CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	Nebraska	FIELD OFFICE	Any	DATE	12/27/2011
PRACTICE: Windbreak/Shelterbelt Renovation 650		Baseline Setting: Appropriate Land Use(s): Crop, Grazed Range, Hay, Headquarters, Mined, Native or Naturalized Pasture, Natural Area, Pasture, Recreation, Urban, Water, Watershed Protection, Wildlife			

RESOURCES, CONSIDERATIONS AND CONCERNS	**PHYSICAL EFFECTS**	**RATIONALE**
SOIL - EROSION		
Sheet and Rill	Slight to Substantial Improvement	Vegetation restored across the slope and surface litter reduces erosive water energy.
Wind	Substantial Improvement	Restoration of tall vegetation reestablishes a wind shadow, reduces erosive wind velocities and provides a stable area which stops saltating particles.
Ephemeral Gully	Slight to Substantial Improvement	Vegetation restored across the slope reduces erosive energy of concentrated flows.
Classic Gully	Not Applicable	Not applicable.
Streambank	Not Applicable	Not applicable.
Shoreline	Not Applicable	Not applicable.
Irrigation Induced	Not Applicable	Not applicable.
Mass Movement	Slight Improvement	Roots of restored vegetation binds the soil layers making the site resistant to gravity-induced movement.
Road, Roadsides, and Construction Sites	Not Applicable	Not applicable.
SOIL – CONDITION		
Organic Matter Depletion	Moderate to Substantial Improvement	Restored roots and vegetative matter and its breakdown increases organic matter.
Rangeland Site Stability	Not Applicable	Not applicable.
Compaction	Slight to Moderate Improvement	Restored root penetration and organic matter helps restore soil structure.
Subsidence	Not Applicable	Not applicable.
Contaminants:		
• Salts and other Chemicals	Slight Improvement	Most woody species take up limited quantities of salts.
• Animal Waste and other Organics - N	Slight to Moderate Improvement	Vigorously growing woody vegetation increases nutrient uptake.
• Animal Waste and other Organics - P	Slight to Moderate Improvement	Vigorously growing woody vegetation increases nutrient uptake.
• Animal Waste and other Organics - K	Slight to Moderate Improvement	Vigorously growing woody vegetation increases nutrient uptake.
• Commercial Fertilizer - N	Slight to Moderate Improvement	Vigorously growing woody vegetation increases nutrient

		uptake.
• Commercial Fertilizer – P	Slight to Moderate Improvement	Vigorously growing woody vegetation increases nutrient uptake.
• Commercial Fertilizer – K	Slight to Moderate Improvement	Vigorously growing woody vegetation increases nutrient uptake.
• Residual Pesticides	Slight Improvement	Increased organic matter may tie up pesticides.
Damage from Sediment Deposition	Slight to Moderate Worsening	Restored vegetation and surface litter traps sediment.
WATER – QUANTITY		
Rangeland Hydrologic Cycle	Not Applicable	Not applicable.
Excessive Seepage	Slight to Moderate Improvement	Restored plants uptake excess water.
Excessive Runoff, Flooding, or Ponding	Slight Worsening	Vegetation will slow runoff and create ponding.
Excessive Subsurface Water	Slight to Moderate Improvement	Restored plants uptake excess water.
Drifted Snow	Substantial Improvement	Snow is captured within and down wind of restored tree/shrub rows.
Inadequate Outlets	Not Applicable	Not applicable.
Inefficient Water use on Irrigated Land	Substantial Improvement	Restored tall vegetation reduces wind speeds and evapotranspiration allowing more efficient use of available water.
Inefficient Water use on Non-Irrigated Land	Slight to Moderate Improvement	Restored tall vegetation reduces wind speeds and evapotranspiration allowing more efficient use of available water.
Reduced Capacity of Conveyances by Sediment Deposition	Slight Improvement	Restored vegetation collects sediment preventing it from being deposited elsewhere.
Reduced Storage of Water Bodies by Sediment Accumulation	Slight Improvement	Restored vegetation collects sediment preventing it from being deposited elsewhere.
Aquifer Overdraft	Slight to Moderate Worsening	Restored deep rooted vegetation can draw water lowering the water table.
Insufficient Flows in Water Courses	Slight to Moderate Worsening	Restored tall vegetation uses available water and restricts runoff.
WATER – QUALITY		
In Groundwater:		
• Harmful Levels of Pesticides	Not Applicable	Not applicable.
• Excessive Nutrients and Organics	Substantial Improvement	Restored vegetation will uptake excess nutrients.
• Excessive Salinity	Neutral	The action may increase vegetative uptake in the shelterbelt.
• Harmful Levels of Heavy Metals	Not Applicable	Not applicable.
• Harmful Levels of Pathogens	Not Applicable	Not applicable.

• Harmful Levels of Petroleum	Not Applicable	Not applicable.
In Surface Water:		
• Harmful Levels of Pesticides	Slight to Moderate Improvement	The action reduces soil erosion from wind and may intercept pesticide drift.
• Excessive Nutrients and Organics	Substantial Improvement	Restored plants and soil organisms uptake nutrients.
• Excessive Suspended Sediment and Turbidity	Slight Improvement	Restored vegetation traps sediment preventing it from being deposited elsewhere.
• Excessive Salinity	Not Applicable	Not applicable.
• Harmful Levels of Heavy Metals	Slight Improvement	The action reduces wind erosion, reducing transport of heavy metals attached to particulates. Some plants may take up heavy metals..
• Harmful Temperatures	Not Applicable	Not applicable.
• Harmful Levels of Pathogens	Not Applicable	Not applicable.
• Harmful Levels of Petroleum	Slight Improvement	Increased microbial activity in the restored area breaks down petroleum contaminants.
AIR – QUALITY		
Particulate Matter less than 10 Micrometers in Diameter (PM 10)	Slight to Moderate Improvement	When properly renovated, the practice reduces particulate emissions from the soil surface.
Particulate Matter less than 2.5 Micrometers in Diameter (PM 2.5)	Slight to Moderate Improvement	When properly renovated, the practice reduces particulate emissions from the soil surface.
Excessive Ozone	Neutral	There is a minimal reduction of ozone precursors through reduced surface temperatures offered by shade and minimal biofiltering of ozone concentrations due to interception by tree and shrub foliage.
Excessive Greenhouse Gas:		
• CO_2 (Carbon Dioxide)	Slight Improvement	Vegetation removes CO2 from the air and stores it in the form of carbon in the plants and soil.
• N_20 (Nitrous Oxide)	Not Applicable	Not applicable.
• CH_4 (Methane)	Not Applicable	Not applicable.
Ammonia (NH_3)	Slight to Moderate Improvement	Interception of NH3 by plants
Chemical Drift	Slight to Substantial Improvement	Properly renovated windbreaks reduce surface air movement and intercept chemical drift.
Objectionable Odors	Slight to Moderate Improvement	Vegetation will reduce wind movement and intercept VOCs, fine particulates, and fugitive dust.
Reduced Visibility	Slight to Moderate Improvement	Reduce wind erosion and intercepting fine particulates and precursors
Undesirable Air Movement	Substantial Improvement	Tall vegetation creates turbulence and slows undesired,

		leeward winds.
Adverse Air Temperature	Moderate to Substantial Improvement	Temperatures in leeward areas are increased accelerating plant germination and growth.
PLANTS – SUITABLIITY		
Plants not Adapted or Suited	Substantial Improvement	Renovation maintains adapted and suited plants.
PLANTS - CONDITION		
Productivity, Health, and Vigor	Substantial Improvement	Plants are renovated and managed to maintain optimal productivity and health.
Threatened or Endangered Plant Species:		
• Plant Species Listed or Proposed for Listing Under the Endangered Species Act	Not Applicable	Not applicable.
• Declining Species, Species of Concern	Not Applicable	Not applicable.
Noxious and Invasive Plants	Moderate to Substantial Improvement	Vegetation is installed and managed to control undesired species.
Forage Quality and Palatability	Moderate to Substantial Improvement	Forage quality and palatability is improved in the protected area.
Wildfire Hazard	Not Applicable	Not applicable.
ANIMALS - FISH AND WILDLIFE		
Inadequate Food	Moderate to Substantial Improvement	Improved plant diversity and quality and quantity of vegetation provides food for wildlife.
Inadequate Cover/Shelter	Moderate to Substantial Improvement	Improved plant diversity and quality and quantity of vegetation provides cover for wildlife.
Inadequate Water	Not Applicable	Not applicable.
Inadequate Space	Moderate to Substantial Improvement	Renovated tall vegetation creates vertical habitat structure and enhanced space for wildlife.
Habitat Fragmentation	Moderate to Substantial Improvement	Vegetation is renovated to connect habitats.
Imbalance Among and Within Populations	Slight to Substantial Improvement	Habitat management is implemented to remove limiting factors.
Threatened and Endangered Fish and Wildlife Species:		
• Fish and Wildlife Species Listed or Proposed for Listing Under the Endangered Species Act	Neutral	Activities are designed, installed, and mitigated to an extent to maintain or enhance species of concern.
• Declining Species, Species of Concern	Neutral	Activities are designed, installed, and mitigated to an extent to maintain or enhance species of concern.
ANIMALS – DOMESTIC		
Inadequate Quantities and Quality of	Slight to Substantial Improvement	The quality and quantity of feed

Feed and Forage		and forage plants is enhanced by improving the microclimate.
Inadequate Shelter	Substantial Improvement	Restored tall vegetation provides shelter.
Inadequate Stock Water	Not Applicable	Not applicable.
Stress and Mortality	Substantial Improvement	Restored tall vegetation moderates temperatures and wind effects reducing stress caused by weather extremes.
HUMAN – ECONOMICS		
Land - Change in Land Use	Not applicable.	Not applicable.
Land – Land in Production	Not applicable.	Not applicable.
Capital – Change in Equipment	Slight Increase.	
Capital - Total Investment Cost	Moderate.	Moderate.
Capital – Annual Cost	Slight increase.	
Capital – Credit and Farm Program Eligibility	Situational.	
Labor - Labor	Negligible	
Labor – Change in Management Level	Negligible	
Risk - Yield	Not applicable.	Not applicable.
Risk - Flexibility	Not applicable.	Not applicable.
Risk - Timing	Substantial Increase	Substantial increase - species should be suitable for planned purpose.
Risk – Cash Flow	Slight to Moderate Increase	Slight to moderate increase due to implementation costs.
Profitability – Change in Profitability	Situational	Slight decrease to moderate increase.
HUMAN - CULTURAL		
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT	Slight to Substantial Increase	Consider impacts to historic landscapes.
HUMAN – ENERGY		
Depletion of Fossil Fuel Resources	Slight Decrease	Practice will improve water use efficiency and reduce plant damage/mortality. When used for homesteads & farmsteads it reduces heat loss.
Underutilization of Non-Fossil Energy Resources	Not Applicable	Not Applicable

Human Considerations Explanation

Considerations	Physical effects indicate:
Land - Change in Land Use	The degree to which implementing the conservation practice is expected to cause a change from one land use to another.
Land - Land in Production	The degree to which implementing the conservation practice is expected to cause an increase or decrease in the amount of land in production.
Capital - Change in Equipment	The degree to which implementing the conservation practice is expected to cause an increase or decrease in the amount of capital equipment required for farm or ranch operations.
Capital - Total Investment Cost	A qualitative measure of the increase in total investment dollars required in order to implement the conservation practice.
Capital - Annual Cost	A qualitative measure of the expected change in annual capital costs required in order to operate and maintain the conservation practice.
Capital - Credit & Farm Program Eligibility	Included to make conservation planners aware of the potential availability of funding for implementing conservation practices.
Labor – Labor	The degree to which implementing the conservation practice is likely to cause an increase or decrease in the total amount of overall farm or ranch labor required for operations.
Labor - Change in Management Level	The degree to which implementing the conservation practice is likely to cause an increase or decrease in the total amount of required active management on a farm or ranch.
Risk – Yield	The degree to which risk, as related to crop or livestock yields, is expected to increase or decrease as a result of implementing the conservation practice.
Risk – Flexibility	The degree to which risk, as related to the flexibility of farm or ranch operations, is expected to increase or decrease as a result of implementing the conservation practice. For example, converting from flood irrigation to a sprinkler system gives a farmer an increase in flexibility of irrigation, which results in a decrease in the level of risk associated with inflexibility of operations.
Risk – Timing	The degree to which risk, as related to the timing of farm or ranch operations, is expected to increase or decrease as a result of implementing the conservation practice.
Risk - Cash Flow	The degree to which risk, as related to cash flow in farm or ranch operations, is expected to increase or decrease as a result of implementing the conservation practice.
Profitability - Change in Profitability	The degree to which farm or ranch profitability is expected to increase or decrease as a result of implementing the conservation practice.
Cultural Resources and/or Historic Properties Present or Suspected to be Present	The degree to which implementation of the conservation practice is expected to increase or decrease the risk of cultural resource disturbance, degradation, or loss.
Depletion of Fossil Fuel Resources	Inefficient use of fossil-originated energy sources (diesel, gasoline, propane, natural gas, coal), lubricants, and other materials.
Underutilization of Non-Fossil Energy Sources	Available and cost-effective alternative energy sources (solar, wind, biofuel, hydroelectric, geothermal) are not being used or are being used inefficiently.