

Name _____

Date: _____

Period: _____

How Many Fish is Enough?

Before Reading: answer the following poll

Which do you think is more important?

- ◇ Saving fish from overfishing
- ◇ Saving the jobs of fishermen

Explain why you voted the way you did.

BOSTON, Massachusetts (Achieve3000, February 18, 2011. Edited by Morgann Clark 10/2013).

Many ecologists think that the biggest threat to marine ecosystems is overfishing. When fishermen are overfishing a species, they're catching it at a rate that scientists believe is too fast to ensure that the species can rebuild and then stay healthy. Scientists are concerned about a decline in any one population. That's because it could upset the food chain and harm other populations in our oceans.

In addition to depleting human food supplies, overfishing disrupts marine ecosystems and affects other species in the food chain.

"Overfishing removes the most important and abundant consumers in a natural ecosystem," says Jeremy Jackson of the Smithsonian Tropical Research Institute. "Fish eat fish, but fish also eat seaweed. If they're not there, the seaweed grows 10 times or 100 times faster than corals, it grows over corals, smothers them, and kills them." These fish are a keystone species, so if their population is disrupted, the entire ecosystem may change.

Now, for the first time in at least a century, officials say that U.S. fishermen aren't taking too many of any species from the sea.

Fisheries reached this [milestone](#) as a result of 2007 [legislation](#). The rules required an end to overfishing by the 2010 fishing year. The 2010 fishing year concludes at different times in 2011, depending on the region. Steve Murawski is the former chief scientist at the National Oceanic and Atmospheric Administration's Fisheries Service. He says the U.S. is the only country that has a law that defines overfishing and requires its fishermen not to engage in it. It's also the only country that has ended overfishing.

Stopping overfishing wasn't easy. Regulators say that in recent years, there were 37 species in the U.S. that were being overfished. New England had the most. It had 10. Officials created management systems for these species. The new systems followed a basic rule of fishery management. The rule is that species become far more abundant when they're being fished at the appropriate level. That level, or catch limit, is determined after considering factors such as a species' life span and its death rate. Knowing this, officials enforced strict limits on how many fish could be caught.

VOCABYULARY:

analyst (*noun*)

somebody with specialized knowledge or skills who studies or examines something and gives an opinion, description, or explanation of it

legislation (*noun*)

a law or laws

milestone (*noun*)

achievement

quota (*noun*)

the number of things allowed



Photo credit: AP
A 2007 law that put limits on how many fish could be caught has been successful in helping fish populations grow. But fishermen say the law has hurt their businesses.

Murawski thinks the catch limits were a good thing. He said that for the first time in written fishing history, which goes back to 1900, "As far as we know, we've hit the right levels, which is a milestone."

Meeting the goals of the catch limits is more than a dramatic benchmark, Murawski says. It also means there will be healthier stocks, or fish populations.

Still, some fishermen and their supporters say that ending overfishing came at a high price. The new legislation created a turbulent year for commercial fishermen. It made it too costly to catch enough fish for some of them to stay in business. In New England, for example, the fleet of fishermen has decreased since the mid-1990s. The fleet went from 1,200 boats to only about 580.

This happened because the new system completely changed the way New England fisheries operated. Fishermen had to work in groups, called sectors, to divide an annual [quota](#) of certain species of fish, which included cod, haddock, and flounder. If they exceeded their catch limits on one species, fishermen were forced to stop fishing on all species.

Dave Marciano is one fisherman who was hard hit by the limits. He fished out of Gloucester, an hour northeast of Boston, for 30 years. He had to sell his fishing permit in 2010.

"It ruined me," said Marciano, 45, adding, "We could have ended overfishing and had a lot more consideration for the human side of the fishery."

What could have been done to help these fishermen? Brian Rothschild is a fisheries scientist at the University of Massachusetts at Dartmouth. He said that it would have been possible for regulators to legally loosen the rules and allow fishermen to safely catch more fish. Regulators, though, did not allow it. According to Rothschild, this needlessly kept fishermen from harvesting fish that were plentiful.

But Tom Nies, a fisheries [analyst](#) for regional New England regulators, says that fish stocks can sometimes be boosted by factors such as strong births in a given year. If overfishing of these species continues, the populations will eventually decline. He says that an end to overfishing is the best way to ensure improved fishing in the future.

For fisherman Steve Arnold, 46, it's difficult to think about the future when he is faced with the challenges of today. His home port of Point Judith, Rhode Island, has fewer boats, older fishermen, and "a lot of frowns on people's faces." The commercial fishermen have suffered, and now their futures are uncertain, he says. Yet, he hopes things will turn around.

"I believe we can get to a better place, but the work isn't done," Arnold said. "We're living through something that we're learning as we go. It's not a comfortable feeling."

Murawski foresees better days for the fishermen who've lost money. He believes that fishermen may have already endured their worst times. And with healthier stocks, he says, their future will be brighter.

The Associated Press contributed to this story.

Activity: answer the following questions using evidence from the text

1. According to the article, why do some fishermen dislike the 2007 fishing legislation?

- A The new system requires them to follow laws similar to the ones followed by fishermen in other countries.
- B The new system requires them to change the size of fish they are allowed to keep.
- C The new system requires them to change the number of fishermen who can be on one boat.
- D The new system requires them to work in groups and divide an annual quota of fish.

2. What is the article mainly about?

- A Many fishermen are thinking about closing down their commercial fishing businesses.
- B Overfishing has been stopped in the U.S., which has harmed some fishing businesses but will help fish populations grow.
- C Officials in other countries are trying to follow the U.S. with laws that define overfishing and require its fishermen not to engage in it.

3. The article states:

- **If overfishing of these species continues, the populations will eventually decline. He says that an end to overfishing is the best way to *ensure* improved fishing in the future.**

Which would be the closest **synonym** for the word *ensure*?

- A Guarantee
- B Postpone
- C Withstand
- D Modify

4. The reader can infer from the article that _____.

- A Dave Marciano was hit hard by overfishing, but he still supports the new fishing system.
- B The new fishing legislation was supported by most commercial fishermen.
- C Fishing permits must be purchased, and there are a limited number of them.
- D Steve Murawski is concerned that there are difficult times ahead for lawmakers.

5. Suppose Erin wants to find out more about the effects of overfishing in the U.S. She would get the **most** information from _____.

- (A) A documentary about Dave Marciano and other fishermen in Gloucester, Massachusetts
- (B) A Web site about the career of fisheries scientist Brian Rothschild
- (C) An identification manual for shellfish along the New England coast
- (D) An article from the National Oceanic and Atmospheric Administration's Fisheries Service

6. Which is the closest **synonym** for the word *quota*?

- (A) Promotion
- (B) Ration
- (C) Gauge
- (D) Minority

7. Which question is **not** answered by the article?

- (A) What are other countries doing to protect ocean life?
- (B) What kinds of fish are most affected by the overfishing legislation?
- (C) Why did officials enact the 2007 overfishing legislation?
- (D) Who has been affected by the 2007 overfishing legislation?

8. The author probably wrote this article to _____.

- (A) Provide more than one point of view about fishing limits in New England
- (B) Suggest that New England fish stocks are declining too quickly to be saved
- (C) Describe the rewards of commercial fishing in New England today
- (D) Inform readers about new laws that apply to anyone fishing in the Atlantic

9. In recent years, officials named 37 species of fish in the U.S. that were being overfished. New England had 10 of those species. According to officials, what percentage of the overfished species did New England have? Choose the closest answer.

- (A) 17%
- (B) 7%
- (C) 27%
- (D) 37%

Now that you have read the article, indicate whether you agree or disagree with this statement.

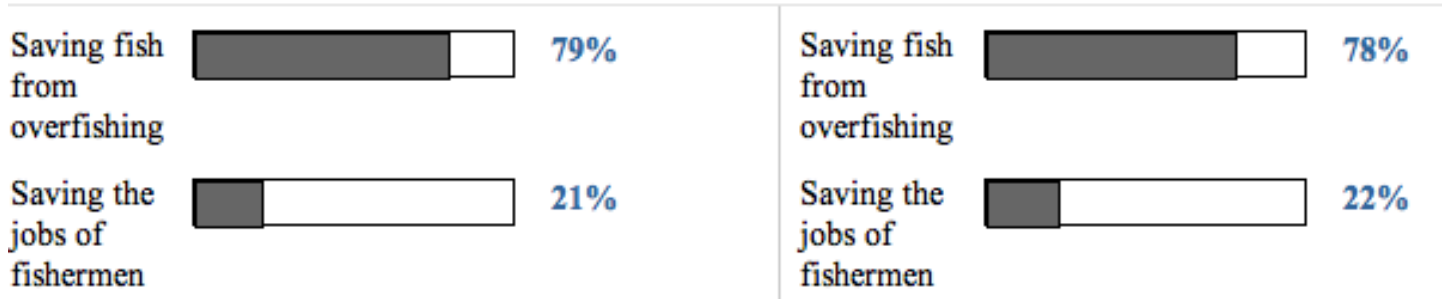
Which do you think is more important?

- ◇ Saving fish from overfishing
- ◇ Saving the jobs of fishermen

Explain why you voted the way you did.

What information might be included in a follow-up story to today's article about overfishing laws? Explain your response. (Use information from the article, as well as your own ideas, in your response.)

NATIONAL RESULTS



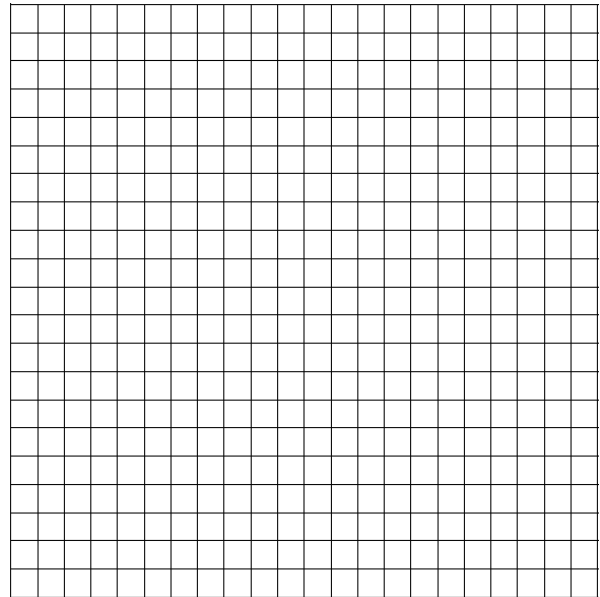
Very few people changed their minds after reading this article. What was the most persuasive evidence for saving the fish from over fishing? What kind evidence do you think would convince people to save the jobs of the fisherman?

Draw LINE GRAPHS below to show the numbers of fish caught and kelp density between 1950-2010

1)

World Wide Fish Catch 1950-2010

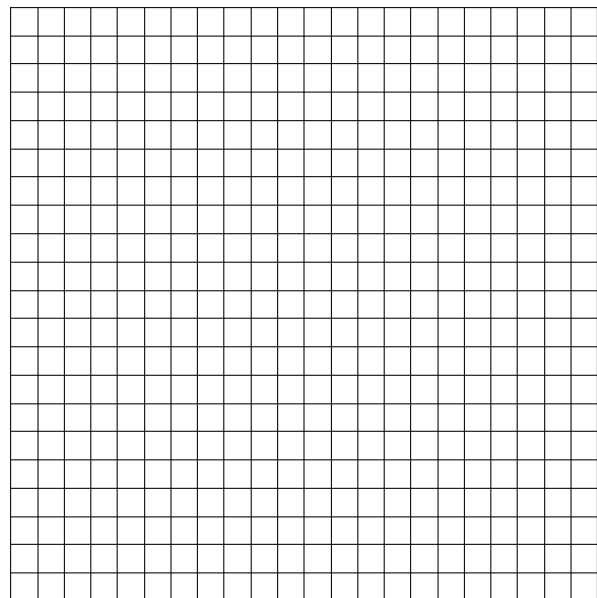
Year	Million Tons
1950	17
1960	26
1970	50
1980	59
1990	84
2000	90
2010	89



2)

Adult Kelp Density 1950-2010

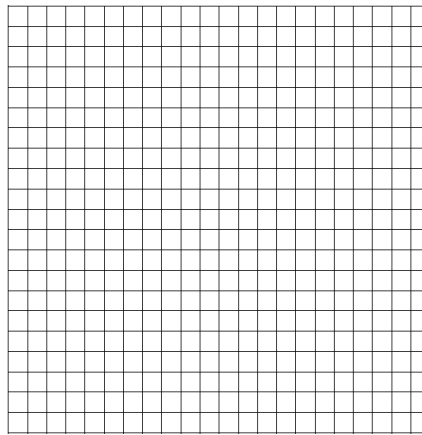
Year	# of plants/meter ²
1950	0.2
1960	0.3
1970	0.5
1980	1.3
1990	2.0
2000	2.7
2010	3.1



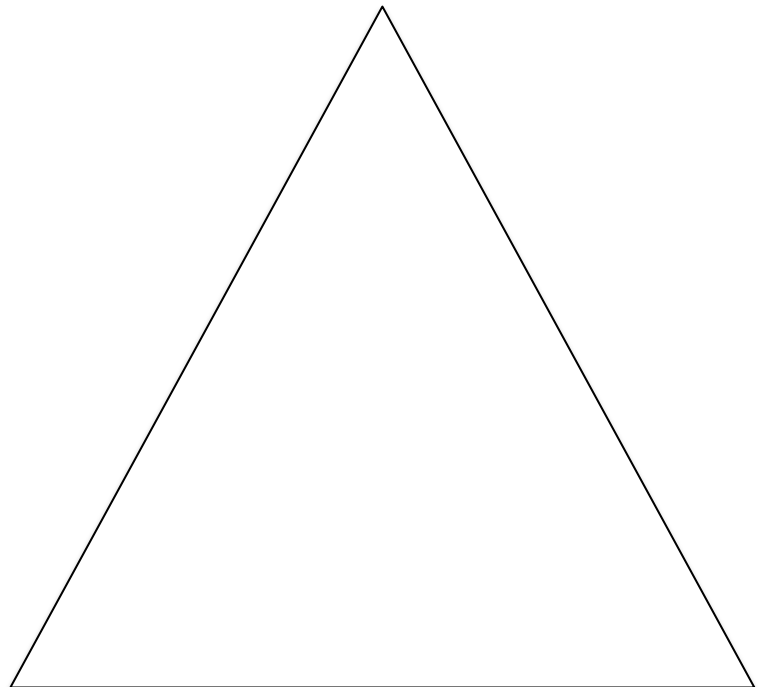
3) What do these graphs show us about the interaction between fish and kelp population?

4) If the fish catching quota legislation continues, what do you infer will happen to the fish and kelp population?

5) Draw below what you think the line graph of kelp and fish populations will look like between 2010 and 2060 with the addition of overfishing legislation. (should reflect answer in question 4)



6) Draw a FOOD WEB and an ENERGY PYRAMID to show feeding relationships between humans, fish and kelp.



CHALLENGE QUESTION: In Santa Barbara, CA the majority of fish caught were carnivorous predator fish. This means that their prey populations are affected. Most of the prey fish are herbivores.

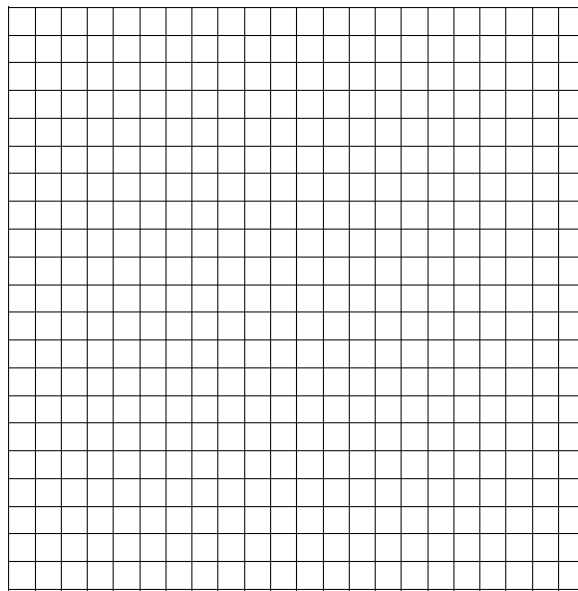
7) Below make a DOUBLE LINE GRAPH to show the relationship between Fish and Kelp density in the Santa Barbara reef. (you will need a key)

Herbivore Fish Density in Santa Barbara

Year	# of fish/meter ²
2001	1.0
2002	0.8
2003	0.5
2004	0.6
2005	0.4
2006	3.1
2007	1.0

Kelp Density in Santa Barbara

Year	# of plants/meter ²
2001	2.5
2002	1.9
2003	1.5
2004	1.3
2005	0.5
2006	0.3
2007	0.2



8) The data for the density of the predatory fish caught from Santa Barbara reef is not provided. **Draw a dotted line on the graph above** to estimate the change in the population density between 2001-2007.

9) Explain the relationship between the fisherman, predator fish, prey fish and kelp using background information and data from the graph.

Writing Rubric

Criteria:	4 points	3 points	2 points	1 point
Task Completion	You pay careful attention to the question asked and make sure to present an answer that is appropriate for the audience being addressed.	You pay some, but not full, attention to the question asked and are not always mindful of the audience being addressed.	You pay some, but little, attention to the question asked and are rarely mindful of the audience being addressed.	You do not pay any attention to the question asked and have no concern for the audience being addressed.
Main Idea and Details	Your main idea is clear, and you give multiple details from reading and graph to support it.	Your main idea is mostly clear, and you give several details from reading and graph to support it.	Your main idea is not completely clear, and you give limited details to support it.	Your main idea is unclear, and you do not give any details to support it.
Mechanics and Grammar	Your writing has no errors in punctuation, capitalization, and spelling.	Your writing has a few punctuation, capitalization, and spelling errors.	Your writing has several punctuation, capitalization, and spelling errors which make it difficult to understand.	Your writing has so many punctuation, capitalization, and spelling errors that it is extremely difficult to understand.
Style and Creativity	Your writing is inviting, compelling, and easy to understand. A great read!	Your writing is clear and easy to understand. A good read.	Some of your writing is unclear or difficult to understand.	Your writing is unclear or difficult to understand.