Noble Land Stewardship: Baseline Sampling and Monitoring Overview

The hallmark of the Noble Land Stewardship (Noble LSP) program is the ecological baseline development and the subsequent on farm measurements defined in the monitoring plan outlining the agricultural and ecological benefits. The Noble LSP will begin in 2018 with twelve ranches in Texas and Oklahoma encompassing approximately 40,000 acres. These "Pilot" ranches are equally distributed across the two states and appropriately represent the Major Land Resource Areas (MLRA's) and production enterprises of the region. Each ranch is georeferenced and stratified utilizing a multivariate landscape stratification methodology to identify soil and plant community sampling sites. Initial baseline assessments will be sampled June-Aug 2018. Subsequent monitoring will follow. Data will be analyzed and stored by Noble.

Noble Land Stewardship Measurable Indicators

1. Soil Sampling Sites will be sampled with a 1.5 inch Giddings soil probe at a depth of 1 meter. Sub samples will vertically stratified at depths of 0-10 cm and 10-30 cm. Soil Samples will be taken in triplicate and sent to 3 laboratories (Ward Laboratories, Servi-Tech Labs, and Noble Soil Biology Lab for DNA Analysis)
    - Soil Organic Carbon- (CO^2e modeled utilizing DayCent or equivalent)
    - % Organic Matter
    - Total Nitrogen
    - Water Extractible Organic Nitrogen and Carbon
    - Standard Inorganic Nitrogen, Phosphorus and Potassium along with micros.
    - CO^2 Respiration
    - Biological Function and Microbial DNA
    - Bulk Density

2. Each stratified location will also be sampled for additional soil health indicators utilizing a MINI-Disk Infiltrometer to test unsaturated hydraulic conductivity and infiltration rates across sites.

3. Vegetation Sampling will be conducted utilizing the aforementioned stratification methodology. However for vegetation sampling, each site will be further stratified by ecological site, where ecological site descriptions are available. Sampling will be collected utilizing the Vegetation GIS Data System (VGS), a software application for recording and managing vegetation and other ecosystem related data. Vegetation sampling components include:
    - Net primary production and forage standing crop
    - Plant community and species composition and frequency
    - % bare ground
    - Plant functional group distribution
    - Shannon diversity index

These sampling methodologies represent a general ecological baseline. They will also be utilized as an integral part of the ranch resource inventory. These data will be used to identify Land Management Concerns (LMC's) which will be addressed within a Land Stewardship Plan for each operation. Noble Research Institute reserves the right to change/update sampling and measurement techniques and methodologies as new technologies arise.