

Can We Save Both Blue Crabs and Watermen?

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Chesapeake Bay lies in the mid-Atlantic region of the East Coast of the United States, surrounded by Maryland and Virginia. In 2001, commercial watermen harvested over 270 million kilograms (600 million pounds) of Chesapeake Bay seafood; blue crabs made up about 10 percent of this harvest. At its peak, the Chesapeake Bay blue crab seafood fishery was worth more than \$150 million per year. Since the mid-1990s, however, the bay's crab population has dropped precipitously and now hovers around its all-time recorded low.

In response to alarming declines in crab abundance, the Bi-State Blue Crab Advisory Committee, a group of scientists and managers from Maryland and Virginia, recommended a 15 percent reduction in baywide harvest between 2001 and 2003. Implementation has been slow, and the future of this species, the fishery, and the watermen who harvest crabs for a living remains in limbo.

Increased fishing pressure has contributed to the decline in blue crab populations. Chesapeake Bay oysters are too scarce to produce a commercially viable yield, so watermen who historically fished both oysters and crabs now focus their efforts exclusively on crabs. Technological improvements have made commercial crab harvesting more efficient, increasing the rate of crab capture. Crabbing has also become a more popular pastime among the burgeoning population of Chesapeake Bay's watershed.

Other sources of crab mortality have also reduced the number of Chesapeake Bay blue crabs. First, the numbers of predators have increased. Both Maryland and Virginia imposed a total moratorium on striped bass fishing from the mid-1980s until 1989, allowing fish populations to increase. Since crabs compose up to 50 percent of the striped bass diet, increasing numbers of these voracious predators might be expected to cause a concomitant decrease in blue crab numbers. Second, crabs have become more vulnerable to predators. Juvenile blue crabs rely on seagrass beds for camouflage to protect them from predation, but increased nutrient pollution of Chesapeake Bay caused mass die-offs of seagrasses in the 1960s and 1970s. Although these plant populations have begun to recover, seagrasses now cover less than 3 percent of the bay's bottom. Finally, nutrient pollution can result in dramatic decreases in oxygen levels, causing crabs to suffocate. Anecdotal evidence supports this, as the incidence of "crab jubilees" (mass exoduses of crabs from water onto land) seems to be increasing.

Declining crab populations might also be a result of decreasing crab birthrates. Some studies have shown that there are too few female crabs to sustain historic population numbers, and the number of eggs per female has decreased. Male sperm counts have also decreased. Either of these factors might negatively impact the number of new crabs produced each year.

So, the current decline in crabs could be attributed to a number of individual factors but is probably a combination of more than one of these. Who is to blame for this problem? How can crab populations be restored? Opinions vary widely.

The states that border Chesapeake Bay have criticized one another for contributing to the blue crab crisis. Maryland claims that Virginia has had a disproportionate impact on crab populations by allowing the capture of mature female and egg-carrying crabs, as well as the capture of smaller crabs that have yet to reproduce, and permitting year-round crabbing. Virginia, in turn, cites its establishment of spawning sanctuaries (started in 2000) and the fact that Maryland catches more crabs as evidence that Virginia is not negatively impacting crabs.

Watermen claim that the decline in crabs is cyclical, exacerbated by the harsh winter of 2002 and Hurricane Isabel in 2003. Restricting crabbing or trying to convert the industry to aquaculture will destroy the traditional way of life that they and their families have maintained for hundreds of years, they say. The watermen fault the recreational fishermen for catching too many crabs and blame state regulatory agencies for allowing striped bass populations to increase.

Recreational crabbers claim the right to use state waters, citing that they already have to buy crabbing licenses and obey strict size regulations and catch limits. They counter the claims of watermen with statistics: For example, the recreational catch in the 2001–2002 season was less than 13 percent of the commercial harvest.

Scientists acknowledge the watermen's observation that crab abundance is often cyclical. However, they say that these depressed population levels have lasted too long to be due to natural causes. They also present data showing that, in the past, populations of both striped bass and blue crabs were higher. Thus, the presence of these fish does not automatically depress crab numbers. Scientists think that the solution to declining crab populations is to create sanctuaries and habitat corridors, places where crabs can live and reproduce without threat of capture. Some environmentalists go even further, stating that use of this natural resource should cease completely, and be replaced with aquaculture.

What Do You Think?

1. Closing the striped bass fishery allowed populations of that animal to recover in less than a decade. Should the Bi-State Blue Crab Advisory Committee take similar action with the blue crab fishery?
2. Should Maryland and Virginia pay watermen *not* to harvest crabs until their populations have recovered?
3. If recreational crabbers adopted a catch-and-release program, would that help crab populations recover? Would such a program be popular?
4. What sorts of scientific evidence would help you decide whether crab populations have recovered?



Environmental Interrelationships

环境交叉关系

Chapter Outline

The Field of Environmental Science
The Interrelated Nature of Environmental Problems
An Ecosystem Approach
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 The Agricultural Middle
 The Dry West
 The Forested West
 The Great Lakes and Industrial Northeast
 The Diverse South
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本章概要

环境科学的领域
环境问题相互关联的特性
生态系统方法
区域环境问题
 北部荒野
 中部农业区
 干旱的西部
 森林茂密的西部
 五大湖和东北工业区
 多样的南部
问题—分析:狼的命运

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环球视点:
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Objectives

After reading this chapter, you should be able to:

- Understand why environmental problems are complex and interrelated.
- Realize that environmental problems involve social, ethical, political, and economic issues, not just scientific issues.
- Understand that acceptable solutions to environmental problems are not often easy to achieve.

学习目标

阅读完本章后, 你应该能够:

- 理解为什么环境问题是复杂并且相互关联的
- 认识到环境问题涉及社会、伦理、政治和经济等各个领域, 而不仅仅是科学问题
- 了解环境问题的合理的解决方法, 常常难以实现

- Understand that all organisms have an impact on their surroundings.
- Understand what is meant by an ecosystem approach to environmental problem solving.
- Recognize that different geographic regions have somewhat different environmental problems, but the process for resolving them is often the same and involves compromise.

- 了解所有生物对它们周围的环境都有影响
- 了解通过生态方法解决环境问题的重要意义
- 认识到不同的地理区域可能面临不同的环境问题, 但它们的解决过程是基本相同的, 并且都包含着妥协

PAST PRESENT FUTURE

过去—现在—将来

1983 Five percent of the colleges and universities in the United States offered undergraduate degrees in environmental science or environmental studies.

1983 There were 450 computers linked to the Internet.

1983 The gross world product (GWP) was 26.5 (trillion 2000 US\$).

2003 Sixty-two percent of U.S. colleges and universities offered undergraduate degrees in environmental science or environmental studies.

2003 The number of computers linked to the Internet had increased to 162,344,723.

2003 The GWP had grown to 46.8 (trillion 2000 US\$).