

ASIAN OYSTERS AND THE CHESAPEAKE BAY



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“In nature there are neither rewards nor punishments; there are consequences”

~ Robert Green Ingersoll

A Brief History

The proposed introduction of nonnative Asian oysters into the Chesapeake Bay is the most recent in nearly two centuries of legislation regarding this resource. From the moment Europeans began to settle Virginia and Maryland, the substantial abundance of the Eastern oyster (*Crassostrea virginica*) resource in the Chesapeake Bay was obvious. The peak of production occurred in the late 1880's when the Chesapeake Bay was the largest oyster-producing region in the world, producing more than twice the oyster catch of all foreign countries combined. However, this abuse could not continue indefinitely, and by the end of the 19th century the oyster stocks in the Bay had begun to noticeably decline (Kennedy and Breisch, 1983). This decline cannot be linked to one single factor. The pressures of the fishing industry, reductions in water quality, destruction of habitat, and attacks by parasitic disease all contributed to reducing the oyster stock to less than 1% of its original size (National Academies of Science, 2004).

The harvesting pressure placed on native oysters in the Chesapeake has increased exponentially over the years due to the development of more efficient gear. When the industry first began, rakes and hand tongs were the only tools used by harvesters. By 1865, however, dredges were legalized and hydraulic patent tongs were invented. These new harvesting technologies increased the oyster catches from 8-25 bushels/day to 30-100 bushels/day (Johnson, 1988). With these new tools, fisherman removed large amounts of oysters from their reef habitat and thereby reduced the integrity of the entire reef system (Coen and Luckenbach, 2000). At the same time, water quality in the Chesapeake was declining considerably due to population growth and localized pollution.

In 1959, Eastern oyster populations in the Chesapeake were hit with the disease MSX, caused by the protozoan parasite *Haplosporidium nelsoni*. Arriving first in the lower Chesapeake via the Delaware Bay, MSX dramatically reduced the oyster populations in high salinity environments. Another protozoan parasite, *Perkinsus marinus*, causing the disease Dermo, was first discovered in 1949, but did not become a problem until the mid-1980's when it attacked oysters in both high and low salinity environments (Virginia Institute of Marine Science, 1998).

Legislation regarding the oyster fishery in Chesapeake Bay was first proposed in 1820. The legislation limiting catch size and equipment use mirrored Mazmanian and Kraft's Epoch I because of the top-down, restrictive approach to resource management. At other times, the legislation resembled Epoch II because it involved privatizing the commons through leasing the once public lands to the private sector.

Maryland's first law affecting the oyster industry prohibited the use of dredging in all waters owned by the state in 1820. The "One-Acre Planting Law" that allowed citizens to lease one acre of land for private cultivation was passed in 1830. However, the violation of the statute was only punishable as a misdemeanor crime. In 1846, Worcester County established the first closed season from April 13 through September 1. Eight years later, fishermen were permitted to use small dredges if they obtained a \$15 license.

In 1865, all former oystering laws were abolished, a statewide licensing system was established, and, for the first time in Chesapeake history, large dredges were legalized. In 1868, "oyster police" were finally established to patrol the leased land for poachers. From 1906 to 1914, Maryland enacted the Haman Oyster bill and the Price-Campbell bill. These two bills closely resembled Mazmanian and Kraft's Epoch II. The Haman Oyster bill allowed portions of bottom in the tributaries, the Tangier Sound, and the Bay to be leased. For the first time,

fisherman could also lease plots of land for cultivation. The Price-Campbell bill raised the number of leases in 1912 to keep up with increasing demand.

Legislators under political pressure passed the Shepherd Act, which destroyed all the leasing legislation, in 1914. Maryland passed legislation in 1951 that required 50% of shucked oyster shells to be sold back to Maryland to be replanted in barren areas. This law was created to stymie the decline in oyster populations, but most packers and processors found ways around the rules in order to get better prices in the market.

Risks of Introduction

Research is currently being performed in order to evaluate all of the potential risks and benefits associated with introducing the Asian Oysters. There are many to consider and it is evident that all stakeholders feel that this is an important step to take before they can begin to stock the Chesapeake Bay. Laura McKay of the Virginia Oyster Heritage Program noted that the primary fear is the accidental introduction of a disease. MSX was brought to the region by Japanese oysters and has been one of the greatest causes of death among the native oyster populations (National Academies of Sciences, 2004). Larry Simms, the President of the Maryland Watermen's Association, is optimistic about avoiding this risk. He believes that since the oysters will be coming from farms in Oregon, rather than Asia, it will be less likely that they will carry disease.

Another fear is that some of the supposedly sterile oysters that scientists are introducing into the Bay for experimental purposes will actually be capable of reproducing. Regulations state that no more than one in one thousand oysters introduced into the Chesapeake for research can be fertile (Libit, 2003). Although Dr. Stan Allen, a researcher at Virginia Institute of Marine Science, believes it is unlikely, it may be possible for sterile individuals to become fertile over

time (Schleck, 2005). If this were to happen, the Asian oyster population could spread and potentially dominate native species.

Benefits of Introduction

Although some locals are hesitant, others want to expedite the research process so that they may reap the benefits of stocking the Chesapeake (Libit, 2003). The native oysters and their filtering capacities were a significant part of the ecosystem in the Bay. Not only does this make for a more enjoyable bay aesthetically, but it also decreases algal blooms, which increases the amount of oxygen in the ecosystem and sustains other life. The Asian Oysters could potentially revitalize the Chesapeake Bay with their filtering capacity, but the risks involved obligate the government to enlist more preliminary research.

Government Involvement

The Public Trust Doctrine allows the states to have the authority over coastal waters and the land beneath them. There are also federal acts that mandate approval from the US Army Corps of Engineers or the respective state's wildlife conservation agency before an introduction can occur. The Executive Order 13112, the Lacey Act, and the National Invasive Species Act are just a few examples (National Academies of Sciences, 2004). The federal government also provides services to the states neighboring the Bay. The U.S. Environmental Protection Agency (EPA) runs the Chesapeake Bay Program in order to advise members about the issues facing the Bay and encourage them to develop solutions together. The program offers grants to state and local governments as well. Virginia, Maryland and Pennsylvania are all members of the program (National Academies of Sciences, 2004).

The type of legislation and the process that must be undergone to introduce the oysters is indicative of Mazmanian and Kraft's Epoch I (Mazmanian and Kraft, 1999). It is a top down structure, and the governor ultimately has final jurisdiction over the decision. Administrative

rationalism is also seen in this situation because the government is relying on the expert opinion of scientists to determine if the introduction is safe (Dryzek, 1997).

Role of the Market

The decline in local oyster populations has hit the Chesapeake fishing industries hard in recent years. Oystermen have been harvesting fewer oysters per season every year since the onset of the MSX and Dermo diseases in 1959 (Fahrenthold, 2004). This steady decline in oyster populations has significantly reduced the income of local oystermen and many have shifted their trade to other forms of commercial fishing as a result (Leshner, 2005).

In addition to local oystermen, the reduced oyster populations have also affected commercial fishermen. In the absence of native oysters and their filtering capacities, nitrogen and phosphorus are allowed to accumulate in the Bay (Fahrenthold, 2004). This nutrient imbalance results in an unhealthy environment for many aquatic organisms. Algal blooms also become more frequent when oysters are not able to adequately filter the Bay. The algae pose a particularly significant threat to the local fisheries because they often result in fish kills (Governor Ehrlich, 2003). It is clear that the commercial fishing industry is at a severe risk due to the imbalance caused by a reduced number of oysters in the Bay.

Many fishermen endorse the introduction of Asian oysters into the Bay in order to secure a stable fishing industry (Simms, 2005). The hope is that the introduced Asian oyster will fill the empty niche left by the native oyster species. Asian oysters, local fishermen hope, will produce a twofold benefit to the industrial markets of the Chesapeake: they will revive the oyster market and protect other fisheries markets by filtering the Bays waters and preventing fish kills (Fritz, 2003).

For the oystermen, there is no question that Asian oysters should be introduced into the Chesapeake Bay. Since native populations have all but vanished completely, the local oystermen

have nothing to lose from the introduction. Their industry and income has already disappeared and the introduction of a new oyster species can only help their situation. Contrastingly, other fishermen may have a great deal to lose if the introduction is not adequately researched and tested before it is implemented. Introducing an exotic species into the Bay could lead to the inadvertent introduction of an accompanying disease that, in turn, could threaten other harvestable organisms in the Bay. Due to this risk, fishermen are somewhat hesitant to undergo an intentional introduction before sufficient research has been conducted (Fahrenthold, 2005).

Despite the risks involved, however, the majority of commercial fishermen support the introduction of Asian oysters into the Chesapeake (Simns, 2005). They feel that adequate research and experimentation will prevent any unintentional repercussions of the introduction. Larry Simns, president of the Maryland Watermens Association (MWA), revealed that the MWA has been lobbying for the introduction of Asian oysters for years. The “entire ordeal” began, he said, when the MWA approached Robert Ehrlich about the issue even before he was elected governor of Maryland in January 2003 (Simns, 2005). Governor Ehrlich announced his administration’s goals to pursue the introduction of the Asian oyster in June of 2003, a mere 6 months after his inauguration (Ehrlich, 2003). The speed with which Ehrlich moved on the issue speaks to the enormous political pull that the fishing industry has in Maryland.

Larry and others in the industry make it clear that it’s not just what is best for the oyster industry, but what’s best for all of the industries that depend on a healthy Bay for a stable income. With nutrient accumulation and oxygen depletion in the Bay, local businesses are relying on a very unstable enterprise. Restaurant owners depend on the seafood to serve in their kitchens. Oystermen and other fishermen depend on stable stocks of fish for their income. Many local businesses depend on the tourism that the Bay provides. Without a healthy Bay, there will be fewer recreationalists flocking to the area every year, thus injuring the local

economy and diminishing the incomes of local residents. In short, the industry of the entire Bay area depends on the ecological health and stability of the Bay.

Although commercial fishermen have recently adopted a stronger concern for the environment, it is primarily an example of weak ecological modernization. Historically, commercial fishermen exploited the Chesapeake for its valuable resources with little concern over how their actions would affect the ecology of the Bay (Fahrenthold, 2004). Fishermen did not become concerned about Bay until it became quite evident that the size of their incomes depended on the health of the Bay. The industry has adopted an environmental ethic in recent years, but only because this ethic will provide them with a more stable income. As Dryzek notes, weak ecological modernization involves no real shift in norms and values, for the industry is still motivated by a capitalist ideology (Dryzek, 1997). What has changed is merely the best means of attaining a steady income. While unyielding exploitation was once the best means of making money, ecological conservation now seems the best method to sustain an income in the Chesapeake.

Environmental Activists

The health of the Chesapeake Bay has long been a high-profile environmental issue, and so the question of introducing a new species has inevitably drawn the attention of local environmental groups. For the most part, their response has been one of hesitance and concern. The Chesapeake Bay Foundation has taken a position against immediate introduction of fertile nonnative oysters, on the grounds that much is still unknown about its life cycle, biology, and potential ecological interactions. The Foundation draws heavily on the National Research Council's 2004 report to support this position (Chesapeake Bay Foundation, 2005). While they fall short of categorically denying introductions at any future date, CBF clearly holds a position opposed to that of the seafood industry and watermen's associations who are anxious to

introduce fertile nonnative oysters as quickly and widely as possible. In a telephone interview, Stephanie Reynolds, Maryland Fisheries Scientist for the Chesapeake Bay Foundation, described her concerns: “We don’t know yet that [Asian oysters] will save the industry...We're fighting for water quality, we’re fighting for native oyster restoration – in a year, we could be fighting another invasive.” (Reynolds, 2005).

Other environmental groups have expressed similar hesitation to act without further scientific research. The U.S. Army Corps of Engineers solicited comments on their proposed Environmental Impact Statement for the introduction project from a number of national and local NGOs. The National Wildlife Federation and The Nature Conservancy, both nationwide environmental groups (rather than regional) have expressed a desire for additional research on the reintroduction of native oysters, a possibility that they feel has not been fully explored. The group Delaware Riverkeeper shows even more reservations, indicating that it does not support any plan that would seek to use introduced non-native oysters as the basis for a new oyster industry (US Army Corps of Engineers, 2004).

Environmental groups are clearly engaging in a discourse of administrative rationalism (Dryzek, 1997). While they have not said that they wish to “leave the decision to the experts” exactly, they place a high premium on the perceived expertise of scientific and academic elites, and ultimately rely on that expertise as justification for their hesitancy. As Ms. Stephanie Reynolds puts it, “We need to wait and see what the science says,” (Reynolds, 2005). Delaware Riverkeeper, however, may be acting under a somewhat more Green Romantic discourse than the others. Delaware Riverkeeper’s emphasis on native species over introduced species may be based less on scientific uncertainty than on a romanticization of native flora and fauna. By stark contrast, groups like Harris Seafood exhibit a strongly Promethean desire to manufacture a

solution to the problem of too few oysters as quickly and with as little interference as possible (US Army Corps of Engineers, 2004) (Dryzek, 1997).

General Public

The sentiments of a collection of people as broad as “the general public” are liable to be extremely varied, and so measuring these sentiments can be imprecise and difficult. However, environmental groups can hardly be expected to be representative of the public at large.

The Army Corps of Engineers, in addition to soliciting comments from specific NGOs, has also solicited comments on its Environmental Impact Statement from the general public via mail and e-mail, as well as through “scoping meetings” in Annapolis and Newport News. Opinion seemed to be evenly divided between those who want more research and those who feel that enough time has already been wasted (US Army Corps of Engineers, 2004). However, a Baltimore Sun poll released in January indicates that as many as 70% of Marylanders believe that more research is needed, while 10% favor immediate introduction and 6% are against introduction (Nitkin, 2005). In this case, the environmental groups seem to be doing a good job of representing the views of the general public in adopting their administrative rationalist approach.

Ultimately, the process of soliciting comments is a classic example of an inquisitive approach to participation (Lauber & Knuth, 1998). Despite the Army Corps of Engineers’ effort to solicit public comments, the public has little or no control over the EIS or any aspect of the process. Full authority for management remains with the government, and the flow of information is mostly one-way. The Army Corps of Engineers, as a Federal agency, tends to do most of its own work – though stakeholders are permitted to challenge the EIS in court as “arbitrary and capricious” (National Academies of Science, 2004).

Environmental groups haven't stopped with the EIS hearings, however. The Chesapeake Bay Foundation has called their membership to action by writing to their representatives in support of a cautious approach that waits for more and more conclusive research to be finished. This, coupled with one-on-one lobbying efforts, has successfully pushed House Bill 1250/Senate Bill 405 through the Maryland state legislature, and a similar bill through the Virginia legislature (Reynolds, 2005). While there is a limited participatory framework in place, NGOs have kept all of their options open.

Conclusion

The situation in the Chesapeake serves as a classic examples of Polyani's double movement (Polanyi, 1944). The market expanded beyond its means, and ended up exploiting the local oyster populations. The oyster populations became too low to recover from the outbreak of two diseases, and the entire bay environment began to suffer. Realizing the problems caused by the depleted oyster populations, the community demanded that the state suppress the market expansion. The state, responding to community pressures, set quotas and limitations on the market to reduce the exploitation of oyster resources in the Bay. Unfortunately, the state response came too late and native populations had already been pushed below a sustainable level. The proposition to introduce Asian oysters into the Chesapeake comes as an effort to restore the damage caused by the unyielding expansion of the market and the resulting environmental exploitation that ensued.

Those who advocate introducing the Asian oyster into the Chesapeake have adopted a Promethean discourse in their own right (Dryzek, 1997). The introduction endorses the tenet that humans can use substitution and innovation to correct the environmental follies of the past. This kind of mix-and-match engineering perspective has yet to prove itself as an ultimate solution to

environmental problems. Unfortunately, the time for strict controls and caution has passed and introducing Asian oysters into the Bay is one of the few remaining options.

The institutional arrangements governing the management of the Chesapeake Bay are moving away from Epoch I management system into something resembling Epoch III. People in and around the Bay area have adopted a new kind of environmental ethic in recent years. Although this ethic is primarily a result of ecological modernization, it should not be discounted as such. Those involved in the Chesapeake oyster case have all realized the importance of a sustainable resource management. It is true that members of industry and community may disagree on what actions are best for the Bay, but in the end both groups are looking to secure a sustainable future for this resource (Mazmanian and Kraft, 1999).

Suggestions

The governance arrangement that currently surrounds this issue could benefit from a few adjustments. The state should make a greater effort to encourage participation of interested individuals. The current participatory arrangement is a hybrid of an expert authority approach and a passive–receptive approach. Instead, a few focused groups from the market and community sectors have taken it upon themselves to send letters, write petitions, and arrange meetings with state officials. The state has passively received these efforts towards participation, but has shown little effort to solicit such information from all interested parties. Neither has the state explicitly shown that these communicative efforts will have any affect on how the state will ultimately decide to act.

Our group proposes that the most efficient governance arrangement for this situation would consist of a few modifications to the current model. The state should still hold ultimate control over what decision is made, but it should have a much more active and open participatory arrangement. There should be a greater distribution of power between the state, the market, and

the community. In order to achieve such a desired balance of power, a conglomerating committee should be formed to convene on the oyster issue in the Chesapeake.

Representatives from local governments, commercial fishing industries, local communities, recreationalist fishermen, environmentalists, and scientists should all have a place in the committee. By bringing everyone to the table, the committee structure would be more likely to result in a compromise between the interested parties. There would also be a more efficient movement of accurate information if represented parties could be accountable for their information. Without free and accurate information exchange decisions can be inappropriate and parties may become confounded (Ostrom, 2000). Finally, allowing representation of the major stakeholders decreases the community tension and may eventually cut down on the resistance of implementing the decision later in the process. Opening up participation among representatives from the state, market and community will distribute power among these institutions in a more effective way, result in freer information exchange, yield a more appropriate final decision, and decrease the resistance to implementing said decision.

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