

## **Lesson Plan: Marine life Research and Persuasive Conservation Pamphlet**

**Instructor:** Watkevich, Gregory

**Grade Level:** Grade 10, but can be modified to other grade levels

**Extended Time:** 2 weeks:

- 1) Allow one day to introduce the assignment.
- 2) Allow 2 days for students to research information, consult with peers and teacher, or work on their project in some way during the duration of the assignment.
- 3) Allow another in class day as required if students are struggling with the assignment. Once the students get started on the assignment, most students should have little difficulty completing the remainder of the work outside of class time.

### **Background Idea: “Stimulating an interest in conservation of organisms”**

It is important to educate, excite and recruit support for marine or other conservation measures. Students will be introduced to a lesson on conservation and the concept of MPA's. Students will research either Atlantic Salmon, Cod, or Haddock, which are currently under environmental stress. They will analyze collected research data and draw conclusions and recommendations for a conservation model. This lesson is intended to stimulate students' interest and provide a method to gain public support for conservation measures to protect marine organism's or other organisms. Education of our younger population is key to species survival and conservation of many of our marine organisms. This will be the theme for the lesson and project. This assignment follows lessons on Ecology, Food Chains, Food Webs, and methods to modern ecological research using three basic approaches: observing, experimenting, and modeling. All of these methods are based on the application of scientific methods to guide ecological inquiry. Students will use the internet to seek data gained from studies based on sound ecological research models, develop a conservation plan and promote their plan in a conservation pamphlet.

### **Theme: Design A Persuasive Marine Conservation Pamphlet Lesson:**

Implementation of the theme will require students to create an educational pamphlet geared to educating the public about the importance of preserving areas for conservation of marine organisms. Their marine conservation pamphlets are intended to move people to action in an attempt to persuade the public, and our legislators, to make decisions serving the best interests of our marine wildlife. The lesson pamphlet is geared to marine organisms, (Haddock, Cod, and Atlantic Salmon) but can be modified to allow students flexibility of interest.

### **Learning Standards:**

6.0 Central Concept: Ecology is the interaction among organisms and between organisms and their environment.

6.1 Analyze changes in population size and biodiversity that result from: natural causes, changes in climate, human activity, and the introduction of invasive and non-native species.

6.2 Use of a food web to identify and distinguish producers, consumers, and decomposers, and explain the transfer of energy through trophic levels. Describe how relationships among organisms add to the complexity of biological communities.

6.3 Understand common patterns of interdependence and community interrelationships of living things: predation and competition and how space, resources, and extreme weather act as limiting factors for predators and prey. Explain how physical and/or behavioral characteristics of organisms help them to survive in their environments.

### **Lesson Plan Objectives and Goals:**

1. The overall objective of this lesson is for students to understand different points of view people have about environmental issues to help students develop an understanding of tradeoffs in solutions to problems.
2. After completing the readings and research, students will have a better understanding of the reasons for population decline of species, land/water resources use and misuse, changes in biodiversity, shared environments, and the global nature of local habitat issues.
3. Students will be able to demonstrate an understanding that events (causes) occurring in one sphere affect processes and organisms in that and/or other spheres through this assignment: also what factors affect population size and what effect human activities have on organisms.
4. Demonstrate an understanding that a local action can result in global effects.
5. Students will propose conservation measures, MPA's, cleanup, or recommended restoration methods for organisms that are under stress from human activities.
6. Students will also recognize and assess the tradeoffs of their proposed solution.

### **Relevant Vocabulary:**

1. **Biodiversity:** the sum total of the variety of organisms in the biosphere.
2. **Carrying capacity:** the largest number of individuals of a population that a given environment can support.
3. **Conservation:** The wise management of natural resources, including the preservation of habitat and wildlife.
4. **Deforestation:** To cut down and clear away an extended area of trees or forests.
5. **Endangered species:** A species in danger of becoming extinct in the near future.
6. **Environment:** The circumstances or conditions that surround one; surroundings.
7. **Habitat fragmentation:** (<http://www.bio.bris.ac.uk/research/community/habitatfragmentation.html>) A key factor in the loss of biodiversity and while numerous studies have quantified declining species number and abundance in fragmented habitats, the fate of the interactions among species remains largely unknown.
8. **Habitats:** The area or environment where an organism or ecological community normally lives or occurs.

9. **Invasive species:** Plants and animals that have migrated to places where they are not native and are able to thrive.
10. **Limiting factor:** factor that cause the growth of a population to decrease.
11. **MPA:** A marine protect area identified by established boundaries.
12. **Native species:** Species that have naturally evolved in an area.
13. **Pollution:** The act or process of polluting or the state of being polluted, especially the contamination of soil, water, or the atmosphere by the discharge of harmful substances.
14. **Preservation Viewpoint:** The belief that all parts of the environment are equally important, no matter how useful they are to humans.
15. **Spillover:** The overflow of organisms from a protected area to adjacent areas because of increased density within the protected area.

#### **Materials:**

- Smartboard
- Computer lab
- Access to the internet
- Suggested web sites
- List of species to research
- Student created data sheet

#### **Pre Lesson Discussion:**

The instructor should introduce the concept of MPA's, Conservation and Preservation Veiwpoints and facilitate a discussion on the lesson vocabulary to insure students understand concepts being presented. If available the instructor should utilize a smartboard to project and present information on MPA's and Conservation issues. Upon completion of the Pre-lesson students will Students will understand the impact of habitat fragmentation, pollution, overfishing, lack of regulations and other concepts associated with depletion of natural resources. The instructor should query the following sites using smart board in class to review conservation issues with students.

#### **Discuss Conservation issues:**

Check the latest issue of "Ocean Conservancy"  
at:<http://www.oceanconservancy.org/site/PageServer?pagename=home>

The Nation Coalition of Marine Conservation [www.savethefish.org/](http://www.savethefish.org/)

Marine Conservation and Biology at: <http://marinebio.org/Oceans/Conservation/>

Nature Conservancy at: <http://www.nature.org/initiatives/marine/>

#### **Discuss MPA's and review pertinent related vocabulary at:**

<http://mpa.gov/glossary.html>

<http://sanctuaries.noaa.gov/management/welcome.html>

<http://www.dfg.ca.gov/mlpa/>

## **Technology Tips:**

Students may need assistance in accessing and/or conducting internet research and identifying reputable web sites as sources of information. They may also need assistance in using programs to compose their research into the proper format in a pamphlet. Provide students with the attached list of recommended web sites. Encourage students to explore other reputable sites for information.

## **Procedures:**

### **Day 1:**

1. Inform students that you will be assigning a marine conservation project and today is to be used to explore general information on conservation and Cod, Haddock and Salmon fisheries. Details of the assignment will follow
2. All students go to the Maine Nature Conservancy web site and watch video “**Can We Save Maines Fisheries?**”  
<http://www.nature.org/wherewework/northamerica/states/maine/>
3. All students read the article about the Penobscot River Model and watch the video.  
<http://www.nature.org/wherewework/northamerica/states/maine/features/art26645.html> and slide show <http://www.nature.org/popups/misc/art26686.html#>
4. Students review video of Bottom Trawl Fishing for Cod, Haddock and Flatfish  
[http://www.oceanfootage.com/video\\_clips/FG38\\_033](http://www.oceanfootage.com/video_clips/FG38_033)
5. Students begin searching the Internet to research the selected species.
6. Students conduct research and determine the following: environmental causes and threats to their organisms' declining population, the organisms' habitat, current population status, current regulations or protection status, breeding and feeding requirements, connect-corridors and habitat loss.
7. Students should also think about possible solutions for the problems that they are identifying and document any groups involved in enacting conservation measures.
8. Students create a data table and record proposed solutions for further discussion.
9. Students must indicate in the solution statement the trade-offs involved in implementing their plan.
10. Students will compare data and share data collected in a teacher facilitated discussion

### **Day 2:**

1. Introduce the Pamphlet Project to students.
2. Identify the required components of the project, rubrics that will be used to assess their final project.
3. Discuss the content, format and layout of the pamphlet. Show students an exemplar.
4. Indicate to students the available resources and sources for assistance to them as they complete their assignment.
5. Teacher should introduce Publisher S/W and how to develop the pamphlet.
6. Show students the appropriate format for citing references

### **Day 3:**

1. Students can begin working in the computer lab on their pamphlet. Provide students with time to locate pictures, graphics and begin typing their pamphlets.
2. Inform students that the balance of the project is assigned as homework.

### **Ideas for Persuasive Pamphlet Message:**

- 1) Students will consider some of the following points to research and include in their pamphlets:
- 2) What are the threats to marine or other organisms?
- 3) Why should certain organisms be protected?
- 4) What arguments about the ecological role of marine organisms could you write about to effectively persuade the public or your representative to support the protection of a particular marine specie or other organism.
- 5) What conservation measures would help?
- 6) What would it take to truly protect an area?
- 7) Funding?
- 8) Programming?
- 9) What is needed to make your argument strong, pointed and undeniable?
- 10) What information should you research and include in order to make your argument as strong as possible? (Students should look for powerful, real facts to share.)

### **Assessment and Reflection:**

- 1) Self assessment rubric: See attached document
- 2) Exemplary - Persuasive Pamphlet

### **Post Project Reflection:** Students should be posed questions about:

- 1) What did you enjoy about this assignment in regards to research, content and logistics of working together?
- 2) What challenges did you encounter in regards to research, content and logistics of working together?
- 3) What did you learn about conservation?
- 4) What did you learn about the value of small and large organisms alike?

## **Gulf of Maine Findings Presentation**

<http://www.rnrf.org/2004cong/GoMpp.ppt>

## **Information on Anadromous Atlantic Salmon**

<http://restoration.gulfofmaine.org/projectplanning/anadromousfishhabitat.php>

[http://www.fws.gov/northeast/gulfofmaine/maps\\_data/index.htm](http://www.fws.gov/northeast/gulfofmaine/maps_data/index.htm)

<http://www.fws.gov/northeast/gulfofmaine/publications/index.htm>

<http://pressherald.mainetoday.com/news/state/070401fishfarms.html>

<http://www.mass.gov/dfwele/dmf/programsandprojects/anadrom.htm#anadromous>

<http://www.outdoorcentral.com/fishing/saltwater-fishing/federal-agencies-to-propose-expanding-gulf-of-maine-atlantic-salmon-population-protected-by-endangered-species-listing>

<http://www.nmfs.noaa.gov/pr/species/fish/atlanticsalmon.htm>

[http://www.krisweb.com/krissheepscot/krisdb/html/krisweb/aqualife/fishpop\\_maine.htm](http://www.krisweb.com/krissheepscot/krisdb/html/krisweb/aqualife/fishpop_maine.htm)

<http://www.fishbase.org/Summary/SpeciesSummary.php?id=236>

<http://www.nmfs.noaa.gov/>

[http://www.biologicaldiversity.org/news/press\\_releases/atlantic-salmon-10-04-2007.htm](http://www.biologicaldiversity.org/news/press_releases/atlantic-salmon-10-04-2007.htm)

<http://www.biologicaldiversity.org/swcbd/SPECIES/atlanticsalmon/index.html>

## **Information on Haddock and Cod Fisheries**

[http://www.gma.org/fogm/Melanogrammus\\_aeglefinus.htm](http://www.gma.org/fogm/Melanogrammus_aeglefinus.htm)

<http://www.gulfofmaine.org/times/winter2002/scientists.htm>

<http://www.fishermensvoice.com/archives/0107fishersknowledge.html>

<http://www.ccchfa.org/pages/15/>

<http://www.gulfofmaine.org/times/fallwinter2008/fishtag.php>

<http://www.mass.gov/dfwele/dmf/recreationalfishing/haddock.htm>

<http://www.flmnh.ufl.edu/fish/InNews/stonington2004.htm>

<http://www.clf.org/programs/projects.asp?id=144>

[http://law.dal.ca/Files/MEL\\_Institute/Canada-USA\\_Bilateral\\_Fisheries\\_Management\\_GOM.pdf](http://law.dal.ca/Files/MEL_Institute/Canada-USA_Bilateral_Fisheries_Management_GOM.pdf)

[http://www.glocestertimes.com/puopinion/local\\_story\\_085204052.html](http://www.glocestertimes.com/puopinion/local_story_085204052.html)

[http://www.glocestertimes.com/punews/local\\_story\\_090223127.html?keyword=topstory](http://www.glocestertimes.com/punews/local_story_090223127.html?keyword=topstory)

[http://www.glocestertimes.com/punews/local\\_story\\_086231221.html](http://www.glocestertimes.com/punews/local_story_086231221.html)

<http://www.gmri.org/science/index.asp>

<http://www.mass.gov/dfwele/dmf/programsandprojects/ccz.htm>

<http://www.nero.noaa.gov/nero/outreach/NECoopResearch.pdf>

Name: \_\_\_\_\_ Date: \_\_\_\_\_

### Assessment Rubric for Persuasive Pamphlet

Criteria	4	3	2	1
Layout Organization	Excellent use of color and space; exemplary organization; WOW!	Good use of color and space; good organization	Includes some color; adequate use of space	Includes no color and/or inadequate use of space
Content	Information is accurate; clearly and creatively conveys the intended message	Information is accurate; clearly conveys the intended message	Information is accurate; message is unclear	Inaccurate or incomplete information; no message
Graphics	3 or more high quality, carefully chosen graphics that enhance the product	2 good quality graphics and enhance the product	Only 1 graphic that do little to enhance the product	No graphics, with little or no added value
Conventions	No glaring spelling/grammar errors; near publishable quality	Very few glaring spelling/grammar errors	Several spelling/grammar errors; does not show evidence of proofreading	Number of spelling/grammar errors make paper difficult to read
Persuasion	Has a clearly stated opinion with supporting background information	Has a clear opinion, but needs more background information	Has an opinion, but lacks adequate background information	Has no opinion or background information

#### Self Evaluation: Student Project Assessment

#### How does this Pamphlet connect with what I've learned?

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#### Sources:

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# Save Majestic Sharks or Save Fin Soup



## Shark Conservation Act Threats to Shark Predators:

**"On the high seas and international waters, there are no regulations for sharks or any catch limits – it's a free-for-all".**

Often sliced off the back of a living shark, leaving the shark to bleed to death in the water, the shark's fin, which is often sold for a high profit, is a valuable commodity. Shark fin soup has been a traditional wedding soup served amongst the wealthy in Chinese culture. With the rise in wealth and globalization of our world, however, this

once rare dish is becoming more common all over the world, resulting in increasing markets for shark fins. Fins, which can be sold for up to £150 per kilogram, are a lucrative business. As demand rises for shark fin soup, so does the number of sharks killed for their fins. It is estimated that 73 million sharks are killed worldwide for the finning trade. This killing has disastrous consequences on the ecosystem from which these sharks are harvested.

**"That the scalloped hammerhead is endangered is a big red flag. It is one of the most highly valued shark species in the fin trade and there are no regulations for fishing it. Where it is protected, in world heritage sites like the Galapagos, shark-finning is rampant. They are protected on paper but nothing is being enforced."**

## *Shark Predators provide “Top- Down” Regulation*

As apex (or top) predators, the bull, great white, and hammerhead sharks are vital to the health of their ecosystem. As studied by Ransom Myers and Julie Baum at Dalhousie University and published in 2003 and 2007, when these sharks are removed from their ecosystems, there is a rise in the populations of their prey, the skate, ray, and smaller shark species. With a rise in these populations, there is a decline in their prey numbers. Scallops, clams, and oysters, the prey of skate, ray, and small sharks, are becoming less common, having dramatic impacts on the seafood industries. This impact has a domino effect throughout the ecosystem, changing the food web at every level.

## Why Should You Care?

### ➤ Economically

While shark finning may be a lucrative business currently, the success of this business will be short lived. At current rates of killing, sharks will be harder and harder to find, making shark finning more competitive and possibly even more dangerous for those finners who will be competing for animals in dangerous conditions.

As well, the increase in the success of shark finning markets is directly correlated to a decrease in the success of seafood (particularly scallop, clam, and oyster) markets. In the US, where seafood, such as scallops, clam, and oyster, is a common part of the diet. Consumers are likely to see an increased cost for these foods.

A decrease in seafood availability and an increase in the seafood cost could cause the collapse of seafood markets, resulting in devastating impacts for local economies dependent on this trade.



## Why Should You Care?

## ➤ Environmentally

The removal of the shark, an apex predator, will cause a domino effect throughout the ecosystem. "These are ecosystems that have evolved over millions and millions of years," said Peter Knights, director of WildAid. "As soon as you start to take out an important part of it, it's like a brick wall, you take out bricks [and] eventually it's going to collapse."

**"Large sharks have been functionally eliminated from the east coast of the U.S., meaning that they can no longer perform their ecosystem role as top predators," says Baum. "The extent of the declines shouldn't be a surprise considering how heavily large sharks have been fished in recent decades to meet the growing worldwide demand for shark fins and meat."**

## ***What is the Shark Conservation Act of 2009?***

H.R. 81, nicknamed the Shark Conservation Act, was introduced to the US House of Representative by Rep. Madeleine Z. Bordallo (D-GU), Chairwoman of the Subcommittee on Fisheries, Wildlife and Oceans on January 6, 2009. The bill bans fins, not attached to sharks, on vessels from entering US or its territories.

## ***What can you do?***

## **Get Involved and Contact your Representative at:**

- ✓ Encourage your local representative to vote to approval the Shark Conservation Act of 2009.

Visit

[http://www.savethefish.org/action\\_items\\_shark\\_finning.htm](http://www.savethefish.org/action_items_shark_finning.htm) to find a sample letter you can send to your representative. To find information about how to contact your representative, visit [www.house.gov/](http://www.house.gov/).

- ✓ Increase awareness of the issue by telling your colleagues, friends, family, and neighbors about the need for shark protection. Encourage them to also contact their local representative.
- ✓ When traveling abroad, boycott restaurants and traders who trade shark fins.

**"More and more fleets are targeting sharks directly," Dr Baum said. "The perception has been that wide-ranging species cannot become endangered because although they may be threatened in one area, they'll be found in another. But fisheries are reaching all corners of the earth and they are intense enough that these species are being threatened everywhere".**

## **Other Laws and Incentives to Protect Sharks:**

[New Congress Jumpstarts Session with Introduction of Bill to End Shark Finning in U.S. \(January 6, 2009\)](#)

[Atlantic States Enact New Measures to Stop Shark Finning \(August 22, 2008\)](#)

[New Survey Finds Economic Incentive for Protecting Ocean Resources \(August 21, 2008\)](#)

[New Report Finds Sharks Critical to Maintaining Healthy Oceans \(July 24, 2008\)](#)

## **Sources:**

Ecosystem, Shrinks Shellfish Supply. *ScienceDaily*. Retrieved February 10, 2009, from <http://www.sciencedaily.com/releases/2007/03/070329145922.htm>  
<http://www.independent.co.uk/news/science/sharkfin-soup-trade-threatens-hammerheads-783548.html>

Baum, J. K. and R. A. Myers. 2003. Shifting baselines and the decline of pelagic sharks in the Gulf of Mexico. *Ecology Letters*. Volume 7 Issue 2 Page 135.

Baum, J. K., R. A. Myers, D. G. Kehler, B. Worm, S. J. Harley, and P. A. Doherty. 2002. Collapse and Conservation of Shark Populations in the Northwest Atlantic. *10.1126/Science.1079777*.