

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

<b>STATE</b>	Arkansas	<b>FIELD OFFICE</b>		<b>DATE</b>	
<b>PRACTICE: Cover Crop 340</b>		Baseline Setting: Appropriate Land Use(s): Crop, Forest, Grazed Forest, Grazed Range, Hay, Headquarters, Mined, Native or Naturalized Pasture, Natural Area, Pasture, Recreation, Urban, Watershed Protection, Wildlife			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>		<b>PHYSICAL EFFECTS</b>		<b>RATIONALE</b>	
<b>SOIL - EROSION</b>					
Sheet and Rill		Moderate to Substantial Improvement		Increased cover during erosive periods will reduce soil detachment by water.	
Wind		Moderate to Substantial Improvement		Increased cover during erosive periods will reduce soil detachment by wind.	
Ephemeral Gully		Moderate to Substantial Improvement		Increased cover during erosive periods will reduce concentrated flow and associated soil detachment.	
Classic Gully		Slight Improvement		Less runoff reduces potential gully erosion.	
Streambank		Not Applicable		Not applicable.	
Shoreline		Not Applicable		Not applicable.	
Irrigation Induced		Not Applicable		Not applicable.	
Mass Movement		Slight Worsening		Increased infiltration and water retention increases the potential for mass movement.	
Road, Roadsides, and Construction Sites		Not Applicable		Not applicable.	
<b>SOIL – CONDITION</b>					
Organic Matter Depletion		Slight to Moderate Improvement		More biomass produced will increase organic matter.	
Rangeland Site Stability		Not Applicable		Not applicable.	
Compaction		Slight to Moderate Improvement		Increased biomass and roots improve aggregation, which gives better resistance to compaction.	
Subsidence		Neutral		If it affects drainage the practice can have an impact on subsidence.	
<b>Contaminants:</b>					
• Salts and other Chemicals		Slight Improvement		Increased organic matter will buffer salts.	
• Animal Waste and other Organics - N		Slight to Moderate Improvement		Vegetation will utilize excessive N, increasing N utilization if vegetation is removed from the field.	
• Animal Waste and other Organics - P		Slight to Moderate Improvement		Vegetation will utilize excessive P, increasing P utilization if vegetation is removed from the field.	

• Animal Waste and other Organics - K	Slight to Moderate Improvement	Vegetation will utilize excessive K, increasing K utilization if vegetation is removed from the field.
• Commercial Fertilizer - N	Slight to Moderate Improvement	Vegetation will utilize excessive N, increasing N utilization if vegetation is removed from the field.
• Commercial Fertilizer – P	Slight to Moderate Improvement	Vegetation will utilize excessive P, increasing P utilization if vegetation is removed from the field.
• Commercial Fertilizer – K	Slight to Moderate Improvement	Vegetation will utilize excessive K, increasing K utilization if vegetation is removed from the field.
• Residual Pesticides	Slight to Moderate Improvement	Increased organic matter adsorbs pesticides and increased biological activity will break pesticides down. Selected vegetation may reduce the need for pesticides.
Damage from Sediment Deposition	Slight to Moderate Improvement	Less erosion results in less sediment.
<b>WATER – QUANTITY</b>		
Rangeland Hydrologic Cycle	Not Applicable	Not applicable.
Excessive Seepage	Slight Improvement	Growing plants will take up excess water. However, infiltration will increase, which may offset some of the benefits.
Excessive Runoff, Flooding, or Ponding	Slight to Moderate Improvement	Growing plants will reduce runoff and increase infiltration.
Excessive Subsurface Water	Slight Improvement	Growing plants will take up excess water. However, infiltration will increase, which may offset some of the benefits.
Drifted Snow	Not Applicable	Not applicable.
Inadequate Outlets	Slight Improvement	Improved vegetative cover conditions reduces runoff and regulates flow to outlets.
Inefficient Water use on Irrigated Land	Neutral	Cover crop may deplete soil moisture prior to planting main crop. If cover crop residue is left on surface, it will improve infiltration and reduce evaporation.
Inefficient Water use on Non-Irrigated Land	Slight to Substantial Improvement	Improves infiltration, soil structure, and winter water use that may otherwise be lost. For dry climates (<20 inches/year); cover crops will compete for main crop's moisture.
Reduced Capacity of Conveyances by Sediment Deposition	Slight to Substantial Improvement	Reduces erosion which results in less sediment transport.
Reduced Storage of Water Bodies by	Slight to Substantial Improvement	Reduces erosion which results in

Sediment Accumulation		less sediment accumulation.
Aquifer Overdraft	Slight Improvement	Increased infiltration may improve aquifer recharge.
Insufficient Flows in Water Courses	Not Applicable	Not applicable.
<b>WATER – QUALITY</b>		
In Groundwater:		
• Harmful Levels of Pesticides	Slight to Moderate Improvement	The action increases soil organic matter, biological activity, and pesticide uptake.
• Excessive Nutrients and Organics	Slight to Moderate Improvement	The action utilizes excess nutrients and increases organic matter. The additional organic matter will increase cation exchange capacity which will hold nutrients.
• Excessive Salinity	Slight Improvement	Cover crops can take up salts and water reducing the leaching potential of salts.
• Harmful Levels of Heavy Metals	Slight Improvement	Higher organic matter levels increases buffering capacity of the soil. Some cover crops can take up some heavy metals.
• Harmful Levels of Pathogens	Slight to Moderate Improvement	The action increases organic matter promoting microbial activity which competes with pathogens.
• Harmful Levels of Petroleum	Not Applicable	Not applicable.
In Surface Water:		
• Harmful Levels of Pesticides	Slight to Moderate Improvement	The action reduces runoff and erosion.
• Excessive Nutrients and Organics	Slight to Moderate Improvement	The action reduces erosion and runoff and transport of nutrients. Cover crops can uptake excess nutrients.
• Excessive Suspended Sediment and Turbidity	Slight to Moderate Improvement	Vegetation will reduce erosion and transport of sediment.
• Excessive Salinity	Neutral	Less runoff reduces transport of soluble salts. Growing vegetation can use excess water which reduces seepage.
• Harmful Levels of Heavy Metals	Slight to Moderate Improvement	Decreased erosion and runoff reduces heavy metal delivery to surface water. Increased soil organic matter increases capacity of soils to retain heavy metals. Cover crops can uptake heavy metals.
• Harmful Temperatures	Not Applicable	Not applicable.
• Harmful Levels of Pathogens	Slight Improvement	Less erosion and runoff reduces delivery of pathogens.
• Harmful Levels of Petroleum	Not Applicable	Not applicable.
<b>AIR – QUALITY</b>		
Particulate Matter less than 10 Micrometers in Diameter (PM 10)	Slight to Substantial Improvement	Ground cover helps reduce wind erosion and generation of

		fugitive dust.
Particulate Matter less than 2.5 Micrometers in Diameter (PM 2.5)	Slight to Moderate Improvement	Ground cover helps reduce wind erosion and generation of fugitive dust.
Excessive Ozone	Slight Improvement	Motor vehicle emissions are reduced through reduced tillage operations. 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 <sub>2</sub> (Carbon Dioxide)	Slight to Moderate 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)	Slight Improvement	Nitrogen fixing by selected cover crops
• CH <sub>4</sub> (Methane)	Not Applicable	Not applicable.
Ammonia (NH <sub>3</sub> )	Slight to Moderate Improvement	Nitrogen is fixed in soils with proper cover crops
Chemical Drift	Not Applicable	Not applicable.
Objectionable Odors	Not Applicable	Not applicable.
Reduced Visibility	Slight to Substantial Improvement	Residues and cover crops reduce wind erosion and fugitive dust
Undesirable Air Movement	Not Applicable	Not applicable.
Adverse Air Temperature	Not Applicable	Not applicable.
<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	Slight to Moderate Improvement	Plants are selected and managed to maintain optimal productivity and health and can contribute to subsequent crop health and productivity.
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	Slight to Moderate Improvement	Adding a cover crop provides a higher quality forage.
Wildfire Hazard	Not Applicable	Not applicable.
<b>ANIMALS - FISH AND WILDLIFE</b>		
Inadequate Food	Slight to Moderate Improvement	Increased quality and quantity of

		vegetation provides more food for wildlife.
Inadequate Cover/Shelter	Slight to Moderate Improvement	Increased quality and quantity of vegetation provides more cover for wildlife.
Inadequate Water	Not Applicable	Not applicable.
Inadequate Space	Slight to Moderate Improvement	Increased cover will increase space for wildlife. May be used to connect other cover areas.
Habitat Fragmentation	Slight to Moderate Improvement	Increased cover will increase space for wildlife. May be used to connect other cover areas.
Imbalance Among and Within Populations	Slight to Moderate Improvement	Habitat management is implemented to remove 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.
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>	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 Substantial Improvement	Cover crops will add supplemental forage.
Inadequate Shelter	Not Applicable	Not applicable.
Inadequate Stock Water	Not Applicable	Not applicable.
Stress and Mortality	Not Applicable	Not applicable.
<b>HUMAN – ECONOMICS</b>		
Land - Change in Land Use	Slight to Substantial	Substantial if large areas are planted, N/A if small areas planted or tilled in.
Land – Land in Production	Substantial decrease	Substantial decrease if permanent cover is added to rotation. N/A if annually tilled in.
Capital – Change in Equipment	Slight Increase.	
Capital - Total Investment Cost	Not applicable.	
Capital – Annual Cost	Moderate increase.	
Capital – Credit and Farm Program Eligibility	Situational.	
Labor - Labor	Slight to moderate increase	Slight to moderate increase to plant crop.
Labor – Change in Management Level	Negligible	
Risk - Yield	Slight Decrease	Slight decrease due to improved soil quality.
Risk - Flexibility	Moderate Increase	Moderate increase due to incorporating additional cropping system.
Risk - Timing	Substantial Increase	Substantial increase - cover crop must not interfere with major

		crop production.
Risk – Cash Flow	Slight Increase	Slight increase due to production of extra crop without benefit of harvest.
Profitability – Change in Profitability	Situational	Moderate decrease to slight increase.
<b>HUMAN - CULTURAL</b>		
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.
<b>HUMAN – ENERGY</b>		
Depletion of Fossil Fuel Resources	Slight to Moderate Decrease	Depending on the purpose of the practice, a substantial amount of material inputs (e.g., fertilizers and pesticides) and/or fossil fuels for harvesting and planting can be saved.
Underutilization of Non-Fossil Energy Resources	Not Applicable	Not applicable.

## 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.