Native Grasslands: Function and Establishment

Tim Siegmund
Private Lands Program Leader
TPWD
Definition of Terms

• **Native Warm Season Grasses**: Grasses where primary growth occurs during the growing season (March-October) whose occurrence predates European Settlement

• **Forbs**: Herbaceous broad leaf plants, both palatable and not palatable for livestock, that generally flower and provide food via the plant or its reproductive structures (seeds, fruits, nuts, etc) for wildlife
What is it about these native grasses that make them beneficial??
It all boils down to STRUCTURE!!
Cover Types

- Fawning Cover
- Nesting Cover
- Brood Rearing Cover
- Escape Cover
NWSG Structure
Composition

Brood Rearing Cover

Overhead Screening Cover
-large, tall weed patches

Open at Ground Level
-grass cover <50%

Lack of Thatch
-thick litter inhibits foraging ability
-quail do not scratch like chickens
-turkeys poults can’t scratch well

Nesting Cover

Large Grass Clumps for Nesting
-thick, numerous grass clumps
-decrease predation risk
-increase ability to select nest site
Decline

- Overgrazing
- Suppression of Fire
- Conversion to Row Crop Agriculture
- Broad Spectrum Herbicide Use
- Introduction of “Improved” Forage Grasses
- Over-fertilization
- Urban and Road Fragmentation
Exotic “Improved” Grasses

• Johnson Grass and Ryegrass - Europe/Mediterranean
• Bermudgrass, Buffelgrass, Kleingrass and Weeping Lovegrass - Africa
• Bahia grass, Dallis grass, Vasey grass - South America
• Nitrogen fertilization favors these grasses
• Intensive Grazing favors these grasses
What Are We Looking For?
Big 5 Prairie Grasses
WHAT ARE WE LOOKING FOR?

Importance of Legumes, Forbs, & Brush

Legumes
- Fix Nitrogen to the Soil
- Attract Pollinators - “Bugs”
- Provide Nutritious Seeds

- partridge pea, snout bean, Illinois bundle flower, leadplant, purple prairie clover, tephrosia/goat rue, roundhead lespedeza, Desmodium spp.
WHAT ARE WE LOOKING FOR?
Importance of Legumes, Forbs, & Brush

Forbs
- Provide Additional Screening Cover

- Attract Pollinators with Flowering

- Majority of Deer Diet in Growing Season

- Late Summer-Winter Provide Large Number of Seeds and Fruits

- Sunflowers, Croton, 3-Seeded Mercury, Ragweed, Goldenrods, Thistles, Compassplant, most wildflowers
Importance of Legumes, Forbs, & Brush

Brush

- Cover for Quail Coveys
- Additional Food Sources
- Nest Sites for birds
- Require Management
  - May become invasive
  - Can alter fire behavior

-Sumac, Yaupon, Wild Plum, Persimmon, Hawthorn, Prickly Ash, Cedar, Mesquite, Huisache
What is Success?

• **Eye of Beholder**
  – Forage Production
    • Focus on Abundance of Palatable Grass
    • 75% or more Grass
  – **Wildlife Habitat**
    • Diversity of Cover Types and Food Production
    • 30-60% Grass
  – **Pollinator Habitat**
    • Providing Blooming Plants the Entire Growing Season
    • 20-50% Grass
  – **Plant Diversity and Occurrence**
    • Number of Plant Species per Acre
    • Rare Plants
Do I Plant, Rest, or a Combination?

- **Plant**
  - 50-75% or Greater Undesirable Species
  - Currently in Undesirable Perennial Cover
  - Know Past History Of Site

- **Rest**
  - Unknown Past Use
  - Hasn’t been rested in Greater than 5 Years
  - No Sign of Conversion to Non-Native Forages

- **Combination**
Cimmaron Plus
application 0.4 oz/acre
Cropland 15+ Years, Johnson Grass Hay for 5 Years

Probably Spray and Replant
Continuously Grazed and Leased for 40 Years. Unknown Perennial Pasture Type

Rest and See What Pops Up
What Are My Resources?

• Tractor Availability
  – 30-40HP or more
  – Tractor Implements
    • Disc, Cultipacker, No-Till Drill, Broadcast

• Acreage of Planting
  – Less than 3 acres; possible to do by hand
  – 3 acres +; Recommend using equipment

• Expertise
  – Personal Knowledge
  – Professional Knowledge

• Time
  – Weekend Project
  – Live on Property
  – How Quick is Quick Enough?
    • Enjoyment
    • Production
What is My Budget?

• Cost Share Programs
  – TPWD – Pastures for Upland Birds (PUB) Program
  – US FWS – Partners for Fish and Wildlife
  – NRCS – Various Programs
  – Usually Require a Contract Agreement

• Pay on Your Own
  – No Contract
  – Recognize Potential for Failure

• Biggest Hurdle in Planning Operation
  – Greatly Impacts Potential Seed Mixture
Planting Methods

- Site Preparation
- Buying/Collecting Seed
- Planting
- Post Planting Management
- Fertilization
So You’ve Decided to Plant!

• Starting from Scratch
  – Eliminate Competition
    • Selective Herbicides
      – Useful for Johnson Grass, Bahia Grass, and Forbs
      – Useful if some Natives are already present
      – Outrider, Plateau, Cimmaron Plus, Escort XP etc.
    • General Herbicides
      – Useful for Bermuda Grass
      – Useful if Limited Desirable Species are Present
      – Round-Up (Glyphosate), Arsenal/Chopper (Imazapyr)
  • No-Till or Prepared Ground
    – Ease of Planting
    – Moisture Retention
    – Equipment Availability
Collecting/Purchasing Seed

• Collect Yourself
  – Local Remnants
  – Roadsides
  – Learn Plants
  – Greater Diversity
  – Processing/Drying is Time Consuming
  – Trial and Error

• Seed Dealers
  – Less Labor Intensive
  – Seed Tested for Viability
  – Greater Diversity = Greater Cost
Planting Details

• Seed Depth
  – Most species ¼ inch or less
  – Eastern Gamma Grass 1 inch
  – Better too Shallow than too Deep

• Seed Rate
  – Want to Be Accurate
  – Forage
    • Drill 7-10 lbs PLS Grass, Broadcast 8-14 lbs PLS Grass; a few palatable forbs, sometimes
  – Wildlife
    • Drill 3-7 lbs PLS Grass/0.5-2 lbs PLS Forbs, Broadcast 3-8 lbs PLS Grass, 1-10 lbs PLS Forbs

• Specialized Equipment
  – No Till Into Dead Sod
    • No Till Drill w/ Fluffy Seed Box- Truax
  – Prepared Ground
    • Spreader w/ Agitator- FSP Equipment
    • Brillion Seeder w/cultipacker-John Deere or Great Plains
    • Various Other Techniques Ensuring Seed to Soil Contact
Post Planting Management

• “1\textsuperscript{st} Year it Sleeps, 2\textsuperscript{nd} Year it Creeps, 3\textsuperscript{rd} Year it Leaps”
  – Patience if Growing Conditions are Less than Ideal

• Forage Production
  – Grass Heavy Mix
    • Broad Leaf Herbicide
    • Mid-Summer Shredding
    • Maybe Nothing

• Wildlife Production
  – Mixture of Grasses and Forbs
    • Selective Herbicide to Control Exotic Grasses
    • Mid-Summer Shredding
    • Maybe Nothing
Fertilization

• Native Forages
  – Adapted to Nitrogen Poor Environments
  – Not Recommended 1\textsuperscript{st} Year
    • Encourages Competition from Annual Weeds
  – Necessary if Haying
    • Haying Mines Nutrients
    • Must be Replaced for Long-Term Viability

Table 1. Effect of fertilizer rate on yield and profitability ranking of native grass at two Oklahoma locations (two-year average 2008-09)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Yield (lbs dry matter forage per acre)</th>
<th>Profitability Ranking</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>St. Louis, Okla.</td>
<td>Ardmore, Okla.</td>
</tr>
<tr>
<td>0-0-0</td>
<td>2,536 D</td>
<td>1,504 B</td>
</tr>
<tr>
<td>50-0-0</td>
<td>3,674 C</td>
<td>2,213 B</td>
</tr>
<tr>
<td>50-50-0</td>
<td>4,648 AB</td>
<td>3,720 A</td>
</tr>
<tr>
<td>100-0-0</td>
<td>4,014 BC</td>
<td>2,161 B</td>
</tr>
<tr>
<td>100-50-0</td>
<td>5,212 A</td>
<td>4,024 A</td>
</tr>
</tbody>
</table>

Yields followed by the same letter are not statistically different at the 5 percent level of probability.
Progression in Photos

• Falls County: Native Grass Planting

• Milam County: Brush Control and Native Grass

• Robertson County: Native Grass Planting

• Houston County: Native Grass Planting
How do we maintain a balance??

- **Management**
  - Disturbance Dependent
    - Fire
    - Grazing
    - Mowing
    - Discing
    - Herbicide Applications
Intensity and Timing

- Rotational Grazing
- Patch-Burn Grazing
- High Intensity/Low Duration Grazing
- Light Stocking Continuous Grazing

Burned and Grazed 2005-2007

2.5 years of Rest and a Fire Later
Figure 2. From Franklin Crider 1955- As grazing pressure increases, root mass decreases. Notice the second plant from the left has about 50% of its top growth removed, and root development is relatively unaffected, but a small increase in grazing pressure leads to a dramatic loss of root development for the 2 plants on the right.
Size Matters

Bigger is Better
- Red-winged blackbirds, dickcissels
  Will use small grassland patches less than 20 acres
- Many other species need 50 acres or more
- Don’t expect Prairie Chickens and Bison on 100 acre prairie

Small Isolated Grasslands: Problems
- Greater likelihood of local extinction
- Support less diverse plant community
- More likely to be isolated from other grasslands
- Management options may be limited
  - Proximity to homes, roads, etc.
  - Preclude use of fire, herbicides, or grazing
- Difficult to break into multiple management units
- Economics of management decisions become higher per unit area
“Grassland Restoration for Upland Birds”

https://www.youtube.com/watch?v=L0giW3z7vYo
“Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it’s the only thing that ever has.”

Margaret Mead