NORTH CAROLINA QUALITY CRITERIA MATRIX

Natural Resource Concern	Description of Concern	State Quality Criteria	Measurement Units	Assessment Tools For Quality Criteria Evaluation
SOIL				
Soil Erosion - Sheet and Rill	Detachment and transport of soil particles caused by rainfall splash and runoff degrade soil quality.	Sheet and rill erosion does not exceed the Soil Loss Tolerance "T".	Tons/Acre/Year – average annual tons of erosion reduced per acre for the field or planning area/unit	• Visual assessment (pedestals, rills) • Erosion-bridge method; erosion meters • Special inventory methods (e.g., Rangeland Health Evaluation Worksheet) • RUSLE2
Soil Erosion - Wind	Detachment and transport of soil particles caused by wind degrade soil quality and/or damage plants.	Wind erosion does not exceed the Soil Loss Tolerance "T" or, for plant damage, does not exceed Crop Damage Tolerances.	Tons/Acre/Year – average annual tons of erosion reduced per acre for the field or planning area/unit	• Visual assessment (pedestals, blow-out areas) • Special inventory methods (e.g., Rangeland Health Evaluation Worksheet) • Erosion prediction tool, i.e., Wind Erosion Equation (WEQ)
Soil Erosion - Ephemeral Gully	Small channels caused by surface water runoff degrade soil quality and tend to increase in size. On cropland, they can be obscured by heavy tillage.	Surface water runoff is controlled sufficiently to stabilize the small channels and prevent reoccurrence of new channels.	Tons/Year – average annual tons of erosion reduced for the field or planning area/unit	• Visual assessment • Volume calculation
Soil Erosion - Classic Gully	Deep, permanent channels caused by the convergence of surface runoff degrade soil quality. They enlarge progressively by headcutting and lateral widening.	Surface water runoff is controlled sufficiently to stop progression of headcutting and widening.	Tons/Year – average annual tons of erosion reduced for the field or planning area/unit	• Visual assessment • Volume calculation • Aerial photo trend analysis
Soil Erosion - Streambank	Accelerated loss of streambank soils restricts land and water use and management.	Accelerated streambank soil loss does not exceed a level commensurate with upstream land use and normal geomorphological processes on site.	Tons/Year – average annual tons of erosion reduced for the field or planning area/unit	• Visual assessment, e.g., Stream Visual Assessment Protocol, Proper Functioning Condition (PFC) • Aerial photo trend analysis • Engineering Field Handbook, Chapter 16

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SOIL				
Soil Erosion - Shoreline	Soil is eroded along shorelines by wind and wave action, causing physical damage to vegetation, limiting land use, or creating a safety hazard.	Shoreline erosion is stabilized to a level that does not restrict the use or management of adjacent land, water or structures.	Tons/Year – average annual tons of erosion reduced for the field or planning area/unit	• Visual assessment • Aerial photo trend analysis • Volume calculation • Erosion transects/pins
Soil Erosion – Irrigation-Induced	Improper irrigation water application and equipment operation are causing soil erosion that degrades soil quality.	Irrigation-induced erosion does not exceed the Soil Loss Tolerance "T". Application rates will not result in runoff.	Tons/Acre/Year – average annual tons of erosion reduced per acre for the field or planning area/unit	• SRFR (Surface Irrigation Model) • CPED (Center Pivot Evaluation and Design) • NRCS National and State Irrigation Guides
Soil Erosion - Mass Movement	Soil slippage, landslides, or slope failure, normally on hillsides, result in large volumes of soil movement	Shallow slumps, slides, or slips are prevented or minimized so that the mass movement of soil material does not exceed naturally occurring rates	Tons/Year – average annual tons of erosion reduced for the field or planning area/unit	• Visual assessment • Aerial photo trend analysis • Volume calculation
Soil Erosion – Road, Road Sides and Construction Sites	Soil loss occurs on areas left unprotected during or after road building and/or construction activities.	Sites are adequately protected from soil loss during and after road building and construction activities. Site is stabilized according to NC Erosion & Sediment Control Field Manual.	Tons/Year – average annual tons of erosion reduced for the field or planning area/unit	• Visual assessment • Volume Calculation • Water and wind erosion prediction tools (RUSLE2 and WEQ) • NC Erosion & Sediment Control Field Manual
Soil Condition - Organic Matter Depletion	Soil organic matter has or will diminish to a level that degrades soil quality.	Soil Conditioning Index is positive.	Soil Conditioning Index improvement – positive improvement in index for the field or planning area/unit	• Soil Conditioning Index • Soil Quality Kit • Soil testing and analysis
Soil Condition - Compaction	Compressed soil particles and aggregates caused by mechanical compaction adversely affect plant-soil-moisture relationships.	Mechanically compacted soils are renovated sufficiently to restore plant root growth and/or water movement. Soil surface managed to minimize crusting.	Non Measurable	• Assessment of plant root systems • Bulk density test-Soil Quality Kit • Dial penetrometer • Wire flag • Visual assessment

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SOIL				
Soil Condition - Subsidence	Loss of volume and depth of organic soils due to oxidation caused by above normal microbial activity resulting from excessive drainage or extended drought.	The timing and regime of soil moisture is managed to attain acceptable subsidence rates.	Non Measurable	• Visual assessment • Inventory of volume and depth • Soil probes and witness poles
Soil Condition - Contaminants - Salts and Other Chemicals	Inorganic chemical elements and compounds such as salts, selenium, boron, and heavy metals restrict the desired use of the soil or exceed the soil buffering capacity	Salinity levels cause less than a 10% decrease in plant yield. Other contaminants do not exceed plant tolerances or are below toxic levels for plants or animals. Follow state guidelines for heavy metals & other contaminants.	Electroconductivity (EC) – average reduction in EC for the field or planning area/unit	• Soil test • Soil Quality Kit- EC meter • Farm*A*Syst assessment • Yield Records • Visual Assessment
Soil Condition - Contaminants - Animal Waste and Other Organics	Nutrient levels from applied animal waste and other organics restrict desired use of the land.	Nutrient application levels do not exceed soil storage/plant uptake capacities based on soil test recommendations and risk analysis results. Meets 590 standard.	Copper Index Zinc Index	• Soil test • Phosphorus Index • Plant tissue test • Application records • Yield records/history • PLAT • RUSLE 1.04
Soil Condition – Contaminants - Commercial Fertilizer	Over application of nutrients degrades plant health and vigor, or exceeds the soil capacity to retain nutrients.	Soil nutrient levels do not exceed crop needs based on realistic yield goals and appropriate pH levels are maintained. Meets 590 standard.	Non Measurable	• Soil Test • Phosphorus Index • PLAT • Soil Quality Kit-pH meter
Soil Condition - Contaminants - Residual Pesticides	Residual pesticides in the soil have an adverse effect on non-target plants and animals.	Pesticides are applied, stored, handled, and disposed of so that residues in the soil do not adversely affect non-target plants and animals.	Non Measurable	• Visual assessment • WIN-PST • NAPRA • Specialized soil test • Plant and animal tissue test

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SOIL				
Soil Condition - Damage from Soil Deposition	Sediment deposition damages or restricts land use/management or adversely affects ecological processes.	Sediment deposition is sufficiently reduced to maintain desired land use/management and ecological processes.	Acres/Year – average annual acres of sediment deposition reduced for the field or planning area/unit	• Visual assessment • Volume calculation • Current water and wind erosion prediction tools (RUSLE2 and WEQ) coupled with sediment delivery ratios • Plant and animal community assessment

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Natural Resource Concern	**Description of Concern**	**State Quality Criteria**	**Measurement Units**	**Assessment Tools for Quality Criteria Evaluation**
WATER				
Water Quantity - Excessive Seepage	Subsurface water oozing to the surface restricts land use and management.	Subsurface water is managed to limit periods of saturation that are unfavorable to the present or intended land use. Management complies with wetland policies.	Acres/Year – average annual acres of seep reduced for the field or planning area/unit	• Visual Assessment (physical presence of water, prevalence of hydrophytic vegetation, etc.) • Client interview • Area measurements
Water Quantity - Excessive Runoff, Flooding, or Ponding	The land becomes inundated restricting land use and management.	Excess water amounts and/or rates of flow are controlled consistent with desired present or intended land use goals and wetland policies.	Non Measurable	• Visual assessment • Client interview • Stream Visual Assessment Protocol • National Engineering Handbook (EFH – chapter 2 and 3) • Hydrologic models, e.g. HECRAS,TR-20,TR-55
Water Quantity - Excessive Subsurface Water	Water saturates upper soil layers restricting land use and management.	Subsurface water is managed to limit periods of saturation compatible with the present or intended land use and wetland policies.	Non Measurable	• Visual assessment of soil cores and coring holes • Plant quality and quantity measurements • National Engineering Handbook, Part 650 (EFH-Chapter 14)
Water Quantity - Inadequate Outlets	Natural or constructed outlets too small to remove excess water in a timely manner.	Outlets are designed, installed, upgraded or maintained to adequately convey water for present or intended uses, and complies with wetland policies.	Non Measurable	• Visual assessment/engineering survey • Client interview • National Engineering Handbook, part 650 (EFH – Chapters 2,3,7) • Hydrologic models, e.g. HECRAS, TR-20, TR-55
Water Quantity - Inefficient Water Use on Irrigated Land	Limited water supplies are not optimally utilized.	Land and water management is planned and coordinated to provide optimal use of natural and applied moisture. Irrigation application rate should not result in runoff.	Acre-inches/ Acre/Year – average annual acre-inches of water per acre used more beneficially for the field or planning area/unit	• Visual assessment • National Engineering Handbook, Part 652, Irrigation Guide • Crop quality and quantity measurements • Farm Irrigation Rating Method (FIRM) • RUSLE 2.0

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WATER				
Water Quantity - Inefficient Water Use on Non-irrigated Land	Natural moisture is not optimally utilized.	Management provides optimum use of natural moisture for the present or intended land use. Soil loss meets or exceeds soil loss tolerance (T).	Acre-Inches/ Acre/Year – average annual acre-inches of water per acre used more beneficially for the field or planning area/unit	• Visual assessment • Plant or animal quality and quantity measurements • RUSLE 2.0
Water Quantity - Reduced Capacity of Conveyances by Sediment Deposition	Sediment deposits in ditches, canals, culverts, and other water conveyances reduce the desired flow capacity.	Conveyance structures are upgraded or maintained to adequately convey water for present or intended uses.	Cubic yards – volume of sediment in cubic yards removed to maintain water conveyances for the field or planning area/unit	• Visual assessment • Client interview • National Engineering Handbook, Part 650 (EFH – Chapters 2,3,70 • Hydrologic models, e.g., HECRAS, TR-20, TR-55
Water Quantity - Reduced Storage of Water Bodies by Sediment Accumulation	Sediment deposits in water bodies reduce the desired volume capacity.	Water bodies and contributing source areas are treated to allow sufficient water storage for present and intended uses.	Acre-Inches/Year – average annual reduction in acre-inches in sediment deposition within water bodies for the field or planning area/unit	• Visual assessment • Depth and area measurements • National Engineering Handbook, Part 650 (EFH – Chapters 2,3,7,11)
Water Quantity - Aquifer Overdraft	Water withdrawals exceed recharge rates.	Land and water management are coordinated to conserve aquifer water levels. Irrigation application should not result in runoff. To ensure infiltration is optimized, soil loss meets or exceeds soil loss tolerance (T).	Non Measurable	• Water level measurements • Stream Visual Assessment Protocol • RUSLE 2.0 • Visual observation

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WATER				
Water Quantity – Insufficient Flows in Water Courses	Water flows are not consistently available in sufficient quantities to support ecological processes and land use and management.	Authorized uses and management of water are coordinated to minimize the impacts on water course flows. Irrigation application should not result in runoff. To ensure infiltration is optimized, soil loss meets or exceeds soil loss tolerance (T).	Non Measurable	• Visual assessment • Water flow records • Gauge Station data • Consumptive use/allocation water rights • Habitat Evaluation Guides • National Biology Handbook • RUSLE 2.0
Water Quality - Harmful Levels of Pesticides in Groundwater	Residues resulting from the use of pest control chemicals degrade groundwater quality.	Pesticides are applied, stored, handled, disposed of, and managed so that ground-water uses are not adversely affected. Meets 595 standard.	Non Measurable	• WIN-PST (Windows Pesticide Screening Tool – USDA/NRCS) • NAPRA (National Agricultural Pesticide Risk Analysis – USDA/NRCS) • Vadose zone and groundwater chemical sampling and assay
Water Quality - Excessive Nutrients and Organics in Groundwater	Pollution from natural or human induced nutrients such as N, P, and organics (including animal and other wastes) degrades groundwater quality.	Nutrients and organics are stored, handled, disposed of, and applied such that ground-water uses are not adversely affected. Meets 590 standard.	Non Measurable	• National Engineering Handbook, Part 651, Ag. Waste Mgt. Field Handbook • Nitrate Leaching Index • PLAT • Leaching Index for soluble nutrients • Phosphorus Leaching Index • Farm*A*Syst • Vadose zone and groundwater chemical/particle sampling and assay
Water Quality - Harmful Levels of Heavy Metals in Groundwater	Natural or human induced metal pollutants present in toxic amounts degrade groundwater quality.	Materials containing heavy metals are stored, handled, disposed of, applied, and managed such that groundwater uses are not adversely affected.	Non Measurable	• Vadose zone and groundwater chemical sampling and assay • Farm*A*Syst

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WATER				
Water Quality - Harmful Levels of Pathogens in Groundwater	Kinds and numbers of viruses, protozoa, and bacteria are present at a level that degrades groundwater quality.	Materials that harbor pathogens are stored, handled, disposed of, applied, and managed such that groundwater uses are not adversely affected.	Non Measurable	• Vadose zone and groundwater chemical sampling and assay
Water Quality - Harmful Levels of Petroleum in Groundwater	Fuel, oil, gasoline and other hydrocarbons present in toxic amounts degrade groundwater quality.	Petroleum products are used, stored, handled, disposed of, and managed such that groundwater uses are not adversely affected.	Non Measurable	• Vadose zone and groundwater chemical sampling and assay
Water Quality - Harmful Levels of Pesticides in Surface Water	Pest control chemicals present in toxic amounts degrade surface water quality.	Pesticides are applied, stored, handled, disposed of, and managed such that surface water uses are not adversely affected. Meets 595 standard.	Non Measurable	• WIN-PST (Windows Pesticide Screening Tool – USDA/NRCS) • NAPRA (National Agricultural Pesticide Risk Analysis – USDA/NRCS) • Surface water chemical sampling assay
Water Quality - Excessive Nutrients and Organics in Surface Water	Pollution from natural or human induced nutrients such as N, P, and organics (Including animal and other wastes) degrades surface water quality.	Nutrients and organics are stored, handled, disposed of, and managed such that surface water uses are not adversely affected. Meets 590 standard.	Non Measurable	• SVAP (Stream Visual Assessment Protocol – USDA/NRCS) • P index • PLAT • National Engineering Handbook, Part 651, Ag. Waste Mgt. Field Handbook • Surface water chemical/particle sampling and assay

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WATER				
Water Quality - Excessive Suspended Sediment and Turbidity in Surface Water	Pollution from mineral or organic particles degrades surface water quality.	Movement of mineral and organic particles is managed such that surface water uses are not adversely affected. Meets 590, 595, and 633 standards.	Tons/Year – average annual tons of sediment/ materials kept from entering surface water for the field or planning area/unit.	• Visual assessment • Client interview • SVAP (Stream Visual Assessment Protocol – USDA/NRCS) • Water Quality Indicators Guide – Surface Waters, Field Sheets IA and 1B (Terrene Institute ©1996) • Surface water chemical/particle sampling and assay • PLAT • WIN-PST • RUSLE 2.0
Water Quality - Harmful Levels of Heavy Metals in Surface Water	Natural or human induced metal pollutants are present in toxic amounts that degrade surface water quality.	Materials containing heavy metals are stored, handled, disposed of, applied, and managed such that surface water uses are not adversely affected.	Non Measurable	• Surface water chemical sampling and assay
Water Quality - Harmful Temperatures of Surface Water	Undesired thermal conditions degrade surface water quality.	Use and management of land and water are coordinated to minimize impacts on surface water temperatures.	Non Measurable	• SVAP (Stream Visual Assessment Protocol – USDA/NRCS) – canopy cover • HSI model for target species (Habitat Suitability Index – USF&WS) • Surface water temperature sampling and assay
Water Quality - Harmful Levels of Pathogens in Surface Water	Kinds and numbers of viruses, protozoa, and bacteria are present at a level that degrades surface water quality.	Materials that harbor pathogens are stored, handled, disposed of, applied, and managed such that surface water uses are not adversely affected.	Non Measurable	• Surface water pathogen sampling and assay
Water Quality - Harmful Levels of Petroleum in Surface Water	Fuel, oil, gasoline and other hydrocarbons present in toxic amounts degrade surface water quality.	Petroleum products are used, stored, handled, and disposed of such that groundwater uses are not adversely affected.	Non Measurable	• Surface water chemical sampling and assay

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AIR				
Air Quality - Particulate Matter Less than 10 micrometers in Diameter (PM 10)	Particulate matter less than 10 micrometers in diameter are suspended in the air causing potential health hazards to humans and animals.	Land use and management operations comply with PM 10 requirements of the State or Federal Implementation Plan and all applicable Federal, Tribal, State, and Local regulations	Pounds/Year – average annual pounds of reduced PM10 emissions for the field or planning area/unit	• Specific guidelines contained in State or Federal Implementation Plan; or other approved NRCS tool. • Air quality analysis
Air Quality - Particulate Matter Less than 2.5 micrometers in Diameter (PM 2.5)	Particulate matter less than 2.5 micrometers in diameter are suspended in the air causing potential health hazards to humans and animals.	Land use and management operations comply with PM 2.5 requirements of the State or Federal Implementation Plan and all applicable Federal, Tribal, State, and Local regulations.	Non Measurable	• Specific guidelines contained in State or Federal Implementation Plan; or other approved NRCS tools
Air Quality - Excessive Ozone	High concentrations of ozone (O_3) are adversely affecting human health, reducing plant yields, and leading to the creation of smog.	Land use and management operations comply with requirements of the State or Federal Implementation Plan and all applicable Federal, Tribal, State, and Local regulations.	Non Measurable	• Specific guidelines contained in State or Federal Implementation Plan; or other approved NRCS tools
Air Quality - Excessive Greenhouse Gas – CO_2 (carbon dioxide)	Increased CO_2 concentrations are adversely affecting ecosystem processes.	Land use and management operations comply with requirements of the State or Federal Implementation Plan and all applicable Federal, Tribal, State, and Local regulations.	Non Measurable	• Model simulations (Century, EPIC, CQUESTER); sampling for soil carbon or International Panel on Climate Change methodology; or other NRCS approved tools
Air Quality - Excessive Greenhouse Gas – N_2O (nitrous oxide)	Increased N_2O concentrations are adversely affecting ecosystem processes.	Land use and management operations comply with requirements of the State or Federal Implementation Plan and all applicable Federal, Tribal, State, and Local regulations.	Non Measurable	• Model simulations (NLEAP or DayCENT), or IPCC methodology; or other NRCS approved tools
Air Quality - Excessive Greenhouse Gas – CH4 (methane)	Increased CH4 concentrations are adversely affecting ecosystem processes. .	Land use and management operations comply with requirements of the State or Federal Implementation Plan and all applicable Federal, Tribal, State, and Local regulations.	Non Measurable	• IPCC methodology; or other NRCS approved tools

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AIR				
Air Quality - Ammonia (NH3)	Animal waste and inorganic commercial fertilizers emit ammonia that contributes to odor, is a PM2.5 precursor, and contributes to acid rain.	Land use and management operations comply with requirements of all applicable Federal, Tribal, State, and Local regulations.	Pounds/Year – average annual pounds of reduced NH_3 emissions for the field or planning area/unit	• Approved NRCS technical guidance and tools
Air Quality - Chemical Drift	Materials applied for pest control drift downwind and contaminate/injure non-targeted fields, crops, soils, water, animals and humans.	Land use and management operations comply with all applicable Federal, Tribal, State, and Local regulations, and applicable label directions.	Non Measurable	• Approved NRCS technical guidance and tools • Visual observation
Air Quality - Objectionable Odors	Land use and management operations produce offensive smells.	Odor-producing facilities and activities are planned and sited to mitigate potential nuisance impacts and meets all applicable Tribal, State, and Local regulations.	Non Measurable	• Olfactory assessment • Agricultural Waste Management Field Handbook (AWMFH) • NRCS approved tools
Air Quality - Reduced Visibility	Sight distance is impaired due to airborne particles causing unsafe conditions and impeded viewing of natural vistas especially in Class I viewing areas (primarily national parks and monuments).	Land use and management operations comply with all applicable Federal, Tribal, State, and Local regulations including state and local smoke and/or burn management plans.	Non Measurable	• Visual assessment • Regional air partnership recommendations and/or state guidance for smoke management
Air Quality - Undesirable Air Movement	Wind velocities (too little or too much) reduce animal or plant productivity, impact human comfort and increase energy consumption.	Devices and practices are sited and planned to mitigate excess or deficient air movement.	Non Measurable	• Visual assessment • Anemometers • Approved NRCS technical guidance and tools
Air Quality - Adverse Air Temperature	Air temperatures (too cold or too hot) reduce animal or plant productivity, impact human comfort and increase energy consumption.	Devices and practices are planned and sited to mitigate temperature extremes.	Non Measurable	• Chill factor indices; heat indices • Air temperature assessment

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PLANTS				
Plants Not Adapted or Suited	Plants are not adapted and/or suited to site conditions or client objectives.	Selected plants are adapted to the soil and climatic conditions or the site is modified to make it suitable for the desired plants. Plants are sustainable, do not negatively impact other resources, and meet client objectives. For specific land uses, additional criteria apply: ***Cropland:*** A healthy stand with vigorous growth. Yields 75% of client expectations. **Rangeland:** Plants on or planned for the site are listed in applicable Ecological Site Descriptions (ESD) ***Pastureland:*** Plants on or planned for the site have a site adaptation score greater than 3 using Pasture Condition Scoring (PCS)and are listed in applicable Forage Suitability Groups (FSG)reports. ***Hayland:*** Plants on or planned for the site are listed in applicable Forage Suitability Groups (FSG) reports. ***Forestland/Agroforest:*** Plants on or planned for the site are listed in Ecological Site Descriptions (ESD) No additional criteria for other land uses in NC.	.Non Measurable	• On-site investigation and records • Forage Suitability Groups (FSG) • Pasture Condition Scoring (PCS) • Client interview • PLANTS database • VEGSPEC • Seeding and Planting Guide • Plant hardiness zone map • Soil pH, drainage class, sodium adsorption ratio (SAR) and electrical conductivity (EC) suitability ranges. • Soil interpretations – Section IV • Local agronomy guides • University Extension Service information • Soil survey manuscripts • Ecological Site Descriptions (ESD) • Conservation Tree and Shrub Groups (CTSG) • Silvics of North America Trees • NRCS Discipline Manuals/handbooks • C-GRAZE • NC RYE database

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PLANTS				
Plant – Condition – Productivity, Health and Vigor	Plants do not produce the yields, quality, and soil cover to meet client objectives.	Selected plants are adapted to the soil and climatic conditions or the site is modified to make it suitable for the desired plants. Plants are sustainable, do not negatively impact other resources, and meet client objectives. For specific land uses, additional criteria apply: ***Cropland:*** A healthy stand with vigorous growth. Yields 75% of client expectations. **Rangeland:** Plants on or planned for the site are listed in applicable Ecological Site Descriptions (ESD) ***Pastureland:*** Plants on or planned for the site have a site adaptation score greater than 3 using Pasture Condition Scoring (PCS)and are listed in applicable Forage Suitability Groups (FSG)reports ***Hayland:*** Plants on or planned for the site are listed in applicable Forage Suitability Groups (FSG) reports. ***Forestland/Agroforest:*** Plants on or planned for the site are listed in Ecological Site Descriptions (ESD) No additional criteria for other land uses in North Carolina. In NC, Realistic Yield Expectations database substitutes for Forage Suitability Groups.	Non Measurable	• Local agronomy guides • Client interview • Plant tissue and harvest analysis • Crop scouting • NRCS discipline manuals/handbooks • National Range and Pasture Handbook • Ecological Site Descriptions • Rangeland Similarity Index Worksheet • Rising plate meter • Forage Suitability Groups (FSG) • Electronic probe calibrated for the forage mixture, or a clip and weigh sampling procedure. • Plot sampling of understory vegetation • Soil survey reports • Soil Testing • Crop/soil yield comparison in the vicinity • Pasture Condition Scoring • Keys for disease and insect symptoms • Keys for nutrient deficiencies, toxicities, and other conditions • Rangeland Health Assessment • Stocking rate of desired species • Plot sampling of understory vegetation • Stocking measurement for the tree stands • Conservation Tree and Shrub Groups (CTSG) • C-GRAZE • NC RYE database

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PLANTS				
Plant Condition - Threatened or Endangered Plant Species	Plant populations and /or habitat quantity and quality have reached a level that one or more plant species are in danger of or threatened with extinction.	Threatened and endangered plant species and/or habitats they occupy are managed to avoid actions that would reduce their current population, health, or sustainability.	Non Measurable	• Client interviews • Inventory site • General Manual, 190, Part 410 • US Fish and Wildlife Service county endangered species lists • Federal and state endangered species rules and regulations • Consultation with appropriate federal, state, and local agencies/groups • PLANTS Website • NC Natural Heritage Element Occurrence Database
Plant Condition - Noxious and Invasive Plants	The site has noxious or invasive plants present.	The site is managed to control noxious and invasive plants and to minimize their spread.	Non Measurable	• Client interviews • Inventory site • Consult weed management associations • Consultation with appropriate federal, state, and local agencies/groups • State or local noxious weed list • PLANTS Website
Plant Condition - Forage Quality and Palatability	Plants do not have adequate nutritive value or palatability for the intended use	Forage plants are managed to produce the desired nutritive value and palatability for the intended use.	Non Measurable	• NIRS Forage Quality Analysis (NUTBAL) • Plant tissue analysis • C-GRAZE
Plant Condition – Wildfire Hazard	The kinds and amounts of fuel loadings (plant biomass) pose risks to human safety, structures, and resources should wildfire occur.	Fuel loadings are reduced and/or isolated to meet client needs in minimizing the risk and incidence of wildfire.	Non Measurable	• Visual assessment protocols • Site and flammable biomass inventories • Aerial photo analysis • USFS Wildland Fuel Models

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ANIMALS				
Fish and Wildlife - Inadequate Food	Quantity and quality of food is unavailable to meet the life history requirements of the species or guild of species of concern	Food availability meets the life history requirements of the species or guild of species of concern.	Non Measurable; based on habitat evaluation guide	• Visual assessment • Inventory of food species • Aerial photo analysis • State Adapted Wildlife Habitat Evaluation Guide • National Biology Handbook • NCWHSI
Fish and Wildlife – Inadequate Cover/Shelter	Cover/shelter for the species of concern is unavailable or inadequate. For aquatic species, this includes lack of hiding, thermal, and/or refuge cover	The ecosystem or habit types support the necessary plant species in the kinds, amounts, and physical structure; and the connectivity of fish and wildlife cover is adequate to support, over time, the species of concern.	Non Measurable; based on habitat evaluation guide	• Visual assessment • Inventory of cover/shelter • Aerial photo analysis • State Adapted Wildlife Habitat Evaluation Guide • National Biology Handbook • NCWHSI
Fish and Wildlife – Inadequate Water	The quantity and quality of water is unacceptable for the species of concern	The quantity and quality of water meets the life history requirements of the species of concern.	Non Measurable; based on habitat evaluation guide	• Surface water dissolved oxygen sampling and assay • Stream Visual Assessment Protocol • Habitat Suitability Index - model for target species • Inventory of water supplies • Aerial photo analysis • State Adapted Wildlife Habitat Evaluation Guide • National Biology Handbook • NCWHSI
Fish and Wildlife – Inadequate Space	Lack of area and fragmentation of areas disrupt life history requirements of the species of concern	Adequate area and connectivity of areas meet life history requirements of the species of concern. (Examples: staging areas for rest and feeding, lekking areas for breeding, migratory movement corridors)	Non Measurable; based on habitat evaluation guide	• Visual assessment • Stream Visual Assessment Protocol • Inventory of space/areas • Aerial photo analysis • State Adapted Wildlife Habitat Evaluation Guide • National Biology Handbook • NCWHSI

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ANIMALS				
Fish and Wildlife - Plant Community Fragmentation	Natural plant communities have insufficient structure, extent, and connectivity to provide ecological functions and/or achieve management objectives.	Fish and wildlife habitat functions of connected plant communities are maintained sufficiently to support the species or guild of species of concern	Non Measurable; based on habitat evaluation guide	• Stream Visual Assessment Protocol • Aquatic and terrestrial habitat evaluation procedures • Wildlife Habitat Evaluation Guide (WHEG) • NCWHSI
Fish and Wildlife - Imbalance Among and Within Populations	Populations are not in proportion to available quantities and qualities of food (plants, predator/prey), cover/shelter, water, and space and other life history requirements.	Land and water use and management are consistent with direct population management activities conducted by fish and wildlife agencies.	Non Measurable; based on habitat evaluation guide	• Fish and wildlife agency guidance and protocols • NCWHSI
Fish and Wildlife - Threatened and Endangered Species	Fish and wildlife populations and/or habitat quantity and quality have reached a level that one or more species are in danger of or threatened with extinction.	Threatened and endangered fish and wildlife species and/or habitats they occupy are managed to avoid actions that would reduce their current population, health, or sustainability.	Non Measurable	• Client interviews • Inventory of presence/absence of T&E species • General Manual, 190, Part 410 • US Fish and Wildlife Service county endangered species lists • Fish and wildlife recovery plans • Federal and state endangered species rules and regulations • Consultation with appropriate federal, state, and local agencies/groups • Fish and wildlife agency web sites • NC National Heritage Element Occurrence Database

NORTH CAROLINA QUALITY CRITERIA MATRIX				
Natural Resource Concern	**Description of Concern**	**State Quality Criteria**	**Measurement Units**	**Assessment Tools for Quality Criteria Evaluation**
ANIMALS				
Domestic Animals – Inadequate Quantities and Quality of Feed and Forage	Total feed and forage is insufficient to meet the nutritional and production needs of the kinds and classes of livestock	Feed and forage including supplemental nutritional requirements are provided to meet production goals for the kinds and classes of livestock. Native grazers are factored into the total feed and forage balance computations.	Non Measurable	• Measured inventory • National Range and Pasture Handbook • Grazing Lands Application (GLA) software • Nutritional Balance Program (NUTBAL) • NIRS/Nutritional Balance Profile Program (NUTBAL Pro) • Forage quality laboratory analysis • Other State adapted forage/livestock management software and job sheets • C-GRAZE
Domestic Animals – Inadequate Shelter	Livestock are not protected sufficiently to meet the production goals for the kinds and classes of livestock	Artificial and/or natural shelter is provided to meet production goals for the kinds and classes of livestock.	Non Measurable	• Visual assessment • Inventory of facilities and their capacities • Aerial photo analysis • National Range and Pasture Handbook
Domestic Animals – Inadequate Stock Water	The quantity, quality and distribution of drinking water is insufficient to meet the production goals for the kinds and classes of livestock	Sufficient water of acceptable quality is provided and adequately distributed to meet production goals for the kinds and classes of livestock. To reduce potential for water contamination, watering facilities are constructed or modified to minimize mortality to indigenous wildlife.	Non Measurable	• Visual assessment • Inventory of distribution needs • Aerial photo analysis • National Range and Pasture Handbook
Domestic Animals - Stress and Mortality	Animals exhibit illness or death from disease, parasites, insects, poisonous plants, or other factors	Land and water use and management are consistent with activities conducted to alleviate stress and mortality factors.	Non Measurable	• Animal health/mortality alerts • State and local biosecurity protocols • State and local standards for animal disposal