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| Course | Agricultural Science II |
| Unit | Introduction to Grassland Management |
| Subunit | Grassland Management Practices |
| Lesson | Grassland Management Plan |
| Estimated Time | Four 50-minute blocks |
| Student Outcome | |

Develop a grassland management plan.



Learning Objectives

1. Identify what is needed to develop a grassland management plan.
2. Identify the steps in developing a grassland management plan.
3. Determine how landowners select a grazing system to suit their needs.
4. Determine how landowners decide what type of forage is to be used.
5. Identify some ways to maintain or renovate grassland.

Grade Level Expectations

Resources, Supplies & Equipment, and Supplemental Information

Resources

1. Activity Sheets
 -  AS 1 - Determining Grassland Condition
 -  AS 2 - Evaluating a Grassland
2. *Introduction to Grassland Management* (Student Reference). University of Missouri-Columbia: Instructional Materials Laboratory, 1997.
3. *Introduction to Grassland Management Curriculum Enhancement, "Unit III - Grassland Management Practices."* University of Missouri-Columbia: Instructional Materials Laboratory, 2003.

Supplies & Equipment

- The Natural Resources Conservation Service *Field Office Technical Guide* used in AS 2 was accessed February 20, 2008, from <http://www.nrcs.usda.gov/technical/efotg/>. Table 1 titled "Species Compatibility to Pasture Suitability Groups for Pasture and Hayland Planting," found in *Pasture and Hayland Planting Standard (512)*, from Section IV, Part B: Conservation Practices, was accessed February 20, 2008, from http://efotg.nrcs.usda.gov/references/public/MO/512_1202.pdf.

Supplemental Information

1. Internet Sites

- ❑ Sargent, M. S and K. S. Carter, ed. "Grassland Management." Part V in *Managing Michigan Wildlife: A Landowners Guide*. East Lansing: Michigan United Conservation Clubs, 1999. Accessed February 20, 2008, from http://www.dnr.state.mi.us/publications/pdfs/huntingwildlifehabitat/Landowners_Guide/Habitat_Mgmt/Grassland/index.htm.
- ❑ Warren G. Magnuson Park Vegetation Management Plan. Seattle Parks and Recreation, Washington. Accessed February 20, 2008, from <http://www.seattle.gov/parks/magnuson/vmp.htm>.



Interest Approach



Have students visit a livestock operation that monitors production closely to show them that the better grassland management inventory, the better the management.

Communicate the Learning Objectives

1. Identify what is needed to develop a grassland management plan.
2. Identify the steps in developing a grassland management plan.
3. Determine how landowners select a grazing system to suit their needs.
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| Instructor Directions | Content Outline |
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| <p>Objective 1</p> <p><i>Ask students what information is needed to complete the grassland management plan. Discuss with students why each of these items is necessary. Review the previous units showing the students how what they have learned fits together.</i></p> | <p>Identify what is needed to develop a grassland management plan.</p> <ol style="list-style-type: none">1. Soil test results: analysis of soil fertility2. Soil identification: information on the type of soil and drainage and use classification3. Maps: visual representation of the land; includes types of soil and physical layout, such as water, slope, and drainage4. Plant composition: quality, quantity, and variety of plants in a plot5. Livestock needs: nutritional needs based on species, age, sex, production level, and environment6. Herd inventory: the quantity of animals within each classification |
| <p>Objective 2</p> <p><i>Ask students to outline the steps in developing a grassland management plan, based on what they have learned in previous lessons.</i></p> | <p>Identify the steps in developing a grassland management plan.</p> <ol style="list-style-type: none">1. Acquire an aerial photograph of the grassland and outline the fields included in the plan.2. Complete soil tests for each field.3. Conduct a complete grassland inventory looking at plant composition to determine the quality and quantity of pasture available and assist in calculating stocking rates.4. Evaluate wildlife habitat.5. Select a grassland management plan, choosing a grazing system and deciding what areas should be grazed and what fields should be mechanically harvested. |

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| <p>Objective 3</p> <p><i>Ask students what different factors would affect or change the grazing system used. Point out that these are the same factors used in selecting the appropriate system for grassland.</i></p> | <p>Determine how landowners select a grazing system to suit their needs.</p> <p>The selection of a grazing system is based on the interaction between the soil, environment, resources, herd needs, wildlife, and plants.</p> |
| <p>Objective 4</p> <p><i>Discuss with students what plants need for optimum growth and what livestock need from forages. These two factors will determine the type of forage needed.</i></p> | <p>Determine how landowners decide what type of forage is to be used.</p> <ol style="list-style-type: none"> 1. Forage management: The goal is persistence of stand and acceptable yields. <ol style="list-style-type: none"> a. Climate b. Site conditions 2. Livestock management: The goal is profitable gains. <ol style="list-style-type: none"> a. Nutrient needs b. Intensity of harvest/ grazing 3. Forage management should be considered first in selecting a forage. |
| <p>Objective 5</p> <p><i>Ask students what steps they might take if they wanted to improve a pasture by changing the plant composition. Have students complete AS 1 and/or AS 2.</i></p> <p> AS 1 - Determining Grassland Condition</p> <p> AS 2 - Evaluating a Grassland</p> | <p>Identify some ways to maintain or renovate grassland.</p> <ol style="list-style-type: none"> 1. Testing the soil and amending it <ol style="list-style-type: none"> a. Spreading fertilizer b. Liming c. Disking 2. Suppressing or destroying existing unwanted plants, either chemically or mechanically by disking or plowing 3. Introducing legumes <ol style="list-style-type: none"> a. Overseeding <ul style="list-style-type: none"> - White clover, annual lespedeza, red clover, and birdsfoot trefoil are most often used; they may be used in combination with each other. - It involves broadcasting legumes into an existing pasture in which the stand is thinned or grazed close to the ground. - It is usually done in late winter or early in the fall. |

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| | <ul style="list-style-type: none"> b. No-till planting <ul style="list-style-type: none"> - This method involves using a no-till drill, which can place the seed in the ground at an optimal depth without the ground being worked up. - It is sometimes used to establish additional grass. - Its advantages include lower seeding rates, precise placement of seed, reduction in the loss of valuable organic matter due to tillage; reduction in soil erosion is one of its greatest benefits. 4. Prescribed burning <ul style="list-style-type: none"> a. Used most commonly for native warm-season grasses b. Removes the previous year's growth, keeps invading woody plants in check, and reduces competition from invading cool-season grasses c. Usually conducted in the spring d. Encourages fast and vigorous growth right after the burn, since it releases nutrients that are locked up in the previous year's growth e. Must be used safely, with training from NRCS or MDC |
| <p>Application</p> <p> AS 1 - Determining Grassland Condition</p> <p> AS 2 - Evaluating a Grassland</p> | <p>Answers to AS 1 Answers will vary.</p> <p>Answers to AS 2</p> <ul style="list-style-type: none"> 1. d 2. a 3. c 4. b 5. d 6. 017 7. 1.1 8. c 9. a 10. a 11. a |

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| | 12. c |
| | 13. c |
| | 14. a |
| | 15. c |
| | 16. c |
| | 17. c |
| | 18. <u>Adapted</u> <u>Not Adapted</u> |
| | a. x |
| | b. x |
| | c. x |
| | d. x |
| | e. x |
| | f. x |
| | g. x |
| | h. x |
| | i. x |
| | j. x |
| | 19. a |
| | 20. a |
| | 21. a |
| | 22. b |
| | 23. b |
| | 24. a |
| | 25. a |
| | 26. This moderately grazed pasture offers very little food or cover for rabbits and quail due to its location and plant composition. |
| | 27. b |
| | 28. b |
| | 29. a. 1,392 lbs. |
| | b. 2,070 lbs. |
| | c. 2,052 lbs. |
| | 30. <u>Adequate</u> <u>Not Adequate</u> |
| | a. x |
| | b. x |
| | c. x |
| | 31. c |
| | 32. e |
| | 33. d |
| | 34. 017 |
| | 35. 1.1 |

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| | <p>Other activities</p> <ol style="list-style-type: none"> 1. Design hypothetical situations where the students are given the current conditions of a livestock operation to determine ways to improve its yield and profitability. 2. Visit a prescribed burn for observation. If the actual burn cannot be attended, visit a field that has been burned and compare it with one nearby that has not. |
| <p>Closure/Summary</p> | <p>For a grassland management program to be profitable, many aspects of production must be considered when making decisions. An inventory of current conditions helps a grassland manager make educated choices about grazing systems, forage selection, and renovation plans. The complexity of these decisions is due to the many different factors that influence the grassland.</p> |
| <p>Evaluation: Quiz</p> | <p>Answers:</p> <ol style="list-style-type: none"> 1. a 2. c 3. d 4. d 5. d 6. The steps in putting together a grassland management plan are as follows. <ol style="list-style-type: none"> a. Acquire an aerial photograph of the grassland and outline the fields included in the plan. b. Complete soil tests for each field. c. Conduct a complete pasture inventory to determine the quality and quantity of pasture available and assist in calculating stocking rates. d. Consider wildlife needs. e. Select a grassland management plan, choosing a grazing system and deciding what areas should be grazed and what fields should be mechanically harvested. 7. The following information is included in each of the components of a grassland management plan. <ol style="list-style-type: none"> a. Soil test results: analysis of soil fertility. b. Soil identification: information on the type of soil and drainage and use classification c. Plant composition: quality, quantity, and variety of plants in a plot |

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| | <ul style="list-style-type: none"> d. Maps: visual representation of the land; includes types of soil and physical layout e. Livestock needs: nutritional needs based on species, age, sex, production level, and environment f. Herd inventory: the quantity of animals within each classification <p>8. Overseeding involves broadcasting legumes into an existing pasture in which the stand is thinned or grazed close to the ground</p> |