



# United States Department of the Interior

OFFICE OF THE SECRETARY  
Office of Environmental Policy and Compliance  
Custom House, Room 244  
200 Chestnut Street  
Philadelphia, Pennsylvania 19106-2904



December 15, 2008

ER 08/1100

Colonel Dionysios Anninos  
District Engineer, Norfolk District  
U.S. Army Corps of Engineers  
803 Front Street  
Norfolk, Virginia 23510-1096

Attention: Mark Mansfield, Planning & Policy Branch

*Subject: Draft Programmatic Environmental Impact Statement (DPEIS) for Oyster Restoration in the Chesapeake Bay, Including the Use of a Native and/or Non-native Oysters*

Dear Colonel Anninos:

The Department of the Interior (Department) has reviewed the subject document, dated October 2008. We offer the following comments pursuant to our jurisdiction and special expertise for your consideration in order to complete the Programmatic Environmental Impact Statement (PEIS).

## **INTRODUCTION**

The DPEIS attributes the decrease in native Eastern oyster (*Crassostrea virginica*) in the Chesapeake Bay to three major factors: over-harvesting, disease, and habitat loss. These factors have led to a severe decline in the ecological function oysters serve in the Chesapeake Bay. The DPEIS proposal is to introduce non-native Suminoe oyster (*Crassostrea ariakensis*) into the Chesapeake Bay to replace the ecological and economic functions of the native Eastern oyster.

The DPEIS identified eight alternatives to the proposed action:

1. no action (status quo)
2. enhance efforts to restore native oysters
3. harvest moratorium
4. cultivate native Eastern oyster
5. cultivate a non-native Suminoe oyster (*C. ariakensis*)
6. cultivate a non-native oyster other than *C. ariakensis*

7. introduce the non-native Suminoe oyster (*C. ariakensis*) and discontinue native Eastern oyster restoration
8. combination of the alternatives which includes:
  - a. cultivate native Eastern oyster only
  - b. combination native Eastern oyster and triploid non-native Suminoe oyster cultivation
  - c. combination native Eastern oyster, diploid non-native Suminoe oyster and triploid non-native Suminoe oyster cultivation

The U.S. Fish and Wildlife Service (Service), a Bureau within the Department, provided comments on the Notice of Intent to Prepare an Environmental Impact Statement in a letter to the U.S. Army Corps of Engineers, dated February 27, 2004.<sup>1</sup> The Service is a cooperating agency along with the Environmental Protection Agency, and the National Oceanic and Atmospheric Administration for the development of the DPEIS. The Service also serves on the Executive Committee (Committee consisting of the District Engineer, Secretary of Department of Natural Resources in Maryland, Secretary of Natural Resources in Virginia), and co-chaired the Ecological Risk Assessment Advisory Group (ERAAG). The ERAAG is a peer review group consisting of risk assessors designated by the lead agencies (Army Corps of Engineers, Maryland and Virginia, and the Potomac River Fisheries Commission) with input from the cooperating agencies.

### **GENERAL RECOMMENDATIONS AND COMMENTS**

Although none of the alternatives evaluated in the DPEIS are projected to meet the goal and time frame established in the DPEIS process, Alternative 8a, “*Native Eastern Oysters Only*”, has the highest probability for success while maintaining the lowest threshold for adverse effects to the Chesapeake Bay.

1.) The Department recommends that the final PEIS include a description of the decision-making process which will be used to identify the selected alternative(s) in the Record of Decision.

The DPEIS identifies potential effects of the proposed action and eight alternatives to natural resources. However, the evaluation process is often qualitative, and the assumptions in many of the models are based largely or solely on professional judgment. While it is recognized that these analyses often represent the best available information, the uncertainty of this type of information causes great concern for the decision-making process. The uncertainty is particularly true for the proposed action and the alternatives that include the introduction of non-native oyster species into the Chesapeake Bay.

2.) The Department recommends that the final PEIS evaluate the potential impacts to native Eastern oysters, including the potential for decline in the native Eastern oyster populations, both within Chesapeake Bay and outside the Bay.

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<sup>1</sup> February 27, 2004, letter to Peter Kube (Regulatory Branch, U.S Army Corps of Engineers, Norfolk District from John Wolflin (Supervisor, Chesapeake Bay Field Office) RE: Scoping Comments on the Notice of Intent (NOI) for a Programmatic Environmental Impact Statement (EIS) to evaluate alternative approaches to increasing oyster populations into the tidal waters of Maryland and Virginia (Chesapeake and Coastal bays) {Federal Register: January 5, 2004 (Volume 69, Number 2)}

There is great uncertainty associated with the effects of the non-native Suminoe oyster on native Eastern oysters. We believe the DPEIS underemphasizes the potential effects on the native Eastern oyster population. The implied premise of the DPEIS is that the native Eastern oyster will not increase in area and numbers sufficient to meet the objective of sustaining an oyster population similar to what was present during the 1920-1970 time period under any of the proposed scenarios. The lead agencies believe that the proposed action is needed to meet the functional needs of the Chesapeake Bay in terms of maintaining reef structure and filtering capacity. However, the Department values native Eastern oysters as a keystone aquatic species that represents the health of the aquatic environment and many other aquatic species in the Chesapeake Bay and Atlantic coast. Based upon the research and modeling documented in the DPEIS, we believe that there is great potential for the non-native Suminoe oyster to outcompete the native Eastern oyster. *“The risk that the Suminoe oyster would interact with the Eastern oyster is moderate to high.”* (DEIS Section 4.15.1, page 4-165)

The DPEIS identifies two objectives under the purpose and need statement: 1) restore the ecological role of oysters in the Chesapeake Bay, and 2) restore economic benefits of an oyster industry in the Chesapeake Bay. The Department’s primary responsibility and role in the PEIS process is to promote the continued restoration of the native Eastern oyster and maintain biological integrity in the Bay.

3.) The Department recommends that the final PEIS include a discussion of strategies on: a) providing critical habitat necessary to implement oyster restoration and b) appropriate management plans to sustain the native Eastern oyster population.

The need for oyster restoration and appropriate management strategies to sustain an oyster population in the Bay resonates throughout the DPEIS. However, there is no discussion of how to create and maintain hard bottom substrate required for oyster restoration. Without a strategy for determining how to create and sustain hard bottom substrate, it is unlikely that the proposed action or any of the alternatives will achieve any significant level of success.

## **DETAILED RECOMMENDATIONS AND COMMENTS**

### ***Executive Summary***

Appendix D provides an extensive evaluation of the economic analysis. The executive summary does not utilize this information when comparing alternatives. For the economic analysis to be useful, an estimate of each alternative’s costs and benefits must be presented. These quantitative estimates should be included in the executive summary table comparing alternatives.

### ***Section 1.1.2, Purpose and Need for Action***

1.) The Department recommends the authors expand the timeframe to include prediction of ecologic stability under the proposed action and for each alternative.

This section states that the difference between the goals established in the Chesapeake Bay 2000 agreement, (a “10 fold increase in oysters”<sup>2</sup>), and the purpose and need statement in the DPEIS, (“establish an oyster population that reaches a level of abundance in Chesapeake Bay that

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<sup>2</sup> Chesapeake Bay Agreement signed by Commonwealth of Virginia, State of Maryland, Commonwealth of Pennsylvania, District of Columbia, United States of America, and the Chesapeake Bay Commission. June 28, 2000

would support sustainable harvest comparable to harvest levels during the period 1920-1970”) is that the Chesapeake 2000 Agreement is intended to be a short-term goal while the purpose and need of the DPEIS is intended to be more expansive. However, the timeframe for comparison in the DPEIS is 10 years. This timeframe limits the decision makers in their ability to understand longer-term ecological impacts.

2.) The Department recommends that the final PEIS include a section that clearly states oyster restoration by itself is not the solution to the water quality clean up in the Bay.

Oyster restoration by itself will likely do little to address increased water quality degradation due to increased shoreline development, human population increases, urban sprawl, etc., when it is occurring at a rapid rate. Other efforts must continue that aggressively target water quality improvement.

#### ***Section 4.1.1.2 Factors that Could Constrain the Success of an Introduction***

A significant data gap needs to be addressed before non-native Suminoe oysters are introduced into the Chesapeake Bay.

The overall assessment concludes that it is likely that native Eastern oysters and non-native Suminoe oysters would coexist in the Bay. However, based on the available research, many crucial competition questions cannot be answered, e.g., gamete interference, making it impossible to predict how interaction would affect the population of either species over time.

#### ***Section 4.1.3 Overview***

1.) The Department recommends that if the decision-makers continue to consider the introduction of non-native oysters, the final PEIS outline a path forward to reduce the uncertainty of statements like the one below.

*“the probability of success of an implementation plan such as the one defined for this DPEIS for establishing a self-sustaining population of Suminoe oyster in Chesapeake Bay cannot be considered to be certain, and the rate at which an introduced population might grow and disperse throughout the Bay cannot be estimated. Although the proposed action appears to have potential for attaining the PEIS goal, the likelihood that such potential could be realized is uncertain.”*

#### ***Section 4.1.3 Alternative 2: Enhance Restoration.***

1.) The PEIS should clarify in detail if there is a realistic timeframe and scenario in which this alternative could meet the stated objective.

This section dismisses the disease resistant oyster on the basis it cannot meet the goals in the purpose and needs section of the DPEIS. We suggest that the DPEIS identify the most likely restoration timeframe for this alternative. The following statement suggests 10 years is not long enough.

*“The existing disease resistant brood stock is not likely to be large enough to produce the number of spat specified for this alternative, at least over the 10-year assessment period.”*  
By adding requested additional information, the document would clarify how such criteria are being used to discard alternatives.

2.) The Department recommends that the final PEIS provide a discussion on techniques for cleaning silted oyster habitat.

Developing new methods for recovering silted oyster habitat is an important role in oyster restoration but it is not adequately addressed in the DPEIS.

***Section 4.1.4 Alternative 3: Harvest Moratorium***

The PEIS should answer the following questions in this section.

What is the nature of the compensation programs for the oyster industries?

Could this program involve Federal funding of commercial hatcheries focused only on Eastern oyster restoration?

What timeframe is considered temporary for a harvest moratorium and also effective for meaningful recovery of native Eastern oyster population(s), while maintaining support of the affected public?

***Section 4.1.6 Alternative 5: Cultivate a Non-native Oyster***

1.) The Department recommends that the term “sterile triploids” be replaced in the document with a more accurate term such as “reduced fecundity triploids.”

This section states that triploid oysters are “*generally considered sterile*”. This statement is an oversimplification. All triploid oysters produce viable gametes. However, the triploid process reduces the number of viable gametes to such a low number that it is statistically improbable that reproduction would lead to successful recruitment. However, Guo and Allen (1994)<sup>3</sup>, and Gong *et al* (2004)<sup>4</sup> clearly demonstrated that viable diploid offspring can arise from triploid parents.

2.) Due to the uncertainty associated with evaluating risk and the fact that we know that triploids have the potential for reproduction, Alternative 8b and Alternative 8c should be combined in the PEIS, as they have the same eventual outcome.

Page 4-49 states “*Given the many unknowns in the two analyses for this evaluation and the variety of possible pathways of introduction, no specific level of risk could be determined for the overall likelihood that implementing Alternative 5 would result in an unintended introduction . . . The level of uncertainty associated with evaluating this risk is high due to lack of information about contributing factors.*”

***Section 4.2 Other Components of the Ecosystem***

1.) The Department recommends that the following topics be discussed in this section.

\* Virginia’s hard shell clam aquaculture industry - economics, environmental impacts, benefits

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<sup>3</sup> Guo, X. and S.K. Allen 1994. Reproduction Potential and Genetics of triploid Pacific Oysters, *Crassostrea gigas* (Thunberg) Biol. Bull. 187:309-318

<sup>4</sup>Gong N., H. Yang, G. Zhang, B.J. Landau and X. Guo 2004. Chromosome inheritance in triploid oyster *Crassostrea gigas* (Thunberg). Heredity: 93:408-415

of culturing filter feeders, and social issues pertaining to water use, and

- \* The ability of non-native Suminoe oyster to set on other shellfish (e.g. ribbed mussels).
- 2.) The Department recommends that the following questions be answered in this section.
- \* Could non-native Suminoe oyster larvae be taken up in ballast water and transported to other areas if introduced?
  - \* How are ecological and biological interactions i.e., potential hybridization, disease/pathogen transfer, between native Eastern oyster and non-native Suminoe oyster going to be measured and monitored?
- 3.) The Department recommends adding a data quality section to the final PEIS that includes:
- \* the types of data that were accepted or rejected due to quality; and
  - \* discussion on the implications of data quality on the outcomes of the assessments.

The following statement on Page 4-53 implies that literature based assumptions are of greater data quality than applicable research.

*“RRM (Relative Risk Model) scores could not be derived for the proposed action because the Bay-wide abundance of oysters that might result from introducing the Suminoe oyster could not be estimated at this time . . . consequently, the potential ecological effects of the proposed action were assessed through an interpretive synthesis of findings of applicable research.”*

***Section 4.2.1 Proposed Action: Introduce the Suminoe Oyster and Continue Efforts to Restore the Native Eastern Oyster***

1.) The Department recommends the final PEIS include a discussion on a third scenario, i.e., competition between the two oyster species and its implications for the future of the Chesapeake Bay.

This section implies that an introduction of the non-native Suminoe oyster would result in two likely scenarios. The first scenario is the establishment of a large and self-sustaining population of non-native Suminoe oyster throughout the Bay and the second scenario being that non-native Suminoe oysters fail to establish.

We believe there is another more realistic scenario that should be examined, which is competition between the two oyster species. The DPEIS suggests there will be competition between the two oyster species, but it is not discussed. Each species demonstrates a selective advantage depending on environmental conditions. The loss of habitat reduces the probability of a successful introduction of the non-native Suminoe oyster and increases the chances of inter-species competition with the native Eastern oyster. It is likely that if the non-native Suminoe oyster is established, this habitat competition will retard both species, hampering the success of either oyster from achieving significant restored ecological or economic function.

2.) The final PEIS should include an eradication plan and associated costs should the proposed management action fail and require mitigation.

The DPEIS provides no mitigation strategy if the non-native Suminoe oyster has unforeseen negative short-term or long-term impacts.

#### ***Section 4.2.6 Alternative 5: Cultivate a Non-native Oyster***

1.) The PEIS should include a discussion on cost analysis as part of this alternative.

Broodstock and hatchery infrastructure are limiting factors for non-native Suminoe oysters and a plan on how to address these limitations should be developed. In order to meet the aquaculture objective, 15-25 new bio-secure hatcheries would be needed. The cost of producing triploid non-native Suminoe oysters in a biosecure hatchery is likely to be more expensive than triploid non-native Suminoe oysters produced in a non-biosecure hatchery.

2.) The PEIS should address shell availability as it relates to this alternative.

Were estimates made for the amount of shell that will be needed for increasing habitat restoration or aquaculture activities? Will enough shell be available for these activities?

3.) The PEIS should clarify and discuss the time it takes a native Eastern oyster to reach market size.

Page 4-64 (final paragraph) states that triploid native Eastern oyster take 18-24 months to reach market size, giving the triploid non-native Suminoe oyster a selective economic advantage due to faster growth to market size. However, Section 4.1.5, page 4-35, states that triploid native Eastern oysters reach market size in 12-18 months.

#### ***4.6.2 Economic Effects***

1.) The Department recommends the final PEIS provide a discussion and side-by-side comparison between the two species of triploids in aquaculture using all available data.

The Virginia Seafood Council conducted extensive trials using the triploid non-native Suminoe oyster.<sup>5</sup> This information could have been used to demonstrate a market analysis of the potential for triploid aquaculture. However, very little information from these extensive trials is included in this document. The estimates of the cost of producing spat in a secure hatchery may significantly offset economic advantages attributed to increased growth rates.

Culture of native diploid Eastern oysters off-bottom, and culture of triploid native Eastern oysters could both be economically viable methods of producing marketable oysters without the environmental risk of introducing a non-native Suminoe oyster.

2.) The Department recommends the adoption of the model approach as described in the white paper by NOAA CBP (2008)<sup>6</sup> as it is useful in decision-making and it will strengthen the final PEIS.

<sup>5</sup> Chesapeake Bay Program, 2008. Recommendations from the Chesapeake Bay Program's Ad hoc Oyster Panel on the proposal, dated February 2008 from the Virginia Seafood Council Submitted to the Virginia Marine Resources Commission: "Maintaining Established Markets for Triploid *Crassostrea ariakensis* produced and cultured in Virginia Waters, Conducting a Shelf Life Study and Increasing the Number of Ploidy Certifications. April 17, 2008.

<sup>6</sup> NOAA Chesapeake Bay Program 2008. Estimating Net Present Value in the Northern Chesapeake Bay Oyster

Page 4-124 states a “*lack of a quantitative projection of the population of diploid Suminoe oyster that might result from an introduction, the inability to predict how quickly the Suminoe oysters might become established in harvestable areas, and the inability to predict what exploitation rate might be experienced by Suminoe oysters in those harvestable areas*”.

This statement represents a summary of the Appendix D economic analysis. Without the projected benefits and costs of each of the EIS alternatives, the economic analysis does not fulfill its intended purpose. Moreover, the indirect economic benefits are described but no attempt is made to quantify the indirect benefits.

The recent white paper by NOAA CBP (2008) offers a solution to this problem. It is a report on an economic analysis using a growth model of the oyster fishery under different scenarios. Among the options are the indirect economic benefits. This model could be adapted for use in the final PEIS. In situations where there is such uncertainty with the data, the use of ranges is usually employed. Such is the case here. Where there is biological uncertainty about growth rates, ranges could be employed and the ecological benefits of water filtration could be included in the quantitative analysis.

3.) The following statement needs further explanation in the final PEIS.

Page 4-129, Processor Benefits/Consumer Benefits, states “*Comprehensive cost and returns data on oyster processing were not available from which to generate estimates of profits to this segment of the industry, and particularly a differential in profits from oysters produced locally versus shellstock transported in from other producing regions.*”

Many of the shucking houses on the Chesapeake Bay have been operating for generations and should have this information available for evaluation.

#### ***Section 4.13 Public Safety and Fouling***

1.) The Department recommends that the final PEIS address the specific monitoring and management necessary to mitigate these issues and the ecological consequences of the longer toxicological and pathogen retention time in the Bay.

This section states that the non-native Suminoe oyster has a greater propensity to retain both toxins and human pathogens, and is slower to deplete these pathogens and toxins than the native Eastern oyster.

#### ***Section 4.15 Potentially Affected Resources Outside of Chesapeake Bay***

1.) The PEIS should include discussions on the expected characterization and population changes of existing oyster stocks in areas outside the Chesapeake Bay.

The DPEIS concludes that there is a high probability and certainty that if non-native oysters become established in the Chesapeake Bay, they will spread into other estuaries as far north as Connecticut and as far south as the Yucatan Peninsula. Since this spread of non-native oysters is

likely, any decision made regarding the effects of introducing non-native Suminoe oysters should address impacts beyond the Chesapeake Bay.

### ***Appendix B. Ecological Risk Assessment***

1.) The Ecological Risk Assessment section in the PEIS should address the combinations of alternatives included in Alternative 8.

The DPEIS fails to address ecological risk assessment in the combinations of alternatives. Specifically, it fails to address the combination Alternative 8a. Because Alternative 8a is not fully evaluated, the reader is led to the conclusion that the only way to meet the stated goal is with the non-native Suminoe oysters. However, we support combinations of actions to improve recruitment and survival as a more realistic approach to the stated goal than isolated actions.

Alternative 8a could be considered the least risky way to achieve the stated objective and could have a much greater certainty than the proposed action.

### **SUMMARY COMMENTS**

After a thorough review of the DPEIS and the Department's history of involvement through the U.S. Fish and Wildlife Service participation in the Executive Committee, Project Delivery Team, and Ecological Risk Assessment Advisory Group, we have come to the following conclusions.

1. We fully support the goal of native Eastern oyster habitat restoration in the Bay. Identification of critical oyster habitat requirements are not part of the current DPEIS, but must be understood before restoration efforts will begin to succeed more consistently. Without understanding the key needs of the oysters, restoration efforts in the Bay will continue to be unsuccessful. An interim step to enhancing restoration as we gather information on critical oyster habitat requirements is to expand oyster sanctuaries and improve monitoring to ensure poaching is not occurring on the protected bars. The strategy of establishing small sanctuary bars close to areas where harvest is allowed minimizes chances for success. Larger closure areas would more effectively protect remaining native Eastern oysters.
2. We believe that the DPEIS does not demonstrate that non-native Suminoe oyster will restore the ecological or economic goals established in the DPEIS process. In addition, the high degree of uncertainty and the fact that once introduced the action is irreversible suggests that further consideration for alternatives concerning the non-native Suminoe oysters should be abandoned for a more defensible alternative. We include triploid aquaculture of non-native Suminoe oyster in this statement because there is no difference in the long run between an introduction of non-native Suminoe oyster using diploids or using triploids in aquaculture.
3. Although none of the alternatives evaluated in the DPEIS are projected to meet the goal and timeframe established in the DPEIS process, Alternative 8a, "*Native Eastern Oysters Only*", has the highest probability for success while maintaining the lowest threshold for adverse effects to the Chesapeake Bay. We believe this alternative is the best opportunity to restore, protect and sustain the natural resources and public uses of the Chesapeake Bay.

Thank you for the opportunity to provide these comments. For further coordination, please contact Leopoldo Miranda, Supervisor, Chesapeake Bay Field Office at 410-573-4573.

Sincerely,

A handwritten signature in black ink that reads "Michael T. Chezik". The signature is written in a cursive style with a large, sweeping initial 'M'.

Michael T. Chezik  
Regional Environmental Officer

cc:

M. Mansfield, COE, Fort Norfolk, VA

L. Miranda, FWS, Annapolis, MD

C. Guy, FWS, Annapolis, MD

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