

SECTION III – C GUIDANCE DOCUMENTS

2. Examples of Resource Management Systems

Introduction

This section describes the effects of **Resource Management Systems (RMS)** on the soil, water, air, plant, and animal (SWAPA) resources and their associated social, economic, and cultural considerations.

An RMS may be prepared for any type of land use. The examples provided in this section focus on land uses commonly associated with agricultural operations. These land uses are:

[Cropland](#)

[Hayland](#)

[Pasture](#)

[Woodland](#)

[Wildlife Land](#)

[Headquarters](#)

Refer to Section V-B of the FOTG for an evaluation of the effects of each example RMS on the SWAPA resources and their social, economic, and cultural considerations.

Resource Management Systems (RMS) for Cropland

Example C1 – Existing Condition: Cropland fields eroding above T with classic gully erosion occurring. The cropping system is continuous corn, conventionally tilled. Fertilizer is applied based on perceived crop needs, without using soil tests to determine soil nutrient levels. A Phosphorous Site Index showed a medium rating. A significant amount of Johnsongrass, a noxious weed, is present.

The following table lists natural resource concerns and associated social, economic, and cultural considerations that have been identified for this planning unit:

RESOURCE	RESOURCE CONSIDERATION	CONCERNS/PROBLEMS
SOIL	Erosion	Sheet and rill erosion Classic gully Soil deposition
	Condition	None identified
WATER	Quantity	None identified
	Quality	Sediment Nutrients and Organics
AIR	None identified	None identified
PLANTS	Health and Productivity	Pests (noxious weeds)
ANIMALS	None identified	None identified

OTHER CONSIDERATIONS	CONCERNS/PROBLEMS
Social and Economic Concerns	Long-term productivity High production costs (tillage operations and fertilizer)
Cultural Resources	None identified

Typical RMS to Address These Concerns – The rotation will be modified to a corn-soybeans planted with no-till, with a cover crop planted in the fall after soybeans to provide over-winter residue. The landowner will begin doing annual soil tests and applying fertilizer accordingly. Johnsongrass will be controlled. The gully will be reshaped and stabilized with a grassed waterway.

Planned Practices

- | | |
|---|---------------------------|
| 328 – Conservation Crop Rotation | 393 – Filter Strip |
| 340 – Cover Crop | 595 – Pest Management |
| 412 – Grassed Waterway | 590 – Nutrient Management |
| 329A – Residue Management: No Till/Strip Till | |

RMS for Cropland (continued)

Example C2 – Existing Condition: Cropland field is relatively flat. A corn-wheat-double cropped soybeans rotation is used. Some areas of the field are poorly drained and adversely affect crop production. Corn and wheat are conventional tilled, while soybeans are no-tilled into the wheat stubble. During wet seasons, equipment tends to bog down in poorly drained soils. Poultry litter is being applied at 4 tons per acre. The Phosphorous Site Index is very high. Soil texture is predominantly loam.

The following table lists natural resource concerns and associated social, economic, and cultural considerations that have been identified for this planning unit:

RESOURCE	RESOURCE CONSIDERATION	CONCERNS/PROBLEMS
SOIL	Erosion	Sheet and rill
	Condition	None identified
WATER	Quantity	Excess subsurface water
	Quality	Nutrients and Organics Pesticides
AIR	None identified	None identified
PLANTS	Health and Productivity	Nutrients Pests
ANIMALS	None identified	None identified

OTHER CONSIDERATIONS	CONCERNS/PROBLEMS
Social and Economic Concerns	High production cost because of time loss, damage to equipment, and crop loss and wet areas.
Cultural Resources	None identified

Typical RMS to Address These Concerns : The crop rotation and residue management meets standards. The existing ditch is restored to capacity. The Phosphorous Site Index is reduced to high with the reducing of poultry litter to two tons per acre. Phosphorus will be applied at the three year crop removal rate to be in compliance with Nutrient Management 590 and the Delaware Nutrient Management Law.

Planned Practices

328 – Conservation Crop Rotation	590 – Nutrient Management
329A – Residue Management, No till/Strip Till	595 – Pest Management
344 – Residue Management, Seasonal	607 – Surface Drainage

RMS for Cropland (continued)

Example C3 – Existing Condition: Cropland field is relatively flat. A corn-wheat-double cropped soybeans rotation is used. Corn and wheat are conventional tilled, while soybeans are no-tilled into the wheat stubble. The soil is sandy loam, droughty, and the Phosphorous Site Index is medium. The operator is not implementing integrated pest management.

The following table lists natural resource concerns and associated social, economic, and cultural considerations that have been identified for this planning unit:

RESOURCE	RESOURCE CONSIDERATION	CONCERNS/PROBLEMS
SOIL	Erosion	Sheet and rill
	Condition	None identified
WATER	Quantity	Insufficient Water
	Quality	Sediment Nutrients and Organics
AIR	None identified	None identified
PLANTS	Health and Productivity	Establishment and Management
ANIMALS	None identified	None identified

OTHER CONSIDERATIONS	CONCERNS/PROBLEMS
Social and Economic Concerns	High production costs (fertilizer and pesticide costs).
Cultural Resources	N/A

Typical RMS to Address These Concerns : The crop rotation and residue management meets standards. The operator will begin implementing irrigation water management, which will improve economic feasibility of the operation and improve nutrient management. He will also begin scouting for insects to determine economic threshold for treatment.

Planned Practices

- 328 – Conservation Crop Rotation
- 329A – Residue Management, No-Till and Strip Till
- 441 – Irrigation Water Management
- 590 – Nutrient Management
- 595 – Pest Management

Resource Management System (RMS) for Hayland

Example H1– Existing Condition: Continuous cool-season grass hay field. The stand is thinning and productivity is low.

The following table lists natural resource concerns and associated social, economic, and cultural considerations that have been identified for this planning unit:

RESOURCE	RESOURCE CONSIDERATION	CONCERNS/PROBLEMS
SOIL	Erosion	Sheet and rill
	Condition	None identified
WATER	Quality	Sediment Nutrients and Organics
	Quantity	None identified
AIR	None identified	None identified
PLANTS	Health and Productivity	Establishment and Management Nutrients
ANIMALS	None identified	None identified

OTHER CONSIDERATIONS	CONCERNS/PROBLEMS
Social and Economic Concerns	Low net return (output compared to input) on the field.
Cultural Resources	N/A

Typical RMS to Address These Concerns – The operator will reseed the hay field and properly manage the forage harvest. Annual soil tests will be taken and fertilizers will be applied based on a nutrient management plan to bring the hay field up to optimum productivity.

Planned Practices

- 512 – Pasture and Hay Planting
- 590 – Nutrient Management
- 511 – Forage Harvest Management

Resource Management Systems (RMS) for Pasture

Example P1 – Existing Condition: Overgrazed cool-season grass pasture with weedy patches and bare soil in some areas. Livestock have a sufficient water supply and are fenced out of stream, but the stream is lacking shade, which is increasing water temperature and affecting dissolved oxygen levels.

The following table lists natural resource concerns and associated social, economic, and cultural considerations that have been identified for this planning unit:

RESOURCE	RESOURCE CONSIDERATION	CONCERNS/PROBLEMS
SOIL	Erosion	Sheet and rill
	Condition	None identified
WATER	Quantity	None identified
	Quality	Sediment Nutrients and Organics
AIR	None identified	None identified
PLANTS	Health and Productivity	Establishment and Management Nutrients Pests (weeds) Temperature
ANIMALS	Health and Productivity	Food

OTHER CONSIDERATIONS	CONCERNS/PROBLEMS
Social and Economic Concerns	Low net return (output compared to input) on the field.
Cultural Resources	N/A

Typical RMS to Address These Concerns : The operator will reseed the pasture and follow proper grazing management. Annual soil test will be taken and fertilizers will be applied based on a nutrient management plan to bring the pasture up to optimum productivity. He has also agreed to plant a riparian forested buffer along side the stream to provide shade to both the stream and the livestock.

Planned Practices

512 – Pasture and Hay Planting
528A – Prescribed Grazing
391 – Riparian Forested Buffer

595 – Pest Management
590 – Nutrient Management

Resource Management Systems (RMS) for Woodland

Example W1 – Existing Condition: An existing woodlot has not been managed. The species present are red maple, sweet gum, black gum, loblolly pine, American holly, and willow oak. The landowner is interested in pine production. No erosion problems or other resource concerns were noted.

The following table lists natural resource concerns and associated social, economic, and cultural considerations that have been identified for this planning unit:

RESOURCE	RESOURCE CONSIDERATION	CONCERNS/PROBLEMS
SOIL	Erosion	None identified
	Condition	None identified
WATER	Quality	None identified
	Quality	None identified
AIR	None identified	None identified
PLANTS	Health and Productivity	Establishment and management
ANIMALS	None identified	None identified

OTHER CONSIDERATIONS	CONCERNS/PROBLEMS
Social and Economic Concerns	Low net return because of species composition.
Cultural Resources	N/A

Typical RMS to Address These Concerns : The existing woodland has sufficient loblolly pines, but they need to be release. The landowner will work with the county forester to develop a forest management plan that includes controlling undesirable hardwoods and releasing the pines.

Planned Practices

666 – Forest Stand Improvement

RMS for Woodland (continued)

Example W2 – Existing Conditions : An existing crop field has reduced yield because of wet conditions. The landowner is interested in increasing his profit margin on the land and improving wildlife habitat.

The following table lists natural resource concerns and associated social, economic, and cultural considerations that have been identified for this planning unit:

RESOURCE	RESOURCE CONSIDERATION	CONCERNS/PROBLEMS
SOIL	Erosion	Sheet and rill
	Condition	None identified
WATER	Quantity	None identified
	Quality	Sediment Nutrients
AIR	None identified	None identified
PLANTS	Health and Productivity	Suitability
ANIMALS Wildlife	Health and Productivity	Food, Cover, and/or Water

OTHER CONSIDERATIONS	CONCERNS/PROBLEMS
Social and Economic Concerns	Low return on crop field. Lack of adequate hunting opportunities.
Cultural Resources	N/A

Typical RMS to Address These Concerns : The existing crop field will be converted to native hardwood tree species beneficial to wildlife. The planting will be allowed to converted to woodland.

Planned Practices

612 – Tree Planting
644 – Wetland Wildlife Habitat Management

590 – Nutrient Management
595 – Pest Management

Resource Management Systems (RMS) for Wildlife Land

Example WL1- Existing Condition: The existing land use is cropland that is being managed properly, but the landowner wants to establish native warm-season grasses and wildflowers for upland wildlife habitat for hunting.

The following table lists natural resource concerns and associated social, economic, and cultural considerations that have been identified for this planning unit:

RESOURCE	RESOURCE CONSIDERATION	CONCERNS/PROBLEMS
SOIL	Erosion	None identified
	Condition	None identified
WATER	Quantity	None identified
	Quality	Nutrients Pesticides
AIR	None identified	None identified
PLANTS	None identified	None identified
ANIMALS Wildlife	Health and Productivity	Food, Cover, and/or Water

OTHER CONSIDERATIONS	CONCERNS/PROBLEMS
Social and Economic Concerns	Low return on crop field. Lack of adequate hunting opportunities.
Cultural Resources	N/A

Typical RMS – The area will be established to native warm-season grasses and wildflowers beneficial to wildlife. The area will be managed for wildlife habitat.

Planned Practices

327 – Conservation Cover

645 – Upland Wildlife Habitat Management

590 – Nutrient Management

595 – Pest Management

RMS for Wildlife Land (continued)

Example WL2 – Existing Condition: A small field of continuous soybeans is gently sloping to a low area at one end of the field. The landowner wants to convert the entire field into a shallow water area with a herbaceous buffer to provide wetland wildlife habitat. A site investigation revealed the presence of prehistoric artifacts at the high end of the field.

The following table lists natural resource concerns and associated social, economic, and cultural considerations that have been identified for this planning unit:

RESOURCE	RESOURCE CONSIDERATION	CONCERNS/PROBLEMS
SOIL	Erosion	Sheet and rill
	Condition	None identified
WATER	Quality	Nutrients and organics
	Quantity	None identified
AIR	None identified	None identified
PLANTS	Health and Productivity	None identified
ANIMALS (Wildlife)	Health and Productivity	Food, cover, and/or water

OTHER CONSIDERATIONS	CONCERNS/PROBLEMS
Social and Economic Concerns	None identified
Cultural Resources	Degradation or damage of resources

Typical RMS to Address These Concerns – The low area of the field will be converted to a shallow water area for wildlife. The spoil will be spread outside of the area of cultural resource concern. The spoil spreading area and cultural resource site will be planted to native warm season grasses and wildflowers. The area will be managed for wildlife.

Planned Practices

- 646 – Shallow Water Area for Wildlife
- 644 – Wetland Wildlife Habitat Management

Resource Management Systems (RMS) for Headquarters

Example HQ1- Existing Conditions : Headquarters at a poultry operation consists of three chicken houses, with the landowner's house nearby. Adjacent neighbors have complained about particulates blown by tunnel fans and excessive odors. Dead poultry are placed in open area behind the houses and are usually buried a few days later. Manure/litter from the poultry house is temporarily stacked outside the houses, and cleanout is stacked in the fields and utilized on their cropland.

The following table lists natural resource concerns and associated social, economic, and cultural considerations that have been identified for this planning unit:

RESOURCE	RESOURCE CONSIDERATION	CONCERNS/PROBLEMS
SOIL	Erosion	Sheet and rill
	Condition	None identified
Water	Quantity	None identified
	Quality	Nutrients and Organics Pathogens
AIR	Quality	Airborne particulates Airborne odors
PLANTS	None identified	None identified
ANIMALS	None identified	None identified

OTHER CONSIDERATIONS	CONCERNS/PROBLEMS
Social and Economic Concerns	Quality of life for neighbors
Cultural Resources	None identified

Typical RMS to Address These Concerns – The landowner will install a waste storage structure for cleanout, and a composting facility to take care of normal mortality. A windbreak will be established to help control particulates and odors from the tunnel fans.

Planned Practices

313 - Waste Storage Structure

317 - Composting Facility

380 – Windbreak/Shelterbelt Establishment

Note: Use Nutrient Management, 590, on cropland and other land uses where animal waste will be applied.

RMS for Headquarters (continued)

Example HQ2-Existing Conditions : Headquarters at a dairy operation that is milking 200 head. Livestock walkways and loafing areas are very muddy in wet weather, and it is difficult to remove accumulated manure. A significant amount of time is spent preparing cows for milking. Although livestock are fenced out of a stream adjacent to the loafing area, it is heavily contaminated with manure runoff from the barnyard. Manure is hauled and spread frequently, usually on a daily basis. Neighbors have complained about odors.

The following table lists natural resource concerns and associated social, economic, and cultural considerations that have been identified for this planning unit:

RESOURCE	RESOURCE CONSIDERATION	CONCERNS/PROBLEMS
SOIL	Erosion	Sheet and rill
	Condition	None identified
WATER	Quantity	None identified
	Quality	Nutrients and organics Pathogens
AIR	Quality	Airborne odors
PLANTS	None identified	None identified
ANIMALS	Health and Productivity	Growth, reproduction, and condition

OTHER CONSIDERATIONS	CONCERNS/PROBLEMS
Social and Economic Concerns	Quality of life for neighbors Inefficient use of time, labor, and equipment with daily hauling and in preparing cows for milking.
Cultural Resources	None identified

Typical RMS- The operator is going to install an above ground tank to store 90 days of waste. Roof gutters will be installed to divert clean water away from the barnyard. The loafing area will be concreted to improve health of cattle and so the area can be scrapped daily. A wastewater treatment strip will be installed to reduce contaminated runoff from entering the stream.

Planned Practices:

561 – Heavy Use Area Protection
313 – Waste Storage Structure

558 – Roof Runoff Management
635 – Wastewater Treatment Strip