

Marsh Madness

Adapted from: “Regulation Rummy” in WOW! Wonders of Wetlands: An Educator’s Guide.
Bozeman: The Watercourse and Environmental Concern, Inc., 1995.

Grade Level: Intermediate

Duration: 1 hour

Setting: Classroom

Summary: Students familiarize themselves with numerous state and federal wetland regulations through a card game.

Objectives: Students will be familiar with the major wetlands regulations and understand the roles of the different state and federal agencies in enforcing those regulations.

Vocabulary: wetlands, hydrophytic, hydric

Related Module Resources:

- Module activity: “Town Hall Meeting”
- Refer to the Additional Module Resources listed under “Fact Sheets and Articles of Interest-Wetland Threats, Protection, & Controversy” and “Websites of Interest-Wetlands Regulations and -Laws, Regulations, Executive Orders, Guidance, & Scientific Documents”

Materials (Included in Module):

- Regulations Review
- Answer Key
- Score Sheet
- 8 medium envelopes each containing a full deck of:
[Marsh Madness Module Activity Envelope]
 - Regulation cards
 - Scenario cards
 - Clue cards
 - Violation cards
- Game card master copies
- NRCS Fact Sheets:
 - Wetland Conservation Provisions (Swampbuster)
 - Wetland Conservation Provisions Questions & Answers
 - Fact Sheet: Mitigation

Additional Materials (NOT Included in Module):

- None

ACADEMIC STANDARDS: (ENVIRONMENT & ECOLOGY)

7th Grade

4.7.7.C. Explain natural or human actions in relation to the loss of species.

- Describe state laws passed regarding threatened and endangered species in Pennsylvania.

4.8.7.D. Explain the importance of maintaining the natural resources at the local, state and national levels.

- Define the roles of Pennsylvania agencies that deal with natural resources.

4.9.7.A. Explain the role of environmental laws and regulations.

- Identify and explain environmental laws and regulations (e.g., Clean Air Act, Clean Water Act, Recycling and Waste Reduction Act, Act 26 on Agricultural Education)
- Explain the role of local and state agencies in enforcing environmental laws and regulations (e.g., Department of Environmental Protection, Department of Agriculture, Game Commission)

10th Grade

4.1.10.E. Identify and describe natural and human events on watersheds and wetlands.

- Identify the effects of humans and human events on watersheds.

4.9.10.B. Explain why environmental laws and regulations are developed and enacted.

- Analyze the roles that local, state and federal governments play in the development and enforcement of environmental laws.

12th Grade

4.1.12.E. Evaluate the trade-offs, costs and benefits of conserving watersheds and wetlands.

- Evaluate the effects of human activities on watersheds and wetlands.

4.9.12.A. Analyze environmental laws and regulations as they relate to environmental issues.

- Compare and contrast environmental laws and regulations that may have a positive or negative impact on the environment and the economy.

BACKGROUND:

Wetlands are areas characterized by the presence of water, **hydric** (saturated) soils and **hydrophytic** (adapted to saturated soil conditions) vegetation. Wetlands have also been characterized in the past in some cases by an unwarranted negative stigma. For centuries, wetlands were incorrectly perceived as breeding grounds for disease and even as unproductive wastelands. As a result, wetlands were commonly filled in or drained to make way for farmland and more “productive” land uses. In fact, early legislation in the United States encouraged the destruction of wetlands for the “common good”. Indeed, wetlands regulations are nothing new; however, in the last 150 years or so, we have come to better understand the importance and functions of wetlands. According to the Pennsylvania Code, wetland functions “include, but are not limited to, the following:

- Serving natural biological functions, including food chain production; general habitat; and nesting, spawning, rearing and resting sites for aquatic or land species.
- Providing areas for study of the environment or as sanctuaries or refuges.
- Maintaining natural drainage characteristics, sedimentation patterns, salinity distribution, flushing characteristics, natural water filtration processes, current patterns or other environmental characteristics.
- Shielding other areas from wave action, erosion or storm damage.
- Serving as a storage area for storm and flood waters.
- Providing a groundwater discharge area that maintains minimum baseflows.
- Serving as a prime natural recharge area where surface water and groundwater are directly interconnected.
- Preventing pollution.
- Providing recreation.”

Our change in understanding and perspective of wetlands is evident in the transformed goals of wetlands regulations. No longer do the regulations encourage the obliteration of wetlands; rather, they seek to protect, restore, and even create wetlands! Such regulations are in place to protect wetland habitats as well as the quality of the water in the wetland. Accordingly, wetland regulations arise from those agencies concerned with water quality as well as those involved in land use since they both have a stake in the outcome. Wetland regulations exist at the federal and state (and in some cases the local) level.

On the national level, oversight of wetland areas is conducted by the U.S. Environmental Protection Agency, the U.S. Army Corps of Engineers, the U.S. National Marine Fisheries Service and the U.S. Natural Resources Conservation Service.

The U.S. Environmental Protection Agency (EPA) regulates wetland concerns through the Clean Water Act. The provisions of the Clean Water Act allow the EPA to oversee anything that would impact both the water currently in the wetland as well as any water that is discharged into the wetland area.

The U.S. Army Corps of Engineers regulatory jurisdiction is concerned mainly with construction in and around wetlands. It ensures that any construction-related discharges do not harm wetlands.

Through the U.S. Fish and Wildlife Service and the U.S. National Marine Fisheries Service protection is offered to endangered and threatened species under the Endangered Species Act. Inland species are protected under the Fish and Wildlife Service while the National Marine Fisheries Service covers ocean species.

The U.S. Natural Resources Conservation Service helps farmers to identify wetlands on their lands so that they can better comply with wetlands regulation and protect those areas.

On the state level, regulations must be as strict, if not more rigid than the established federal regulations. The regulations may be tailored to ensure the continued health of

Pennsylvania wetlands. In Pennsylvania, the PA Department of Environmental Protection (PA DEP) takes the lead role with its Environmental Protection portion of the PA Code. The PA DEP assigns responsibilities to other state agencies for permitting and enforcement in each agency's area of expertise.

Pennsylvania protects its wetlands in and around farming areas in a number of ways. Although wetlands can sequester nutrients, transform pollutants, and filter sediment, too many nutrients or pollutants or too much sediment in a wetland can overburden the wetland ecosystem. Therefore, spreading manure to fertilize crop fields must be accomplished in an appropriate manner or a permit from the PA DEP is required. Farmers must follow the guidelines set out in "Manure Management for Environmental Protection" to ensure that they don't apply too much fertilizer and in so doing lose it to the environment, and potentially contaminate wetlands. Farmers must concern themselves with nitrogen-based nutrient management plans as well as erosion and sediment control plans. Too much nutrient applied contributes to waterways and wetland pollution. In addition, erosion due to plowing and tilling of large areas can lead to increased sediment loads in waterways and wetlands. Manure storage and transfer are also areas of concern to farmers. Most smaller farms do not need permits to perform these tasks, but newer and larger ones must apply for a permit and have their designs reviewed and approved.

Mining operations are another Pennsylvania-specific area of concern for wetland health. An entire section of the PA Code is devoted to mining operations. Companies must restore, enhance or maintain wetland areas affected by their mining operations.

Recreation takes a front seat in the preservation and protection of wetlands. Natural wetland areas are set aside according to provisions in the PA Code so that they may be enjoyed and used by hikers, canoers, hunters and environmental educators as well as the plants and animals that call them home.

Many of the endangered and threatened species of Pennsylvania plants and animals make their homes in wetland areas. The PA Department of Environmental Protection works in conjunction with the Fish and Boat Commission and the Game Commission to further the lives of these species through preservation of their habitats.

OVERVIEW:

Students will match given scenarios with appropriate wetland regulations to gain points. Violations will be given when scenarios and regulations are mismatched. Students will use Clues as necessary to help determine the connection between scenarios and regulations.

PROCEDURE:

Teacher Preparation:

1. Locate the Regulation Sheet, the Regulation, Scenario, Clue and Violation cards, and the Answer Key in the module.

2. Familiarize yourself with the regulations covered in the activity.
3. Make photocopies of the Regulation Sheet for your students.
4. Make photocopies of the Answer Key and Score Sheet for approximately 1/3 to 1/5 of your students.

Student Activity:

1. Discuss the need for wetlands regulations with your students.
2. Distribute the Regulation Sheet to students and use it to review applicable wetland regulations with them.
3. Separate students into small groups (3-5 students per group).
4. Give each group an envelope of game cards and an Answer Key.
5. One student in each group is assigned as dealer/scorekeeper and given the answer sheet.
6. The entire deck of **Regulation** cards is dealt out to the others in the group.
7. The dealer makes separate piles of **Clue**, **Scenario**, and **Violation** cards.
8. Players draw a **Scenario** card and attempt to match it with an appropriate **Regulation** card. If a match is made, the pair is laid down on the table and the player continues to draw until he/she cannot make a match OR 3 matches/pairs have been made.
9. One **Clue** card may be drawn to help a player make a match. If it is no help, it may be kept for use in a later round. If the player is not able to make a match, play moves on to the next player.
10. If a player lays down an incorrect match as a pair, the other players can identify it and order a **Violation** card drawn. (This must take place before the next play.) If the scorekeeper determines the Violation was issued unfairly (by matching the scenario number with the corresponding number on the Answer Key), the person challenging the match receives a **Violation** card.
11. **SCORING:** A correct Scenario/Regulation pair is worth 10 points. A Violation card is worth -10 points (minus 10 pts.). Use the Score Sheet to keep track of each player's points.
12. **WINNING:** The person with the most points wins.

DISCUSSION:

Who are the main players in wetland regulation/protection? *On the national level, the Environmental Protection Agency, the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, and the U.S. Natural Resources Conservation Service. In the state of Pennsylvania, PA Department of Environmental Protection, PA Department of Conservation of Natural Resources, PA Fish & Boat Commission, and the PA Game Commission.*

Define and explain the roles of Pennsylvania and federal agencies that deal with wetlands regulations. *See Regulation Sheet.*

What are the rules designed to do? *Protect the water in wetlands from being polluted as well as protect the variety of living species within the wetlands.*

Describe several human activities affect wetlands. *See the Background section.*

Do the regulations adequately cover the subject? Are there loopholes? *There are so many different agencies that approach the subject that it is pretty well covered. On the flip side, with so many different agencies responsible, there are bound to be loopholes or gaps between their regulations. They work very hard to make sure those areas are covered.*

Should there be improvements to the regulations? If so, what should they be? *This is more a thoughtful question than a right/wrong answer.*

Is there a different emphasis placed on the importance of wetlands in other parts of the country? *While the laws remain largely the same, differing land and water situations require differing outlooks. Areas on the ocean coastlines, arid desert areas, and the central part of the country have all developed their own state laws with different emphasis.*

EVALUATION:

- Correctly match scenarios to regulations.
- Explain why there are so many different agencies involved in wetland regulations.
- Discussion questions above.

EXTENSIONS AND MODIFICATIONS:

- Create more scenarios, particularly ones that are locally appropriate.
- Further research one or more of the wetland regulations.
- Create a newspaper article with one of these scenarios/regulations.
- Tape a talk show discussing one of these scenarios/regulations.
- Hold a Mock Trial employing one of the scenarios.
- Hold a Town Meeting employing one of the scenarios.
- Discuss the potential changes in the outcome if one of the scenarios is moved to Arizona/Colorado, or Florida/Louisiana.
- Discuss the potential changes in the outcome if one of the scenarios is moved to another country.

NOTES (PLEASE WRITE ANY SUGGESTIONS YOU HAVE FOR TEACHERS USING THIS ACTIVITY IN THE FUTURE):



REGULATIONS REVIEW: MARSH MADNESS

Name _____ Date _____

Regulation Review

Basic facts of each law/regulation are listed below. Look at the specific laws for more detailed information.

Clean Water Act, Sections 401 and 402. Administered by the Environmental Protection Agency (EPA) along with state agencies, this act was set up to regulate pollution. It was brought into reality as a response to the deterioration of the nation's surface waters.

Clean Water Act, Section 401. Water Quality Certification. Regulates anything that may discharge pollutants into surface waters or wetlands. Federal/state permits are required and may be revoked for filling wetlands, licensing hydropower plants, or discharging pollution into water.

Clean Water Act, Section 402. National Pollutant Discharge Elimination System (NPDES). Requires permits be issued by EPA or PA DEP for discharge of pollutants from a point source (specific location) into navigable waters.

Clean Water Act, Section 404. This section concerns the dredging and filling of wetlands and regulates construction-related discharges (i.e. dam, bridge, road) by requiring permits for those activities through the U.S. Army Corps of Engineers. It does not cover normal farming and forestry discharges.

National Environmental Policy Act (NEPA). Through this policy, all government agencies are required to take into account the environmental impact of any action they wish to undertake. Environmental Impact Statements (EIS) are required on major federal actions that may affect the quality of the environment. The U.S. EPA is required to review and comment on all Environmental Impact Statements.

Executive Order 11990 (Protection of Wetlands). This executive order was enacted to protect wetlands on federal lands.

Rivers and Harbors Act. This act is enforced by the U.S. Army Corps of Engineers. It gives them the authority to protect wetlands from pollution by prohibiting discharge of solids or construction in waterways. It was in place long before the Clean Water Act came about and is still used to stop polluters, especially in the case of oil or hazardous materials spills.

Food Securities Act of 1985 ("Swampbuster" provisions). This act helps to close a loophole in the Clean Water Act. Agricultural discharges into wetlands were not included in the Clean Water Act. In fact, draining and filling wetlands on farm property was actually encouraged and federal subsidies were issued to farmers for converting wetlands to farmlands. Through this act, the Natural Resources Conservation Service now helps farmers to identify wetlands on their farms.

Executive Order 11988 (Floodplain Protection). This act helps to insure public safety by severely limiting floodplain activities. In the process, it also protects the floodplains and the wetlands within them.

Coastal Zone Management Act. This act requires states to set up regulations concerning coastal zones. The focus of the PA Coastal Zone Management Program is conserving coastal resources, improving public access, protecting natural resources and promoting proper planning. One of the important aspects of the act is controlling nonpoint source pollution

Endangered Species Act. In order to protect endangered and threatened species, this act includes protection of their habitats. Wetland areas that offer homes to these species are protected under this act. Wetland areas associated with inland species fall under protection of the U.S. Fish and Wildlife Service, while the National Marine Fisheries Service protects those associated with marine species. In Pennsylvania, the PA Fish and Boat Commission along with the PA Game Commission help to enforce this act.

Fish and Wildlife Coordination Act. The U.S. Fish and Wildlife Service administer this act. It states that the impact of water-related projects on wildlife must be considered equally with the need for the project. Therefore, all water-related federal projects (such as the construction of dams) must be reviewed for their potential impact on fish and wildlife to decide whether or not to continue with the project.

Transportation Equity Act for the 21st Century (TEA-21). This act authorizes monies to improve the Nation's transportation infrastructure, enhance economic growth and protect the environment. Ten percent of all funds for surface transportation projects (STPs) are set aside for transportation enhancements including environmental and water quality improvement projects (i.e. bicycle and pedestrian pathways, mitigation of water pollution due to highway runoff). In addition, any reconstruction, resurfacing, rehabilitation or restoration projects under STP set aside up to 20% of the cost to be used for environmental enhancements such as stormwater treatment systems and riparian or wetland restoration projects.

Title 25 PA Code, Environmental Protection. Most everything relating to Pennsylvania wetlands is covered in this section of the PA Code. It details the responsibilities of the PA Department of Environmental Protection in protecting and preserving wetlands along with other surface waters. PA DEP is responsible for reviewing applications and issuing permits for all construction projects in and near wetlands. Through different parts of the Code the Clean Streams Law (35 P.S. §§ 691.1-691.1001), the Solid Waste Management Act (35 P.S. §§ 6018.101- 6018.1003), the Surface Mining Conservation and Reclamation Act (52 P.S. §§ 1396.1- 1396.31), the Pennsylvania Sewage Facilities Act (35 P.S. §§ 750.1-750.20), and the Oil and Gas Act (58 P.S. §§ 601.101-601.605) have been enacted to ensure that projects in each of these areas do not adversely affect the water quality in the state's wetlands.

25 PA Code, Chapter 44. Conservation Areas. This chapter of the Code enforces the establishment of conservation areas within the state. The PA DEP is charged to preserve open space, conserve natural resources, and make these areas available for outdoor recreation and environmental education activities. Protection of wetlands is one of the primary uses of this portion of the Code.

25 PA Code, Chapter 61. Land and Water Conservation Fund. The Land and Water Conservation Fund is established through this section of the Code. It provides funding for setting aside areas for special recreation needs, including wetland areas.

25 PA Code, Chapter 77. Non-coal exploration activities. When mining for anything other than coal, regulations state to avoid the disturbance of wetlands areas.

25 PA Code 87, Surface Mining of Coal. When mining for coal, wetland areas must be restored, enhanced or maintained. In addition, fish and wildlife habitats in the area must be protected.

25 PA Code, Chapter 235. Administration of the Storage Tank and Spill Prevention Program. In order to protect state wetlands, no siting permits are issued if the installation is proposed in wetlands.

25 PA Code, Chapter 105. Dam Safety and Waterway Management. Most of the wetland protection regulations can be found in this section of the PA Code. It also outlines the Department of Environmental Protection's definition of a wetland and the functions of a wetland, which are referred to throughout the Code:

*“Wetlands—*Areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions, including swamps, marshes, bogs and similar areas.

*Wetland functions—*Include, but are not limited to, the following:

- Serving natural biological functions, including food chain production; general habitat; and nesting, spawning, rearing and resting sites for aquatic or land species.
- Providing areas for study of the environment or as sanctuaries or refuges.
- Maintaining natural drainage characteristics, sedimentation patterns, salinity distribution, flushing characteristics, natural water filtration processes, current patterns or other environmental characteristics.
- Shielding other areas from wave action, erosion or storm damage.
- Serving as a storage area for storm and flood waters.
- Providing a groundwater discharge area that maintains minimum baseflows.
- Serving as a prime natural recharge area where surface water and groundwater are directly interconnected.
- Preventing pollution.
- Providing recreation.”

Wild Resource Conservation Act. This is the Pennsylvania state regulation to preserve and protect threatened and endangered plants and animals. This act, in conjunction with the Fish and Boat Code and the Game and Wildlife Code, identifies and protects those species that are in danger of disappearing from the state mainly due to habitat loss. Through this act, a Wild Resource Conservation Fund was created to collect voluntary contributions to help study the number and range of these species and keep track of their progress.

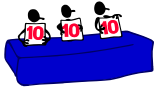
PA Coastal Zone Management Program. This policy involves the protection of two widely separated coastlines within the Commonwealth. It concerns all aspects of the coast, but in the case of wetlands, it seeks to maintain the natural benefits of wildlife habitat, water quality, flood control and biological diversity by protecting and enhancing coastal wetlands.



ANSWER KEY : MARSH MADNESS

1. Building a boat ramp. *Rivers and Harbors Act; CWA Section 401; CWA Section 404; 25 PA Code 105.*
2. Building a U.S. Environmental Protection Agency office adjacent to a wetland. *National Environmental Policy Act; Executive Order 11990; Executive Order 11988; Endangered Species Act; Fish and Wildlife Coordination Act; 25 PA Code 105; Wild Resource Conservation Act.*
3. Using federal funds to build PA 60 adjacent to a wetland. *National Environmental Policy Act; Executive Order 11990; Executive Order 11988; Endangered Species Act; Fish and Wildlife Coordination Act; 25 PA Code 105; Wild Resource Conservation Act; TEA-21; 25 PA Code 105; Wild Resource Conservation Act.*
4. Removal of woody vegetation in a wetland on land that is enrolled in a federal farm program land. *Food Securities Act – “Swampbuster”.*
5. Draining wetlands on land that is enrolled in a federal farm program. *Food Securities Act – “Swampbuster”.*
6. Building a non-federally funded bridge over a river. *River and Harbor Act; Section 404; Fish and Wildlife Coordination Act; 25 PA Code 105; Wild Resource Conservation Act; TEA-21.*
7. Building a post office on a floodplain. *Executive Order 11988 (Floodplain Protection); National Environmental Policy Act; Fish and Wildlife Coordination Act; Wild Resource Conservation Act.*
8. Building houses adjacent to Lake Erie. *Coastal Zone Management Act; PA Coastal Zone Management Program.*
9. Discharging sewage treatment effluent into a wetland. *Clean Water Act, Section 401, Section 402; Clean Water Act, Section 404; Rivers and Harbors Act if adjacent to navigable waters; 25 PA Code.*
10. Discharging heated water from a power plant into channels that flow through a wetland. *Clean Water Act, Section 401; Clean Water Act, Section 402; 25 PA Code.*
11. Using federal funds to build a fishing pier next to an osprey nesting site. *Rivers and Harbors Act; Endangered Species Act; Executive Order 11988; Executive Order 11990 (Floodplain Protection); Section 401, Section 404; 25 PA Code 105; Wild Resource Conservation Act.*
12. Constructing a private home in a freshwater wetland. *Fish and Wildlife Coordination Act; Clean Water Act, Section 404; Clean Water Act, Section 401; 25 PA Code 105; Wild Resource Conservation Act.*
13. Building a motel near Pymatuning Lake adjacent to a bald eagle nest tree. *Endangered Species Act; Clean Water Act, Section 401; Clean Water Act, Section 404; Rivers and harbors Act; Fish and Wildlife Coordination Act; 25 PA Code 44; 25 PA Code 105; Wild Resource Conservation Act.*
14. Using federal funds to build a public airport with no wetlands impact in a coastal management zone in Erie PA. *Clean Water Act, Section 401; National Environmental Policy Act; Executive Order 11988; Coastal Zone Management Act; Fish and Wildlife Coordination Act; TEA-21; PA Coastal Zone Management Program.*
15. Creating a pond with an impoundment (dam) in a wetland. *Clean Water Act, Section 401; Clean Water Act, Section 404; 25 PA Code 105.*

16. Building a private dam on a French Creek that supports a population of bluebreast darters. *Clean Water Act, Section 401; Clean Water Act, Section 404; Endangered Species Act; Fish and Wildlife Coordination Act; Rivers and Harbors Act; 25 PA Code 105, 25 PA Code 44, Wild Resource Conservation Act.*
17. Filling a private created wetland. *Clean Water Act, Section 401; Clean Water Act, Section 404.*
18. Building a fish pond in a wetland. *Clean Water Act, Section 401; Clean Water Act, Section 404; Fish and Wildlife Coordination Act; 25 PA Code 105; Wild Resource Conservation Act.*
19. Filling wetlands with debris from coal-mining operations. *Clean Water Act, Section 401; Clean Water Act, Section 404, Fish and Wildlife Coordination Act; 25 PA Code 87; Wild Resource Conservation Act.*
20. Building an island in a wetland. *Clean Water Act, Section 401; Clean Water Act, Section 404; Fish and Wildlife Coordination Act; 25 PA Code 105; Wild Resource Conservation Act.*
21. Without using federal funds, building highways through wetlands. *Clean Water Act, Section 401; Clean Water Act, Section 404; Fish and Wildlife Coordination Act; 25 PA Code 105; Wild Resource Conservation Act.*
22. Draining a wetland for agricultural use. *Food Securities Act – “Swampbuster”.*
23. Planting an alfalfa crop outside of Evans City, PA. *No regulation.*
24. Pumping irrigation water out of wetlands, with return water not re-entering wetlands. *No regulation.*
25. Mowing cattail vegetation in wetlands next to I-79. *No regulation.*
26. Creating a pond with an impoundment (dam) in a nonwetland area. *No regulation.*
27. Grazing cattle in a wetland. *No regulation.*
28. Creating a wetland from an upland. *No regulation.*
29. Spraying herbicide on a crop. *No regulation.*
30. Filling in a gravel pit immediately after mining activities cease. *No regulation.*
31. Cranberry Township developer seeks permission to relocate a wetland in the way of his new shopping center. *25 PA Code 105; Wild Resource Conservation Act.*
32. Mining for gypsum next to a wetland. *25 PA Code 77.*
33. Oil company wants to build storage facility alongside Allegheny River in Franklin. *25 PA Code 235.*



SCORE SHEET : MARSH MADNESS

A. Player Names	B. Tally of Correct Matches	C. Tally of Violations	D. Total Correct Matches X 10	E. Total Violations X (-10)	F. Total Score (Column C plus Column E)
1.					
2.					
3.					
4.					
5.					