



## Partnership for the Delaware Estuary, Inc.

January 10, 2006

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### Executive Director

Kathy E. Klein

Jim Hoff, Ph.D.

NOAA Damage Assessment Center  
1305 East-West Highway, SSMC-4, Room 10219  
Silver Spring, MD 20910

Dear Jim,

Thank you for the invitation to participate in the development of a list of potential restoration activities as part of the natural resource damage assessment (NRDA) process in response to the *Athos I* oil spill of November 2004. As you know, the Partnership for the Delaware Estuary, home of the Delaware Estuary Program, is charged with comprehensive, estuary-wide management including environmental restoration and enhancement. We obviously have a vested interest in this NRDA process and want to provide our regional scientific and restoration knowledge to assist you and the other NRDA partners.

Due to the short timeline to respond to your letter, we are prepared, at this point in time, to focus on first order suggestions of a general nature. In the coming months, we will work to provide you with specific project ideas as this process moves forward.

We generally support the initial list of example restoration projects included with your letter that are being considered to be appropriate by the trustees to repair the injuries incurred by the spill. We would like to suggest that there be added emphasis to some items on the list and the inclusion of a few new items. Our suggestions are as follows:

- 1. Emphasize activities having nearest "proximity to affect area."** This is listed as Primary Factor 1b to be considered in weighing the merits of proposed restoration projects. The attached guidance document for evaluation criteria states that "For the *Athos I* oil spill, the affected area may be defined as the region approximately 15-20 miles above Philadelphia, downstream to approximately 15-20 miles below the Delaware Memorial Bridge. However, projects located in other areas of Delaware River and Bay may also be considered if a relationship to the injured resource can be demonstrated." In scanning the list of potential projects in your letter, it appears that most would address living resources and habitats in the lower Estuary, outside of the most heavily impacted area. While we actively support efforts to restore oysters, horseshoe crabs, red knots and other shorebirds, install gull exclusions from nesting areas, and remove dams in the watershed, we believe that this list is biased toward restoration activities that are familiar, and in many cases already underway. There are few concrete ideas for restoration to the most injured region, and we suggest that opportunities should be especially sought there. Some examples are offered in #4 and #5 below (please see the two attached forms).

### Partnership for the Delaware Estuary: A National Estuary Program

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**2. Emphasize enhancement of natural resources that improve water quality.** The draft list includes an important phrase that needs to be better highlighted: "...to improve water quality" under bullet #4 of "Subtidal Habitats." We concur that wetlands and populations of filter-feeding bivalves (e.g., oysters) can help improve water quality. These types of natural resources offer multiple benefits including both ecological structure (e.g., provision of essential fish habitat) and function (water quality improvement, energy and nutrient cycling). Considering that this NRDA process is related to both habitat and water quality repair, we recommend that special attention be assigned to habitats and resources that provide important ecosystem services.

**3. Include "intertidal" habitats on list.** The headers in the list separate ideas according to shorelines, subtidal habitats, biota, and lost public uses. Most bullets under "Shorelines" are related to wetlands, and perhaps also beaches. We would like to suggest broadening the scope of this section by renaming it to be "Intertidal Areas and Shorelines." Intertidal mud flats are extensive in the Delaware Estuary, and one of the messages from the recent Delaware Estuary Science Conference is that we may be underestimating the ecological importance of these areas. Although less abundant, rocky intertidal areas such as cobble shorelines may also be important. Beaches could be explicitly mentioned in the last bullet of this "Intertidal" section.

**4. Consider other bivalves in addition to oysters.** Many species of bivalve mollusks are native to the Delaware Estuary, including clams and mussels for example. It is possible that these animals may be just as abundant and important to water quality as oysters. Some of these animals are also known to live much farther up in the Estuary, closer to where the *Athos* I spill occurred, as compared to where oysters are found in the Delaware Bay. Some of these animals live in shallow subtidal areas, some in intertidal mud flats, while others live attached to surfaces in the intertidal zone. Although these animals are not the focus of restoration efforts as often as oysters, protocols nevertheless exist for their propagation and restocking. They also represent excellent candidates for enhancement and restoration where success criteria must be tracked, because the attached species can be easily monitored after planting.

**5. Focus wetland enhancement and restoration on freshwater tidal marshes.** In the Delaware Estuary there are a variety of different types of wetlands, including freshwater tidal marshes in the upper system, brackish marshes in the middle Estuary that are often dominated by the invasive form of *Phragmites*, and salt marshes in the lower Estuary. Although all of these types of tidal wetland provide similar services and are prone to similar threats (e.g. sea level rise), they differ considerably in their biodiversity and level of imperilment.

Of great concern to us are the tidal freshwater wetlands (TFWs) in the upper portion, coinciding with the area of the *Athos* I spill. Historically, vast portions of the shores along this stretch were covered with TFWs, including much of South Philadelphia and the airport complex. Today, perhaps less than 5% of pre-settlement TFW acreage remains. Acre for acre, these marshes may provide greater ecosystem and socioeconomic services than the brackish and salt marshes, which are characteristic of the lower Estuary, particularly because of their urban backdrop and proximity to heavy industry. TFWs "filter" surface and groundwater runoff, detoxify some classes of pollutants, remove excess nutrients, and trap sediment. Like other tidal marshes, TFWs represent a "first line of defense" for floods and storm surges. They have higher biodiversity than other wetland types and provide habitat for important species, such as wild rice (*Zizania aquatica*) and

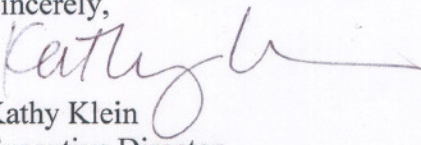


sturgeon (*Acipenser brevirostrum*). They also provide important recreational outlets for people. For all of these reasons, we recommend that opportunities to restore or enhance TFWs be given high priority.

As you can see from the suggestions we have provided above, our intent is to help round out the list by ensuring that all potentially injured natural resources are considered, including areas such as intertidal mud flats and functionally important species that are not commonly studied such as native shellfish. We also lend our support to prioritize areas nearest the spill, such as freshwater tidal marshes, particularly because these areas have historically received less attention.

We look forward to continuing to participate in this process by offering more specific project ideas and technical expertise. Please feel free to call on us at any time.

Sincerely,

A handwritten signature in cursive script, appearing to read "Kathy Klein", with a long horizontal flourish extending to the right.

Kathy Klein  
Executive Director



## M/T ATHOS I NATURAL RESOURCE DAMAGE ASSESSMENT

### RESTORATION IDEA FORM \*

#### Instructions

Please complete as many sections as possible. Your ideas will still be considered even if you are unable to fill out every section. If you need more space, please use additional paper and label appropriate sections. Completed forms should be sent to the contact listed below.

**Your Name:** Kathy Klein

**Street Address:** Partnership for the Delaware Estuary;  
One Riverwalk Plaza; 110 S. Poplar Street, Suite 202

**City, State, Zip:** Wilmington, DE 19801

**Phone and E-Mail:** KKlein@DelawareEstuary.org;  
302-655-4990

**Restoration Idea:** Please describe the restoration idea and its location. If you have a specific project in mind, please tell us how it will result in restoration of injured natural resources to baseline conditions and/or compensation for interim losses. Please complete a separate form for each restoration idea submitted.

**Enhance or restore freshwater tidal marshes.** In the Delaware Estuary there are a variety of different types of wetlands, including freshwater tidal marshes in the upper system, brackish marshes in the middle Estuary that are often dominated by the invasive form of *Phragmites*, and salt marshes in the lower Estuary. Although all of these types of tidal wetland provide similar services and are prone to similar threats (e.g. sea level rise), they differ considerably in their biodiversity and level of imperilment. Of greatest concern are the tidal freshwater wetlands (TFW's) in the upper portion, coinciding with the area of the Athos I spill.

Historically a vast portion of the shores along this stretch were covered with TFW's, including much of South Philadelphia and the airport complex. Today, perhaps less than 5% of pre-settlement TFW acreage remains. Acre for acre, these marshes may provide greater ecosystem and socioeconomic services than brackish and salt marshes characteristic of the lower Estuary, particularly because of their urban backdrop and proximity to heavy industry. They "filter" surface and groundwater runoff, detoxify some classes of pollutants, remove excess nutrients, and trap sediment. Like other tidal marshes, TFW's represent a "first line of defense" for floods and storm surges. They have higher biodiversity than other wetland types and provide habitat for important species, such as wild rice (*Zizania aquatica*) and sturgeon (*Acipenser brevirostrum*). They also provide important recreational outlets for people. For all of these reasons, we recommend that opportunities to restore or enhance TFW's be given high priority.

Although it can be more difficult to acquire land or otherwise identify sites for marsh restoration in the urban corridor compared with salt and brackish marshes lower in the system, we believe that with effort suitable sites can be identified to perform TFW projects. Particular attention should be devoted to the tidal tributaries in the upper estuary (e.g., Ridley, Chester, Woodbury, Mantua Creeks; Schuylkill, Brandwine and Christina Rivers, etc.), especially near their mouths where public access and educational tie-ins could help reconnect people to the Delaware Estuary system.

**Contacts:** Please provide names, addresses, and phone numbers of people knowledgeable about the restoration idea or projects. **Dr. Danielle Kreeger**; Science Coordinator; Partnership for the Delaware Estuary; One Riverwalk Plaza; 110 S. Poplar Street, Suite 202; Wilmington, DE 19801; DKreeger@DelawareEstuary.org; 302-655-4990 x-104.

**THANK YOU VERY MUCH FOR YOUR TIME!**

Completed Forms and/ or questions can be directed t

Dr. Jim Hoff, NOAA Damage Assessment Center  
1305 East-West Highway, SSMC-4, Room 10219



# M/T ATHOS / NATURAL RESOURCE DAMAGE ASSESSMENT

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**Shellfish Restoration in the middle and upper Delaware Estuary.** Populations of filter-feeding shellfish such as oysters, mussels, and clams are vital components of healthy estuarine ecosystems, and they have always been important in the Estuary. These organisms provide critical environmental services including the removal of nutrient-rich, turbidity-forming particles from the water column, supplying usable nutrients for marsh plants, and creation of essential habitat and food for fish and crabs. A variety of native bivalves species inhabit different areas of the estuary, including mussels, oysters and clams in the lower Bay, and mussels and clams in brackish areas of the middle estuary. The prevalence of native species of mussels and clams in the upper estuary is poorly studied although they were historically found there.

Having not yet seen the results of the NRDA process to determine whether injuries to these fauna were assessed, we have no point of reference to comment on how this project would repair injuries to "baseline conditions." However, we believe that if this is the case (injury may not be proven or quantified because it wasn't assessed), this should not prevent a restoration or enhancement project from proceeding if it is certain to address areas that are widely regarded as having likely been impacted but are too difficult to quantify (e.g., intertidal and subtidal invertebrate communities). The concept of performing a shellfish restoration using species other than oysters is not familiar to many, but offers great potential for helping to repair injuries to ecologically important natural resources closer to the spill site than possible with oysters. The benefits are expected to be comparable, on balance.

Although brackish and freshwater species of mussels and clams are not commercially valuable here (like oysters), they perform the same ecological services as oysters. They also represent excellent candidates for monitoring success criteria, especially intertidal mussels that live affixed to surfaces. Technical expertise and protocols for propagation and planting can be furnished by a partnership between PDE and a local university such as the Rutgers Haskin Shellfish Laboratory.

**Contacts:** Please provide names, addresses, and phone numbers of people knowledgeable about the restoration idea or projects. **Dr. Danielle Kreeger**; Science Coordinator; Partnership for the Delaware Estuary; One Riverwalk Plaza; 110 S. Poplar Street, Suite 202; Wilmington, DE 19801; DKreeger@DelawareEstuary.org; 302-655-4990 x-104.

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