EASTERN BAY OYSTER COALITION WORKGROUP

PRE-MEETING QUESTIONNAIRE
SUMMARY OF RESPONSES

DESIGNED AND COMPILED BY
OYSTER RECOVERY PARTNERSHIP & FACILITATED SOLUTIONS, LLC

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3. Educational and cultural role

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1. Consensus and a shared goal(s) for oyster habitat and production in Eastern Bay
2. A focused, realistic, equitable, united, and executable plan for oyster habitat and production in Eastern Bay
3. Strategies to create a self-sustained and enhanced oyster population in Eastern Bay

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1. A self-sustained, resilient, and healthy oyster population
2. Maximized ecosystem services associated with oyster habitat
3. Healthy and well-managed harvest
4. Increased oyster aquaculture production and the expansion of aquaculture
5. Continued and expanded oyster restoration and replenishment activities
6. Improved communication and cohesion among stakeholders
7. Science-based and adaptive approach to decision making and management that would allow for all of the above

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1. Favorable historic, geological, geographic, and recent environmental conditions
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3. Maintenance of harvest areas
4. Management tools and initiatives
5. Improved communication and changes in perception

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1. Lack of oyster habitat and broodstock to support sustainable population
2. Conditions, fisheries management, and activities in Eastern Bay are limiting the recovery of oysters, harvest, and the ability to properly manage them
3. Continued development in watershed continues to degrade water quality
4. Collaboration and communication continues to be challenging

Trends Affecting Eastern Bay

1. Political support is generally in favor of oysters, but is challenging to navigate
2. Overdevelopment in watershed continues

3. Economy and funding are currently favorable for oyster production. However, funding is competitive, not guaranteed, not always well spent, and gaps remain
4. Increased oyster activities and management initiatives focused on Eastern Bay
5. Current environmental conditions and impacts from climate change will have variable impacts on oyster production and habitat value
6. Limited availability of substate (i.e., shell) due to competing substrate needs
7. Loss of widespread knowledge of oyster culture in Eastern Bay continues

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13. Explore management plans/efforts in other regions of Chesapeake Bay, and investigate components from those that may be applicable to Eastern Bay
14. Consequences of not having a plan, how to maintain the plan, who owns and implements the plan
15. How to design a collaborative structure that can be adaptive based on user input
16. Define goals, objectives, and metrics to achieve measurable results
17. Current funding and workforce development goals, needs, and plans to support comprehensive restoration and growth of oyster industry in Eastern Bay – is current framework and funding enough?

Undesirable Future for Eastern Bay in 2033

1. A decline in or elimination of the oyster population
2. A lack of momentum, interest, and resources available for oyster restoration and production
3. Poor resource management and planning

Summary of Vision of Success Themes

1. Self-sustained oyster population
2. Sustained and booming harvest from fishery and aquaculture

3. Focused, impactful, sustainable resource management
4. Economic bounty and tourism
5. Cultural significance
6. Careful planning, relying on science and expertise, collaboration
7. Generous dedicated funding
8. Ecosystem benefits and resilience
9. A healthy ecosystem
10. Improved oyster production and habitat
11. Engaged and supportive stakeholders, culture, and economy

Headlines 2033 – Baltimore Sun & Watermen's Gazette

1. Eastern Bay Revival: A Triumph in Environmental Restoration and Sustainable Management
2. Eastern Bay Shows a Heartbeat
3. A return to the 60's
4. 10 years later: We have more oysters in Eastern Bay because we figured out how to work together
5. Oyster harvest levels in Eastern Bay not seen in 30 years are sustained for fifth year in a row
6. Recreational fishing tournament held in Eastern Bay a huge success thanks to restored oyster habitat
7. Today the State of Maryland and the Maryland Department of Natural Resources are happy to report that the Eastern Bay on Maryland's Eastern Shore is no longer on the States endangered list
8. Eastern Bay Oysters are Making a Splash
9. The Remarkable Oysters of Eastern Bay
10. Good planning and Mother Nature returns Eastern Bay to thriving
11. Localized oyster harvest dominated by spat from Eastern Bay is setting records not seen since the fifties

I. Introduction

The Oyster Coalition Workgroup (OCW) was convened by the Oyster Recovery Partnership (ORP) to develop consensus recommendations for oyster policies, management, and restoration/replenishment activities that improve oyster production and the ecological and ecosystem services from oyster habitat restoration, and meet the needs of industry, citizen, NGOs, and government stakeholders in Eastern Bay and its tributaries.

This questionnaire was designed to solicit an initial set of key issues and questions from stakeholders of the Oyster Coalition Workgroup in advance of the Organizational Meeting scheduled for February 2–3, 2024. In addition to this summary, we have incorporated OCW member responses into the organizational meeting agenda packet.

A. OCW Perspectives

All 17 OCW members completed the pre-meeting questionnaire. Several stakeholder perspectives were represented in the responses. All individuals identified with multiple perspectives.

Perspective	Count *Individuals can represent more than one perspective*
Oyster fishery/watermen	11
Seafood buyers/processors	3
Aquaculture	6
Non-profit environmental organizations	5
Oyster restoration	10
Recreational fishing interests	4
Biologist/scientist	3
Fishery managers	2
Federal, State, or Local government	4
Citizen interested in Chesapeake Bay health	4
Other	1 (clammer)

Workgroup members were also asked to provide their perspectives about the benefits that oysters and oyster habitat provide in Eastern Bay. The following three key benefits were described:

1. Ecosystem benefits of providing habitat, filtration, protection of coastal areas, and serving as a keystone species to improve the broader Eastern Bay ecosystem
2. Economic benefits to the seafood industry, recreational fishing, and as a food source
3. Educational and cultural role

Overarching Topic	**Summary of Details Provided by OCW Members**
1. Ecosystem Benefits	• Habitat – enhance biodiversity, provide structure and habitat for other species (in a system dominated by low relief sand and mud habitat), food for other species (fish, crabs, rays), significantly supports secondary productivity • Filtration – filter algae, sediment, pollutants, and nutrients from water (and sequester into tissue and shell), clean water

	• Decrease erosion/provide some protection to coastal areas, protection • Keystone species – Bay ecosystem and health begins with oysters. Oysters filter water. Clean water leads to abundance of seagrasses, sea worms, crabs, fish nurseries, which leads to larger fish and a balanced ecosystem
2. Economic Benefits, Food Source	• Support watermen, processors, dealers, restaurants • Commercial harvest and aquaculture provide income for individuals and businesses, support third party suppliers throughout the country • Provide downstream economic impacts by facilitating food production in coastal communities • As a habitat, oysters support commercially and recreationally important marine resources • No-input protein source • Maryland is known for safe and wholesome shellfish
3. Educational and Cultural Role	• Symbol for Bay health or sickness • Excellent tool for demonstrating importance of water quality • Useful to raise awareness for Bay clean-up efforts • Sustain watermen and seafood culture • Provide downstream cultural impacts by facilitating socialization in coastal communities

II. OCW Outcomes

Members were asked to reflect on outcomes of the OCW process and their broader goals for successful oyster restoration and management in Eastern Bay.

A. Most important successful outcomes of the OCW

Workgroup members indicated that the most successful outcomes of the OCW process would be:

1. Consensus and a shared goal(s) for oyster habitat and production in Eastern Bay
2. A focused, realistic, equitable, united, and executable plan for oyster habitat and production in Eastern Bay
3. Strategies to create a self-sustained and enhanced oyster population in Eastern Bay

Overarching Topic	Summary of Details Provided by OCW Members
1. Consensus	• Shared understanding of opportunities and a shared goal • Consensus that restored oyster sanctuary system helps water quality and viability of public fishery
2. Focused, Realistic, Equitable, United, and Executable Plan	• Plan is based on previous knowledge and experiences • Plan improves the quality of Eastern Bay while protecting the current heritage

	• Plan is inclusive of all stakeholders, generated by stakeholders, and supported by all • Plan leaves room for innovation, is adaptive • Uses the tools and resources available – including oyster BMPs • Involves waterman and NGOs working together to achieve targets generated by the OCW
3. Strategies to Create a Self-sustained and Enhanced Oyster Population	• Healthy and productive oyster sanctuaries • Identifying areas to plant spat-on-shell (including public oyster bars) • Allowing and budgeting for bar cleaning

B. What does successful restoration and management in Eastern Bay look like?

Workgroup members indicated that successful restoration and management in Eastern Bay would include the following elements:

1. A self-sustained, resilient, and healthy oyster population
2. Maximized ecosystem services associated with oyster habitat
3. Healthy and well-managed harvest
4. Increased oyster aquaculture production and the expansion of aquaculture
5. Continued and expanded oyster restoration and replenishment activities
6. Improved communication and cohesion among stakeholders
7. Science-based and adaptive approach to decision making and management that would allow for the above

Overarching Topic	Summary of Details Provided by OCW Members
1. Self-sustained, Resilient, Healthy Oyster Population	• Improved, healthy, prolific natural spat set • Oyster population resilience (climate change and extreme weather) • Thriving and expanding oyster population in sanctuaries • An oyster population that can sustain itself under some level of exploitation and continue to provide measurable water filtration capacity and valuable habitat to facilitate secondary productivity
2. Maximized Ecosystem Services	• Maximized associated ecosystem services • Everyone benefitting from restoration of Eastern Bay • An oyster population that can sustain itself under some level of exploitation and continue to provide measurable water filtration capacity and valuable habitat to facilitate secondary productivity
3. Healthy and Well-managed Harvest	• Healthy and well-managed harvest from aquaculture and wild harvest areas, sustained and managed at a level to maximize yields and price • More substrate, more harvest • Improved harvest (as good as in the 80s) with reef created from dredged shell • An oyster population that can sustain itself under some level of exploitation and continue to provide measurable water filtration capacity and valuable habitat to facilitate secondary productivity

4. Increased Oyster Aquaculture Production and Expansion of Aquaculture	• Increased oyster aquaculture production from increases in number of leases, more bottom leases and farming of bottom • Add aquaculture where there is no wild harvesting and away from historic oyster bottom
5. Continued or Expanded Restoration/Replenishment Activities	• More plantings, increased oyster shell and habitat • More plantings in fishery areas results in increased harvest • More plantings in sanctuaries results in increased population and broodstock • Combined plantings results in increased spat set, harvest, and broodstock in non-planted areas • Planting and establishment of broodstock specifically using diploid oysters (across sanctuary, wild harvest, and aquaculture areas) • Restoring public fishery • Planting seed • Bar cleaning • Reef created from dredged shell
6. Improved Communication and Cohesion	• Everyone being on the same page and communicating better, from waterman groups to NGOs • Having a cohesive working group making decisions based on science as well as local water knowledge and common sense • Create a centralized database that is accessible to the public to see where reefs are located
7. Adaptive Management and Updates to Management	• Science-based approach to decision making and management • Combination of many efforts and leveraging mixture of approaches and use in various areas • Wild harvesting on historic oyster bottom and sanctuaries in rivers/tributaries • Expand current and develop new sanctuary/seed areas • Redefine harvest bars and expand aquaculture – both would benefit wild fishery • More restrictions on oyster dredging • Diversification of protections and access to oysters over time and in space – protect some oysters from exploitation, allow other oysters to be exploited, changing protections in space and time, provide for alternative oyster production pathways that are driven by external sources (e.g., through aquaculture techniques and technologies)

C. OCW Draft Goal Statement

Draft Goal Statement – *The goals of the Oyster Coalition Workgroup are to (1) develop a package of consensus recommendations informed by the best available science, data, and stakeholders' experiences for the management and restoration of oysters in Eastern Bay, Maryland, and (2) to ensure there is a reliable mechanism and process for the monitoring, funding, and implementation of the Sustainable Oyster Restoration and Management Plan for Eastern Bay, Maryland. The Workgroup process will be informed by the best available science and shared stakeholder values, resulting in the economically and ecologically sustainable long-term maintenance and growth of oyster production in Eastern Bay and its tributaries.*

Average Rating	*4= Acceptable*	*3= Minor Reservations*	*2= Major Reservations*	*1= Not Acceptable*	*No Response*
3.8	9	3			5
Comments or Revisions	• Change to "…long-term maintenance and growth of **oyster restoration and** production in Eastern Bay and its tributaries." • Keep it simple • Shared priorities/goals need to happen before recommendations. This could be goal #1. • Decisions should be based on science and local knowledge • Continued funding for implementation of projects/awareness is critical • This is an all-encompassing statement of the group's activities • Identifying funding mechanisms for any developed plan is a critical component				

III. Looking Back

Workgroup members were asked to reflect on key milestones, people, actions, and time periods that have made a difference (for better or worse) for (1) the Eastern Bay system and (2) oyster production and habitat in Eastern Bay. Many of the responses overlapped so they have been grouped together here. Member responses are grouped by overarching topics.

Overarching topic	Positive	Negative
Infrastructure/ Development	• Adding public sewer to replace aging septic systems and improve water quality	• Conowingo Dam privately operated for profit • Waterfront development on Kent Island and lower QA County • QA and Talbot County gov. – detrimental for promoting or allowing significant development to occur in Eastern Bay watershed (1980s-present) • Increased population on Eastern Bay has increased pressure on natural resources (without added pressures of sea level rise, local subsidence, runoff)
Relationships, Funding, Politics	• Funding to Horn Point Laboratory & oyster hatchery has increased • Gov Erlich seemed to have an interest in oysters along with DNR Secretary Franks – this was short-lived • Getting harvest and seafood industry/restaurants back up and running after COVID • More interest in oysters has been positive for leaseholders and restoration work in general	• Discord within DNR and impacts on progress and employees – Over the years DNR has squelched good employees in the oyster division because they didn't want to hear that restoration reefs were not performing or that power dredging wouldn't kill everything • Relationships between DNR, NGOs, and watermen seemingly weren't always pleasant • COVID halted production in seafood industry and support for Maryland oyster market
Fishery Regulations & Restoration Activities	Activities & regulations – • Beginning of seed and shell repletion program (1960s) – on harvest bars and later sanctuaries • Dredge shell used to create reefs that produced billions of oysters (1960-2006)	Activities & regulations – • Introduction of oyster power dredge (1800s) • Introduction of commercial hydraulic clam dredge (1900s) • Introduction of commercial diving for oysters (1980s)

	• Introduction of commercial diving for oysters (1980s) • Dive and hand tong boundaries established • Dredging with open bags to turn shell over (2000s) • Planting shell on leased bottom (2000s) • Establishment of oyster sanctuaries by DNR • Planting of spat on shell • Revamping aquaculture in Maryland (2010) • DNR focused management on Eastern Bay (2019) • Poplar Island Reclamation project • TNC SOAR program Groups – • MD State gov., QA Co gov., watermen and others on OAC – beneficial for focusing attention and dedicating resources to restoring EB oyster habitat (2022) • Local NGOs – beneficial for promoting health of EB ecosystem • Harris Seafood attempts for adding shell and spat in Eastern Bay and other areas	• The removal of 750,000 bushels of shell and seed under repletion program that were never replaced (2000s) • End of dredged shell program (2000s) • Revamping aquaculture in Maryland (2010) • Dive and hand tong boundaries established • When dive bottom was taken and given to dredgers • Diving was not the best harvest practice for eastern Bay Groups – • DNR – detrimental to EB by removing seed and shell under repletion program
Natural Processes/Ecology	• Natural spat sets (1997, 2003, 2009) • Good water quality • High production of oysters in 1970s and 80s until Dermo and MSX	• Prevalence of oyster disease – Dermo and MSX (1970s, 80s) • Hurricane Agnes (1972) • Storm runoff and siltation (1990s) • Drought (1999-2002) • Dermo and MSX wipe out oysters in Eastern Bay (2002) • Hurricane Isabel (2003) brought heavy sedimentation to Eastern Bay and killed everything • Freshets (2011, 2019) • Water quality

IV. Looking Around

Workgroup members were asked to reflect on key factors that are currently enhancing, impeding, or otherwise impacting oyster production and habitat in Eastern Bay.

A. Tailwinds

Factors that Workgroup members felt are enhancing oyster production and habitat in Eastern Bay:

1. Favorable historic, geological, geographic, and recent environmental conditions
2. Recent focus on and support for oyster restoration and replenishment activities in Eastern Bay
3. Maintenance of harvest areas
4. Management tools and initiatives
5. Improved communication and changes in perception

Overarching Topic	Summary of Details Provided by OCW Members
1. Favorable Environmental Conditions	• Low rainfall supporting ideal salinity ranges, resulting in increased spat sets and marketability of oysters • More balanced weather – the last few winters were mild and no droughts • No tropical storms, excessive rainfall flushing into Eastern Bay • No Ohio valley/PA storms requiring the opening of flood gates at the Conowingo Dam • Historic abundance of oysters in this region • Small watershed and shoreline morphology limits external inputs to system (from land and larger Chesapeake Bay – e.g., freshwater discharge from Conowingo Dam) • Proximity to infrastructure to move oyster product (Rt. 50/301) and tourist destination (Kent Island) increases demand for local oysters
2. Oyster Restoration and Replenishment Activities	• MDNR setting aside portions of Eastern Bay as sanctuaries • Political support for restoration • Additional interest and funding for Eastern Bay • Continued support for oyster restoration through sanctuaries, repletion program for public fishery, and support of aquaculture production in EB and other areas within MD portion of Bay • Ongoing restoration and shell, seed, and spat on shell plantings in properly sited areas • MD State gov., QA Co gov., watermen and others on OAC focused attention and dedicated resources to restoring EB oyster habitat (2022)
3. Maintenance of Harvest Areas	• Shell recovery – Open bag dredging has helped clean shells, turn bottom, and bring shells to the surface
4. Management Tools and Initiatives	• Recent development of oyster management plan • Recent adoption of stock assessment methods to support oyster management • Focus on all available substrates to support oyster production

	• Aquaculture
5. Improved Communication	• More NGO awareness campaigns and social media by watermen • Watermen being more receptive to change

B. Headwinds

Factors that Workgroup members felt are impeding oyster production and habitat in Eastern Bay:

1. Lack of oyster habitat and broodstock to support sustainable population
2. Conditions, fisheries management, and activities in Eastern Bay are limiting the recovery of oysters, harvest, and the ability to properly manage them
3. Continued development in watershed continues to degrade water quality
4. Collaboration and communication continues to be challenging

Overarching Topic	Summary of Details Provided by OCW Members
1. Lack of Oyster Habitat and Broodstock to Support Sustainable Population Levels	• Lack of substrate to enhance existing oyster habitat • Lack of funding for enhancement activities • Seed/larvae availability is inconsistent or limiting • Poor spat set • Lack of available substrate and seed to boost habitat and population has hampered advancement • Not enough shell and spat-on-shell plantings
2. Conditions, Management, and Activities in Eastern Bay	• Disease pressure, 2022 die off from MSX and dermo • Heavy rain events (2018) • Multiple years of low harvest has allowed for tremendous amounts of sedimentation to cover previously harvestable areas and have limited spat recruitment • Bar cleaning • Power dredge • Overharvesting on dredge bottom • Poaching • Large area of Eastern Bay makes enforcing lease and sanctuary boundaries challenging • Large fetch in many directions, which makes working in Eastern Bay a challenge, also presents challenge for deploying aquaculture gear • Not enough turning bottom and cleaning shell • Too much area being taken from wild harvest
3. Continued Development Impacts Water Quality	• Increased bacteria loads from waterfront property development on Kent Island are closing more areas in Eastern Bay to shellfish harvest (for wild harvest and aquaculture) • Water quality associated with development and lacking sewage treatment • Shoreline is overpopulated • Pollution, run-off, siltation

	• Low dissolved oxygen levels • QA County gov. has promoted and allowed significant development to occur in surrounding critical areas during 1980 to present
4. Collaboration and Communication	• Pushback from multiple user groups that are one-sided in their vision of Eastern Bay oyster production • Bureaucracy • Lack of community support for aquaculture siting near waterfront homes – large quantity of uninformed landowners on Kent Island makes aquaculture leasing impossible in near-shore locations • Lack of cooperation with watermen • Some stakeholders not receptive to change • Continued lack of trust between management and groups with a stake in oyster production. • Lack of commitment for data driven decisions guided by appropriate science. • Lack of value for expert ecological local knowledge in decision making. • Rules, regulations not easily understood by the general public, everyone has opinions but no understanding

C. Trends

Trends (e.g., social, political, economic, etc.) that Workgroup members felt are affecting oyster production and habitat in Eastern Bay currently or in the coming years:

1. Political support is generally in favor of oysters, but is challenging to navigate
2. Overdevelopment in watershed continues
3. Economy and funding are currently favorable for oyster production. However, funding is competitive, not guaranteed, not always well spent, and gaps remain
4. Increased oyster activities and management initiatives focused on Eastern Bay
5. Current environmental conditions and impacts from climate change will have variable impacts on oyster production and habitat value
6. Limited availability of substate (i.e., shell) due to competing substrate needs
7. Loss of widespread knowledge of oyster culture in Eastern Bay continues

Overarching Topic	**Summary of Details Provided by OCW Members**
1. Political Support	• Political will supports oyster restoration efforts, generally irrespective of political party • Administration changes (political) tend to effect ongoing efforts long-term • Increasingly divisive and misinformed political landscape will make management more difficult • NIMBY-based protests to lease applications • Administration changes (political) tend to effect ongoing efforts long-term

	• Interest in restoration efforts is getting tiresome, creating a lack of organizations willing to invest in this and future long-term restoration efforts
2. Overdevelopment in Watershed	• Overdevelopment in watershed may impair water quality through increased runoff • Expanding sewer collection system to replace septic tanks on Kent Island
3. Funding and Economy	• Increased attention and funding for oysters • Increased interest among groups and funding sources are (will) enhance restoration/fishing efforts and oysters/habitat • Impending economic recession beginning to affect consumer spending (less disposable income to spend on seafood) • Interest in restoration efforts is getting tiresome, creating a lack of organizations willing to invest in this and future long-term restoration efforts • Increased competition for available funding • Wasting money on meetings that go nowhere – put the money in the water • Labor shortage in seafood industry is limiting oyster harvest, distribution, and growth of aquaculture • Public demand for product at restaurants and privately
4. Increased Oyster Focus in Eastern Bay	• Aquaculture has grown by 24% since 2012 • DNR Seed and shell program • DNR Eastern Bay sanctuary project • DNR Eastern Bay public fishery project • Creating increased spat sets via additional plantings will generate momentum and commitment
5. Environmental Conditions	• Some new Chesapeake Bay fisheries (black sea bass, red drum, speckled trout) rely on oyster reefs • Increased frequency of significant rain events will cause more freshets and localized shellfish closures • Preciptiation in Maryland has increased by 10.4% since 1901 • Increased frequency of nuisance flooding will restrict expansion of seafood industry (limited real estate to expand, viability of working waterfront) • More frequent and harsher droughts will result in higher prevalence of disease in oyster populations • Warming waters will lead to greater risk of seafood pathogens (e.g., vibrio) and hurt oyster production • Ocean acidification could have consequences for oyster shell formation

7. Oyster Culture	• Public likes seeing NGOs partner with watermen to educate • Fading recognition of watermen culture with public and politically

D. Key Strategic Issues & Critical Challenges

Workgroup members were asked to rank how critical they thought each of the following prompts were for improving oyster habitat and production in Eastern Bay. Some members provided additional context on related issues and key information required to address each prompt.

1. The Role of Oysters in a Healthy Eastern Bay System.

Average Rating	*Very Critical*	*Critical*	*Somewhat Critical*	*Less Critical*	*Not Critical*	*Don't Know*	*No Response*
4.1	**5**	**4**	**3**	**2**	**1**	**0**	
	9	3	1	3	0	0	1
Related Issues	• Oyster's importance as ecosystem engineers • Evaluating success of restoration is a moving target in face of climate and land use change – restoration siting should concentrate on resilient and practical locations for long-term success • Land use impacts on watershed, water quality, and oysters • Support restoration and sanctuaries along with supporting the industry • Important to understand overlapping economic activities in Eastern Bay (e.g., other fisheries) • Strategic sanctuary and replenishment placement • Shell resource dynamics and needs – how to manage scarce existing shell and provide clean shell for bottom, how incorporate alternate substrates • NGOs should be teaching about importance and role of oysters in Eastern Bay. Interpretive signs in Kent Narrows would help with general education • Lack of unified plan to effectively manage and use available funding to support all stakeholders • No comprehensive adaptive management plan for decision making						
Key Information Required	• Data showing that ecosystem services of harvested reefs lacking compared to healthy protected reefs • Information on land use and sewage inputs, other nutrient inputs • Scale/trend/location of overlapping economic activities • Siltation and water quality surveys • Access to QA County Comprehensive Plan – GIS mapping overlaid with anticipated development plans, water quality modeling of future development coupled with QA County septic records to assess impacts from aging septic systems • Bottom types, Gear types • Information on alternate substrates • Current known distribution of oyster habitat in EB. • Current harvest records from EB public fishery. • Historical planting data, monitoring data showing success (or not) of plantings • Information on allowable substrates, sources of substrate, and infrastructure to deploy substrates. • Estimates of how much substrate is needed. • Input from management on overall goal to restore oyster habitat in Eastern Bay						

2. Oyster Habitat Characteristics and Restoration Siting.

Suitable locations, heights, water depth, and salinity

Average Rating	*Very Critical*	*Critical*	*Somewhat Critical*	*Less Critical*	*Not Critical*	*Don't Know*	*No Response*
4.4	**5**	**4**	**3**	**2**	**1**	**0**	
	8	7	1	0	0	0	1
Related Issues	• Siting should occur in areas where broodstock can do best, where reefs are currently productive • Consider bottom data (benthic composition and existing substrate), tidal and current data (for predicting larvae source-sink dynamics, siltation patterns), water quality data, past planting data, etc. • Suggest changes to current regulations to help meet goals • All of the stakeholders need to be at the table to discuss who gets access to what areas, everyone gets a vote. • Lack of shell due to sediment • Recovering substrate, Planting shells • Management and restoration plan needs to be adaptive • Location of current management boundaries delineating public fishing grounds, restoration, and aquaculture. Considerations for changing these and rationale • Equitable distribution of suitable locations/areas is a primary need • Lack of substrate • Lack of a unified plan to effectively manage and use available funding to support all sectors. • No comprehensive adaptive management plan for decision making.						
Key Information Required	• Up to date oyster habitat and bottom survey data in Eastern Bay • DNR annual oyster survey data in Eastern Bay in sanctuaries and public bars • DNR Chesapeake Bay-wide oyster survey data • Siltation and water quality data (access to DNR Eyes on the Bay, NOAA CBOFS, ShoreRivers database) • Historical planting data, monitoring data showing success (or not) of plantings • Historical and recent use by area, current disposition of water bottom, and current interests. • Current known distribution of oyster habitat in EB. • Information on allowable substrates, sources of substrate, and infrastructure to deploy substrates. • Input from management on overall goal to restore oyster habitat in EB.						

3. Siting of Aquaculture Leases and Public Fishery Replenishment Activities.

Average Rating	*Very Critical*	*Critical*	*Somewhat Critical*	*Less Critical*	*Not Critical*	*Don't Know*	*No Response*
3.9	**5**	**4**	**3**	**2**	**1**	**0**	
	5	5	3	2	0	0	2
Related Issues	• Emphasize importance of establishing healthy broodstock in sanctuaries • Industry leads selection of harvest reefs for planting • Lease siting challenging if space conflicts with other use • Focus plantings on areas only highly productive for fishery • Work with watermen on ways to support fishery • Should be easier to obtain a lease • Should focus on creating new habitat • Educating industry and public on (1) where aquaculture leases can occur and (2) gear used to harvest from them • Ensure lease applications aren't acquiring free inventory from public or commercial plantings						

	• Aquaculture should not impede on wild harvesting, and vise versa. • The perception that fishery replenishment takes a back seat to oyster recovery • Wye Island Sanctuary • Equitable distribution of suitable locations/areas is a primary need • Location of current management boundaries delineating public fishing grounds, restoration, and aquaculture. Considerations for changing these and rationale – Yates Bar regulatory boundaries and regulations need to be overhauled to allow for expansion of aquaculture and to help optimize public fishery siting • Definition of habitat characteristics used as a rule to allow aquaculture to be sited in EB and MD in general. • Characteristics used to determine oyster habitat worthy of repletion activities.
Key Information Required	• Identify areas where public opposition to lease siting is low, identify incentives to lease in these areas • Groundtruthing/ up to date oyster habitat and bottom survey data in Eastern Bay • Information on areas that are prone to poor and good water quality • DNR annual oyster survey data in Eastern Bay in sanctuaries and public bars • DNR Chesapeake Bay-wide oyster survey data • Current expanse of oyster aquaculture leases in Eastern Bay, and what percentage of the oysters harvested from Eastern Bay are from aquaculture? • What information was used to determine current management structure to delineate boundaries of public fishing grounds, restoration, and aquaculture. • What are the metrics used by DNR to determine whether public oyster grounds are viable for repletion efforts?

4. Oyster Substrate and Cultch.

Availability and use of shell or alternate cultch materials

Average Rating	*Very Critical*	*Critical*	*Somewhat Critical*	*Less Critical*	*Not Critical*	*Don't Know*	*No Response*
4.8	**5**	**4**	**3**	**2**	**1**	**0**	
	11	3	0	0	0	1	0
Related Issues	• The lack of suitable substrate is greatest hurdle to oyster restoration – lack of clean shell limits ability for spat to survive, restricts • Cost of shell limits amount that can be planted and ultimate impact on oyster habitat and production • Shell recycling efforts are critically understaffed and under funded • State and federal permitting requirements to import shell and/or use alternate materials • Need to identify where shell is already on the bottom and focus efforts there • Use of biomimetic/synthetic shell in the long-term • Incentivize local seafood processors to retain shell for Eastern Bay • Options for recovering shell – e.g., power dredging and/or cleaning oyster bars where conducting restoration or on aquaculture leases • Equitable availability and distribution of substrate (as well as larvae/seed) will be critical to achieving any gains in oyster production in the system • Lack of a unified plan to identify and manage available substrate sources • No comprehensive adaptive management plan for decision making						
Key Information Required	• Options to recover shell post-harvest or post-consumption, retain shell in Maryland • DNR's shell budget for Maryland and Eastern Bay – does this exist? • Data showing the efficacy of alternative substrates – cost, results from testing, where to find/acquire materials						

	• Information on reef height requirements to mitigate hypoxic periods in summer • Investigate whether oyster shell is available from out of state, and the cost to import • Political decisions on if/where to dredge shell from historic reefs that are currently not open to harvest • A review of Gov Exec Order to explore alternatives to oyster shell • Data on spat set trends • Data on sanctuary productivity • Historic oyster habitat in Eastern Bay to inform proper siting and identify in-water sources of shell • Current and projected needs, sources, costs, etc. • Information on allowable substrates, sources of substrate, and infrastructure to deploy substrates • Input from management on overall goal to restore oyster habitat in EB. What defines success?

5. Water Quality and Quantity.

Freshwater flow, quantity, timing, nutrient loading and other inputs, salinity balance, parasites and disease, and drought

Average Rating	*Very Critical*	*Critical*	*Somewhat Critical*	*Less Critical*	*Not Critical*	*Don't Know*	*No Response*
3.9	**5**	**4**	**3**	**2**	**1**	**0**	
	5	7	2	2	0	0	1
Related Issues	• Salinity range in Eastern Bay is generally high enough for oyster reproduction and low enough for less disease pressure • Freshets and impacts on natural oyster reproduction • Wastewater and sewage treatment, pollution – Expand the sewer collection system on Kent Island, St. Michaels Wastewater treatment plan • Dead zones – where are these in Eastern Bay? • Bacteria monitoring to ensure food safety • Extreme weather events (droughts and increased frequency of major rain events) • Existing groups conducting water quality monitoring and existing data in Eastern Bay • Long term trends in inputs will inform how to distribute recommended actions across the system. The workgroup should explore how these trends may inform siting of different activities • How to successfully integrate oyster nutrient reduction value into water quality planning • Monitoring of oyster disease and parasites						
Key Information required	• Climate change impacts on oyster restoration outcomes in Eastern Bay (short-term) • Oyster BMP status and criteria • Information on current water quality monitoring efforts • Historical data on disease, water quality, nutrient loading, output from wastewater treatment plants, etc. and resulting impacts to oysters in all management zones (oyster disease and mortality data) • Information from QA and Talbot County and State officials about water quality priorities and needs • Information on current oyster disease and mortality monitoring efforts						

6. Land Use, Development, and Tourism Impacts on the Fishery and Eastern Bay System.

Average Rating	*Very Critical*	*Critical*	*Somewhat Critical*	*Less Critical*	*Not Critical*	*Don't Know*	*No Response*
3.3	**5**	**4**	**3**	**2**	**1**	**0**	
	2	4	6	2	1	1	1
Related Issues	• Impacts of increased development pressure on the Eastern Shore and the EB watershed on water quality, oyster population, and oyster industry (including economy) • Eastern Bay is a major tourist location, many boats use the area throughout the summer • There won't be a sustainable fishery/industry if the water quality is too adversely affected by land use, regardless of restoration efforts • Chesapeake National Recreational Area impacts – How many is too many people? • Critical Area Commission has enough rules and regs on development, and now QA County is under the MS 3 permit • The workgroup should stay focused on impacts on oysters – it is not our purpose to dive into land use issues and advocacy • In-water solutions can only go so far to address issues caused by land use • Eco-tourism can be used to raise awareness and local buy in for project recommendations • How does the growth of newer public and business strategies like tourism impact watermen culture and the recognition of the importance of a heathy EB system to humans?						
Key Information Required	• Information that can be communicated about living shorelines and shoreline protections that incorporate oysters to combat increase in hardened shorelines • Land use maps • Current status and trends of land use changes to set expectations; workgroup can't control these • Historic and current data on oyster sales for region and harvest numbers • Access to current QA County Comprehensive Plan • GIS mapping overlaid with anticipated development plans. Resulting water quality modeling of future development coupled with QA County septic records to assess impact from aging septic systems. • A list of businesses/companies that are involved in ecotourism • Information from watermen's association on community support for planning and finances						

7. Lack of Holistic, Sustainable Eastern Bay Management Plan Informed by Science.

Average Rating	*Very Critical*	*Critical*	*Somewhat Critical*	*Less Critical*	*Not Critical*	*Don't Know*	*No Response*
3.8	**5**	**4**	**3**	**2**	**1**	**0**	
	5	2	2	3	0	3	2
Related Issues	• It is important to have a management plan for evaluation, succession plantings, and continued monitoring. Making sure restoration efforts are working and that the investments in the public fishery are sustainable are critical. • Streamlining ability for aquaculture to implement farming practices could allow more oysters to be planted with private funds and relieve pressure on the public fishery areas. • Current DNR oyster management plan – differing perspectives on what science is/is not used in current plan and activities in Eastern Bay • Navigating personal agendas will be challenging to reach consensus • Harvest thresholds, critical mass targets • Increasing distrust in science by some stakeholders/public • The group should explore what management plans are already in place for other areas of the Chesapeake Bay, and investigate components from those management plans that are						

	applicable to the Eastern Bay • A holistic and science-based plan is the only way to make meaningful progress • How to maintain a plan and who owns and implements the plan
Key Information Required	• Restoring public fishery areas with public money should be tightly linked to sustainability monitoring. An ineffective public restoration would be one where public funds are used every season or every few seasons to replenish what is unsustainably harvested. Rotational harvest should be a recommendation, as well as harvest techniques that are least impactful to oyster habitat and potential reproduction. • The Working Group should recommend that the delay or gap between applying for an aquaculture lease and being able to plant oysters be reduced dramatically through investments by the relevant agencies. • Need a discussion of how a lack of such a plan is an impediment • Comprehensive plan and future funding • Historic annual spat set data • Weather (precipitation & water quality) records • Oyster density maps • Priorities of each interested group • See other sections

8. Status of Eastern Bay Public Oyster Fishery Management and Strategy

Average Rating	*Very Critical*	*Critical*	*Somewhat Critical*	*Less Critical*	*Not Critical*	*Don't Know*	*No Response*
3.9	**5**	**4**	**3**	**2**	**1**	**0**	
	4	5	6	0	0	1	1
Related Issues	• What is the current management strategy? An analysis of the current (and/or past) management strategies of this system will educate workgroup members and inform recommendations • Harvesting of restored public fishery bottom should be managed so as not to deplete broodstock. It should not be the goal for public funds to replenish PFAs indefinitely; rather that restoration efforts should set up a sustainable harvest area for licensed harvesters in the public areas. • Currently not a major public fishery in Eastern Bay – Poor recruitment has led to a decline in population and harvest • Need to know this in combination with expansion of aquaculture • PSFA oyster density requirements • PFSA substrate composition, lack of substrate • PFSA activities and planned future activities – bar cleaning, planting spat on shell, others • Sanctuary productivity • Lack of a unified plan to effectively manage and use available funding to support all sectors • No comprehensive adaptive management plan for decision making • Location of current management boundaries delineating public fishing grounds, restoration, and aquaculture • Characteristics used to determine oyster habitat worthy of repletion activities						
Key Information required	• Summary presentation by DNR on main fishery topics and current management strategy • What do we hope to have in the future and how do we get there • Historic harvest records with some level of accuracy, benthic maps of oyster habitat, DNR annual survey of public bars to identify most productive fishery areas • Information on allowable substrates, sources of substrate, and infrastructure to deploy substrates						

	• Input from management on overall goal to restore oyster habitat in EB. What defines success? • What information was used to determine current management structure to delineate boundaries of public fishing grounds, restoration, and aquaculture • What are the metrics used by DNR to determine whether public oyster grounds are viable for repletion efforts?

9. Emergence of Aquaculture.

And its relationship to wild oyster harvest in Eastern Bay

Average Rating	*Very Critical*	*Critical*	*Somewhat Critical*	*Less Critical*	*Not Critical*	*Don't Know*	*No Response*
2.9	**5**	**4**	**3**	**2**	**1**	**0**	
	1	5	3	0	4	2	2
Related Issues	• Oysters are placed at private expense in aquaculture • Aquaculture's main benefit is to reduce pressure on the PFSAs in Eastern Bay • Aquaculture has helped the public fishery designate Maryland as a year-round quality source for oysters • Aquaculture and public fishery rarely compete for the same customer base – any conflict is unfounded • Resource allocation to and growth of both wild fishery and aquaculture should be equitable • Are there any spillover benefits from aquaculture to the fishery? Are oysters introduced to leases spawning and spilling over to viable bottom substrate? Many oyster farmers use primarily triploids which don't reproduce • Fundamental concerns that aquaculture will close off areas to wild harvest – how can spatial conflict be resolved equitably? How can leasing be expanded and leases be sited equitably to enhance wild harvest and water quality? • Misunderstandings of the value aquaculture has on the local environment – The workgroup should explore options of equitable distribution of activities and ways to educate user groups on aquaculture, wild oysters, and restoration interactions • Lack of a unified plan to effectively manage and use available funding to support all sectors • No comprehensive adaptive management plan for decision making • Location of current management boundaries delineating public fishing grounds, restoration, and aquaculture • Definition of habitat characteristics used as a rule to allow aquaculture to be sited in EB and MD in general						
Key Information Required	• The current wait time to be allocated a lease is way too long. Recommendations should be made to DNR that allow for a streamlined process for lease applications, especially for those intending to participate in regenerative aquaculture efforts (i.e. planting diploids, harvesting via diving or hand-tonging, water column leases vs. SLLs, etc.) • Consult with leasing industry. • Harvest data both from public fishery and aquaculture • Lease application records from DNR – Average issuance time for Eastern Bay leases, compiled list of reasons for lease application opposition and ranking them. • Accurate oyster densities to open/close PSFAs and expand leasing in Eastern Bay • Data on numbers of aquaculture leases, numbers of oysters harvested, current and expected acres of bottom with aquaculture leases • Input from management on overall goal to restore oyster habitat in EB. What defines success? • What information was used to determine current management structure to delineate boundaries of public fishing grounds, restoration, and aquaculture.						

10. Oysters and Chesapeake Bay in Decline.

Status quo is failing

Average Rating	*Very Critical*	*Critical*	*Somewhat Critical*	*Less Critical*	*Not Critical*	*Don't Know*	*No Response*
3.5	**5**	**4**	**3**	**2**	**1**	**0**	
	2	6	4	3	0	1	1
Related Issues	• Oyster restoration could be a unique and critical tool in the efforts to clean up waterways, shore up the regional economy, and become more resilient in the face of climate change • Focusing on overall Bay health is too broad for this discussion • Climate change will have an impact on oyster habitat and production • Symbiotic relationship between oysters and SAV. Habitat creation value • More than just oysters are in decline in the Upper Bay – should consider crabs, baitfish, rockfish, and oysters • How Eastern Bay is impacted by other forces/efforts in the broader Chesapeake Bay, and how efforts compete for resources • Lack of a unified plan to effectively manage and use available funding to support all oyster stakeholders • No comprehensive adaptive management plan for decision making • Location of current management boundaries delineating public fishing grounds, restoration, and aquaculture • Definition of habitat characteristics used as a rule to allow aquaculture to be sited in Eastern Bay and MD in general						
Key Information required	• Drivers of decline – natural and human-induced • Ecological service measurements provided by aquaculture, wild fishery, and restoration • Historical data on catch for oysters, blue crabs, and rockfish, and water quality information • Input from management on overall goal to restore oyster habitat in EB. What defines success? • What information was used to determine current management structure to delineate boundaries of public fishing grounds, restoration, and aquaculture						

11. Public Awareness.

Awareness of culture, economy, and environment in Eastern Bay

Average Rating	*Very Critical*	*Critical*	*Somewhat Critical*	*Less Critical*	*Not Critical*	*Don't Know*	*No Response*
3.8	**5**	**4**	**3**	**2**	**1**	**0**	
	3	8	2	2	0	2	0
Related Issues	• It's important for the public to be informed about the efforts to restore the oyster population and the ecosystem services provided by healthy reefs. If the general public, and waterfront property owners are supportive of restoration, conservation, and aquaculture, the process for all becomes more effective. • Awareness needs to focus on continual education to the public on the benefits of restoration, public harvest and aquaculture. All have a valuable part in sustaining a viable population of oysters • It is critical to figure out how best to engage, and successfully engage the communities surrounding Eastern Bay • Rely on experience and expertise of divers – what are they seeing? How can we improve the bottom in their eyes? • Public education on food safety and water quality • Demonstrate the efficacy of sanctuaries to the public • What is the public currently hearing about Eastern Bay and oysters here?						

	• Success relies on a focused, clearly communicated, results-driven process • Efforts by other NGO's to promote awareness, economy and environment should be surveyed, so the 'wheel is not reinvented'. Select what works from other NGO endeavors and apply to an Eastern Bay plan. • Funding and staffing to deliver oyster education programs. CBEC already delivers oyster education programs that can built upon. • How does the growth of newer public and business strategies like tourism impact watermen culture and the recognition of the importance of a heathy EB system to humans?
Key Information required	• Solid, science-based communication strategies • Define key groups in Eastern Bay watershed • Environmental impact of sanctuaries on fishery enhancement • Consumer perception of Eastern Bay oysters • Results and perception of stakeholders at a broader scale – from groups making a living on the water, from other oyster restoration/multi-use regions • Information on QA and Talbot County comprehensive community plan • Information from watermen's association on community support for planning and financial support

12. Current Process for Building Consensus on Oyster Restoration and Management in Eastern Bay.

Average Rating	*Very Critical*	*Critical*	*Somewhat Critical*	*Less Critical*	*Not Critical*	*Don't Know*	*No Response*
3.6	**5**	**4**	**3**	**2**	**1**	**0**	
	3	5	5	2	0	1	1
Related Issues	• Scale – consensus-building process around the Choptank River was considered a success, more recent Chesapeake Bay-wide effort was much more challenging • Past sanctuary and industry efforts (public and private) have been separate and often in conflict • Seems too contentious, needs to be more respectful and productive • Shared understanding and goals are required to move forward • Define user groups • Data is critical to any discussion and the process should heavily rely on this • Lack of vision and goals associated with existing collaborative management structure • How to design a collaborative structure that can be adaptive based on user input. • Define measurable goals, objectives, and metrics to achieve measurable results						
Key Information required	• An understanding of the thoughts and goals of each group, and how each group is affected by the outcome • Historical data on fishing effort and harvest trends in Eastern Bay – number of license holders, catch totals going back 50 years • Oyster population numbers and trends • Water quality data and trends • Input from management on how current management bodies and input is used to inform management • Input from management on overall goal to restore oyster habitat in EB. What defines success?						

13. Availability of Resources.

Funding, infrastructure, oyster larvae, workforce

Average Rating	*Very Critical*	*Critical*	*Somewhat Critical*	*Less Critical*	*Not Critical*	*Don't Know*	*No Response*
4.4	**5**	**4**	**3**	**2**	**1**	**0**	
	8	7	2	0	0	0	0
Related Issues	• Ample and maintained funding levels and sources are required – how much is required to support comprehensive restoration of Eastern Bay, is current funding enough? • There is high interest among Eastern Bay constituents in oyster restoration in sanctuaries, and that interest can be leveraged to hold state agencies to prescribed funding levels • Hatchery status, capacity, and larval availability/needs to support oyster restoration and production in Eastern Bay • How to use limited resources wisely? – where to invest, how much, when • Available substrate for oyster production (e.g., shell) • Equitable distribution of resources will be critical • Workforce development goals, needs, and plans for growing wild fishery and aquaculture						
Key Information required	• Current regulatory framework and laws that support or detract from oyster production • Maps of Eastern Bay habitat and water quality • Available and upcoming resources, relationships, funding levels, and funding sources • Number of harvesters exploiting oysters in Eastern Bay • Recent harvest trends of oyster harvest in Eastern Bay • Information from QA and Talbot County on where the oyster production workforce fits in their strategy and what resources are available to support • Information on hatcheries						

14. Recreation and Tourism in Eastern Bay.

Average Rating	*Very Critical*	*Critical*	*Somewhat Critical*	*Less Critical*	*Not Critical*	*Don't Know*	*No Response*
2.8	**5**	**4**	**3**	**2**	**1**	**0**	
	2	3	3	4	3	1	1
Related Issues	• Recreation and tourism in EB is linked to oyster restoration only so far as restoration efforts contribute to swimmable, fishable waters. If restoration is done well, recreation and tourism will increase without any further effort from the Working Group or the state. • 3rd span of Bay Bridge – what are anticipated impacts and traffic patterns? • Anticipated tourism impacts from the establishment of the Chesapeake National Recreational Area • Wastewater plants too small to handle current weekend tourism influx • How does the growth of these newer public and business strategies like tourism impact watermen culture and the recognition of the importance of a heathy EB system to humans? • What are the goals of QA and Talbot County on recreation and tourism; revenue, support, etc.						
Key Information required	• The economic impacts of healthy oyster reefs to recreational fishing, charter industry, and marina revenue • Review opportunities for expanding ecotourism and DNR's support for this – e.g., dive charters to oyster reefs • MDOT final timeline for 3rd Bay Bridge span and impact on local tourism in Eastern Bay • Information on QA and Talbot County comprehensive community plans and where recreation, tourism, and oyster stakeholders fit in those plans						

15. Other Issues

Additional Issues that the Workgroup would like to explore that were not listed in the Questionnaire:

- How does oyster production compete or impact other uses of and habitats/marine resources in Eastern Bay?
    - Need data from DNR - Historic habitat and overlapping resources, maps of historic oyster and clam harvest and seeding
    - Need data from counties on other uses of Eastern Bay
    - Need maps of SAV beds and information on current SAV restoration efforts in Eastern Bay
- Funding and long-term planning
- Other benefits of oyster habitat
- Incentivizing aquaculture via ecosystem improvement payments
- Harvest reporting – Lack of enforceable harvest reporting requirements in public fishery makes effective/accurate stock assessment nearly impossible.
- DNR regulatory, permitting, licensing, and enforcement changes needed
    - Delays in permitting and lease issuance by DNR
    - Blanket DNR enforcement vs. smart DNR enforcement for both aquaculture and fishery
    - DNR regulatory overhaul as it relates to aquaculture and fishery
    - Limiting the amount of oyster harvest licenses available to new people
- Pile dredging in Miles River and Eastern Bay
- Upstream contributors of pollution
    - Conowingo Dam and massive release of sediment into the Bay
    - Treated sewage discharged into the Bay

V. Looking Forward

Workgroup members were asked to reflect on potential future scenarios for oysters and oyster habitat in Eastern Bay.

A. Undesirable Future

Workgroup members indicated that an undesirable future for Eastern Bay in 2033 would include the following elements which would lead to cascading impacts to the regional environment, economy, and culture. Most Workgroup members indicated that the most undesirable future would be the elimination of oysters in Eastern Bay.

1. A decline in or elimination of the oyster population in Eastern Bay
2. A lack of momentum, interest, and resources available for oyster restoration and production
3. Poor resource management and planning

Overarching Topic	Elements or Drivers of an Undesirable Future in Eastern Bay
1. Decline in Oyster Population	• Disease is prevalent • Continued degradation and loss of oyster habitat • No viable fishery and no aquaculture to offset loss of oyster habitat

	• Siltation overwhelms oyster reefs – the bottom is desert, all reefs are silted over (from storms or other processes) • Climate change impacts oyster population • Decline in oyster habitat results in devastation to other finfish commercial fisheries and populations. Commercial harvest of menhaden exceeds capacity for few remaining filter feeders to keep up • Restoration sanctuaries fail due to poaching, disease, and/or siltation • 100-200 spat per bushel natural • No public oyster bars left for harvesting • No oysters • Oysters die off from weather or disease • The Kent Narrows has always been a window into the past, as is St. Michaels. Now the charter boats are almost non-existent. The oyster and clamming boats are gone, and commercial crabbing is on its last breath. Everything being sold and consumed in St. Michaels and the Narrows does not come from local waters, and everywhere you go someone is telling a story about "When I was a kid there were plenty of……."
2. Lack of Momentum, Interest, and Resources	• Funding for conservation and replenishment has been diverted • Groups argue and interest wanes • Fewer oysters leads to fewer jobs for industry
3. Poor Resource Management and Planning	• Lack of sustainable wild fishery harvest due to poor reporting and overharvest • Lack of aquaculture expansion due to lease issuance delays, lack of viable leasable area, and continued opposition • Future of Eastern Bay resembles the current status quo – minimal restoration effort, poorly managed system, no flexibility to amend regulations based on water quality conditions and population density • Increased development pressure and aging infrastructure leads to large tracts of Eastern Bay being off limits to harvest due to increased bacteria loads • Not allowing ecotourism, which could bring awareness • No bottom to be leased or restored due to regulations • A system without a holistic approach to management with no buy in from major user groups, disparate projects • No unified approach to manage oyster productive has been established – therefore, Eastern Bay oyster habitat is still recruitment limited, substrate availability has not increased, oyster production on public fishing grounds has not improved, the presence of aquaculture has not increased, and the public and businesses have no better understanding or appreciation of the value of oysters and Eastern Bay oyster habitat and its ecosystem

B. Successful Future

Members were asked to draft a newspaper headline for the Baltimore Sun and Watermen's Gazette showcasing the successful future of Eastern Bay in 2033. The headlines, text, and other considerations that Workgroup members provided encompassed several key themes for a successful Eastern Bay.

1. Self-sustained oyster population
2. Sustained and booming harvest from fishery and aquaculture
3. Focused, impactful, sustainable resource management
4. Economic bounty and tourism
5. Cultural significance
6. Careful planning, relying on science and expertise, collaboration
7. Generous dedicated funding
8. Ecosystem benefits and resilience

Headlines for a Successful Outcome for Eastern Bay in 2033:

- "Eastern Bay Revival: A Triumph in Environmental Restoration and Sustainable Management"
- "Eastern Bay Shows a Heartbeat"

  After decades of underperforming, Eastern Bay has shown life and hope for a better future. Spat set has improved to such a degree that this is seen as a signal that the efforts are yielding results….. Potential exists for the fishery and aquaculture sites to experience natural increases in harvest, not dependent on plantings and expensive intervention. Nature is rebounding….
- "A return to the 60's"

  After many years of a degrading Eastern Bay since Hurricane Agnes in 1972, Eastern Bay has finally returned to its original luster. Successful oyster management was the key to this great achievement. Along with the return of the oyster population and sustainable public oyster fishery Eastern Bay is now the most productive aquaculture area in the Chesapeake Bay. SAV has again returned to new levels and along with have seen great numbers of crabs and fish flocking to the grass's sanctuary. Once seem destined for doom, Eastern Bay is back where it belongs and thru continual management practices will be for the foreseeable future.
- "10 years later: We have more oysters in Eastern Bay because we figured out how to work together"
- "Oyster harvest levels in Eastern Bay not seen in 30 years are sustained for fifth year in a row"
- "Recreational fishing tournament held in Eastern Bay a huge success thanks to restored oyster habitat"
- *Today the State of Maryland and the Maryland Department of Natural Resources are happy to report that the Eastern Bay on Maryland's Eastern Shore is no longer on the States endangered list.*

  The once threatened area is now producing Oysters as it did in the 1950's when Trains transported Oysters by the box car loads from Kent Narrows to Philadelphia because they were to numerous for the local shucking houses. Dump truck loads of Oyster shells are being replanted every week and local Waterman are breathing a sigh of relief as they head to work every day. Water clarity now rivals Florida and tourists and fisherman can see teeming shoals of fish over the many Oyster Bars. The local hotels and charter boats are now helping tourists see what a lot of planning and hard work can accomplish in just a short time. Business is booming and the area has become a pilgrimage for many

environmental tourists in hopes that they can learn something to take home and make their local waterways a place of enjoyment for generations to come.

- "Eastern Bay Oysters are Making a Splash"

  Due to careful scientific management, there are more oysters in recorded history in Eastern Bay than ever before. Through judicious and aggressive funding efforts from MD DNR, environmental NGOs, and their federal partners, there are more fully restored oyster sanctuaries, the aquaculture industry has taken off, and the public fishery has a sustainable and growing harvest.
- "The Remarkable Oysters of Eastern Bay"

  The Eastern Bay Oyster Coalition united and "closed the gap between both sides of the bivalve" by putting differences aside to regenerate the oyster population in Eastern Bay through educational and economic development opportunities within the region.
- "Good planning and Mother Nature returns Eastern Bay to thriving"
- "Localized oyster harvest dominated by spat from Eastern Bay is setting records not seen since the fifties"

  Restoration efforts by oyster stakeholders and the public continue to see significant improvements to Eastern Bay oyster habitat, water quality, and SAV growth benefiting the fishing and tourism industries.

Additional Details and Thoughts from OCW Members About What a Successful Future for Eastern Bay Could Look Like in 2033:

- Plantings are abundant, oysters are abundant, many sites are planted
- Broodstock develops and the oysters grow
- No major die-offs occur
- Spat set increases and are maintained, which suggest that all efforts have resulted in successful restoration of Eastern Bay
- Plenty of oysters in Eastern Bay including restored oyster bars, more oysters available for the public fishery, and successful oyster aquaculture
- The ability to still make a living off oystering, plenty of open oyster bars, successful program for ongoing oyster protection and planting
- A lot of oysters

C. Vision Themes

Workgroup Members Were Asked to Identify Key Themes That Summarize Their Desired Future for Eastern Bay. Proposed Vision Themes Encompassed Three Major Themes:

1. A healthy ecosystem
2. Improved oyster production and habitat
3. Engaged and supportive stakeholders, culture, and economy

Overarching Topic	Themes Proposed by OCW Members
1. Ecosystem Health	• Ecosystem resilience • A healthy ecosystem • Water quality improvement

	• Sustainability • Increased oysters, crabs, and rockfish
2. Improved Oyster Production and Habitat	• Enhancing spat set • Expansion of productive aquaculture bottom • Seed areas created for public fishery replenishment • Oyster sanctuaries replenished and maintained – both reproduction and spat sets throughout Eastern Bay • Alternative substrates used to boost natural production • Increase oyster habitat and harvest • Focus on spat-on-shell • Bring shells to surface by bagless dredging • Less bureaucracy to obtain oyster leases
3. Engaged and Supportive Stakeholders, Culture, Economy	• Collaboration, synergy, collective will • Cooperation, coordination • Equitable • Holistic • Expand public awareness • Science-based management • Local community buys into the plan and helps foster awareness • Economic benefits (restaurants thriving and ecotourism boat trips running) • Education – both passive (regional interpretive signage) and active (at CBEC and other NGOs)

VI. Additional Information

Additional Information That Workgroup Members Thought Would Be Helpful at Workgroup Meetings and in Preparing to Participate in the Workgroup. These are Listed in Order of Rank.

Topic	**Average Rating (out of 5)**
Information about oyster restoration activities and outcomes	4.5
Current status and trends of oyster populations, harvest, and economic value of Eastern Bay-wide oyster fishery	4.4
Briefing on historic, current, and projected commercial harvesting from the oyster fishery and aquaculture in Eastern Bay	4.2
Briefing on State regulation programs related to the oyster fishery	3.9
Briefing and information on the use of decision-support tools (modeling)	3.9
Briefing and information on climate changes and rising sea levels impacts on oyster habitat and production	3.6
Scientific information about oysters	3.6

Other Information Requested:

- Oyster Futures model applied to Eastern Bay
- MDNR Fall survey data from the past 10 years
- Shell charts from Seed Repletion program
- Historical data on license holders for oysters, clams, crabs, and rockfish
- Historical data on yearly harvesting
- Historical data on water quality for the area under consideration
- Models that have worked in other areas of the Bay
- Any website links from other states/NGOs working through the same issues or questions