

Activity Title: Confronting the Tragedy of the Commons: Investigating Sustainable Fisheries Management with NOAA

Subject (Focus/Topic): Biology, Environmental Science, Ecology

Grade Level: Advanced high school or college non-science majors or majors courses

Average Learning Time

Two to four 50-minute class periods, plus student research outside class time

Lesson Summary (Overview/Purpose): This activity will familiarize students with examples of the Tragedy of the Commons, sustainable fisheries management strategies, and NOAA's fisheries work.

Overall Concept (Big Idea/Essential Question): Sustainable management of natural resources, including ocean ecosystems and fisheries, can prevent irreversible exhaustion of those resources, a tragedy of the commons.

Specific/Key Concepts:

- A Tragedy of the Commons can result from unchecked human activity, including consumption of natural resources or commonly held (publicly held) property.
- Ocean fisheries are examples of a commons and are vulnerable to overexploitation and tragedies of the commons.
- Various human activities contribute to declines in fish populations.
- Sustainable management practices can facilitate rebound and recovery of fisheries.
- Understanding biological and ecological characteristics of species is essential in developing effective management strategies.
- We can make sustainable individual consumer choices, specifically with regard to the seafood we purchase and eat.

Focus Questions (Specific Questions):

- What is a Tragedy of the Commons, and how does it happen?
- How does the concept of the Tragedy of the Commons apply to fisheries?
- What factors contribute to declines in fish populations?
- What strategies can be employed to manage sustainable fisheries?
- What is the mission and role of National Oceanic and Atmospheric Administration (NOAA), and how and where does it work?
- What is NOAA's role in assessment and management of fisheries resources?
- How can individuals choose to eat seafood sustainably?

Objectives/Learning Goals:

- Students will describe accurately at least three appropriate examples of the Tragedy of the Commons.
- Students will describe four factors that lead to population declines in fisheries.
- Students will describe biological and ecological characteristics of two commercially important fish species.
- Students will outline at least two fisheries management strategies that can help populations recover from decline.
- Students will identify NOAA and describe its mission and work related to fisheries.
- Students will describe how to find sustainable seafood choices.

Materials

- Computers with Internet access
- (Optional) Projection equipment for presentations in class
- Slides or laminated sheets depicting various species

Background Information

The concept known as the **Tragedy of the Commons** is extremely important in ecology, environmental science and economics. It helps us understand the impacts of human activities on the natural environment, particularly how overuse or overexploitation of resources can lead to degradation of the environment and how, alternatively, natural resources can be managed sustainably. The Tragedy of the Commons was described initially by [Garrett Hardin](#) in a now-famous [article](#) published in the journal *Science* in 1968. Today, Hardin's work is recognized as contributing to a wide range of disciplines, including ecology, population theory, economics and political science.

The Basic Idea: What is the Tragedy of the Commons?

The notion of the tragedy of the commons arose in colonial America. In the seventeenth century, immigrants to New England lived in villages where they had privately owned homesteads and gardens. In addition to their private land, they also set aside community-owned pastures, called **commons**, where all of the villagers' livestock, primarily cattle and sheep, could graze on land shared by all. On their own private land, the owners had an incentive not to graze too many animals or overuse the land, because it was to their advantage to be able to use that land productively well into the future. However, when it came to the commonly held grazing land, the individual owners did not have that same incentive to be good stewards. Consequently, they allowed too many animals to graze on the common property, so the commons were overgrazed and became degraded to the extent that they were no longer able to support the villagers' animals.

In this instance and others, the tragedy of the commons occurs when groups of humans overuse, overexploit or degrade public resources, often to the extent that the resources are ruined for all. Sometimes, that destruction is irreversible, such as when a species is driven to extinction. The Passenger or Wild Pigeon (*Ectopistes migratorius*), once among the most numerous birds in the world, went from a few billion individuals during the 19th century to extinction early in the 20th century, a result of extensive deforestation, habitat destruction and overhunting.

There are many examples of the tragedy of the commons. You can probably think of some that apply in your own homes, schools and communities. On a local and global scale, some examples include: overfishing and depletion of fish stocks in domestic and international waters; overharvesting of lumber and destruction of native forests; excessive traffic causing congestion and gridlock on urban highways, and the rise of resistant diseases as a result of indiscriminate overuse of antibiotics.

Overuse of resources beyond Earth's ability to replenish them is known as **overshoot**. Overuse of resources often yields short-term benefit but threatens long-term sustainability. As long as humans hold the belief that Earth's resources are inexhaustible or that short term benefits outweigh long-term costs, overshoot will continue.

We should note that a tragedy of the commons is not always a result of greed; sometimes, it is a result of struggles for survival. For example, in many areas of the world where populations are growing, people cut down forests to convert the land for agriculture so they can produce enough food to survive.

A lesson to be learned from these examples is that a resource held for use by all (a "common" resource) will ultimately be destroyed or ruined if our values and practices do not serve to protect that resource.

There is good news, however. Humans can avoid tragedy by altering our values and implementing sustainable practices.

How Does the Tragedy of the Commons Apply to Our Ocean Resources and Fisheries?

Fish and shellfish are ocean resources that have economic/commercial and ecological value. The health of ocean ecosystems, a commons, is threatened as a result of over fishing as well as other factors, including those listed below. When a fishing area (a **fishery**) first opens, it may be fished by relatively few individuals and/or commercial interests that often enjoy bountiful catches and profits. As word spreads, more and more people start to fish the same area. They remove fish *unsustainably*, faster than they can reproduce. It becomes harder and harder to find fish, and the catches diminish. If the fishing continues without limits, a severe decline or even total collapse of the fish population will occur. Most fisheries in the world today are severely overfished. The California sardine fishery, the Newfoundland cod fishery, and the king crab fisheries of the Bering Sea are examples of the tragedy of over fishing.

The good news is that many fisheries are now managed to avoid over fishing. Management is challenging, because it is expensive and difficult to assess the number, size, and age of the fishery stock, and to set and enforce limits on fishing.

Besides overfishing, other non-fishing activities often result in negative impacts to marine ecosystems. Some of the non-fishing activities that impact marine ecosystems include:

- recreational and commercial ship activities that result in trampling of sea grasses, corals and disturbances to fish nurseries and habitats;
- cutting of mangrove roots and branches to create areas of shade or to tie up boats;
- coastal development that results in erosion and sediment transport to the sea;
- clearing of sea grasses and other coastal wetlands;
- pollution from inadequately treated sewage and spills;
- climate change

Background information adapted from:

- Coastal Oceans
<http://www.cop.noaa.gov/ecosystems/coastaloceans/default.aspx>
- <http://oceanworld.tamu.edu/students/fisheries/fisheries6.htm> – A Texas A&M University website with resources for students about fisheries and over-fishing.

The Tragedy of the Commons

- <http://www.forbes.com/asap/2001/0910/061.html>
- <http://oceanworld.tamu.edu/resources/oceanography-book/tragedyofthecommons.htm>

What is NOAA's role?

The [National Oceanic and Atmospheric Administration \(NOAA\)](#), a federal agency of the United States Department of Commerce, is dedicated to protecting and preserving the nation's living marine resources through scientific research, fisheries management, enforcement and habitat conservation. NOAA's [National Marine Fisheries Service](#) (NOAA Fisheries) is the lead federal agency responsible for the stewardship of the nation's offshore living marine resources and their habitat. NOAA Fisheries manages, conserves and protects fish, whales, dolphins, sea turtles and other living creatures in the ocean.

NOAA's Mission: Science, Service, and Stewardship.

To understand and predict changes in climate, weather, oceans, and coasts,
To share that knowledge and information with others, and
To conserve and manage coastal and marine ecosystems and resources.

Resources Useful for Student Research

- [NOAA Fisheries Service http://www.nmfs.noaa.gov/](http://www.nmfs.noaa.gov/)
- [Fisheries Home](#)
- NOAA National Marine Fisheries Service Southeast Regional Office
<http://sero.nmfs.noaa.gov>
- Information on grouper species
http://www.fishwatch.gov/seafood_profiles/species/grouper/group_pages/index.html
- Information on snapper species
http://www.fishwatch.gov/seafood_profiles/species/snapper/group_pages/index.html
- [FishWatch](#) – What you need to know to choose safe, sustainable seafood
- Sustainable Seafood <http://www.kidsafeseafood.org/what-is-sustainable-seafood/>

Common Misconceptions/Preconceptions:

- Science is only for geeks and geniuses; it's boring and requires lots of memorization.
- The oceans are vast and limitless.
- The Tragedy of the Commons means we are doomed; there is little we can do to prevent environmental disasters and the decline of our oceans.
- Individual consumer choices don't matter much.

Materials:

- Computers with Internet access
- Access to print or online resources with college and university catalogs and career related information

Technical Requirements:

Computer projection equipment for class presentation or individual computers with audio and video capability

Teacher Preparation:

- Review background information on Tragedy of the Commons, ecological concepts, fish species.
- Teacher may choose to adapt the lesson contents, assignment requirements and grading rubric as necessary.
- (Optional) Make laminated copies of handouts on fish species and information provided below for circulation in class. (especially if students have limited access to Internet resources)

Key Words

- Tragedy of the Commons
- Fisheries
- By catch
- Fish quotas
- Sustainable seafood

Pre-assessment Strategy/Anticipatory Set:

- Review the concept of the Tragedy of the Commons, and ask students to offer examples, both local and global.

- Brainstorm some of the natural and anthropogenic factors that affect fish populations.
- 4. Show NOAA's introductory video http://www.noaa.gov/images/onenooa_cap_lan.mov (~3:00) Describes mission and work of NOAA
- Discuss some of the techniques that NOAA scientists use to study and assess changes in fish populations.
- Have students identify some of the most common types of seafood they eat, and ask them if they know where those foods come from and how they are caught or harvested.
- Ask students to define in advance sustainable fishing and seafood eating.

Lesson Procedure:

In this lesson, students will investigate the status of selected commercially important fisheries, some of the causes of population decline, and what management strategies can be employed to reverse the decline and foster sustainable fisheries. They will become familiar with the mission of NOAA and some of the techniques NOAA uses to assess fish populations.

General discussion:

1. Briefly review the factors that affect population sizes in a biological community: availability of mates and resources such as food, light, suitable habitat; predators; pollution/water quality; human activities (recreation, boat traffic, noise, fishing); regulations such as fishing quotas.
2. Define what constitutes a sustainable population (reproduction and growth rates are sufficient to replace numbers lost to fishing/harvesting or decline from other anthropogenic or natural factors).
3. Review, as needed, the background information students have read.
4. In groups of 3 to 4 students or with the class as a whole, have students brainstorm strategies that can be used to reduce overfishing and encourage sustainable management. Possible responses might include: laws and regulations; limits/quotas; financial incentives or penalties; prohibiting fishing in certain areas or times of year; establishing preserves or sanctuaries off-limits to fishing and development.
5. Assign group tasks.
Each group of two to four students will be assigned a topic to investigate and will give a five minute presentation on their findings to the class.

Group research may take place during class time or outside of class.

Group assignments:

Groups 1, 2, 3, 4: Investigate and report on specific commercially important fisheries: grouper/red snapper species. (See species information below.)

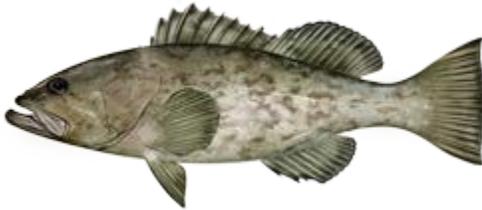
Each group report should include:

- Species characteristics**
- Habitat and range**
- Population, fishing rate**
- Habitat impacts**
- Bycatch issues**
- Status of the fishery (limits, quotas, management issues)**
- Economic value**
- Special notes: current research, challenges, threats**

Group 1

Gag Grouper

http://www.fishwatch.gov/seafood_profiles/species/grouper/species_pages/grouper_gag.htm



Mycteroperca microlepis

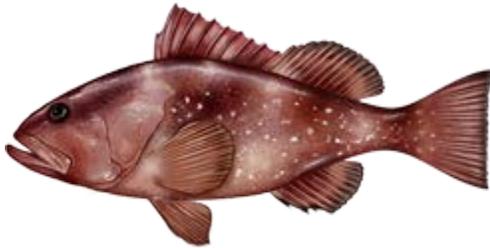
ALSO KNOWN AS:

Grouper, Velvet Rockfish, Small-scaled Rockfish

Group 2

Red Grouper

http://www.fishwatch.gov/seafood_profiles/species/grouper/species_pages/red_grouper.htm



Epinephelus morio

ALSO KNOWN AS:

Grouper, Cherna Americana, Negre

Group 3

Red Snapper

http://www.fishwatch.gov/seafood_profiles/species/snapper/species_pages/red_snapper.htm



Lutjanus campechanus

ALSO KNOWN AS:

Snapper, Genuine red snapper, American reds, Spot snapper

Group 4

Vermilion Snapper

http://www.fishwatch.gov/seafood_profiles/species/snapper/species_pages/vermillion_snapper.htm



Rhomboplites aurorubens

ALSO KNOWN AS:

Snapper, Beeliner, Clubhead Snapper, Night Snapper

Group 5: Research and report on other human activities (besides overfishing) contributing to decline of fisheries.

1. Describe other **anthropogenic** (human) activities and factors that cause fish populations to decline.
2. Define and discuss bycatch, and describe conservation and management measures to reduce bycatch and the mortality caused.
3. Describe strategies and policies that can help protect and stabilize fish populations at sustainable levels.
4. What are the advantages of an **ecosystem approach**?

To get started: ["Overfished" isn't just about fishing.](http://www.nmfs.noaa.gov/stories/2011/07/14_overfished_isnt_just_about_fishing.html)

http://www.nmfs.noaa.gov/stories/2011/07/14_overfished_isnt_just_about_fishing.html

Group 6: NOAA's mission and work (general)

1. What is NOAA, and what is its mission?
2. Where and how does NOAA work?
3. What types of ships and equipment does NOAA operate?
4. What employment opportunities does NOAA offer?
5. What opportunities does NOAA offer for students?

To get started: <http://www.noaa.gov/about-noaa.html>

Group 7: NOAA's fisheries work

1. What is NOAA's work in connection to fisheries?
2. How and where does NOAA conduct its work?

To get started: <http://www.noaa.gov/fisheries.html>

Group 8: What we can do?: Choosing sustainable seafood.

1. What is meant by sustainable seafood?
2. What are the differences between farm-raised and wild caught seafood?
3. How can we find out if our seafood choices are sustainable?
4. What is an "ecolabel"?
5. What can we do to help?

To get started: Sustainable seafood eating

http://www.fishwatch.gov/buying_seafood/choosing_sustainable.htm

Things You Can Do: Take the ocean pledge

<http://www.seaweb.org/getinvolved/oceanpledge.php>

Assessment and Evaluation

Each group will report its findings to the class in a five minute presentation.

Individual student learning will be assessed through evaluation of the presentations and responses to quiz questions.

Additional Related Resources

- NOAA's National Marine Sanctuary Program:
<http://sanctuaries.nos.noaa.gov/education/>.
- NOAA Opportunities for Students – Scholarships, internships and fellowships for undergraduate and graduate students
- Careers in Marine Sciences <http://www.marinecareers.net/>
- Colleges and Universities with marine science-related programs
http://www.marinecareers.net/links_degrees.php
- Internship and Volunteer Programs in marine and environmental sciences
- <http://oceanservice.noaa.gov/topics/coasts/ecoforecasting/> - An overview of ecological forecasting and links to additional resources.
- Photos of *Life at Sea* from the *Pisces*, a NOAA fisheries research ship

- *Pisces* Ship Specifications

Glossary

NOAA's Fish Glossary: <http://www.st.nmfs.noaa.gov/st4/documents/FishGlossary.pdf>

Fishery - Refers to the activities involved in catching a species of fish or shellfish, or a group of species that share the same habitat. Example: the grouper fishery off the coast of Florida, wild salmon fishery, cod fishery in the North Atlantic. For [more information](#): What is a Fishery? http://www.fishwatch.gov/wild_seafood/what_is_a_fishery.htm

Bycatch – Capturing of fish or shellfish other than the intended target. For example, commercial fishing nets may catch endangered sea turtles or other fish species that have little commercial value. For [more information](#): http://www.nmfs.noaa.gov/by_catch/bycatch_whatism.htm

Standards:

National Science Education Standards Addressed

Content Standard C: Life Science

- Populations and Ecosystems
- Diversity and Adaptations of Organisms

Content Standard F: Science in Personal and Social Perspectives

- Populations, Resources, and Environments

Ocean Literacy Principles Addressed

http://oceanliteracy.wp2.coexploration.org/?page_id=47

[Ocean Literacy Principle #5](#): The ocean supports a great diversity of life and ecosystems.

[Ocean Literacy Principle #6](#): The ocean and humans are inextricably interconnected.

State Science Standards Addressed: N/A

Other National or State Standards Addressed:

National Educational Technology Standards for Students (NETS-S) The Next Generation (http://cnets.iste.org/students/NETS_S_standards-1-6.pdf):

2. Communication and Collaboration

Students use digital media and environments to communicate and work collaboratively, to support individual learning and contribute to the learning of others.

3. Research and Information Fluency

Students apply digital tools to gather, evaluate, and use information.

National Business Education Association (NBEA) standards

(<http://nbea.org/curfbes.html>):

Communication:

I. Foundations of Communication - Achievement Standard: Communicate in a clear, courteous, concise, and correct manner on personal and professional levels.

II. Social Communication - Achievement Standard: Apply basic social communication skills in personal and professional situations.

Information Technology:

VII. Information Retrieval - Achievement Standard: Gather, evaluate, use, and cite information from information technology sources.

Author: Margaret Stephens

Community College of Philadelphia
1700 Spring Garden Street, W3-10
Philadelphia, PA 19130
215 751-8869
mstephens@ccp.edu

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Additional Information and Resources:

General Information about Fisheries and Fishing

What is a Fishery?

Source: http://www.fishwatch.gov/wild_seafood/what_is_a_fishery.htm

“Fishery” simply refers to the activities involved in catching a species of fish or shellfish, or a group of species that share the same habitat. Different types of fisheries include:

Commercial fisheries refer to the whole process of catching and marketing fish and shellfish for sale. Commercial fisheries include fishery resources, fishermen, and related businesses. Commercial fisheries can include **artisanal fisheries**, which are based on traditional or small-scale gear and boats. They can also include **industrial fisheries** for

species not directly used for human food (e.g., Atlantic menhaden used for omega-3 supplements, pet food, and other products).

- In a **subsistence fishery**, the catch is shared and consumed directly by the families and kin of the fishermen, rather than being sold at the next larger market.
- Last but not least are **recreational fisheries** in which fishermen catch fish for personal use, pleasure, or competition.

How do fishermen catch fish?



We also identify and manage fisheries based on the fishing method. Commercial fishermen generally harvest seafood with some variety of pots, nets, or fishing line. Fishing methods vary in scale and operation depending on the species and area being fished. For example, fishermen lower pots onto the seafloor to harvest crabs and lobsters, tow large trawl nets through the water column to harvest schools of Alaska pollock, and deploy baited longlines into the water to catch swordfish. A commercial fishery could be just one person on a small boat casting nets by hand, or a huge fleet of trawlers processing tons of fish at a time.

Does fishing harm the environment?



Some fishing methods can incidentally capture other marine animals (bycatch) or damage sensitive habitats such as coral reefs, but this all depends on how the fishing gear is configured and where in the ocean it's used. Healthy ocean ecosystems include diverse, abundant marine life and healthy habitat. They are essential to productive fisheries. We

must ensure that fisheries do not jeopardize these ecosystems. In the United States, reducing bycatch and protecting habitat are two of the fundamental standards that drive the management of all fisheries. Fishermen, scientists, and managers continually work together to improve fishing methods and implement management measures that reduce potential impacts of fishing. To learn more, see:

- [NOAA Fisheries National Bycatch Program](#)
- [NOAA Fisheries Office of Habitat Conservation](#)

[NOAA Fisheries Office of Protected Resources](#)

Additional information for student group assignments

Background Information for Group 5

"Overfished" isn't just about fishing

Source:

http://www.nmfs.noaa.gov/stories/2011/07/14_overfished_isnt_just_about_fishing.html

When you see the word “overfishing” in the NOAA Fisheries [Status of Stocks](#) report to Congress, released this week, it’s only natural to think that fishermen must be causing it, right? Although fishing certainly adds significant pressure, stocks can also become “overfished” for many other reasons, including natural mortality, disease, and natural population cycles.

Environmental changes are another significant contributor. A fish’s environment (habitat) includes physical factors, such as temperature and bottom type, as well as chemical factors, such as oxygen levels and dissolved minerals. The habitat needs for each stage of a fish's life cycle—egg, larvae, juvenile, and adult—vary within the same water body. So changes in these environmental factors can greatly affect the population of a stock.

For example, in the Bering Sea off the coast of Alaska, scientists are seeing decreases in Tanner crab populations, which led to the recent determination that the species is overfished. Scientists are finding that the primary driver of this decrease is not fishing pressure but rather changes in the crab’s habitat.

They saw that, since the first formal surveys of southern Tanner crab in the early 1970s, the eastern Bering Sea populations have fluctuated greatly, with peaks in abundance (or biomass) in 1975, 1990, and 2007. But since 2007, the number of mature male Tanner crabs declined substantially and fell below a threshold in 2009 that led to its overfished status. NOAA scientists are assessing whether this population drop may have been influenced by climate impacts such as increased seawater temperature and ocean acidification.

Managing fisheries using an ecosystem approach

More than 3,000 species of fish inhabit America's coastal rivers, marshes, coral reefs, seagrass beds, deep ocean canyons, and other ocean habitats. So healthy coastal and marine habitat is critical to rebuilding and sustaining our nation's fisheries

One of the greatest long-term threats to commercial and recreational fisheries is the loss of marine, estuarine, and other aquatic habitats. Other fish habitats have been so greatly harmed that fish populations cannot recover without our help. Impacts from certain fishing practices, as well as coastal development, threaten to alter, damage, or destroy these habitats.



Fisheries management relies on intensive studies of the relationship between fish and their habitat. NOAA Fisheries works with regional fishery management councils and state and local partners to ensure that fisheries are managed using an ecosystem approach, looking at the entire system instead of just one small area.

For the Tanner crab, NOAA is developing a stock rebuilding effort that will begin during the 2012-2013 fishing year. NOAA will carefully monitor changes in the crab's environment so the stock can be managed effectively.

As for other fish around the country, NOAA is working to identify [essential fish habitat](#) for every life stage of federally managed species, and continues to focus on [restoring and protecting](#) coastal habitat.

Background Information for Group 7

NOAA's Fisheries Work



<http://www.noaa.gov/fisheries.html>

NOAA is dedicated to protecting and preserving the nation's living marine resources through scientific research, fisheries management, enforcement and habitat conservation. NOAA's [National Marine Fisheries Service](#) (NOAA Fisheries) is the lead

federal agency responsible for the stewardship of the nation's offshore living marine resources and their habitat. NOAA Fisheries manages, conserves and protects fish, whales, dolphins, sea turtles and other living creatures in the ocean.

NOAA Fisheries works within the [Magnuson-Stevens Act](#), the [Marine Mammal Protection Act](#) and the [Endangered Species Act](#) to fulfill its mission of promoting healthy ecosystems. Federally-managed living marine resources provide an important source of food and recreation for the nation, as well as thousands of jobs and a traditional way of life for many coastal communities.

NOAA Fisheries Office of Sustainable Fisheries <http://www.nmfs.noaa.gov/sfa/sfweb/>

NOAA Fisheries works closely with other NOAA offices to protect and conserve marine resources. Specifically, NOAA's [Office of Oceanic and Atmospheric Research](#) explores and investigates ocean habitats and resources. NOAA's [National Ocean Service](#) provides maps and other data to help fishers and managers and also maintains a network of [Marine Sanctuaries](#) and [Estuarine Research Reserves](#) to help protect important resources. NOAA's [Office of Marine and Aviation Operations](#) provides a fleet of ships and boats to support the



agency's fisheries operations.

The Office of Sustainable Fisheries (OSF) is a Headquarters program office of [NOAA's](#) National Marine Fisheries Service ([NMFS](#) or NOAA Fisheries Service). OSF works to manage fish stocks important to commercial, recreational, and subsistence fisheries through guidance and support of Regional Offices and Regional Fishery Management Councils ([RFMC](#)). OSF also strives to facilitate effective communication between and among constituents and supports a variety of seafood safety measures.

Fisheries Management

OSF helps to implement the requirements of the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 ([MSA](#)), which:

- Mandates the use of annual [catch limits](#) and accountability measures to end overfishing
- Provides for widespread market-based fishery management through [catch shares](#), and
- Calls for increased [international cooperation](#)

Extensions (Additional Information)

Barotrauma, safer catch and release methods

<http://sero.nmfs.noaa.gov/sf/2012SARedSnapperSeasonDiscardMortality.htm>

Many saltwater fish, such as red snapper, suffer from “barotrauma” following release back into the water. Barotrauma is a build-up of swim bladder gases that makes it difficult or impossible for them to go back down after release. The key to improving the survival of these released fishes is to return them to the depth from which they are caught as quickly as possible. A variety of recompression tools are on the market, including descender devices, release weights, release baskets, and others. For other tips and tactics, check out: <http://catchandrelease.org/redsnapper.shtml>.

Through a program called FishSmart, anglers and NOAA Fisheries Service are looking for ways to make sure more released fish survive. Learn more at: http://www.nmfs.noaa.gov/stories/2012/04/04_11_12fishsmart_workshops.html. Through careful fishing and use of proper release techniques, millions of fish released today can survive to improve the health of fisheries.

For more information, visit the FishSmart website.