CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	Nebraska	FIELD OFFICE	Any	DATE	12/27/2011
PRACTICE: Riparian Forest Buffer 391		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			

RESOURCES, CONSIDERATIONS AND CONCERNS	**PHYSICAL EFFECTS**	**RATIONALE**
SOIL - EROSION		
Sheet and Rill	Slight to Moderate Improvement	Vegetation and surface litter reduces erosive water energy on the planted site.
Wind	Slight to Moderate Improvement	Vegetation creates a wind shadow and reduces erosive wind velocities and provides a stable area which stops saltating particles.
Ephemeral Gully	Slight Improvement	Vegetation reduces erosive energy of concentrated flows.
Classic Gully	Moderate Improvement	Reduces runoff and erosion.
Streambank	Moderate Improvement	Roots of vegetation binds the soil making it resistant to water flow erosion.
Shoreline	Moderate Improvement	Roots of vegetation binds the soil making it resistant to water flow erosion.
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	Not Applicable	Not applicable.
SOIL – CONDITION		
Organic Matter Depletion	Moderate to Substantial Improvement	Increased vegetative matter and its breakdown increases soil organic matter.
Rangeland Site Stability	Not Applicable	Not applicable.
Compaction	Moderate to Substantial Improvement	Root penetration and organic matter helps restore soil structure.
Subsidence	Not Applicable	Not applicable.
Contaminants:		
• Salts and other Chemicals	Slight Improvement	Increased vegetation will increase salt uptake and increased organic matter may tie up salts and other chemicals.
• Animal Waste and other Organics - N	Slight to Substantial Improvement	Unless the system is overloaded, plants and soil organisms can scavenge excess N.
• Animal Waste and other Organics - P	Slight to Substantial Improvement	Unless the system is overloaded, plants and soil organisms can scavenge excess P.
• Animal Waste and other Organics - K	Slight to Substantial Improvement	Unless the system is overloaded, plants and soil organisms can

		scavenge excess K.
• Commercial Fertilizer - N	Slight to Substantial Improvement	Unless the system is overloaded, plants and soil organisms can scavenge excess N.
• Commercial Fertilizer – P	Slight to Substantial Improvement	Unless the system is overloaded, plants and soil organisms can scavenge excess P.
• Commercial Fertilizer – K	Slight to Substantial Improvement	Unless the system is overloaded, plants and soil organisms can scavenge excess K.
• Residual Pesticides	Slight to Moderate Improvement	Plants and soil organisms uptake residues and soil organic matter neutralizes pesticides.
Damage from Sediment Deposition	Slight to Moderate Improvement	Vegetation and surface litter traps sediment but is adapted to such deposits. Deposits in riparian areas reduce deposits elsewhere.
WATER – QUANTITY		
Rangeland Hydrologic Cycle	Not Applicable	Not applicable.
Excessive Seepage	Slight to Moderate Improvement	Plants uptake excess water.
Excessive Runoff, Flooding, or Ponding	Moderate Worsening	Vegetation causes flooding and ponding.
Excessive Subsurface Water	Slight to Moderate Improvement	Plants uptake excess water.
Drifted Snow	Not Applicable	Not applicable.
Inadequate Outlets	Not Applicable	Not applicable.
Inefficient Water use on Irrigated Land	Not Applicable	Not applicable.
Inefficient Water use on Non-Irrigated Land	Not Applicable	Not applicable.
Reduced Capacity of Conveyances by Sediment Deposition	Substantial Improvement	Riparian areas collect sediment preventing it from being deposited elsewhere.
Reduced Storage of Water Bodies by Sediment Accumulation	Substantial Improvement	Riparian areas collect sediment preventing it from being deposited elsewhere.
Aquifer Overdraft	Not Applicable	Not applicable.
Insufficient Flows in Water Courses	Moderate to Substantial Improvement	Riparian areas intercept precipitation and infiltrate and retain runoff with a net, elevated release to water courses.
WATER – QUALITY		
In Groundwater:		
• Harmful Levels of Pesticides	Slight to Moderate Improvement	Trees, shrubs, and other vegetation take up pesticide residues. Also, pesticide degradation may be improved by increased soil organic matter and biological activity.
• Excessive Nutrients and Organics	Substantial Improvement	Permanent vegetation will uptake excess nutrients.
• Excessive Salinity	Slight Improvement	The action may result in some uptake by plants.
• Harmful Levels of Heavy Metals	Slight Improvement	The action may result in metal uptake by some plants.
• Harmful Levels of Pathogens	Slight to Moderate Improvement	Riparian areas capture and delay

		pathogen movement and increase pathogen mortality. Soil microbial activity enhances competition with pathogens.
• Harmful Levels of Petroleum	Not Applicable	Not applicable.
In Surface Water:		
• Harmful Levels of Pesticides	Moderate to Substantial Improvement	Trees, shrubs and other vegetation reduce runoff, trap adsorbed pesticides, take up pesticide residues and may intercept pesticide drift.
• Excessive Nutrients and Organics	Substantial Improvement	Plants and soil organisms in the buffer will utilize nutrients. The buffer will filter out suspended particles to which nutrients are attached.
• Excessive Suspended Sediment and Turbidity	Moderate to Substantial Improvement	Vegetation protects soil surface and traps sediment, nutrients and other materials.
• Excessive Salinity	Slight Improvement	The action increases infiltration and reduces runoff.
• Harmful Levels of Heavy Metals	Slight to Moderate Improvement	The action filters sediment, and some plants may take up heavy metals.
• Harmful Temperatures	Slight to Substantial Improvement	Riparian forest canopy shades streams and rivers, moderating water temperatures.
• Harmful Levels of Pathogens	Slight to Substantial Improvement	Riparian areas capture and delay pathogen movement and thereby increase their mortality.
• Harmful Levels of Petroleum	Slight Improvement	Increased microbial activity in the riparian area breaks down petroleum contaminants.
AIR – QUALITY		
Particulate Matter less than 10 Micrometers in Diameter (PM 10)	Slight Improvement	Vegetation reduces erosive wind velocities and provides a stable area which stops saltating particles.
Particulate Matter less than 2.5 Micrometers in Diameter (PM 2.5)	Slight Improvement	Vegetation reduces erosive wind velocities and provides a stable area which stops saltating particles.
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.
Excessive Greenhouse Gas:		
• CO_2 (Carbon Dioxide)	Moderate to Substantial 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)	Not Applicable	Not applicable.
Chemical Drift	Slight to Moderate Improvement	Tall vegetation slows surface air movement and intercepts chemical drift.
Objectionable Odors	Slight Improvement	Tall vegetation slows surface air movement and intercepts and captures air borne materials.
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	Slight to Substantial Improvement	Tall vegetation creates turbulence and slows undesired, leeward winds.
Adverse Air Temperature	Moderate to Substantial Improvement	Tall vegetation provides shade and moderates temperatures.
PLANTS – SUITABLIITY		
Plants not Adapted or Suited	Moderate to Substantial Improvement	Buffer establishment and management creates or maintains the desired plant community.
PLANTS - CONDITION		
Productivity, Health, and Vigor	Substantial Improvement	Plants are selected 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	Neutral	When threatened or endangered plants are present, protection and recovery are addressed in the planning process.
• Declining Species, Species of Concern	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	Moderate to Substantial Improvement	Plants are managed to optimize forage quality and palatability.
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	Substantial Improvement	Improved plant diversity and quality and quantity of vegetation provides cover for wildlife.
Inadequate Water	Slight to Moderate Improvement	Water can be temporarily trapped in the riparian area. Warm-season water is cooled.
Inadequate Space	Moderate to Substantial	Buffers can restore desired

	Improvement	habitats/space.
Habitat Fragmentation	Moderate to Substantial Improvement	Buffers can restore and reconnect desired habitats/space.
Imbalance Among and Within Populations	Moderate to Substantial Improvement	Buffers are designed to minimize 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 Feed and Forage	Moderate to Substantial Improvement	These sites may be used as feed and forage by livestock if the intended purpose is maintained.
Inadequate Shelter	Moderate to Substantial Improvement	Buffers can provide shade and protection from wind.
Inadequate Stock Water	Not Applicable	Not applicable.
Stress and Mortality	Moderate to Substantial Improvement	Riparian vegetation alters temperatures and wind effects reducing stress caused by weather extremes.
HUMAN – ECONOMICS		
Land - Change in Land Use	Slight to substantial.	
Land – Land in Production	Slight to substantial.	
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	Slight to moderate decrease	Slight to moderate decrease with land taken out of production.
Labor – Change in Management Level	Slight increase.	
Risk - Yield	Not applicable.	Not applicable.
Risk - Flexibility	Not applicable.	Not applicable.
Risk - Timing	Not applicable.	Not applicable.
Risk – Cash Flow	Slight to Moderate Increase	Slight to moderate increase due to establishment cost.
Profitability – Change in Profitability	Situational	Slight increase to substantial decrease.
HUMAN - CULTURAL		
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT	Slight to Substantial Decrease	Historic properties in agricultural context can be protected from erosion by permanent vegetative cover.
HUMAN – ENERGY		
Depletion of Fossil Fuel Resources	Slight to Moderate Decrease	Establishing forest buffers on cropland removes need for annual agronomic energy inputs.
Underutilization of Non-Fossil Energy	Slight to Moderate Decrease	This practice can potentially

Resources		provide a source of biomass fuel.

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.