install a "new" wire at the appropriate height.
- B5. Secure long rubber pieces over the staples on wooden posts to prevent abrasion of the fabric against fence clips, protrusions on the t-posts, or barbs on the fence wires. This step is not always necessary if the barrier is attached to the side of the posts opposite the other fence wires.
- B6. Make an accordion pleat at the end of the visual barrier fabric, overlapping 8-10 inches four to six times. The end of the material should be folded on top of the leading edge. This thickened section will be secured to a wooden post with staples. Making sure the bottom edge of the fabric is flush with the ground, hammer the staples first through the top grommet and into the fence post. Then secure the bottom grommet. Several staples may be hammered between the top and bottom to secure this anchor point. Note: the staples should be oriented vertically (i.e. one tine above not next to the other).
- B7. From this point the fabric will be attached to each of the wooden posts in succession. Someone can begin attaching the grommets along the fabric hems to the appropriate wires with plastic cable ties or hog rings. (If a new HTF strand was used, you may now raise the wire to the appropriate height and staple it to the wooden post with the fabric already attached.) Two people may then tighten the fabric until slack is removed and staple the fabric to fence posts. Use duct tape to reinforce the fabric in places where it cannot be stapled at a grommet. In some cases the crew may feel that it is necessary to better secure the barrier to the fence post. Place a strip or square of rubber over the fabric for protection and stapled through the rubber into the post.
- B8. At the end of the length of fabric, fold the fabric over and secure it as described in Step 6.

- B9. In places where the bottom wire does not sit on the bottom of the trench, use rebar stakes to sink the wire to the trench bottom. The wire may be stapled to the base of the wooden posts to further secure it.
- B10. Fill the trench with the excavated material so that no light shows through the fence. If necessary, fill any prairie dog holes along the fenceline with soil and rocks. It may be necessary to take fill from the field to close gaps where light penetrates under the barrier.
- B11. Each of the wood droppers on HTF fence is secured with metal clips. The ends of these clips can tear the fabric. As a last step, bend the ends of the clips away from the fabric so they do not poke holes in the material.

Artificial Barrier Options

- OPT1. Horizontal Barriers
 - a. Artificial horizontal barriers can be installed in conjunction with the vertical vinyl barrier to discourage animals from tunneling directly under the structure by using 1-inch mesh, 36-inch wide poultry wire
 - b. The wire should be buried 3 inches below the soil surface, extend out from the vinyl at least 2½ feet, and overlap the bottom of the vertical barrier by 6 inches on the prairie dog side (i.e., containment side) of the barrier.
- OPT2. Native Woody Plants in Conjunction with Artificial Barriers (See Appendix 2)
- OPT3. Native Woody Plants Only (See Appendix 2)
- OPT4. Native Tall Grasses or Other Tall Vegetation (e.g., planted crops)
- OPT5. Terrestrial Predator Enhancements
- OPT6. Avian Predator Enhancements (see Sections 1 and 2 of Plan)

City of Fort Collins Visual Barrier Design



APPENDIX 2

Preliminary Specifications for Development of Visual Barriers to Control Directional Spread of Prairie Dogs

(Adapted from 06/99 version by Gene T. Miller, Texas Parks & Wildlife Department, Canyon, TX)

DESCRIPTION

These specifications are offered to help control directional spread of black-tailed prairie dogs while improving the woody cover component requisite for other native short grass prairie species in the High Plains and Rolling Plains. The following are initial recommendations; however, they should not be taken as the final word on minimum requirements necessary to control spread such as: 1) density of plants within rows, 2) distance between rows, and 3) length of rows beyond maximum width (span distance) of existing burrow holes within a dog town where directional spread is occurring. These details are currently part of an adaptive management strategy for prairie dog conservation and management.

SPECIFICATIONS

Design

- Minimum row length of visual barriers is recommended to exceed the widest point between burrow holes (when viewed perpendicular to the direction of spread) by at least 100 feet on either end (you may want to use 200 feet on either end as standard, fashioned as “wings”).
- Minimum barrier size recommended is 70' wide (if fenced and using 6' weed barrier fabric) or 30' wide (if not fenced and using 6' fabric), consisting of a 3-row (parallel) planting with a evergreen row 20' from the fence, followed by a second evergreen row at a 15' interval, followed by a deciduous shrub row at a 15' interval, then followed by a 20' interval to the fence. Length will be 100-200' longer (on each end) than the widest distance between burrow holes when viewed perpendicular to the direction of spread. *Spacing and placement of planting materials within all rows should be staggered to achieve a solid visual barrier in the shortest elapsed time possible when viewed from an angle perpendicular to the direction of spread.*
- Minimum 3-row planting width using 10' wide weed barrier fabric (contact Shaw Fabric Products @ 1-800-359-1912 for use of laying machine) featuring a *twin-row, high-density conifer planting* with a shrub row will be 58' (if fenced and using 10' fabric) or 18' (if not fenced and using 10' fabric), consisting of an evergreen row 20' from the fence, followed by a second evergreen row within ~3 feet to be covered under the same strip of 10' (wide) fabric, followed by a deciduous shrub row at a 15' interval, then followed by a 20' interval to the fence. Again, length will be 100-200' longer (on each end) than the widest distance between burrow holes when viewed perpendicular to the direction of spread.

Species

- Evergreen (native) species recommended for planting is Rocky Mountain juniper (*Juniperus scopulorum*).
- Deciduous shrub species recommended for planting are Fourwing saltbush (*Atriplex canescens*) and Aromatic sumac (*Rhus aromatica*) because of being native to the nearby escarpment breaks of Palo Duro Canyon and their locally-grown availability from the (Texas Forest Service) West Texas Nursery in Lubbock.
- If you need to go with containerized (more expensive) plants for a more immediate visual barrier, you will need to modify the planting sequence described by laying fabric first, then planting trees and shrubs, followed by watering.

Spacing

- *Within rows*, evergreens should be spaced at 6-8' intervals (quick visual barrier) whether using seedlings from TFS or containerized trees/shrubs from a recommended commercial source, and *rows staggered* for a solid barrier when viewed perpendicular from the direction of spread. Deciduous shrubs should be spaced at 12-15' intervals.

Fencing

- Fencing is recommended on visual barriers with a 2 or 3-strand barbed wire fence (NRCS specs) as part of the plant protection strategy that may be necessary when planting in close proximity to an active prairie dog colony ("dryland beaver syndrome"). Standard clearance recommended on all plantings is 20' minimum from outside rows, with a 20' border on each end to accommodate maintenance/equipment. **Fencing is recommended to be done prior to barrier installation unless evergreens and deciduous shrubs are to be protected individually with heavy wire protection cages, and provided that livestock grazing is not present. In the event that barriers are to be installed where livestock grazing is present, they should be fenced to prevent trampling.**
- 24" x 1" poultry netting should be attached with hog rings around exterior of fence at bottom with 4" buried in the ground on the outside of fence as part of the construction phase (critical for protection from small rodents, prairie dogs, and rabbits). This means the bottom wire should be ~17 inches above ground level (allows for ~1" bend in wire with ~3-4 inches buried outward). A 4" (deep) trench with wire buried vertically during fence construction works well. If livestock grazing (trampling) is not a factor, then individual plant protection with heavy wire cages is a viable option (less expensive initially, but more labor intensive and costly over time as plants mature).

Site Preparation

- On grassland (range or CRP land), an area slightly larger than the area to be fenced should be mowed clean *if needed* to remove rank vegetation in order to facilitate fencing and planting operation.
- On grassland (range or CRP land) where land is classified as highly erodible (HEL), sod should not be removed from the entire site, but only from where rows are to be planted.
- For site prep of individual tree/shrub row to be planted, a 10' wide strip (seedbed), centered on the "planting line", must be disced, plowed, and/or roto-tilled in the fall or early winter, so as to remove all grass. The goal is to achieve a high-quality seedbed for mechanical tree planting and fabric laying. **This is critical to establishment and success of the planting.** *If 10' wide material is used for a twin-row, high-density evergreen strip, the planting bed should be 12-14' wide.*
- **On clay and clay loam sites**, at least the "planting line" on each 10' strip must be chiseled to a depth of 12" or greater during the fall prior to planting. Chiseling greatly facilitates use of the tree planter (depth). **This is critical to establishment and success of the planting.**

Planting Stock

Source

- A critical point is that seedling source should be from the same region as the planting area. Materials from Texas Forest Service (West Texas Nursery) in Lubbock, distributed through local Soil & Water Conservation Districts, are recommended. **The use of locally-grown and adapted planting materials is critical to the establishment and success of the planting.** Contact at Texas Forest Service-West Texas Nursery is *Mr. Raymond T. Cragar, Silviculturalist (806-746-5801).*

Type of Stock

- Deciduous seedlings (1-0 and 2-0) may be bare-root stock. Minimum stem caliper at the root collar is 3/16" for 1-0 seedlings and 1/2" for 2-0 seedlings. Minimum height is 12" for 1-0 stock and 15 inches for 2-0 stock.
- Evergreen seedlings (1-0 and 2-0) **should be containerized** with a minimum stem caliper at the root collar of 3/16"

for 1-0 seedlings and 3/8" for 2-0 seedlings (this should not be confused with larger, i.e. 5 or 10-gallon containerized plants obtained from commercial sources *if research time frame dictates the necessity for an immediately-functioning barrier*).

Planting Method

- Two (2) tractors (50+ hp, Cat II, 3-pt hitch) **with operators** on planting day, **plus a crew of 6 persons** (minimum) to install planting is recommended.
- A tractor-drawn tree planter (Category II, 3-point hitch) is recommended for installation of seedlings and fabric. It may be possible to use the TPWD tree planter and fabric layer (in the case of a cooperative demonstration site) by contacting the Wildlife Regional Office @ 915/651-4748, or to rent a tree planter from Texas Forest Service (806/746-5801) in Lubbock..
- Weed barrier fabric (6' width) should be installed by machine (Category II, 3-point hitch) immediately after trees are planted. *If opting to install a twin-row, high-density conifer strip utilizing 10' weed barrier fabric, contact Shaw Fabric Products @ 1-800-359-1912 for the use of their machine.* Seedlings will be pulled up through a slit cut in the fabric.
- **On clay sites**, 6" companion pins should be placed offset from the row at 1' intervals on each side of seedlings and midway between each seedling in the row center.
- **On sandy sites**, 10" companion pins are recommended as specified above.
- Protection of evergreens from wind damage should be accomplished by placement of wind screens on the west and south side of each seedling **at planting time**.
- Lastly, individual seedlings will be hand watered **at planting time** with a nurse tank, preferably that has only been used for water (no chemicals) or that has been thoroughly cleaned and rinsed.

Maintenance and Care

Supplemental Watering

- Supplemental watering **at least twice** during the growing season (depending on moisture conditions) is recommended for the first 3 years. The rates are adjustable because of soil type. Sufficient water should be applied to thoroughly soak the soil below the root zone. (The weed barrier fabric will accept water at the rate of about 9 gallons per square foot per minute).

Vegetation Shading

- On east-west plantings where vegetation height immediately adjacent to the tree row exceeds 2', a 6' wide strip should be shredded **on the south side** of the row to prevent shading. Likewise, on north-south plantings, the **west side of the tree row** should be mowed (6'). **This is important for the first 2 years. However, in the case of establishing a visual barrier to control direction control of prairie dogs, the investigators may want to forego this activity unless severe competition threatens survival of the planting.**

Protection

- Protection with fencing as previously described is recommended. For technical assistance on prairie dog, gopher, or rabbit control measures, contact Texas Wildlife Damage Management Program.
- 24" x 1" poultry netting should be installed on the outside of fence with 4" draped (L-shape) and buried at the bottom for rodent control.

- Firebreaks around barrier plantings are recommended, depending on the local situation, removal of rank vegetation immediately surrounding the planting by grazing, and aesthetic considerations. They can be established by removing all flammable materials through discing or scraping. The firebreak width should be 2 1/2 times the height of the surrounding vegetation but not less than 4' wide. Wind protection is required for conifer (evergreen) seedlings. Wind screens should be used to protect each seedling from wind damage (see Planting Method).
- Trees should be inspected periodically to detect insect or disease problems. Contact the Texas Forest Service in Lubbock for specific diagnosis and recommended control measures.

Tree Replacement

- Loss of seedlings less than 3 years from original planting date should be replaced. Replacement of older trees should be done if the resultant gap in the visual barrier is larger than the average crown spread of adjacent trees. Replanting with the same species is recommended.

Cost Guidelines

Cost for 3 rows of shrubs are as follows: for the seedlings, weed block fabric, staples and plant protectors Texas Forest Service is projecting cost at \$7500 per mile. The Texas Forest Service has offered their services in planning and assisting with this project.

Temporary visual barrier (silt barrier) ranges from \$83-\$100 per 100' roll; this is the barrier that has the net wire fence built into the product. Estimated cost = \$4382/mile

APPENDIX 3

Funding Options

1. US Fish and Wildlife Service (Partners for Fish and Wildlife Program)

Initiated in Texas in 1990, the U.S. Fish and Wildlife Service’s Partners for Fish and Wildlife (PFW) program restores and enhances fish and wildlife habitat on private lands. The PFW program initially targeted wetland habitat for restoration and enhancement work. However, the success of this landowner friendly program encouraged the Service to expand it to benefit all federal trust resources, including waterfowl, other migratory birds, and candidate, threatened, and endangered species. Projects generally involve wetland, native prairie, and/or riparian restoration activities. The PFW program provides cost-sharing and technical assistance to non-federal landowners, including private landowners, local governments, native American tribes, educational institutions, and other entities.

Through 2001, the Service has entered into 776 partnerships with private landowners, covering approximately 135,000 acres in Texas. Approximately 55,000 acres of wetlands, 119 miles (2,233 acres) of riparian corridors, and 78,000 acres of native prairie and other upland habitats have been restored and/or enhanced by the PFW program in Texas. Throughout the State, the PFW program has also participated in projects seeking to educate the public regarding the benefits of wetland and other wildlife habitat by providing funds used to develop outdoor environmental classrooms.

The PFW program has been very well received by participating private landowners, known as Cooperators. In fact, many interested landowners remain on field office waiting lists at the end of each fiscal year. Several Cooperators have been honored as recipients of National and Regional wetland stewardship awards and also with local “Wildlife Conservationists” awards. A close working relationship often exists with personnel from the Natural Resource Conservation Service (NRCS), local Soil and Water Conservation Districts, Texas Parks and Wildlife Department, Texas Forest Service, other government agencies, and private organizations such as Ducks Unlimited and the National Wild Turkey Federation.

A PFW private lands agreement is a minimum 10-year contract between the USFWS and the private landowner or other entity. In exchange for receiving cost-share funds for habitat improvement practices, the private landowner agrees to maintain the improvements for the life of the contract. Improvements are generally implemented during the first year of the contract, but extensions may be granted if technical difficulties arise.

For planned habitat improvements on the Lubbock Land Application Site, the Texas PFW program is prepared to contribute up to \$15,000 in cost-share assistance. Projected budgets are shown below:

Option 1: Erection of silt fence and permanent vegetative barriers on two southeast corner circles

Practice	Cost
Vegetative visual barrier (two rows of fourwing saltbush and one row of aromatic sumac) – 3.4 miles @ \$7,500.00/mi.	\$25,500.00
Temporary silt barrier fence – 3.4 miles @\$4,382.00/mi.	\$14,898.80
TOTAL	\$40,398.80

Option 2: Erection of permanent vegetative barriers on two southeast corner circles without silt fence; wheat would be broadcast in the circle corners in an effort to provide supplemental food for prairie dogs while the vegetative barrier and adjacent crop were initiating growth. If successful, this technique would not require the use of a temporary silt fence barrier and would be less costly than Option 1.

Practice	Cost
Vegetative visual barrier (two rows of fourwing saltbush and one row of aromatic sumac) – 3.4 miles @ \$7,500.00/mi.	\$25,500.00
Broadcast wheat on 80 acres of circle corners – 4800 lbs. seed @ \$0.60/lb.	\$2,880.00
TOTAL	\$28,380.00

Option 3: Enrollment of eligible circle corners in the **USDA Continuous Signup Conservation Reserve Program (CRP)**.

For non-irrigated circle corners that have been cropped during at least two of the past five years, enrollment in the USDA’s Continuous Signup Conservation Reserve Program is a viable option. This program provides 50% cost share for establishment of field windbreaks (Conservation Practice 15, the equivalent of a vegetative visual barrier), plus incentive payments that increase the effective cost share to 90%. The contract holder also receives a per acre rental payment for the enrolled acreage (typically in the \$30 - \$35 range). The minimum standard for Conservation Practice 15 is two rows of coniferous trees, with the option for additional rows of deciduous or coniferous trees or shrubs. The contract length is 10 or 15 years, and the program is administered by the USDA’s Natural Resources Conservation Service and Farm Services Agency. While this option could be applied to cropped areas currently under center pivot irrigation, the effluent disposal goals of the LLAS may not allow for a loss of irrigated acreage at this time. *For more details, contact the Lubbock County USDA Service Center at (806) 785-5644.*

2. Texas Parks and Wildlife Department (Landowner Incentive Program)

What can the Landowner Incentive Program offer?

Most rare species inhabit privately owned and managed lands in Texas. Incentive programs to assist private landowners in protecting and managing rare species can have a direct and positive impact on their conservation. It is the goal of this program to provide financial incentives that encourage landowners to help conserve rare species. The program is flexible and is open to all private landowners who have a desire to voluntarily manage for rare species on their land.

What are some of the criteria for applying?

The proposed action by the landowner must contribute to the enhancement of at least one rare species or its habitat. Rare species include those species that are federally or state listed as threatened or endangered as well as selected vertebrates, invertebrates and plants. A copy of the rare species list for your county are available to prospective applicants upon request.

The landowner's property must be able to provide suitable habitat for a rare species. The natural movement or reintroduction of individuals onto that property must be feasible and the property must be within the historic range of the targeted species.

The results of the action must be measurable. Therefore, the landowner must agree to allow biologists onto their property for a pre-agreement survey and periodic progress checks to assess the success of the project objectives. The kind and amount of information recorded can be negotiated by the landowner.

The landowner must be willing to sign a project agreement or management plan. Each agreement or management plan will be designed to meet the landowner's individual conservation and land use needs and objectives. Name and address will be required for accounting purposes, but any other recording of information specific to the property can be negotiated with the landowner. Inability to complete management actions due to weather or other conditions beyond the landowner's control will be considered individually and rescheduled.

How do I get involved with the Landowner Incentive Program?

First, contact your regional endangered species biologist to discuss your options. If necessary, a site visit will be scheduled to further discuss appropriate management activities for your property. Finally, complete and submit 3 copies of the application to the regional biologist who conducted the site visit. Application forms are provided by the regional biologist.

Applications will be reviewed on a first-come, first-served basis and will be ranked sequentially by the Landowner Incentive Program Committee. The committee consists of landowner and various natural resource agency representatives. The primary selection criteria will be based on the extent to which the action achieves species recovery or alleviates threats to the species balanced against the cost effectiveness of the proposed action. Applicants not selected will be eligible to reapply. Successful applicants will be notified and arrangements will be made to discuss and draft a conservation plan and the terms of the agreement. Funds will be dispersed after the conservation agreement has been signed by TPW and the private landowner.

What are some projects eligible for funding?

TPW wants to encourage creative projects for conserving rare species. Some ideas that funds can be used for may include (but are not limited to) offsetting the cost of management activities such as habitat improvements (restoring native vegetation, prescribed burns, selective brush management, grazing management systems) or habitat protection (constructing enclosure fences, gating caves). Funds can also be awarded to help with legal fees necessary to develop a conservation easement. Other actions not listed here that will accomplish conservation goals at reasonable cost are encouraged and will be considered.

What are the funding limitations?

The amount of \$10,000.00 has generally been considered the funding limit for a project, larger projects will be considered. Although there are no project duration limitations, results of management actions that can be documented in less than 5 years are preferred. The applicant should contribute a significant amount of funds, labor or materials toward the completion of the project. A minimum of 10% of the funds will be retained until conclusion and final assessment of the project. Payment schedules will be negotiated with the landowner to meet the objectives of the management plan. Receipt of final payment will be contingent on the landowner's fulfillment of the agreement and completion of the project.

Please contact Duane Lucia (806-761-4971), Heather Whitlaw (806-746-4031), or the LIP Program Administrator at (512) 389-4799 or 1-800-792-1112, ext. 4799 for additional information.

Texas Parks and Wildlife

Rev-11 6/30/00

**Landowner Incentive Program
Application Form**
(Please type or print legibly)

A. Landowner Information:

The person indicated here will be responsible for the project. If the application is submitted by someone other than the legal landowner, the landowner will be required to cosign the agreement prior to the beginning of the project.

Name: _____ Phone Number(s):

Address: _____

City: _____ State: _____ Zip Code: _____ Landowner Agent:

B. Project Summary:

Briefly describe project goal, budget, proposed work, how results will be measured and how the effects will be sustained:

C. Property Description:

County where project will occur: _____ Number of acres that will be part of the
project: _____

Location of the property:

Description of property (vegetation, topography, soils, creeks, springs, caves, land use, etc.) Attach additional
pages if necessary:

Note: Please include topographic and location maps if possible.

D. Expected Benefits:
 List those rare species and rare natural communities that will be targeted for conservation:

<i>Quantify the expected benefits of the project, such as:</i>	Currently	After project
Acres of rare species habitat or rare natural communities present		
No. of properties under management		
No. of landowners participating in project		
Wildlife management plans in place for rare species or rare natural communities		

E. Project Description:
Be as complete as possible. Attach additional pages if necessary.

What type of conservation or management action(s) will be done to improve the status of rare species or rare natural communities?

F. Proposed Budget:
 Describe how funds will be used:

Detail budget costs	LIP funds requested	Costs covered by applicant or other partners
Labor		
Travel		
Supplies and materials		
<i>Contracted work and services</i>		
Utilities		
Rent		
Equipment		
Other		
TOTAL		

G. Proposed schedule of work:

Outline a proposed time schedule to complete the management actions proposed for your project (in days, months, years).

H. Supporting information:

Attach any other information that may help us in our evaluation of your application. Include supporting information such as photos, maps, and data.

AREA BELOW IS FOR TPW USE ONLY:

Reviewing TPW Biologist: _____

Date _____

Project Title:

Date received: _____

Date reviewed: _____

Date ranked by LIP Review committee: _____ Rank _____

Recommended for funding? _____ Amount and source _____

3. Other Potential Cooperators

National Fish and Wildlife Foundation (NFWF)

(for more information see <http://www.nfwf.org/programs/programs.htm>)

NFWF General Challenge Grant Program (see Programs described below)

The National Fish and Wildlife Foundation funds projects to conserve and restore fish, wildlife, and native plants through challenge grant programs. The Foundation awards challenge grants to projects that address priority actions promoting fish and wildlife conservation and the habitats on which they depend, work proactively to involve other conservation and community interests, leverage Foundation-provided funding, and evaluate project outcomes. Federal, state, and local governments, educational institutions, and nonprofit organizations are welcomed to apply for a general challenge grant throughout the year, using the General Challenge Grant Guidelines.

NFWF Special Grant Programs

In addition to the general challenge grant and small grant programs, the Foundation administers a number of special grant programs with specific guidelines and time-lines. If your project does not meet the criteria of any program described below, please consider applying under the general challenge grant program. Also, please note, if your project is not funded under the grant program for which it was submitted, Foundation staff may move your project to the general challenge grant program or a different special grant program if it has the potential of being funded under it.

Budweiser Conservation Scholarship Program

Anheuser-Busch and the Foundation are pleased to sponsor the Budweiser Conservation Scholarship Program, a competitive scholarship program to support and promote innovative research or study that seeks to respond to today's most pressing conservation issues.

2003 Preproposal Due Date: NA

2003 Full Proposal Due Date: January 17, 2003

2003 Notification Date: May 31, 2003

Contact: Tom Kelsch

FMC Corporation Bird and Habitat Conservation Fund

The National Fish and Wildlife Foundation and FMC Corporation have formed a multi-year partnership to fund habitat conservation program benefiting birds, with a particular focus on prairie species and waterfowl.

2003 Preproposal Due Date: June 1, 2003

2003 Full Proposal Due Date: July 15, 2003

2003 Notification Date: November 30, 2003

Contact: Peter Stangel

Migratory Bird Conservancy

The Migratory Bird Conservancy (MBC) is the first ever habitat conservation fund created and supported by birding businesses and their customers! Because the MBC offers an excellent opportunity for birders and birding businesses to contribute to the goals and objectives of Partners in Flight, the Foundation is matching all contributions to the MBC and is administering a grant program to fund priority habitat conservation projects for the conservation of Neotropical migratory birds. Visit the new Migratory Bird Conservancy website today at www.conservebirds.org.

2002 Preproposal Due Date: June 1, 2002

2002 Full Proposal Due Date: July 15, 2002

2002 Notification Date: September 30, 2002

Contact: Kathleen Moore

Native Plant Conservation Initiative

Supports on-the-ground conservation projects that protect, enhance, and/or restore native plant communities on public and private lands. Projects typically fall into one of three categories and may contain elements of each: protection and restoration, information and education, and inventory and assessment.

2002 Preproposal Due Date: NA

2002 Full Proposal Due Date: July 15, 2002

2002 Notification Date: October 31, 2002

Contact: Caroline Cremer

Natural Resources Conservation Service: Conservation on Private Lands

The goal of this program is to support high quality projects that engage private landowners, primarily farmers and ranchers, in the conservation and enhancement of wildlife and natural resources on their lands.

2002 Preproposal Due Date: NA 2002

2002 Full Proposal Due Date: May 17, 2002

Notification Date: July 31, 2002

Contact: Jody Olson

Pathways To Nature Conservation Fund

Is a partnership between the more than 270 Wild Birds Unlimited, Inc. franchises and the National Fish and Wildlife Foundation. The Pathways To Nature™ Conservation Fund offers grants to enhance environmental education activities and bird and wildlife viewing opportunities at significant nature tourism destinations in the United States and Canada.

2003 Preproposal Due Date: NA

2003 Full Proposal Due Date: NA

2003 Notification Date: NA

Contact: Peter Stangel

Seeking Common Ground

Is a nationally-sponsored partnership effort undertaken by federal and state government agencies and private conservation organizations in order to achieve a common goal: maintaining and improving the health of America's rangelands for the benefit of wildlife and habitat. SCG attempts to achieve this goal by funding demonstration projects in the eleven western states that focus on reducing the conflicts that exist between wildlife interests and competing rangeland interests, such as those of the grazing, mining, timber, and oil and gas industries.

2002 Preproposal Due Date: June 1, 2002

2002 Full Proposal Due Date: July 15, 2002

2002 Notification Date: October 31, 2002

Contact: Brian Ocepek

APPENDIX 4

Contact Information

Texas Parks and Wildlife Department (Lubbock, TX)

Heather Whitlaw

hawhitlaw@ag.tamu.edu

806-746-4031

Duane Lucia

duane.lucia@tpwd.state.tx.us

806-761-4971

United States Fish and Wildlife Service (Canadian, TX)

John Hughes

john_p_hughes@fws.gov

806-323-6636

United States Department of Agriculture -Wildlife Services (Canyon, TX)

Rick Gilliland

rickey.l.gilliland@aphis.usda.gov

806-651-2880

Texas Forest Service, West Texas Nursery (Lubbock, TX)

Raymond Cragar

tfslub@door.net

806-746-5801

Lubbock County USDA Service Center (Lubbock, TX)

806-785-5644

National Fish and Wildlife Foundation

Texas-Oklahoma Regional Office (Dallas, TX)

Dick Davis, Director

214-943-0552

National Office (Washington, D.C.)

202-857-0166

Jennifer Murphy, Assistant Director

214-943-0552

Llano Estacado Audubon Society (Lubbock, TX)

Ellen Roots McBride

Erootsmcbride@aol.com

(806) 785-1876

Jill Haukos

Haukos@aol.com

806-797-2012

City of Fort Collins, Natural Resources Department

Donna Dees

ddees@fcgov.com

970-217-6683