CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	Nebraska	FIELD OFFICE	Any	DATE	12/27/2011
PRACTICE: Range Planting 550		Baseline Setting:			
		Appropriate Land Use(s): Graze Forest, Grazed Range, Native or Naturalized Pasture, Watershed Protection, Wildlife			
RESOURCES, CONSIDERATIONS AND CONCERNS		**PHYSICAL EFFECTS**		**RATIONALE**	
SOIL - EROSION					
Sheet and Rill		Moderate to Substantial Improvement		Establishment of adapted species increases vegetative cover and reduces erosion potential. During the establishment period, there may be a slight to moderate risk of erosion, depending on seedbed preparation, seeding method, and species planted.	
Wind		Moderate to Substantial Improvement		Establishment of adapted species increases vegetative cover and reduces erosion potential. During the establishment period, there may be a slight to moderate risk of erosion, depending on seedbed preparation, seeding method, and species planted.	
Ephemeral Gully		Moderate to Substantial Improvement		Establishment of adapted species increases vegetative cover and reduces erosion potential. During the establishment period, there may be a slight to moderate risk of erosion, depending on seedbed preparation, seeding method, and species planted.	
Classic Gully		Slight to Substantial Improvement		Establishment of adapted species increases vegetative cover and reduces erosion potential. During the establishment period, there may be a slight to moderate risk of erosion, depending on seedbed preparation, seeding method, and species planted.	
Streambank		Slight to Moderate Improvement		Establishment of adapted species increases vegetative cover and reduces erosion potential. During the establishment period, there may be a slight to moderate risk of erosion, depending on seedbed preparation, seeding method, and species planted.	
Shoreline		Slight to Moderate Improvement		Establishment of adapted species	

		increases vegetative cover and reduces erosion potential. During the establishment period, there may be a slight to moderate risk of erosion, depending on seedbed preparation, seeding method, and species planted.
Irrigation Induced	Not Applicable	Not applicable.
Mass Movement	Neutral	The increase in vegetation enhances soil binding by root mass and removal of soil moisture by increased transpiration. There may be a slight worsening because of increase in infiltration.
Road, Roadsides, and Construction Sites	Not Applicable	Not applicable.
SOIL – CONDITION		
Organic Matter Depletion	Moderate to Substantial Improvement	There will be enhanced root development, litter accumulation, increased biological activity, and/or reduced tillage if associated with change in land use.
Rangeland Site Stability	Moderate to Substantial Improvement	There will be enhanced root development, litter accumulation, increased biological activity.
Compaction	Moderate to Substantial Improvement	Enhanced root development, litter accumulation, increased biological activity, and/or reduced tillage may improve soil structure.
Subsidence	Slight Improvement	There will be enhanced root development increasing soil stability. There may be slight initial increase because of soil disturbing operations during seedbed preparation and establishment that may increase oxidation of organic matter.
Contaminants:		
• Salts and other Chemicals	Slight Improvement	Site planted to adapted species could contribute to the reduction of saline seep areas. There would be a negligible decrease of selenium, boron, and heavy metals because of very limited uptake by pasture plants.
• Animal Waste and other Organics - N	Slight to Moderate Improvement	There will be increased N use by vigorously growing grasses and/or legumes. There may be a slight potential for increased leaching because of improved infiltration.

• Animal Waste and other Organics - P	Slight to Moderate Improvement	There will be increased P use by vigorously growing grasses and/or legumes. There may be a slight potential for increased leaching because of improved infiltration.
• Animal Waste and other Organics - K	Slight to Moderate Improvement	There will be increased K use by vigorously growing grasses and/or legumes. There may be a slight potential for increased leaching because of improved infiltration on sandy soils.
• Commercial Fertilizer - N	Slight to Moderate Improvement	There will be increased N use by vigorously growing grasses and/or legumes. There may be a slight potential for increased leaching because of improved infiltration.
• Commercial Fertilizer – P	Slight to Moderate Improvement	There will be increased P use by vigorously growing grasses and/or legumes. There may be a slight potential for increased leaching because of improved infiltration.
• Commercial Fertilizer – K	Slight to Moderate Improvement	There will be increased K use by vigorously growing grasses and/or legumes. There may be a slight potential for increased leaching because of improved infiltration on sandy soils.
• Residual Pesticides	Slight to Substantial Improvement	Proper seedbed preparation and the establishment of a healthy, vigorous stand will reduce pesticide use in general. There may be a slight potential for increased leaching because of improved infiltration.
Damage from Sediment Deposition	Slight to Substantial Improvement	There will be a reduction in erosion due to increased cover and reduced overland flow depending on management.
WATER – QUANTITY		
Rangeland Hydrologic Cycle	Moderate to Substantial Improvement	Establishment of adapted species increases vegetative cover and reduces erosion potential. During the establishment period, there may be a slight to moderate risk of erosion, depending on seedbed preparation, seeding method, and species planted.
Excessive Seepage	Neutral	There will be an increase in plant uptake and transpiration in the long-term. There may be a slight to moderate increase in seepage because of increased

		infiltration depending on the species selected.
Excessive Runoff, Flooding, or Ponding	Slight to Moderate Improvement	There will be an increase in cover and infiltration, reducing runoff and overland flow.
Excessive Subsurface Water	Neutral	There will be an increase in plant uptake and transpiration in the long-term. There may be a slight to moderate increase in seepage because of increased infiltration depending on the species selected.
Drifted Snow	Not Applicable	Not applicable.
Inadequate Outlets	Slight Improvement	There will be an increase in cover and infiltration, reducing runoff and overland flow.
Inefficient Water use on Irrigated Land	Not Applicable	Not applicable.
Inefficient Water use on Non-Irrigated Land	Slight to Substantial Improvement	The plant species selected will be adapted to meet the seasonal distribution of moisture.
Reduced Capacity of Conveyances by Sediment Deposition	Moderate to Substantial Improvement	There will be an increase in protective vegetative cover, reduced runoff, and increased infiltration resulting in less sediment transport.
Reduced Storage of Water Bodies by Sediment Accumulation	Slight to Moderate Improvement	There will be an increase in protective vegetative cover, reduced runoff, and increased infiltration resulting in less sediment transport.
Aquifer Overdraft	Neutral	Plant species will be selected that are adapted to the amount, frequency, and availability of water, whether on irrigated or non-irrigated lands.
Insufficient Flows in Water Courses	Slight to Moderate Improvement	Selection of adapted species will increased cover and improve infiltration, enhancing interflow.
WATER – QUALITY		
In Groundwater:		
• Harmful Levels of Pesticides	Slight to Moderate Improvement	The action increases soil organic matter and biological activity.
• Excessive Nutrients and Organics	Slight to Moderate Improvement	Permanent vegetation will uptake excess nutrients.
• Excessive Salinity	Slight Improvement	There will be an increase in plant uptake when adapted plant species are used. There is the slight potential for leaching of salt into ground water because of increased infiltration.
• Harmful Levels of Heavy Metals	Slight Improvement	Certain plant species can take up heavy metals. Increased infiltration may increase the potential of heavy metal movement to groundwater.
• Harmful Levels of Pathogens	Slight Improvement	Increased soil microbial activity

		will enhance competition with pathogens.
• Harmful Levels of Petroleum	Not Applicable	Not applicable.
In Surface Water:		
• Harmful Levels of Pesticides	Slight to Moderate Improvement	The action decreases runoff and erosion.
• Excessive Nutrients and Organics	Slight Improvement	Improving vegetative cover will reduce runoff and erosion, and reduce the delivery of organics and nutrients to surface water.
• Excessive Suspended Sediment and Turbidity	Slight to Substantial Improvement	There will be improved vegetative cover with a reduction of runoff and sedimentation.
• Excessive Salinity	Slight Improvement	Dense vegetation will increase infiltration and reduce runoff. Planting of range species in recharge areas may reduce movement of salts to seep areas and surface waters.
• Harmful Levels of Heavy Metals	Slight to Moderate Improvement	Improved plant growth reduces runoff and increases uptake.
• Harmful Temperatures	Neutral	The action protects soil and water quality.
• Harmful Levels of Pathogens	Slight Improvement	The improved vegetative cover and increased soil microbiological activity will reduce movement of pathogens, however a land use change to pasture may increase potential pathogen levels.
• Harmful Levels of Petroleum	Not Applicable	Not applicable.
AIR – QUALITY		
Particulate Matter less than 10 Micrometers in Diameter (PM 10)	Slight to Moderate Improvement	Establishing permanent vegetation reduces the potential for generation of particulates by wind erosion.
Particulate Matter less than 2.5 Micrometers in Diameter (PM 2.5)	Slight to Moderate Improvement	Establishing permanent vegetation reduces the potential for generation of particulates by wind erosion.
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)	Slight to Moderate 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	Not Applicable	Not applicable.
Objectionable Odors	Not Applicable	Not applicable.
Reduced Visibility	Slight to Moderate Improvement	Reduction in particulates due to improved ground cover.
Undesirable Air Movement	Not Applicable	Not applicable.
Adverse Air Temperature	Not Applicable	Not applicable.
PLANTS – SUITABLIITY		
Plants not Adapted or Suited	Substantial Improvement	There will be a selection of well-adapted and compatible species, varieties, and/or cultivars for each site.
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	Substantial Improvement	Selected plant species will have adequate nutritive value and palatability for the intended use.
Wildfire Hazard	Not Applicable	Not applicable.
ANIMALS - FISH AND WILDLIFE		
Inadequate Food	Slight to Substantial Improvement	Plant species are selected that are well-adapted and compatible to the site and provide food for wildlife.
Inadequate Cover/Shelter	Slight to Substantial Improvement	Plant species are selected that are well-adapted and compatible to the site and provide cover for wildlife.
Inadequate Water	Not Applicable	Not applicable.
Inadequate Space	Moderate to Substantial Improvement	Planting can restore desired habitats/space.
Habitat Fragmentation	Moderate to Substantial Improvement	Planting can restore and reconnect desired habitats/space.
Imbalance Among and Within Populations	Slight to Moderate Improvement	Increase forage supply and cover.
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	Substantial Improvement	Plant species will be selected that accommodate seasonal livestock production and nutritional needs.
Inadequate Shelter	Not Applicable	Not applicable.
Inadequate Stock Water	Not Applicable	Not applicable.
Stress and Mortality	Slight to Substantial Improvement	Improved forage cultivars will improve livestock health.
HUMAN – ECONOMICS		
Land - Change in Land Use	Slight to Substantial	N/A, if currently grazed, substantial if change from crop, non-use or wildlife.
Land – Land in Production	Substantial increase	Substantial increase if land is brought into production.
Capital – Change in Equipment	Slight Increase.	
Capital - Total Investment Cost	Moderate.	Moderate.
Capital – Annual Cost	Not applicable.	Not applicable.
Capital – Credit and Farm Program Eligibility	Situational.	
Labor - Labor	Slight increase.	
Labor – Change in Management Level	Slight increase.	
Risk - Yield	Not applicable.	Not applicable.
Risk - Flexibility	Slight Increase	Slight increase due to deferment of affected area until establishment is complete.
Risk - Timing	Substantial Increase	Substantial increase - practice must be implemented during climatic and establishment period.
Risk – Cash Flow	Slight Increase	Slight increase because of implementation costs.
Profitability – Change in Profitability	Slight increase.	
HUMAN - CULTURAL		
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT	Slight to Substantial Increase	Planting impacts (mechanical) on previously undisturbed land types.
HUMAN – ENERGY		
Depletion of Fossil Fuel Resources	Not Applicable	Not Applicable
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.