

CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	Pennsylvania	FIELD OFFICE	Any	DATE	
PRACTICE: Grazing Land Mechanical Treatment 548		Baseline Setting:			
		Appropriate Land Use(s): Grazed Forest, Grazed Range, Native or Naturalized Pasture, Pasture			
RESOURCES, CONSIDERATIONS AND CONCERNS		PHYSICAL EFFECTS		RATIONALE	
SOIL - EROSION					
Sheet and Rill		Slight to Substantial Improvement		Increased surface roughness and improved vegetation cover will increase infiltration, reduce runoff, reduce soil movement.	
Wind		Slight to Moderate Improvement		An increase in vegetative cover and surface roughness decreases erosion by wind.	
Ephemeral Gully		Slight to Substantial Improvement		An increase in surface cover and infiltration reduces soil erosion by water.	
Classic Gully		Slight Improvement		Slight improvement because of increased infiltration and decreased overland flow into gully.	
Streambank		Slight Improvement		Erosion on streambanks reduced due to increased infiltration and reduced runoff.	
Shoreline		Slight Improvement		Erosion on streambanks reduced due to increased infiltration and reduced runoff.	
Irrigation Induced		Slight Improvement		Increased infiltration reduces runoff.	
Mass Movement		Slight Worsening		Improved infiltration causes instability.	
Road, Roadsides, and Construction Sites		Not Applicable		Not applicable.	
SOIL – CONDITION					
Organic Matter Depletion		Slight to Moderate Improvement		Improved plant vigor and productivity increases organic matter.	
Rangeland Site Stability		Moderate to Substantial Improvement		Fracture compacted soil layers and improve soil permeability, reduce water runoff and increase infiltration, break up sod-bound conditions and thatch to increase plant vigor, and renovate and stimulate plant community for greater productivity.	
Compaction		Moderate to Substantial Improvement		Altering the site with mechanical means will decrease compaction.	
Subsidence		Not Applicable		Not applicable.	
Contaminants:					
• Salts and other Chemicals		Slight Improvement		Increased porosity and increased infiltration may decrease salts	

		and other chemicals through leaching.
• Animal Waste and other Organics - N	Neutral	Effects vary, because of mineralization and leaching.
• Animal Waste and other Organics - P	Slight Worsening	Effects vary, because of mineralization.
• Animal Waste and other Organics - K	Neutral	Effects vary, because of mineralization and leaching (sandy soils).
• Commercial Fertilizer - N	Neutral	Effects vary, because of mineralization and leaching.
• Commercial Fertilizer – P	Slight Worsening	Effects vary, because of mineralization.
• Commercial Fertilizer – K	Neutral	Effects vary, because of mineralization and leaching (sandy soils).
• Residual Pesticides	Not Applicable	Not applicable.
Damage from Sediment Deposition	Slight to Moderate Improvement	Reduced runoff due to increased infiltration decreases erosion..
WATER – QUANTITY		
Rangeland Hydrologic Cycle	Substantial Improvement	Fracture compacted soil layers and improve soil permeability, reduce water runoff and increase infiltration.
Excessive Seepage	Slight Worsening	Increased water infiltration, dependant on subsoil characteristics.
Excessive Runoff, Flooding, or Ponding	Slight to Moderate Improvement	Increased infiltration and decreased runoff.
Excessive Subsurface Water	Slight Worsening	Increased infiltration.
Drifted Snow	Not Applicable	Not applicable.
Inadequate Outlets	Slight to Moderate Improvement	Increased infiltration and decreased surface runoff.
Inefficient Water use on Irrigated Land	Slight to Moderate Improvement	Increased water infiltration and improved plant, soil, moisture, and air relationships.
Inefficient Water use on Non-Irrigated Land	Slight to Moderate Improvement	Increased water infiltration and improved plant, soil, moisture, and air relationships.
Reduced Capacity of Conveyances by Sediment Deposition	Slight Improvement	Increased infiltration and decreased erosion.
Reduced Storage of Water Bodies by Sediment Accumulation	Slight Improvement	Increased infiltration and decreased erosion.
Aquifer Overdraft	Not Applicable	Not applicable.
Insufficient Flows in Water Courses	Not Applicable	Not applicable.
WATER – QUALITY		
In Groundwater:		
• Harmful Levels of Pesticides	Slight to Moderate Worsening	The action increases infiltration and deep percolation.
• Excessive Nutrients and Organics	Slight Worsening	The action increases the potential for infiltration and leaching.
• Excessive Salinity	Neutral	The action increases infiltration and leaching but also increases

		plant growth and uptake.
• Harmful Levels of Heavy Metals	Slight Worsening	The action improves infiltration and increase the potential for leaching. However, plant growth and uptake are increased.
• Harmful Levels of Pathogens	Slight Worsening	The action improves infiltration and increase the potential for leaching. However, plant growth and microbial activity are also increased.
• Harmful Levels of Petroleum	Not Applicable	Not applicable.
In Surface Water:		
• Harmful Levels of Pesticides	Slight to Moderate Improvement	The action reduces runoff.
• Excessive Nutrients and Organics	Slight to Moderate Improvement	Modifications to soil conditions will increase infiltration and reduce runoff. Improved plant growth will better utilize nutrients, decreasing the potential for losses in runoff.
• Excessive Suspended Sediment and Turbidity	Slight to Moderate Improvement	Soil disturbance increases infiltration and decreases runoff.
• Excessive Salinity	Slight to Moderate Improvement	The action increases infiltration and decreases runoff.
• Harmful Levels of Heavy Metals	Slight Improvement	Improved vegetation growth increases vigor of ground cover that can increase heavy metal uptake and reduces runoff.
• Harmful Temperatures	Not Applicable	Not applicable.
• Harmful Levels of Pathogens	Slight to Moderate Improvement	Slight to moderate improvement because of increased infiltration and decreased runoff.
• Harmful Levels of Petroleum	Not Applicable	Not applicable.
AIR – QUALITY		
Particulate Matter less than 10 Micrometers in Diameter (PM 10)	Slight to Moderate Worsening	Equipment operations can generate particulate emissions.
Particulate Matter less than 2.5 Micrometers in Diameter (PM 2.5)	Slight Worsening	Equipment operations can generate particulate emissions.
Excessive Ozone	Neutral	There is a short-term increase in vehicle emissions and ozone precursors from site preparation equipment.
Excessive Greenhouse Gas:		
• CO ₂ (Carbon Dioxide)	Slight Improvement	Improved vegetative cover removes CO ₂ from the air and stores it in the form of carbon in the plants and soil.
• N ₂ O (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	Not Applicable	Not applicable.
Undesirable Air Movement	Not Applicable	Not applicable.
Adverse Air Temperature	Not Applicable	Not applicable.

PLANTS – SUITABILITY		
Plants not Adapted or Suited	Slight to Substantial Improvement	Site is modified to enhancing suited and desired species.
PLANTS - CONDITION		
Productivity, Health, and Vigor	Moderate to Substantial Improvement	Site is modified to enhance the health and vigor of desired species.
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	Slight Worsening	Undesired plants can colonize newly treated areas.
Forage Quality and Palatability	Moderate to Substantial Improvement	Treatments will increase quality and palatability of forage.
Wildfire Hazard	Not Applicable	Not applicable.
ANIMALS - FISH AND WILDLIFE		
Inadequate Food	Slight to Moderate Improvement	Plant production and species diversity will provide food for wildlife.
Inadequate Cover/Shelter	Slight to Moderate Improvement	Plant production and species diversity will provide cover/shelter for wildlife.
Inadequate Water	Slight Improvement	Slight improvement because of improved water quality, less erosion, and enhanced interflows.
Inadequate Space	Not Applicable	Not applicable.
Habitat Fragmentation	Not Applicable	Not applicable.
Imbalance Among and Within Populations	Neutral	Slight improvement is possible because of increased productivity and species diversity.
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	Treatment improves plant production and species diversity.
Inadequate Shelter	Not Applicable	Not applicable.
Inadequate Stock Water	Not Applicable	Not applicable.
Stress and Mortality	Slight Improvement	Improved forage quantity and quality improves animal

		condition and reduces stress.
HUMAN – ECONOMICS		
Land - Change in Land Use	Not Applicable	Not Applicable
Land – Land in Production	Not applicable	Not applicable.
Capital – Change in Equipment	Moderate increase.	
Capital - Total Investment Cost	Moderate.	
Capital – Annual Cost	Slight increase.	
Capital – Credit and Farm Program Eligibility	Situational.	
Labor - Labor	Moderate to substantial increase.	
Labor – Change in Management Level		
Risk - Yield	Slight Decrease	Slight decrease due to improved soil permeability, infiltration and plant vigor.
Risk - Flexibility	Slight Increase	Slight increase. Treated areas need to be relatively free of undesirable plants that increase with soil disturbance.
Risk - Timing	Moderate Increase	Moderate increase - practice should be applied prior to growing season.
Risk – Cash Flow	Slight to Moderate Increase	Slight to moderate increase because of treatment cost.
Profitability – Change in Profitability	Slight to moderate increase.	
HUMAN - CULTURAL		
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT	Slight to Substantial Increase	Construction impacts (mechanical).
HUMAN – ENERGY		
Depletion of Fossil Fuel Resources	Slight Decrease	Practice increases infiltration which improves forage production quality and irrigation efficiency.
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.