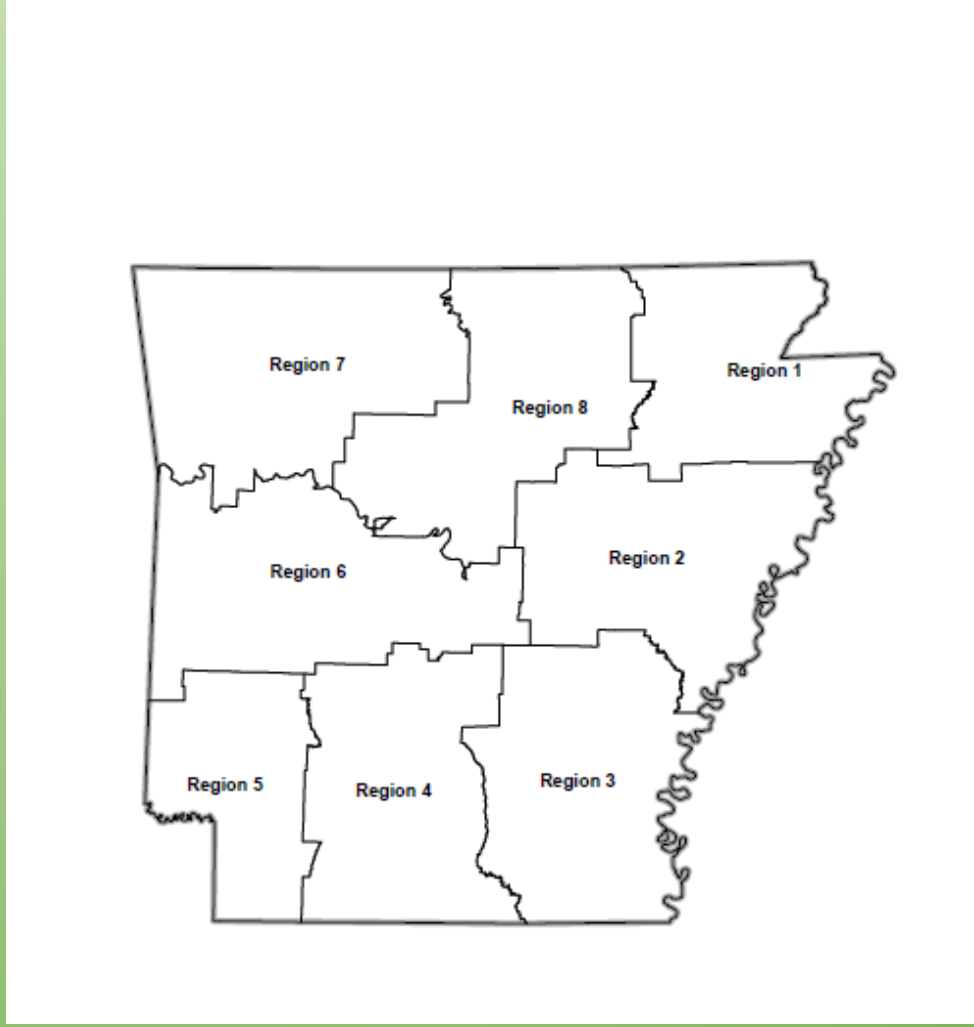
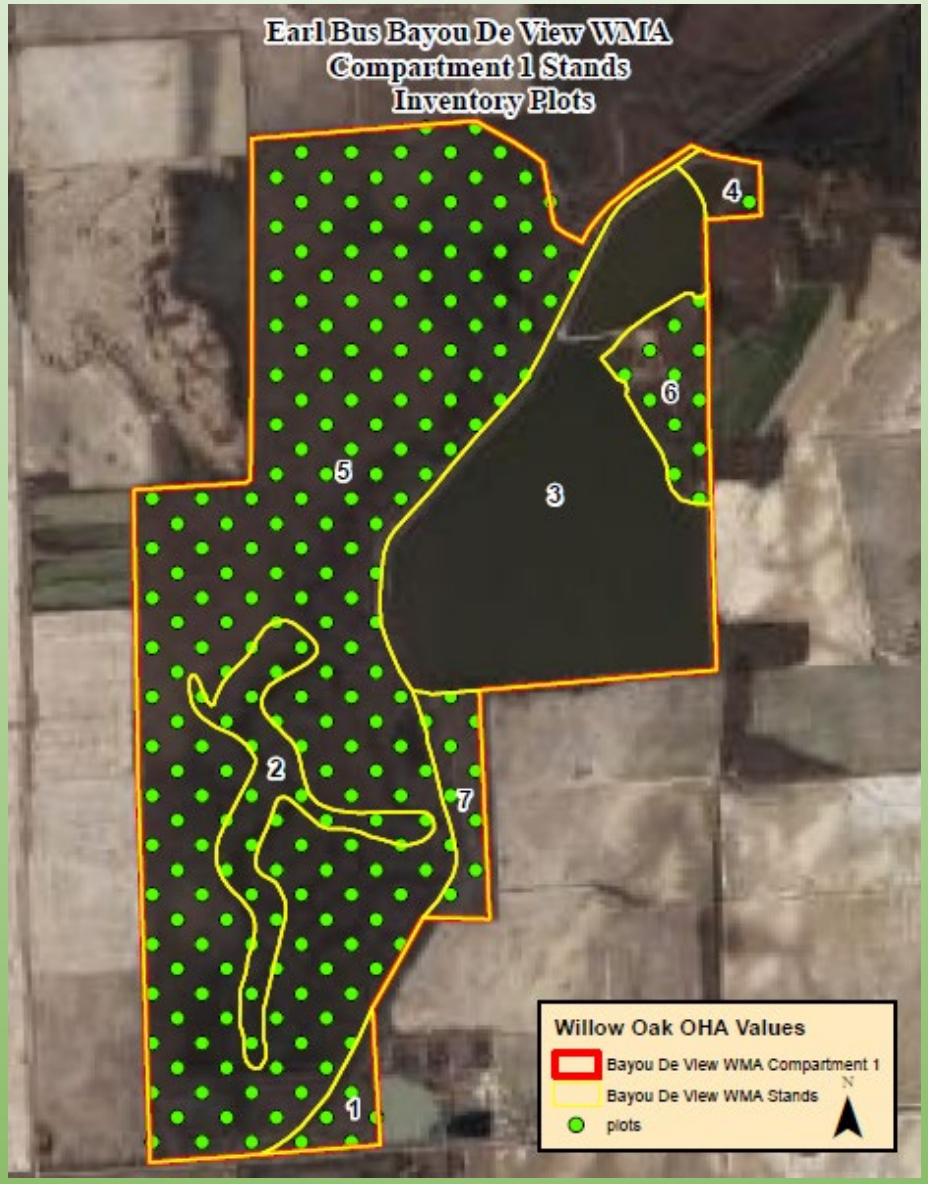
# AGFC
# Habitat Program
# Forest Health Assessment

# AGFC
# Habitat Program Staff

- **Habitat Coordinator**: Rob Willey/TWS Certified Wildlife Biologist
- **Asst. Habitat Coordinator:** Michael Gregory/AR Registered Forester/Region 7
- **Prescribe Fire Manager:** Randy Brents
- **Habitat Biologist:** Anthony Pappas/AR Registered Forester/Candidate for SAF Certified Forester/Region 1
- **Habitat Biologist:** Andrew Green/TWS Associate Wildlife Biologist/Region 2
- **Habitat Biologist:** Brady Bradley/TWS Associate Wildlife Biologist/Region 3
- **Habitat Biologist:** Joshua Harris/ Regions 4/5
- **Habitat Biologist:** Steve Burgess/AR Registered Forester/Regions 6/8
- **Habitat Biologist:** Lorne Green/AR Registered Forester/SAF Certified Forester/Region 8



# Plot Layout


Earl Bus Bayou De View WMA
Compartment 1 Stands
Inventory Plots
1
2
3
4
5
6
7
Willow Oak OHA Values
Bayou De View WMA Compartment 1
Bayou De View WMA Stands
plots
N

# Plot Level Forest Metrics Data Collection

- Plot Level (represents 4 acre vicinity of plot center)
  - Canopy closure
  - Mid-story density
  - Under-story coverage
- Plot Center (variable radius prism cruise)
  - Species
  - Diameter (dbh)
  - Forest product and merchantable height determination
  - Crown Class - where the tree falls within the hierarchy of the forest
    - Dominant
    - Co-Dominant
    - Intermediate
    - Suppressed
  - Tree health
- Plot Center (1/100$^{th}$ acre fixed radius reproduction cruise)
  - Species/number of stems
  - Diameter

# Tree Level Forest Metrics Data Collection

## Tree Stress Calculations

- At the plot center all trees are evaluated and scored based on each of the four stress indices.
  - Tree Condition - measure of tip die back from water stress
  - Epicormic Branching - branches on the bole of the tree below the crown due to water stress
  - Bark Condition – damage indicators including bleeds, splits, stains, conks, sloughing
    - Changed from a factor identification to a Healthy, Light, Moderate, Heavy scale
  - Basal Swell - swelling of the bole
- A formula is then used to establish the accumulative amount of stress each tree is expressing (OHA – Overall Health Assessment).

  ***(Tree Condition*4+Epicormic Branching*2+Bark Condition*3)+Basal Swell***
- Health categories:
  - 0-9 no stress
  - 10-13 slight stress
  - 14-22 moderate stress
  - 23-25 heavy stress
  - 26-29 near death
  - 30 dead
- If Tree Condition or Bark Condition is ≥4 then OHA = 26.
- OHA value places each tree in a category of Healthy, Slight Stress, Moderate Stress, Heavy Stress, or Near Death and is the basis of the following reporting.

# Monitoring

- Same data collection as before but with added forest measurements and collected 3 years post harvest.
  - 1 plot per 8 acre plot grid
    - 1/100$^{th}$ acre red oak regen plot <36”
    - Percent Cover
      - % Grasses/forbs/bare dirt (modified from NBCI to help answer questions for quail and turkey habitat)
    - Cavities per acre
      - This is collected during tree level reporting. Any tree that falls in the plot and has a cavity present, the corresponding large or small check box is checked.

# Goals

- Reduce man hours working up data
- Create an inventory system that would answer as many of the DFC questions as possible.
- Be able to look at the data spatially

# Henry Gray Hurricane Lake GTR Cruise

**Stand Level Info Report**

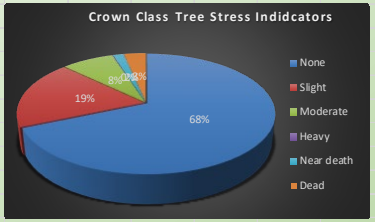
| StandID | Land Class | AWAP | Acres | Stand OHA | Saw BA/AC | Pulp BA/AC | Saw TPA | Pulp TPA | Saw + PW BA | Submerch BA | Submerch TPA | Species 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 54 | | 56 | 12.41 | 61.54 | 52.31 | 18.66 | 68.35 | 113.85 | 9.23 | 238.46 | Nuttall Oak |
| 2 | 54-56 | | 198 | 12.06 | 46.46 | 71.04 | 17.35 | 88.21 | 117.50 | 8.00 | 197.92 | Overcup Oak |
| 3 | 54 | | 210 | 10.60 | 46.33 | 57.35 | 13.39 | 88.50 | 103.67 | 7.48 | 238.78 | Overcup Oak |
| 4 | 54 | | 70 | 10.22 | 58.13 | 32.50 | 18.59 | 60.73 | 90.63 | 6.14 | 168.75 | Overcup Oak |
| 5 | 54 | | 71 | 10.07 | 62.22 | 56.67 | 21.68 | 76.65 | 118.89 | 2.91 | 66.67 | Bitter Pecan |
| 6 | 11 | | 76 | 10.58 | 43.33 | 83.33 | 20.15 | 105.38 | 126.67 | 10.91 | 400.00 | Overcup Oak |
| 7 | 54 | | 25 | 9.50 | 88.33 | 46.67 | 26.47 | 77.97 | 135.00 | 5.45 | 150.00 | Bitter Pecan |
| 8 | 54 | | 80 | 10.54 | 55.56 | 65.56 | 14.75 | 69.55 | 121.11 | 7.39 | 222.22 | Nuttall Oak |
| 9 | 54 | | 45 | 9.41 | 67.78 | 54.44 | 22.10 | 105.73 | 122.22 | 9.70 | 311.11 | Green Ash |
| 10 | 54 | | 177 | 10.14 | 59.35 | 57.61 | 19.72 | 94.04 | 116.96 | 4.74 | 132.61 | Nuttall Oak |
| 11 | 62 | | 34 | 10.22 | 54.29 | 65.71 | 18.16 | 108.69 | 120.00 | 3.74 | 128.57 | Nuttall Oak |
| 12 | 54 | | 140 | 10.67 | 41.52 | 78.18 | 11.66 | 108.63 | 119.70 | 9.59 | 257.58 | Nuttall Oak |
| 13 | 54 | | 457 | 10.58 | 59.00 | 51.75 | 17.77 | 85.63 | 110.75 | 8.94 | 278.75 | Nuttall Oak |
| 14 | 62 | | 39 | 12.76 | 54.55 | 63.64 | 14.05 | 92.91 | 118.18 | 6.74 | 227.27 | Nuttall Oak |
| 15 | 54 | | 18 | 11.98 | 56.00 | 72.00 | 19.73 | 97.24 | 128.00 | 10.91 | 440.00 | Bald Cypress |
| 16 | 54-56 | | 197 | 12.92 | 32.35 | 76.27 | 15.51 | 127.07 | 108.63 | 13.99 | 207.84 | Overcup Oak |
| 17 | 54-56 | | 110 | 13.29 | 78.00 | 70.50 | 31.73 | 77.82 | 148.50 | 11.34 | 150.00 | Bald Cypress |
| 18 | 54 | | 80 | 12.83 | 67.78 | 43.89 | 16.86 | 72.75 | 111.67 | 15.76 | 422.22 | Nuttall Oak |

# Sheffield Nelson Dagmar Monitoring Cruise

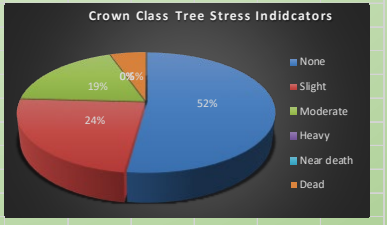
**Stress by Crown Class Report**

| | |
|---|---|
| **Compartment ID:** | |
| **Stand ID:** | 1 |
| **Acres:** | 260.00 |

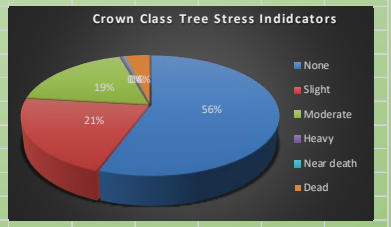
| Stress | Crown class | % OHA Stress by Crown Class |
|---|---|---|
| None | All | 68.52 |
| Slight | All | 18.64 |
| Moderate | All | 7.82 |
| Heavy | All | 0.10 |
| Near death | All | 1.60 |
| Dead | All | 3.32 |



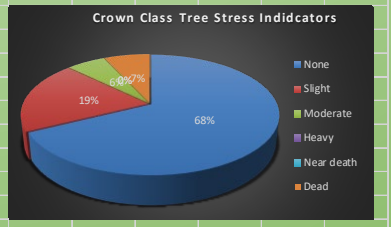

| | | |
|---|---|---|
| None | 1-D | 52.19 |
| Slight | 1-D | 23.67 |
| Moderate | 1-D | 18.76 |
| Heavy | 1-D | 0.00 |
| Near death | 1-D | 0.00 |
| Dead | 1-D | 5.39 |



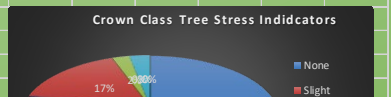

| | | |
|---|---|---|
| None | 2-C | 55.63 |
| Slight | 2-C | 21.23 |
| Moderate | 2-C | 18.68 |
| Heavy | 2-C | 0.48 |
| Near death | 2-C | 0.31 |
| Dead | 2-C | 3.68 |



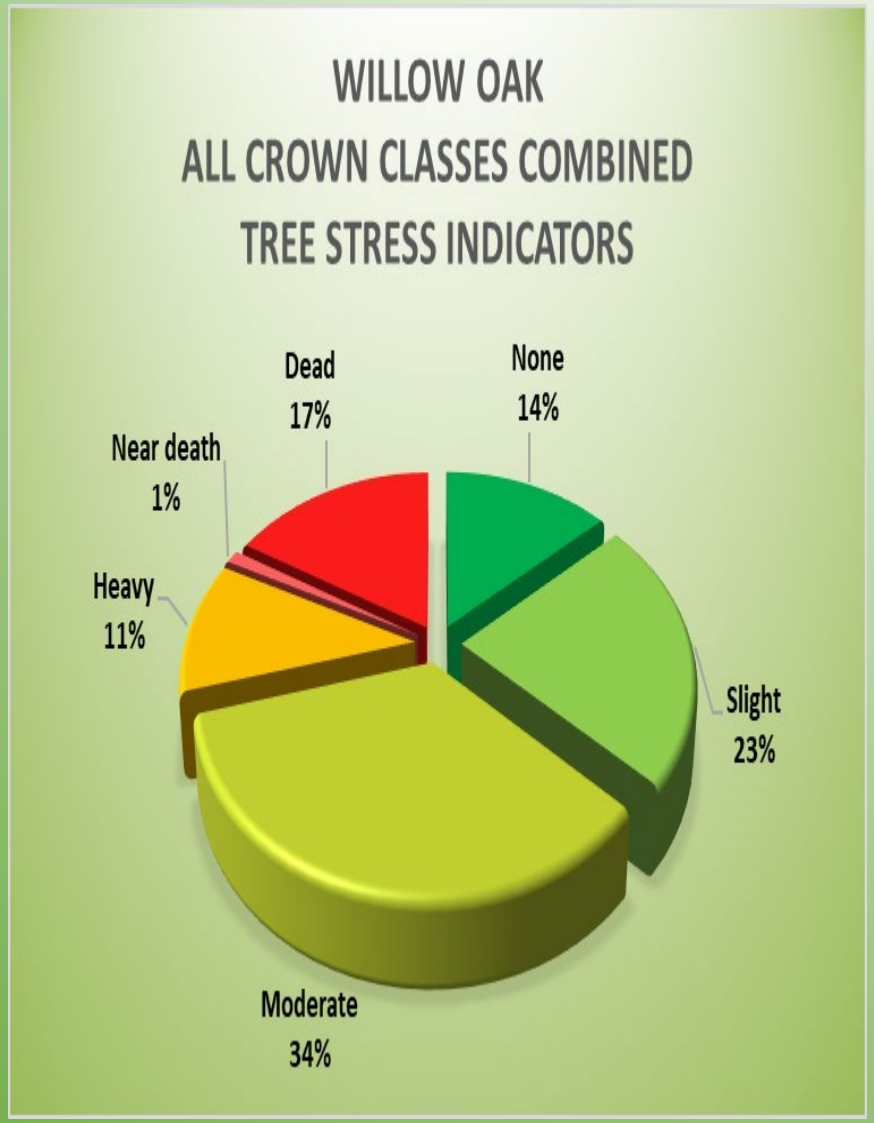

| | | |
|---|---|---|
| None | 3-I | 67.64 |
| Slight | 3-I | 19.59 |
| Moderate | 3-I | 5.85 |
| Heavy | 3-I | 0.00 |
| Near death | 3-I | 0.00 |
| Dead | 3-I | 6.92 |

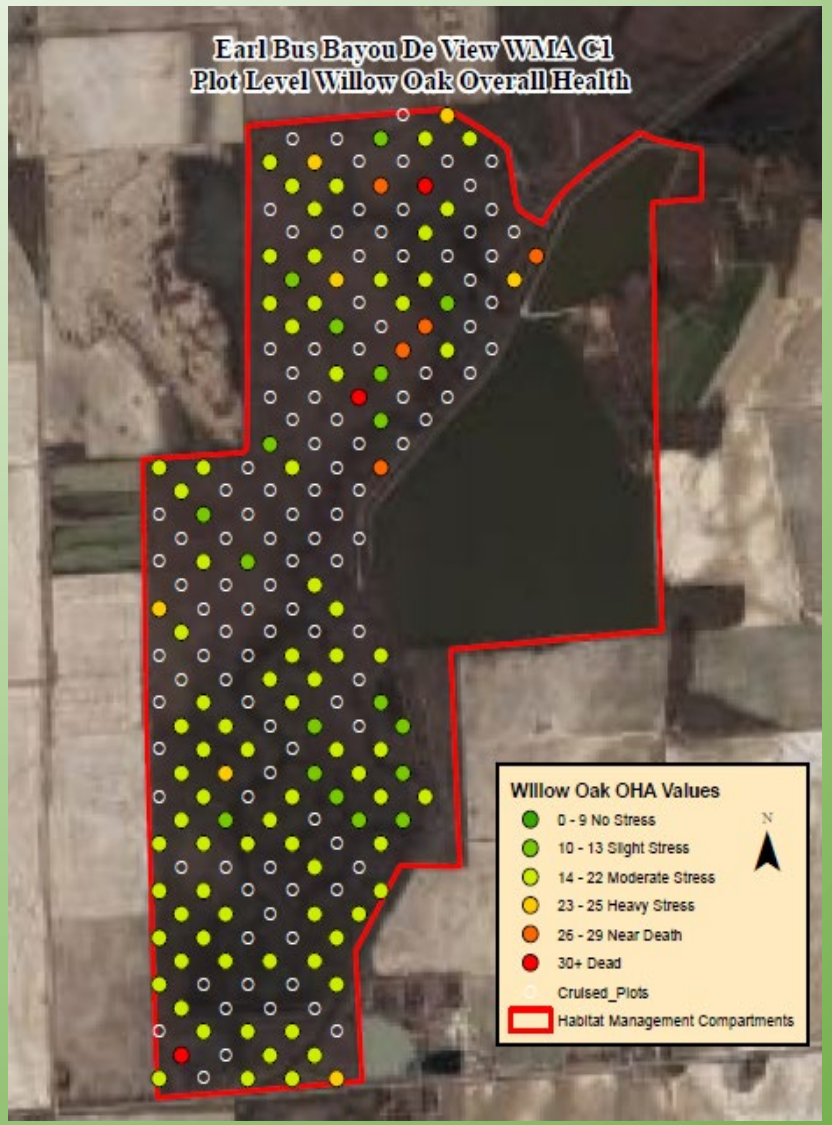



| | | |
|---|---|---|
| None | 4-S | 77.73 |
| Slight | 4-S | 16.62 |
| Moderate | 4-S | 2.56 |
| Heavy | 4-S | 0.00 |



# Bayou De View WMA Compartment 1
# Willow Oak OHA-South Oliver GTR



# Bayou De View WMA Compartment 1
# Index of Willow Oak Density

# Bayou De View WMA Compartment 1
# Index of Red Oak Regeneration Density

# Examples at Sheffield Nelson Dagmar

- 2015 GTR Health data
  - Avg Red Oak OHA = 21
    - 11% No Stress
    - 19% Slight Stress
    - 22% Moderate Stress
    - 39% Heavy Stress
    - 9% Near Death

- 2020 GTR Health data
  (post treatment)
  - Avg Red Oak OHA=13
    - 68% No Stress
    - 19% Slight Stress
    - 8% Moderate Stress
    - 0% Heavy Stress
    - 2% Near Death
    - 3% Dead

# Comparison with DFC's defined by the LMVJV

| Forest Variables | Desired Stand | Current |
|---|---|---|
| | Structure | Conditions |
| | Primary Management Factors | |
| Over story Canopy Cover | 60-70% | 55% |
| Mid story Cover | 25-40% | 45% |
| Basal Area$_2$ | 60-70 ft$_2$/acre with > 25% in older classes | 72 ft$_2$/acre with 27% in older classes |
| | Secondary Management Factors | |
| Dominant Trees | >2/acre | .5/acre |
| Understory Cover | 25-40% | 71% |
| Regeneration | 30-40% of area | 8% (advanced red oak regen) |
| Small Cavities (<10-inch | >4 visible holes/acre | .6/acre |
| diameter) | OR >4 "snag" stems >4 inch dbh | .1/acre |

# Questions?