Worksheet 1A.Examine Category 1 Climate-Smart Design Considerations: *Climate change effects on Target stressors*

*SAVs*

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| **A1** | **A2** | **A3** | **A4** | **A5** | **A6** | **A7** |
| **Action number** | **Existing Management Action** | **Target Stressor(s)** | **Climate change effects on stressor(s): (direction, magnitude, mechanism, uncertainty)** | **Timing of climate change effects** | **Implications for effectiveness metrics and how to measure them** | **Notes** |
| 1 | **Homeowner initiated SAV restoration project**: SAV restoration along the shoreline of the property on Kirwans Landing Lane on Kent Island, MD. | * Sediment & nutrient runoff agricultural land * Habitat destruction * Armored (rip-rap) shoreline * Invasive *Phragmites* | * Sediment & nutrient runoff from adjacent ag lands may increase with increasing rainfall/runoff projected for the winter. However, reduced rainfall & runoff during the summer may allow for a seasonal decrease in turbidity & eutrophication. * Increased storm intensity and hurricanes threaten direct destruction of SAV habitat. * SLR will increase water depths in SAV habitat, decreasing habitat suitability, and will be a particular problem where shoreline hardening prevents habitat migration. * Success of *Phragmites* invasion may increase with climate change (particularly increasing temperatures). However, SAV abundance is positively correlated with presence of adjacent shoreline marsh (Patrick et al. 2014), and it is not clear whether it matters if that marsh is composed of native or invasive species. | * Seasonal timing of rainfall expected to change, with increased rainfall in winter, decreases in summer. Similar seasonal changes in sediment and nutrient delivery expected. * SLR is already occurring and will continue to increase, threatening SAV (*Zostera*) habitat. * More intense storms & hurricanes are already occurring & are likely to increase, though confidence in ability to project these changes is low. | **Effectiveness metrics:**  Acres of SAV, positive SAV growth rates, inter-annual persistence of SAV beds. Measuring habitat metrics (e.g., water depth, turbidity, others) may also be valuable in identifying contributing factors influenced by climate change to any changes in SAV success.  **Target(s) for effectiveness metrics:** is there a desirable % SAV coverage to be achieved?  **Implications for how to measure effectiveness metrics:** Monitoring SAV status following major storms and subsequent recovery period would help distinguish chronic (press) from episodic (pulse) disturbances. |  |
| 2 | **Eelgrass restoration in Virginia Coastal Bays**: Restoration of SAV beds. | * Temperature * SLR * Eutrophication * Declining light penetration (turbidity) |  |  | **Effectiveness metrics:**  **Target(s) for effectiveness metrics:**  **Implications for how to measure success metrics:** |  |
| 3 | **Protection of the Susquehanna Flats SAV bed**: Designate Susquehanna Flats SAV beds as an Estuarine Protected Area. | * Physical damage from boat traffic & fishing * WQ impairments (sediments, nutrients, including turbidity & light limitation) * Physical damage from storms |  |  | **Effectiveness metrics:**  .  **Target(s) for success metrics:**  **Implications for how to measure effectiveness metrics:** |  |
| 4 | **SAV and conflicting uses of potential shallow water habitat**: Implement protective fishing regulations in designate SAV beds in the mesohaline portion of the Maryland Bay in the vicinity of the mouth of the Choptank and the Tred Avon Rivers. | * Direct physical damage from use of hydraulic clam dredges, where use of jets of waters to stir up the bottom can uproot SAV and cause turbidity. * Direct damage from oyster aquaculture, where floats placed directly over SAV beds can cause direct burial, shading, and turbidity from harvesting. |  |  | **Effectiveness metrics:**  **Target(s) for effectiveness metrics**  **Implications for how to measure effectiveness metrics:** . |  |