MPA Designation Project

How do researchers and stakeholders justify, develop, and propose MPA management plans in order to designate new MPAs?

Overview

Students justify the designation of a new MPA and develop a management plan for species monitoring, governance, social and economic impacts, compliance and enforcement, and education and outreach.

For the complete activity with media resources, visit: http://www.nationalgeographic.org/activity/mpa-designation-project/

Directions

**1. Introduce the MPA problem scenarios and project-based learning challenge.**
Use the MPA Management Plan Case Study Vocabulary List to pre-teach the vocabulary. Distribute copies of the Gulf of Castellammare Fishery Reserve and Arctic Fishery problem scenarios, as well as the Problem Scenario Notetaking worksheet. Read aloud the directions and the problem scenario challenge for the activity from the notetaking worksheet. Remind students of the work they did in prior MPA, case study, and stakeholder activities in this unit. Tell them that they will need to use all of the content and strategies they learned to be successful in justifying the creation of the MPA and developing an effective management plan. Explain that successful MPAs require well-designed management plans that address important species monitoring, MPA effectiveness, enforcement and compliance, public communication, outreach and long-term education, and analysis of the social and economic costs and benefits. For homework, have students read the two problem scenarios and complete the notetaking worksheet.
2. During the next class period, discuss the MPA problem scenarios and the completed notetaking worksheets.
Divide students into pairs. Have pairs exchange their completed notetaking worksheets and discuss the information that they recorded in their comparison charts. Instruct them to add important information that they discovered during their discussion. As a whole class, discuss the similarities and differences between the two MPA problem scenarios. Address any questions that students may have.

3. Have students select one of the MPA problem scenarios to explore in depth.
Tell students that they need to decide as a class which MPA problem scenario they will focus on for their project challenge. Set a time limit for discussion and explain to them that they will need to come to a consensus. Once the class has selected its MPA problem scenario, tell students they are going to work in small groups to gather information that will help them justify the designation of the MPA and develop an effective management plan. Explain to students that after each small group has developed its management plan component, they will regroup as a class to compile the components into one, comprehensive site management plan and present the plan to a fictitious MPA stakeholder approval committee.

4. Have students work in small groups to develop the five components of the management plan.
Divide the class into five small groups and assign each group a component from the following list:

- Group 1: List of Biodiversity and Species Monitoring Plan
- Group 2: Management Overview and Site Specific Goals
- Group 3: Social and Economic Impacts
- Group 4: Compliance and Enforcement
- Group 5: Education and Outreach Strategies

Distribute a copy of the Management Plan Components handout to each student. Read the directions aloud, including the problem scenario challenge. Allow students time to read through all of the management plan components. Address any questions they may have. Then distribute a copy of the Project Evaluation Criteria rubric and explain that this criteria will be used to evaluate students' work. Remind them that as a class, they must accomplish two primary objectives:
• Justify the creation and designation of the MPA
• Develop and present an effective management proposal for the MPA

Provide groups with butcher paper, colored markers, and poster board. Some groups will need to collaborate and share information. Facilitate groups in sharing their work as needed. For example, Group 1 should complete its species list first and share it with Group 5 so they can make their food web; Groups 3 and 5 should collaborate on how the MPA may address cultural resource preservation and education; Groups 2 and 4 should collaborate on stakeholder identification, management goals, and compliance/enforcement strategies.

5. **Discuss and integrate each group’s management plan component.**
After small groups have completed the management plans for their assigned components, regroup as a class. Have students compile, discuss, and revise their plans, as needed, so that all of the components together make up one comprehensive management plan that will be used during their final presentation to the MPA stakeholder approval committee.

6. **Have students use media to develop their formal MPA management plan presentation.**
Explain to students that the next step is for them to turn their MPA proposal and management plan presentation materials into a formal presentation using their media of choice. Examples of presentation formats include presentation software, public service announcements, websites, blogs, e-posters, paper posters, tabletop placards, brochures, songs, or educational games/activities. Explain that students are playing the critical role of advocates who are “selling” the idea of creating the MPA in order to preserve valuable cultural and ecological resources. The media they use to present their proposal and management plan must be an appropriate format to convey the essential information about their problem scenario MPA. Remind them that their work will be evaluated based on the project evaluation criteria: quality, organization and clarity, creativity, evidence of science content learning, and effort exhibited.

7. **Have students present their proposed management plan to the “MPA stakeholder approval committee.”**
Select a day and time for the class to present their MPA proposal and management plan to an audience that represents the MPA stakeholder approval
committee. This could be a group of their peers, parents, school administrators, or a public group. Allow 30 minutes for the presentation, with an additional 15 minutes of time for questions and answers. Let the class decide what format they want to use to present the justification for the creation of the MPA and the management plan. Make sure that all students have some role in the presentation planning and development, including the invitations and promotion of the presentation. Provide copies of the complete management plan and the Project Evaluation Criteria rubric to all presentation attendees.

Peer Evaluation

Use the Project Evaluation Criteria rubric to evaluate student projects. Distribute the rubric to the audience representing the stakeholder approval committee and have them evaluate student work. Then, share the evaluations and feedback with students and ask them to respond to the feedback, either verbally or in writing.

Extending the Learning

Have students use the same problem scenario format and criteria to develop and present a proposed management plan for a nearby protected area. The protected area chosen can already be designated as a protected area or one that students want to newly designate. Set up an audience and forum for students to share their work with their peers, parents, school administrators, or a public group.

Objectives

Subjects & Disciplines

**Geography**
- Human Geography
- Physical Geography

**Language Arts**
- Speech

**Science**
- Oceanography

**Social Studies**
Learning Objectives

Students will:

- analyze the components of a MPA problem scenario
- justify the designation of a MPA
- collaboratively develop a comprehensive management plan for a proposed MPA
- present a media-based MPA management plan to a (fictitious) stakeholder approval committee

Teaching Approach

- Learning-for-use
- Project-based learning

Teaching Methods

- Cooperative learning
- Discussions
- Information organization
- Reading
- Writing

Skills Summary

This activity targets the following skills:

- 21st Century Student Outcomes
  - Learning and Innovation Skills
    - Communication and Collaboration
    - Critical Thinking and Problem Solving
• 21st Century Themes
  • **Global Awareness**

• Critical Thinking Skills
  • Analyzing
  • Applying
  • Creating
  • Understanding

• Geographic Skills
  • **Analyzing Geographic Information**
  • **Answering Geographic Questions**
  • **Asking Geographic Questions**
  • **Organizing Geographic Information**

**National Standards, Principles, and Practices**

**IRA/NCTE Standards for the English Language Arts**

• **Standard 12:**
  Students use spoken, written, and visual language to accomplish their own purposes (e.g., for learning, enjoyment, persuasion, and the exchange of information).

**National Council for Social Studies Curriculum Standards**

• **Theme 3:**
  People, Places, and Environments

**National Geography Standards**

• **Standard 14:**
  How human actions modify the physical environment
• **Standard 16:**
The changes that occur in the meaning, use, distribution, and importance of resources

National Science Education Standards

• **(9-12) Standard F-3:**
Natural resources
• **(9-12) Standard F-5:**
Natural and human-induced hazards
• **(9-12) Standard F-6:**
Science and technology in local, national, and global challenges

Ocean Literacy Essential Principles and Fundamental Concepts

• **Principle 5c:**
Some major groups are found exclusively in the ocean. The diversity of major groups of organisms is much greater in the ocean than on land.

• **Principle 5d:**
Ocean biology provides many unique examples of life cycles, adaptations and important relationships among organisms (such as symbiosis, predator-prey dynamics and energy transfer) that do not occur on land.

• **Principle 5e:**
The ocean is three-dimensional, offering vast living space and diverse habitats from the surface through the water column to the seafloor. Most of the living space on Earth is in the ocean.

• **Principle 5f:**
Ocean habitats are defined by environmental factors. Due to interactions of abiotic factors such as salinity, temperature, oxygen, pH, light, nutrients, pressure, substrate and circulation, ocean life is not evenly distributed temporally or spatially, i.e., it is “patchy”. Some regions of the ocean support more diverse and abundant life than anywhere on Earth, while much of the ocean is considered a desert.

• **Principle 5h:**
Tides, waves and predation cause vertical zonation patterns along the shore,
influencing the distribution and diversity of organisms.

• **Principle 6b:**
  From the ocean we get foods, medicines, and mineral and energy resources. In addition, it provides jobs, supports our nation’s economy, serves as a highway for transportation of goods and people, and plays a role in national security.

• **Principle 6c:**
  The ocean is a source of inspiration, recreation, rejuvenation and discovery. It is also an important element in the heritage of many cultures.

• **Principle 6d:**
  Much of the world’s population lives in coastal areas.

• **Principle 6e:**
  Humans affect the ocean in a variety of ways. Laws, regulations and resource management affect what is taken out and put into the ocean. Human development and activity leads to pollution (such as point source, non-point source, and noise pollution) and physical modifications (such as changes to beaches, shores and rivers). In addition, humans have removed most of the large vertebrates from the ocean.

• **Principle 6g:**
  Everyone is responsible for caring for the ocean. The ocean sustains life on Earth and humans must live in ways that sustain the ocean. Individual and collective actions are needed to effectively manage ocean resources for all.

**Preparation**

**What You’ll Need**

**Materials You Provide**

• Butcher paper
• Colored markers
• Glue
• Pencils
• Posterboard
• Scissors
Required Technology

- Internet Access: Required
- Tech Setup: 1 computer per small group, Projector, Speakers
- Plug-Ins: Flash

Physical Space

- Classroom

Grouping

- Large-group instruction
- Small-group instruction

Resources Provided: Websites

- National Marine Protected Areas Center: Nominating MPAs to the National System of Marine Protected Areas

Resources Provided: Handouts & Worksheets

- MPA Management Plan Case Study Vocabulary List
- Problem Scenario: The Gulf of Castellammare Fishery Reserve
- Problem Scenario: Arctic Fishery
- Problem Scenario Notetaking II
- Management Plan Components
- Project Evaluation Criteria

Background & Vocabulary

Background Information
Marine Protected Areas are created to protect vulnerable habitats and species, increase biodiversity, prevent overfishing, conserve resources for future generations, and aid in scientific research. Successful MPAs include an enforcement program aimed at obtaining compliance, a coordinated public communication strategy, broad-reaching outreach and long-term education initiatives, and analysis of the social and economic costs and benefits. Successful planning and designation of MPAs depends on cooperative stewardship and the involvement of all affected stakeholders.

Prior Knowledge

["marine protected areas and their importance in the preservation and management of marine resources"]

Recommended Prior Activities

- Marine Protected Areas
- Marine Protected Areas: Case Studies
- Marine Protected Areas: Student Case Studies
- Marine Protected Area: Stakeholder Debate

Vocabulary

<table>
<thead>
<tr>
<th>Term</th>
<th>Part of Speech</th>
<th>Definition</th>
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<tbody>
<tr>
<td>marine protected area (MPA)</td>
<td>noun</td>
<td>area of the ocean where a government has placed limits on human activity.</td>
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For Further Exploration

Websites

- World Database on Marine Protected Areas
- Census of Marine Life: Investigating Marine Life
- NOAA: National Marine Protected Areas Center
- World Resources Institute: Marine Protected Areas of the World
- National Geographic Education: National Teacher Leadership Academy (NTLA)
Funder

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