Minimizing the Impacts of Oil and Gas Development

Forrest Smith

Dan L Duncan Endowed Director
South Texas Natives & Texas Native Seeds Projects
Caesar Kleberg Wildlife Research Institute
Texas A&M University-Kingsville
South Texas Natives & Texas Native Seeds Projects

- **Mission:** *Develop native seed sources for Texas*
  - 30 Commerical native seed sources developed in last 14 yrs
  - Seed for >50,000 acres of plantings available annually
    - Working to develop additional seed sources for Central and West Texas

- **What we do:**
  - Collect seeds of native plants from wild stands
  - Test, select, and increase suitable populations
  - Provide seed stock to commercial growers for large-scale production
  - Figure out the best methods to use to successfully restore native plants
Long and Important Partnership with Texas AgriLife Center in Uvalde
Challenges for oil field restoration:

- Realistic expectations & informed recommendations
  - Lack of objective research
  - Little regulation
- Is the corporate mindset of doing good reaching the ground?
  - Contractors
- What do we think is needed?
  - Better information about restoration
  - Informed private landowners
  - Keep it simple
VOLUNTARY CONSERVATION PRACTICES

Balancing Wildlife Conservation and Oil and Gas Development in the Eagle Ford Shale Region of South Texas
Operations

- Locate tracking ponds in a way that takes advantage of natural features, minimizes soil erosion, and provides lasting benefits to wildlife while also protecting sensitive habitats such as high-quality riparian areas.
- Protect sensitive areas such as streams and unique plant communities by avoiding disturbance within or near these features, and when possible during pipeline construction or maintenance, bore under the feature.
- Control soil erosion at all stages of construction and development. Consider natural contours during construction and require procedures to maintain natural contours and drainages. Monitor these processes.
- Construct and operate with short-term, long-term and final reclamation goals in mind.
- Consider aesthetics during construction whenever possible.

Reclamation

- Remove development infrastructure from the surface.
- Request re-contour of the site to pre-construction specifications to facilitate the return of the natural landscape.
- Specify reclamation techniques desired.
- Control erosion, including removing, storing and planting topsoil for future reclamation and vegetation reestablishment.
- Test the soil before attempting reclamation to ensure successful plant establishment is possible.
- Request interim reclamation of areas in and around roads, pads, pipelines and other infrastructure throughout development and production phases.
- Reseeds with mixes of locally adapted native species. Order native plant seed mixes one year in advance to ensure availability.

Control exotic and invasive plant species and monitor for desired results.

- Prepare a firm seed bed and use planting equipment appropriate for the type of seed being planted.
- Use annual cover crops for temporary erosion control.
- Measure reclamation success by plant establishment and survival, erosion control, and water quality.
- Deliberate grazing to permit adequate plant establishment.
- Ensure abandoned wells are properly plugged and pads reclaimed as required by law.

Monitoring

- Conduct baseline and follow-up surveys to assess impacts.
- Identify monitoring procedures for adherence to the SUA, construction activities, reclamation results, and potential problems with invasive plants or hazards to wildlife.
- Ensure that monitoring procedures and resulting data are used within an adaptive management context to allow landowners and operators to refine plans to adapt to changing conditions.
- Use remote monitoring where applicable to gauge production and reduce traffic.

Create a simple, consistent, and predictable monitoring plan with clear guidelines on ‘who, when and how’ for use by both the landowner and the operator. Stay engaged and keep communicating.

Establish a simple reporting system for compliance with the SUA and reclamation plans. Request quarterly or yearly reports.
Is this wildlife habitat?
Maybe it could be someday?

8 months ago this was a drilling pad.
Oil pad for 40 years
24 months later
Negotiate the strongest Surface Use Agreement (SUA) Possible

- Be detailed
  - Example: “restore to previous condition” vs. “restore exactly this way using this technique, this seed, this contractor, etc.”
  - Negotiate to be in control of your own restoration (get paid to improve your own land)

- Be specific
  - When, where, how, what, who

- Be diligent in seeing that it is followed
  - Do not assume the plan will be
  - Do not assume anybody but you is concerned with your interests
What are the impacts of oil and gas development?

- **Habitat loss:**
  - 8-10 acres denuded/well
- **Habitat degradation:**
  - 7-20% of surface area direct impact
- **Habitat fragmentation**
  - 4,500 ft of road added per well
  - 8% loss of core areas
- **Soil degradation**
  - *Erosion-estimated at 74 tons per acre*
- **Invasive species**
  - *OWB- occurs in 82% of near-road locations vs. 22% random locations*
Location is everything

- If you can:
  - Avoid high quality habitats
  - Avoid difficult to restore areas
  - Consider aesthetics
  - Prevent fragmentation
  - Consider crossing old pastures/cropland
    - Cheaper
  - Be willing to negotiate
Soils management

- How to clear?
  - Plow/grub
  - Hydro-ax
  - Chemical

- Trenching
  - Blade top 1-6” to the side and windrow (natural seedbank)

- Double trench/ditch
  - Premise to keep topsoil and subsoil layers separate
  - Soil tests and knowledge of soil profiles is important
1. PROTECT THE TOPSOIL & TEST THE SOIL BEFORE ANY WORK IS DONE
2. PREVENT EXOTIC SPECIES
INTRODUCTION
3. Reseeding matters—negotiate for it

Live Oak Co., Texas-Eagle Ford Shale Pipeline
Planted February 2012, photo June 2012

South Texas Natives released seeds
Non-ecotypic native seed mix
Two years later...

Adapted native seed mix planted

“Standard” native seed mix planted
Where native seed used in restoration originated from is very important.
**Seed Origin** is very important

- Local adaptation is a must for “now” performance
  - *It will “adapt” is a poor strategy!*
- “Native” is a relative term
  - Little bluestem is native from Canada to Mexico
- Location of the seed company *has nothing to do with where seed originated from*
- Ask seed companies for seed origin
  - Seed Certification proves origin
  - Named varieties give assurances
  - If dealer does not know origin and quality of their seed, don’t buy it
Seed quality is also very important
Things to know for today:

- Native Seed supply for South Texas is excellent
  - 2015 was an outstanding production year
  - Douglass King Seed Company is primary vendor
  - 22 different STN releases available
- Seed cost average $85 per acre, ranging to $140
- Planting window for 2015 is closed-wait to plant in spring 2016
  - Strong El Nino conditions make spring plantings an excellent option
  - Cooler winter may necessitate later planting dates
  - Prepare seedbeds now, be diligent to control weeds early and often
  - Consider cool season cover crops (small grains)
La Salle County, Texas-10 mile Eagle Ford Shale pipeline right of way planted with native grasses
Duval County, Texas: 7 mile Eagle Ford Shale Pipeline right of way
Maverick County, Texas, Drilling Pad Site Restoration
Kleberg County, TX-Historic Oil Pad/Drilling Site Restoration, pad from 1960s
Kleberg County, TX-New pipeline right of way, planted
October 2014
Review

- Negotiate the best possible surface use agreement
- Protect the topsoil
  - Test soil properties before and after
- Reseed using locally adapted, high quality native seeds
  - Use seeds that are ecotypic in origin to your soils and region
  - Buy seed on a Pure Live Seed (PLS) basis
  - Beware of seed without proof cleanliness (use certified seed only)
- Restoration, even improvement, of lands impacted by oil and gas exploration can be extremely successful
Uvalde County, Texas—conversion of irrigated cropland to native grassland for cattle forage and quail habitat
Atascosa County, Texas—conversion of marginal cropland to native grassland for cattle forage and quail habitat
For more information or for recommendations:

- [http://ckwri.tamuk.edu/research-programs/south-texas-natives/](http://ckwri.tamuk.edu/research-programs/south-texas-natives/)
- Email: [forrest.smith@tamuk.edu](mailto:forrest.smith@tamuk.edu)
- For seed mixture recommendations, send GPS coordinate of planting site(s) and planting date