

SECTION III - C GUIDANCE DOCUMENTS

2. Examples of Resource Management Systems

Introduction

This section provides examples of **Resource Management Systems (RMS)** that are typically used in Maryland to treat or prevent problems associated with soil, water, air, plant, and animal resources (SWAPA).

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:

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

[Cropland](#)

[Hayland](#)

[Pasture](#)

[Woodland](#)

[Wildlife Land](#)

[Headquarters](#)

Resource Management Systems (RMS) for Cropland

Example 1: Highly erodible cropland fields with classic gully erosion occurring in two areas. 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 significant amount of Johnsongrass (a noxious weed) is in several areas.

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 Classic gully Soil deposition
WATER	Quantity	None identified
	Quality	Sediment Nutrients
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	Cost and cost-effectiveness Availability of skills, labor, and equipment
Cultural Resources	None identified

Typical RMS to treat these concerns:

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

RMS for Cropland (continued)

Example 2: Cropland field is relatively flat. A corn-soybean rotation is used. Some areas of the field are poorly drained and adversely affect crop production. During wet seasons, equipment tends to bog down in poorly drained soils. Fertilizer is applied based on perceived crop needs, without using soil tests to determine soil nutrient levels. Pesticide leaching is a concern due to high water tables. Soil texture is predominantly sandy 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
WATER	Quantity	Excess subsurface water
	Quality	Sediment
		Nutrients Pesticides
AIR	None identified	None identified
PLANTS	Health and Productivity	Suitability
ANIMALS	None identified	None identified

OTHER CONSIDERATIONS	CONCERNS/PROBLEMS
Social and Economic Concerns	Cost and cost-effectiveness Availability of skills, labor, and equipment
Cultural Resources	None identified

Typical RMS to treat these concerns:

328 – Conservation Crop Rotation
 344 – Residue Management, Seasonal
 590 – Nutrient Management
 606 – Subsurface Drainage
 595 – Pest Management

RMS for Cropland (continued)

Example 3: Highly erodible cropland fields with ephemeral gullies in some areas. Plants are stunted and stressed where erosion is severe. The cropping system is grain corn, conventionally tilled, with hay in the rotation. Fertilizer is applied based on perceived crop needs, without using soil tests to determine soil nutrient levels. No pest problems or pesticide concerns were noted. In one field, prehistoric artifacts were observed at the top of the slope.

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 Ephemeral gully Soil deposition
WATER	Quantity	None identified
	Quality	Sediment Nutrients
AIR	None identified	None identified
PLANTS	Health and Productivity	Suitability Establishment and Management
ANIMALS	None identified	None identified

OTHER CONSIDERATIONS	CONCERNS/PROBLEMS
Social and Economic Concerns	Cost and cost-effectiveness Availability of skills, labor, and equipment
Cultural Resources	Degradation or damage of resources

Typical RMS to treat these concerns:

- 328 – Conservation Crop Rotation
- 329A – Residue Management, No-Till and Strip Till
- 362 – Diversion
- 412 – Grassed Waterway
- 585 – Contour Stripcropping
- 590 – Nutrient Management
- 595 – Pest Management

Resource Management System (RMS) for Hayland

Example: Continuous cool-season grass hay field. The stand is thinning and productivity is low. Soil test results indicate high levels of phosphorus in the soil.

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
WATER	Quality	Sediment Nutrients
AIR	None identified	None identified
PLANTS	Health and Productivity	Nutrients
ANIMALS	None identified	None identified

OTHER CONSIDERATIONS	CONCERNS/PROBLEMS
Social and Economic Concerns	Cost and cost-effectiveness
Cultural Resources	None identified

Typical RMS to treat these concerns:

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

Resource Management Systems (RMS) for Pasture

Example 1: 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 streams.

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
WATER	Quantity	None identified
	Quality	Sediment Nutrients
AIR	None identified	None identified
PLANTS	Health and Productivity	Nutrients Pests (weeds)
ANIMALS	Health and Productivity	Food

OTHER CONSIDERATIONS	CONCERNS/PROBLEMS
Social and Economic Concerns	Cost and cost-effectiveness
Cultural Resources	None identified

Typical RMS to treat these concerns:

- 512 – Pasture and Hay Planting
- 528A – Prescribed Grazing
- 595 – Pest Management
- 590 – Nutrient Management

RMS for Pasture (continued)

Example 2: Cool-season grass-legume pasture. Some areas of the pasture are heavily grazed and weedy, but cover is generally good. Livestock have unrestricted access to a trout stream, resulting in extensive bank erosion and impaired water quality for fish. In-stream water quality tests indicate high levels of fecal coliform bacteria.

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
WATER	Quantity	Insufficient water supply
	Quality	Sediment Nutrients and organics Pathogens Aquatic habitat suitability
AIR	None identified	None identified
PLANTS	Health and Productivity	Nutrients Pests (weeds)
ANIMALS	Health and Productivity (Livestock)	Food Water
	Health and Productivity (Fish)	Water

OTHER CONSIDERATIONS	CONCERNS/PROBLEMS
Social and Economic Concerns	Cost and cost-effectiveness
	Availability of skills, labor, and equipment
Cultural Resources	None identified

Typical RMS to treat these concerns:

528A – Prescribed Grazing
 595 – Pest Management
 590 – Nutrient Management
 382 – Fence
 574 – Spring Development
 614 – Trough
 561 – Heavy Use Area Protection
 728 – Stream Crossing

Resource Management Systems (RMS) for Woodland

Example 1: An existing woodlot has not been managed. Some valuable trees are present, but there are also invasive species in some areas. 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
WATER	None identified	None identified
AIR	None identified	None identified
PLANTS	Health and Productivity	Establishment and management Pests (invasive species)
ANIMALS	None identified	None identified

OTHER CONSIDERATIONS	CONCERNS/PROBLEMS
Social and Economic Concerns	Cost and cost-effectiveness Availability of skills, labor, and equipment
Cultural Resources	None identified

Typical RMS to treat these concerns:

666 – Forest Stand Improvement
595 – Pest Management

RMS for Woodland (continued)

Example 2: A highly erodible cropland field will be planted and managed for Christmas tree production.

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
WATER	Quality	Sediment Nutrients
AIR	None identified	None identified
PLANTS	Health and Productivity	Pests (insects and weeds)
ANIMALS	None identified	None identified

OTHER CONSIDERATIONS	CONCERNS/PROBLEMS
Social and Economic Concerns	Cost and cost-effectiveness Availability of skills, labor, and equipment
Cultural Resources	None identified

Typical RMS to treat these concerns:

- 612 – Tree Planting
- 327 – Conservation Cover (*establish grass between the rows*)
- 590 – Nutrient Management
- 595 – Pest Management

Resource Management Systems (RMS) for Wildlife Land

Example 1: Area is a 3-acre lawn consisting of frequently mowed cool-season grasses. Landowner wants to establish and maintain native warm-season grasses and wildflowers for upland wildlife habitat. Existing turf is dense and is fertilized several times during the growing season based on turf color. No soil tests have been used to determine soil nutrient levels. Insecticides are periodically applied for "preventive" purposes, regardless of whether or not insect pests are actually 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	None identified	None identified
WATER	Quality	Nutrients Pesticides
AIR	None identified	None identified
PLANTS	Health and Productivity	Pests (weeds)
ANIMALS	Health and Productivity	Food and cover

OTHER CONSIDERATIONS	CONCERNS/PROBLEMS
Social and Economic Concerns	Cost and cost-effectiveness Availability of skills, labor, and equipment
Cultural Resources	None identified

Typical RMS to treat these concerns:

- 327 – Conservation Cover
- 590 – Nutrient Management
- 595 – Pest Management
- 645 – Upland Wildlife Habitat Management

RMS for Wildlife Land (continued)

Example 2: 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 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
WATER	Quality	Nutrients and organics
AIR	None identified	None identified
PLANTS	Health and Productivity	Pests (weeds)
ANIMALS	Health and Productivity	Food, cover, and water

OTHER CONSIDERATIONS	CONCERNS/PROBLEMS
Social and Economic Concerns	Cost and cost-effectiveness Availability of skills, labor, and equipment
Cultural Resources	Degradation or damage of resources

Typical RMS to treat these concerns:

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

Resource Management Systems (RMS) for Headquarters

Example 1: 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 house cleanout is stacked on bare ground where soils have a seasonal high water table. It is periodically hauled off-site for use elsewhere.

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
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 Cost and cost-effectiveness Availability of skills, labor, and equipment
Cultural Resources	None identified

Typical RMS to treat these concerns:

- 561 - Heavy Use Area Protection
- 313 - Waste Storage Structure
- 317 - Composting Facility
- 590 - Nutrient Management
- 633 - Waste Utilization
- 380 - Windbreak/Shelterbelt Establishment

RMS for Headquarters (continued)

Example 2: 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
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 Cost and cost-effectiveness Availability of skills, labor, and equipment
Cultural Resources	None identified

Typical RMS to treat these concerns:

- 561 – Heavy Use Area Protection
- 313 – Waste Storage Structure
- 558 – Roof Runoff Structure
- 635 – Wastewater Treatment Strip
- 590 – Nutrient Management
- 633 – Waste Utilization

RMS for Headquarters (continued)

Example 3: Farmstead with no livestock. Heavily used areas around the house and equipment sheds were previously planted to grass, but cover is now sparse and some erosion is occurring. The farm lane is rough and uneven in some spots. Access is difficult in wet weather.

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
WATER	Quantity	None identified
	Quality	Sediment
AIR	None identified	N/A
PLANTS	Health and Productivity	Suitability
ANIMALS	None identified	N/A

OTHER CONSIDERATIONS	CONCERNS/PROBLEMS
Social and Economic Concerns	Cost and cost-effectiveness Availability of skills, labor, and equipment
Cultural Resources	None identified

Typical RMS to treat these concerns:

342 – Critical Area Planting
560 – Access Road