

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	Nebraska	FIELD OFFICE	Any	DATE	3/5/2012
<b>PRACTICE: Tree/Shrub Establishment 612</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
<b>SOIL - EROSION</b>					
Sheet and Rill	Substantial Improvement	Vegetation and surface litter reduces erosive water energy.			
Wind	Substantial Improvement	Tall vegetation creates a wind shadow, reduces erosive wind velocities and provides a stable area which stops saltating particles.			
Ephemeral Gully	Moderate to Substantial Improvement	Vegetation, surface litter and roots reduce erosive energy of concentrated flows.			
Classic Gully	Slight to Moderate Improvement	Vegetation, surface litter and roots reduce erosive energy of concentrated flows.			
Streambank	Not Applicable	Not applicable.			
Shoreline	Not Applicable	Not applicable.			
Irrigation Induced	Not Applicable	Not applicable.			
Mass Movement	Moderate Improvement	Roots of vegetation binds the soil layers making the site resistant to gravity-induced movement.			
Road, Roadsides, and Construction Sites	Slight to Moderate Improvement	Vegetation and surface litter reduces erosive water energy.			
<b>SOIL – CONDITION</b>					
Organic Matter Depletion	Moderate to Substantial Improvement	Establishment of permanent woody vegetation can lead to increased root and shoot development. Decomposition increases soil organic matter.			
Rangeland Site Stability	Not Applicable	Not applicable.			
Compaction	Slight to Moderate Improvement	Root penetration and organic matter helps restore soil structure.			
Subsidence	Not Applicable	Not applicable.			
Contaminants:					
• Salts and other Chemicals	Slight to Moderate Improvement	Woody vegetation takes up limited quantities of salts and other chemicals.			
• Animal Waste and other Organics - N	Slight to Moderate Improvement	Increase vegetative growth and N uptake.			
• Animal Waste and other Organics - P	Slight to Moderate Improvement	Increase vegetative growth and P uptake.			
• Animal Waste and other Organics - K	Slight to Moderate Improvement	Increase vegetative growth and K uptake.			
• Commercial Fertilizer - N	Slight to Moderate Improvement	Increase vegetative growth and N uptake.			
• Commercial Fertilizer – P	Slight to Moderate Improvement	Increase vegetative growth and P			

		uptake.
• Commercial Fertilizer – K	Slight to Moderate Improvement	Increase vegetative growth and K uptake.
• Residual Pesticides	Slight to Moderate Improvement	Increased organic matter can tie up some pesticides.
Damage from Sediment Deposition	Neutral	Vegetation and surface litter trap sediment from off-site but vegetative cover reduces erosion.
<b>WATER – QUANTITY</b>		
Rangeland Hydrologic Cycle	Not Applicable	Not applicable.
Excessive Seepage	Slight to Moderate Improvement	Deep rooted plants uptake excess water.
Excessive Runoff, Flooding, or Ponding	Slight Worsening	Vegetation slows surface flow rates and creates ponding.
Excessive Subsurface Water	Slight to Moderate Improvement	Deep rooted plants uptake excess water.
Drifted Snow	Slight to Moderate Improvement	Snow is captured by tree/shrub crowns and deposited within the grazed area.
Inadequate Outlets	Slight to Moderate Improvement	Vegetation slows and retains runoff; the need for larger outlets is reduced.
Inefficient Water use on Irrigated Land	Not Applicable	Not applicable.
Inefficient Water use on Non-Irrigated Land	Slight to Moderate Improvement	Adapted and managed vegetative production allows more efficient use of available water.
Reduced Capacity of Conveyances by Sediment Deposition	Moderate to Substantial Improvement	Vegetation collects sediment preventing it from being deposited in conveyances.
Reduced Storage of Water Bodies by Sediment Accumulation	Moderate to Substantial Improvement	Vegetation collects sediment preventing it from being deposited in water bodies.
Aquifer Overdraft	Slight to Moderate Worsening	Deep rooted vegetation can draw water lowering the water table.
Insufficient Flows in Water Courses	Slight to Moderate Improvement	Vegetated areas intercept precipitation and retain runoff with a net, elevated release to water courses.
<b>WATER – QUALITY</b>		
In Groundwater:		
• Harmful Levels of Pesticides	Moderate to Substantial Improvement	The action reduces the need for pesticide use and trees and shrubs take up pesticide residues.
• Excessive Nutrients and Organics	Slight to Moderate Improvement	Permanent vegetation will uptake excess nutrients.
• Excessive Salinity	Slight Improvement	The action may promote contaminant uptake by plants.
• Harmful Levels of Heavy Metals	Slight Improvement	Establishing metal-accumulating trees and shrubs may remove heavy metals from the soil profile.
• Harmful Levels of Pathogens	Moderate to Substantial Improvement	Increased vegetative cover and soil microbial activity can

		enhance competition with pathogens.
• Harmful Levels of Petroleum	Not Applicable	Not applicable.
<b>In Surface Water:</b>		
• Harmful Levels of Pesticides	Moderate to Substantial Improvement	The action reduces runoff and the need for pesticide use. Also, trees and shrubs take up pesticide residues.
• Excessive Nutrients and Organics	Slight to Moderate Improvement	Permanent vegetation will uptake excess nutrients.
• Excessive Suspended Sediment and Turbidity	Moderate to Substantial Improvement	Vegetation provides cover, reduces wind velocities, and increases infiltration.
• Excessive Salinity	Slight Improvement	The action promotes contaminant uptake by plants.
• Harmful Levels of Heavy Metals	Slight Improvement	Some plants may take up heavy metals.
• Harmful Temperatures	Slight to Moderate Improvement	Near streams and other water bodies, trees and shrubs provide shade to moderate water temperature.
• Harmful Levels of Pathogens	Slight to Substantial Improvement	Woody vegetation captures and delays pathogen movement and thereby increase their mortality.
• Harmful Levels of Petroleum	Slight Improvement	Increased microbial activity in the planted area breaks down petroleum contaminants.
<b>AIR – QUALITY</b>		
Particulate Matter less than 10 Micrometers in Diameter (PM 10)	Slight to Moderate Improvement	Permanent vegetative cover reduces wind erosion and fugitive dust generation.
Particulate Matter less than 2.5 Micrometers in Diameter (PM 2.5)	Slight to Moderate Improvement	Permanent vegetative cover reduces wind erosion and fugitive dust generation.
Excessive Ozone	Neutral	There is a minimal reduction of ozone precursors through reduced surface temperatures offered by shade or ground cover, and minimal biofiltering of ozone concentrations due to interception by vegetation.
<b>Excessive Greenhouse Gas:</b>		
• CO <sub>2</sub> (Carbon Dioxide)	Substantial Improvement	Vegetation removes CO <sub>2</sub> from the air and stores it in the form of carbon in the plants and soil.
• N <sub>2</sub> O (Nitrous Oxide)	Not Applicable	Not applicable.
• CH <sub>4</sub> (Methane)	Not Applicable	Not applicable.
Ammonia (NH <sub>3</sub> )	Not Applicable	Not applicable.
Chemical Drift	Slight to Moderate Improvement	Tall vegetation slows surface air movement and intercepts 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 Substantial Improvement	Tall vegetation slows surface air movement and intercepts and captures air borne materials. Reduced wind erosion improves visibility.
Undesirable Air Movement	Moderate to Substantial Improvement	Tall vegetation creates turbulence and slows undesired, leeward winds.
Adverse Air Temperature	Substantial Improvement	Tall vegetation provides shade and moderates temperatures.
<b>PLANTS – SUITABILITY</b>		
Plants not Adapted or Suited	Substantial Improvement	Plants selected are adapted and suited.
<b>PLANTS - CONDITION</b>		
Productivity, Health, and Vigor	Substantial Improvement	Plants are selected and managed to maintain optimal productivity and health.
Threatened or Endangered Plant Species:		
<ul style="list-style-type: none"> <li>Plant Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>	Neutral	When threatened or endangered plants are present, protection and recovery are addressed in the planning process.
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>	Neutral	When threatened or endangered plants are present, protection and recovery are addressed in the planning process.
Noxious and Invasive Plants	Moderate to Substantial Improvement	Vegetation is installed and managed to control undesired species.
Forage Quality and Palatability	Substantial Improvement	Feed and forage plants used by wildlife are managed to maintain optimal conditions.
Wildfire Hazard	Not Applicable	Not applicable.
<b>ANIMALS - FISH AND WILDLIFE</b>		
Inadequate Food	Slight to Substantial Improvement	Plants are chosen and managed to enhance food value for target species.
Inadequate Cover/Shelter	Moderate to Substantial Improvement	Plants are chosen and managed to enhance cover/shelter.
Inadequate Water	Not Applicable	Not applicable.
Inadequate Space	Substantial Improvement	Tall vegetation creates vertical habitat structure and enhanced space for wildlife.
Habitat Fragmentation	Moderate to Substantial Improvement	Vegetation is installed and managed to connect habitats.
Imbalance Among and Within Populations	Moderate to Substantial Improvement	Cover is designed to minimize limiting factors.
Threatened and Endangered Fish and Wildlife Species:		
<ul style="list-style-type: none"> <li>Fish and Wildlife Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>	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.
<b>ANIMALS – DOMESTIC</b>		
Inadequate Quantities and Quality of Feed and Forage	Slight to Moderate Improvement	These sites may be used as feed and forage by livestock if the desired trees and shrubs are not harmed.
Inadequate Shelter	Moderate to Substantial Improvement	Tall vegetation provides shelter.
Inadequate Stock Water	Not Applicable	Not applicable.
Stress and Mortality	Moderate to Substantial Improvement	Tall vegetation moderates temperatures and weather effects.
<b>HUMAN – ECONOMICS</b>		
Land - Change in Land Use	Substantial	Substantial, if converting to woodland.
Land – Land in Production	Substantial decrease.	
Capital – Change in Equipment	Slight Increase.	
Capital - Total Investment Cost	Substantial.	Substantial.
Capital – Annual Cost	Slight increase.	
Capital – Credit and Farm Program Eligibility	Situational.	
Labor - Labor	Moderate to substantial increase	Moderate to substantial increase during planting, otherwise 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 the planned purpose.
Risk – Cash Flow	Slight to Moderate Increase	Slight to moderate increase because of establishment costs.
Profitability – Change in Profitability	Slight decrease.	
<b>HUMAN - CULTURAL</b>		
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT	Slight to Substantial Increase	Construction impacts (mechanical) associated with site preparation.
<b>HUMAN – ENERGY</b>		
Depletion of Fossil Fuel Resources	Not Applicable	Not Applicable
Underutilization of Non-Fossil Energy Resources	Slight to Substantial Decrease	Practice can establish trees for biomass energy.

## Human Considerations Explanation

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