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Brief Description of Proposed Priority Options Resources and Resources-Based Industries Technical Working Group DRAFT

RRI-1. New Criteria for Identifying Priority Protection Areas

Option Description

Rising sea level will impact coastal ecosystems and natural resource lands. These resources provide important wildlife habitats, have regional significance for migratory birds, protect coastal communities from storm surge and erosion, sequester large amounts of carbon, provide sediment and nutrient water quality benefits, and generate economic benefits through farming, forestry, fishing and passive recreation. As sea level rises, various future conditions are possible. As an example, tidal marshes, beaches and dune habitats have the potential to: 1) migrate landward if there are no barriers to migration, such as roads and buildings, or 2) become eliminated if the opportunity to migrate landward is blocked, or the rate of migration is exceeded by the rate of sea level rise. Identifying where these resources are, how important they are for various ecosystem values and economic services and what the likely impact of sea level rise will be provides the basic information needed to plan for the protection and management of priority coastal natural resources.

This option proposes to develop and test new and existing criteria for identifying ecologically and economically important lands (including important habitats and marsh migration corridors). This would include using existing natural resource assessments such as the Green and Blue Infrastructure and Maryland Strategic Forest Lands Assessment and considering conservation priorities, such as DNR's Priority Conservation Areas and other agency conservation targets. The objective of this option is to identify target areas where strategic actions can be focused to buffer against the impacts of sea level rise and other climate changes.

Strategic actions can include targeted conservation along landward edge of tidal marshes to allow horizontal marsh migration, sand and sediment replenishment to fuel the vertical growth of wetlands, barrier removal, alternative land management practices and others.

Option Design

Targets:

- Identify high ecological and economic priority natural resources
- Identify the degree of risk to natural resources resulting from sea level rise
- Recommend specific management actions appropriate to the value of the resource and the degree of risk

Timing:

- An initial and coarse level assessment of resource vulnerability to sea level rise could be conducted within the first year using results from sea level rise modeling and existing resource assessments.
- Field studies may need to be conducted in order to develop and test specific criteria
- Strategy recommendations will need to be developed based on the results of these assessments and could involve federal, State and local governments, non-profits, natural resource industry sectors and the public.
- A plan for implementing strategies should follow the strategy development, but is not addressed in this option

Parties Involved:

- Resource assessment and threat analysis should be completed by MD DNR, UMD and other technical and scientific organizations

Implementation Mechanisms

Implementing this recommendation would require the investment of staff and funding to complete the analysis, conduct any specialized studies and to coordinate the development of a suite of strategic actions.

Related Policies/Programs in Place

DNR's existing resource assessments include the following:

- The Green Infrastructure Assessment: identifies an ecological hub and corridor network across the State, prioritizes for ecological value, and is a DNR foundation for focusing conservation and restoration work.
- The Blue Infrastructure Assessment: specifically focuses on aquatic values and the aquatic/terrestrial interface; surveys aquatic, wetland and shoreline natural resources and identifies areas of highest ecological and economic value; currently under development
- Strategic Forest Lands Assessment: specifically focuses on forests; identifies forested areas of highest ecological and economic value
- Shorelines Online: A survey of shoreline condition
- Sea level rise projections

Other studies and programs

Restoration of Blackwater Wildlife Refuge marshes: ongoing study that is building up degraded marshes by sediment replenishment and marsh grass plantings.

Estimation of Adaptation Benefits and Costs

Provide a bulleted summary regarding the overall benefits and costs expected to result from the implementation of the option, as per the categories listed below.

Capital intensity: Characterize the option relative to the expected costs associated with implementation up to the previously indicated target level. This estimate can be provided either quantitatively or qualitatively depending on data availability.

Flexibility: Characterize the option relative to its flexibility regarding future corrective action given reduction in uncertainty levels regarding future impacts. This estimate can be provided qualitatively as per the outcome of TWG discussions.

Adaptive capacity: Characterize the option relative to the degree to which it builds adaptive management capacity among state institutions and among private entities. This estimate can be provided qualitatively as per the outcome of TWG discussions.

Other: Identify and characterize as appropriate other adaptation benefits and costs that would need to be addressed to better understand the implications for the implementation of the option in the state.

Documentation of Adaptation Benefits and Costs

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Data Sources: Indicate as specifically as possible the sources that were used to characterize the option relative to its costs and benefits.

Quantification Methods: Indicate as specifically as possible the methodology that was used to quantify the capital intensity of the option, as appropriate.

Key Assumptions: Indicate as specifically as possible the key assumptions on which the characterization of the option's costs and benefits is based

Key Uncertainties: Indicate as specifically as possible the key uncertainties embedded into the characterization of the option's costs and benefits.

Additional Benefits and Costs

Provide up to one paragraph describing additional benefits and costs, if any, that have not been captured in the estimate of costs and benefits described earlier.

Feasibility Issues

Provide up to one paragraph describing state-specific issues related to implementation feasibility.

Status of Group Approval

At the conclusion of the process, provide an indication of the status of TWG approval. Three categories are possible, namely full TWG consensus, super-majority, or majority consensus based on a number of objection(s).

Barriers to Consensus

At the conclusion of the process, provide a brief and specific description of any objections to the option.

RRI-4 & RRI-11. Forest and Wetland Protection

Option Description

Use enforcements, financial incentives, and educational outreach to retain and expand forests and wetlands in the Critical Area and other areas subject to storm surge and sea level rise to enhance adaptive response to climate change. The aim of this option is to develop actions that prioritize retention or forest and expansion of forests and wetlands in rural and developed areas that are expected to be impacted. The expected benefits of this option include protection from shoreline erosion, reducing peak runoff during storm events, and avoiding stranded infrastructure.

Critical Areas, buffers, and other future impact areas will be targeted for forest establishment and expansion based on elevation and landscape planning. Future forest and wetlands areas will provide replacement zones for wildlife migration and movement corridors. Research efforts are needed to develop more water and salt tolerant plant species as sea level rise impacts move inland. Forest conservation incentive policies will be increased in targeted areas emphasizing not only preservation and expansion, but forest management issues that optimize forest health.

The climate change benefits are multiple as these forests and wetlands will continue to sequester carbon until called upon to provide a critical storm barrier. Water and air quality, wildlife habitat and multiple other natural resource improvements will be side benefits of implementing this option. Increased forests provide “green” renewable resources for wood products for construction and fuels. Forest industry jobs and related fields help the economy of Maryland.

Option Design

Targets:

1. Undeveloped areas within 1000 ft of mean high tide (current Critical Area definition), floodplain areas in the coastal zone, and areas prone to salt water intrusion are potential areas to target for expansion and protection, preventing further development. Already developed areas will consider all opportunities for tree establishment, raingardens, and other green infrastructure.
2. Future impact areas based on elevation mapping (< 5 ft. in elevation) become priority forest retention and establishment areas. Lower areas are more suitable for salt-tolerant woody species or for wetland establishment, especially where connected to existing wetlands.
3. Realize a goal to have 70% of the riparian area in Maryland forested. Accelerate the timeline to achieve such a goal (i.e., by 2025).
4. Create or augment dedicated sources of local funding, such as through ballot initiatives, for the conservation of forests and support these through state matching grants.
5. Identify and develop programs to enhance and protect wildlife corridors and maintain connectivity of green forest core areas across the landscape.

Timing: Program will be implemented in 2009 due to the need to establish forests areas as soon as possible. This will maximize the benefits of growth prior to future needs. An intensive public relations effort will begin prior to full implementation (2008-2009) to the citizens of Maryland, but particularly to the citizens of future impacted areas of the sea level rise issue and the values of promoting and enhancing forest areas. This program should run indefinitely (continuous) and be evaluated every 5 years for effectiveness.

- **Parties Involved:** The Maryland Dept of Natural Resources and the Dept. Of Agriculture will be lead agencies involved in the implementation of the program. Infrastructure is already in place through several cooperative programs such as CREP utilizing Soil Conservation Districts as the on-the-ground contact for landowners. DNR and Dept of Ag can provide the promotional staff and resources to identify and target contact areas. Some overlap with existing programs of the federal Natural Resources Conservation Service (NRCS) is noted. Numerous other national, regional, and local private nonprofit organizations also conduct and support land protection (e.g., land trusts) and wildlife enhancement activities (e.g., wildlife and waterfowl habitat restoration groups).

Other: County and local governments must become involved in this endeavor both in promotional and implementation efforts including land use planning and zoning efforts.

Implementation Mechanisms

For restoration of riparian forest buffers and wetland restoration, this option can be implemented through existing programs such as CREP and WRP. Other forest restoration incentives are limited and more need to be created. There may be opportunities to use other Farm Bill program and funds to promote forest restoration. Staffing and funding must accompany the program as current on-the-ground and support resources are minimal at this time due to funding cuts and staff reductions.

For conservation, ideally new state legislation that provides matching grants to local government for forest land protection would be invoked. This would accompany local government initiatives, passed by voters, to create dedicated funds to protect these lands and qualify for matching state funds. There may be opportunities to use other Farm Bill program and funds to promote forest protection and management. Staffing and funding must accompany the program as current on-the-ground and support resources for forests are dwarfed by those provided for protection of farm lands.

Related Policies/Programs in Place

Provide up to one paragraph describing any existing or planned programs or policies that are complementary or reinforcing.

Estimation of Adaptation Benefits and Costs

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Documentation of Adaptation Benefits and Costs

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Quantification Methods: Indicate as specifically as possible the methodology that was used to quantify the capital intensity of the option, as appropriate.

Key Assumptions: Indicate as specifically as possible the key assumptions on which the characterization of the option's costs and benefits is based

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Additional Benefits and Costs

Provide up to one paragraph describing additional benefits and costs, if any, that have not been captured in the estimate of costs and benefits described earlier.

Feasibility Issues

Provide up to one paragraph describing state-specific issues related to implementation feasibility.

Status of Group Approval

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Barriers to Consensus

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RRI-7 & RRI-9. Modify Environmental Protection Regulations to Promote Sustainable Shoreline and Buffer Area Management Practices

Option Description

This option recognizes the need for both planning and permitting level efforts to guide landowner choices in managing shoreline erosion control practices. Designing and implementing a specific shoreline erosion control practice that achieves a balance between protecting the landowner and minimizing disruption to the coastal environment under state jurisdiction is a complex task. Past efforts to mandate local shoreline erosion control plans, under the Critical Areas law were unsuccessful due to a number of factors. An increased understanding of non-structural and structural erosion control alternatives at the practitioner level; new mapping resources, shoreline inventories and web enabled analytical tools are sufficiently in place to facilitate local comprehensive erosion control management plans. Adopting a collaborative state-local approach to developing such plans will maximize the odds of success.

The aim of this option is to modify the Tidal Wetlands and Critical Areas laws and/or regulations to promote sustainable shoreline and buffer area management practices on public and private lands. These modifications should incorporate the following elements:

- A requirement for state and local governments to cooperatively develop comprehensive shore erosion management plans that determine and specify the type and location of shore protection practices based on their physical and hydrodynamic setting. Additional attention should be given to encourage the use of living shorelines as a means to manage a continuum of habitat and natural resource features that extend from shallow water habitats, beaches and wetlands to upland forested buffers.
- Amend State statutes and regulations to remedy jurisdictional gaps and conflicts between State and local governments within the 100-foot Critical Area buffer.
- A requirement for permit applicants to demonstrate that their preferred erosion control alternative is least disruptive to the shoreline and critical area buffer; and has the least potential to adversely affect natural resources subject to long term erosion. To guide applicants, the State will develop a preferential order of erosion control alternatives and practices, which are presumed to progress from the least to most detrimental effect on natural resources. DNR's Shoreline and Erosion Control Program should be reoriented to promote the installation of innovative shore protection techniques that maximize habitat restoration and enhancement, and provide technical assistance and subsidies for shoreline stabilization projects.
- A revision to current tidal wetland regulations enabling private land owners to rebuild storm damaged tidal marshes, including the placement of additional clean sandy fill, plants and temporary biodegradable structures to protect rebuilt areas. Currently, introducing clean sandy fill material requires a state permit, while simple planting of wetland species on

existing substrate in the correct hydrologic and salinity regime does not. Repairs would be authorized only if conducted under guidelines issued by the Maryland Department of Environment.

- A requirement directing state agencies to jointly develop and maintain up-to-date guidelines that describe preferred shoreline and buffer management practices that will facilitate climate adaptive strategies for coastal environments subject to sea level rise, erosion and storm hazards.

Option Design

Define specific objectives and/or structure to be recommended, and provide a bulleted summary regarding the overall option design modalities, as per the categories listed below.

Targets: Implement recommended regulatory and planning requirements for 100% of the area subject to tidal wetlands permitting authority.

Timing: Make required regulatory changes by 2009; promulgate guidance manual by 2010; initiate shoreline management plans by 2011.

Parties Involved: Critical Areas Commission, Maryland Department of Environment, Maryland Department of Natural Resources.

Other: Resource Conservation and Development agencies, local governments in the coastal zone, Board of Public Works, Wetlands Administrator, Army Corps of Engineers other federal resource management agencies.

Implementation Mechanisms

Implementation of this option will include a combination of executive, legislative and programmatic actions. Potential actions will include regulatory amendments to Title 16 of the Environment Article (Wetlands and Riparian Rights Act) to remedy jurisdictional gaps between State and local governments within the 100-foot Critical Area buffer and revise permitting process; modifications to COMAR Title 27 “order of preference” for shoreline protection treatments; and the Annotated Code of Maryland’s Natural Resources Article (§8-1001 through 8-1008) to reorient the Shoreline and Erosion Control Program.

Related Policies/Programs in Place

A number of state sponsored activities are currently underway that relate to this option including incentives and technical assistance for soft shoreline erosion control through the Department of Natural Resources Shoreline and Erosion Control Program; sea level rise and storm surge mapping; and green and blue infrastructure assessments. Development of technical assistance tools and products are essential for identifying areas at risk and determining appropriate shore erosion treatment, and currently include: the Erosion Vulnerability Assessment (EVA) and Planning Tool, focusing on defining important infrastructure and environmental risk attributes in the coastal landscape that are vulnerable to shoreline erosion within the next 50 years; and a Living Shorelines Suitability tool being created for Worcester County that identifies areas that

are not suitable for living shoreline treatments, those that are suitable and those that may be suitable with design restrictions.

Estimation of Adaptation Benefits and Costs

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Additional Benefits and Costs

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Feasibility Issues

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Barriers to Consensus

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RRI-8. Impacts Assessment for Fish Stocks and Habitat

Option Description

Conduct an assessment of the expected impacts of sea level rise on fish habitat and fish stocks. The evaluation will also identify strategies for risk reduction.

Option Design

Define specific objectives and/or structure to be recommended, and provide a bulleted summary regarding the overall option design modalities, as per the categories listed below.

Targets: Indicate as specifically as possible the target for the option. Targets may be defined in physical terms (e.g., install a tree planting program along 100% of all vulnerable undeveloped coastal areas as a flooding control strategy), economic terms (e.g., increase incentives by 25% for purchase of industrial flood hazard insurance), or other terms (e.g., identify all public and private systems/facilities at serious risk from sea level rise)

Timing: Identify the year in which the option would be implemented in the state, including any details regarding ramp-up to meet the targets above (e.g., install a tree planting program starting in 2010 and reach the specified target after a 5-year period).

Parties Involved: Identify the state agencies, private entities, and other parties covered by the option.

Other: As needed, identify other factors/parties that would need to be engaged for successful implementation of the option in the state.

Implementation Mechanisms

Provide up to one paragraph describing how the option would be implemented. Specify whether implementation would be based on changes to existing rules/regulations, new legislation, provision of incentives, or other mechanisms.

Related Policies/Programs in Place

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