Outcome: Submerged Aquatic Vegetation

Goal: Sustain and increase the habitat benefits of SAV (underwater grasses) in the Chesapeake Bay.

Outcome: 130,000 acres of SAV by 2025

Long term Target: 185,000 acres of SAV Bay-wide

2 year Target: 90,000 acres of SAV by 2017

Management Approach 1: Restore Water Clarity in the Chesapeake Bay					
Key Action** *Description of work/project. Define each major action step on its own row. Identify specific program that will be used to achieve action.*	**Performance Target(s)** *Identify incremental steps to achieve Key Action.*	**Participating Entity** *Identify responsible partner for each step.*	**Geographic Location**	**Timeline** *Identify completion date (month & year) for each step)*	**Factors Influencing and/or Gap** *Identify related factor or gap in Management Strategy*
1.Continue work to achieve water clarity/SAV standards in areas designated for SAV use - see Water Quality GIT Workplan	Water Quality Management Action 2 (Enhance Monitoring) Key Action 1 : Continue work to improve temporal and regional patterns in water quality criteria attainment in tidal and non-tidal waters.	Bay States (DC, DE, MD, NY, PA, VA, WV); Water Quality GIT	Chesapeake Bay Watershed	2016	
	Water Quality Management Action 3 (Bay TMDL Midpoint Assessment) Key Action 2: Explain the drivers of water-quality trends in the watershed.	Bay States (DC, DE, MD, NY, PA, VA, WV); Water Quality GIT	Chesapeake Bay Watershed	2016-2017	
2. Continue to improve the SAV component of shallow water model	Model the impacts of water quality on SAV and other living resources in the tidal Chesapeake Bay.	ODU (Zimmerman)	tidal Chesapeake Bay	Dec-16	

Management Approach 2: Protect existing Submerged Aquatic Vegetation in the Chesapeake Bay

Key Action** *Description of work/project. Define each major action step on its own row. Identify specific program that will be used to achieve action.*	**Performance Target(s)** *Identify incremental steps to achieve Key Action.*	**Participating Entity** *Identify responsible partner for each step.*	**Geographic Location**	**Timeline** *Identify completion date (month & year) for each step)*	Factors Influencing and/or Gap *Identify related factor or gap in Management Strategy*
3.Evaluate and enhance current statutes and regulations that protect existing SAV in the Chesapeake Bay.	1) Assemble all current statutes and regulations that protect existing SAV in the Chesapeake Bay from human activities that contribute to its direct loss.	SAV Workgroup	Chesapeake Bay	If funded, evaluation would take approximately one year to complete.	Funding
	2) Review current statutes and regulations for both strengths and weaknesses, with particular attention paid to consistency of protection between Bay states, loopholes, unintended detrimental consequences related to the prioritized protection of other Bay resources, and general inadequacies.				
	3) Review and summarize regulations designed to protect SAV, and their efficacy, in other states, such as Florida and Washington.				
	4) Make policy recommendations based on review of current Chesapeake Bay state regulations compared to other state regulations that may be more thorough and successful.				

4. Monitor SAV throughout Chesapeake Bay	Continue annual Bay-wide aerial SAV monitoring to ensure up to date data regarding the extent and recovery of SAV in the Chesapeake Bay and its tributaries. This data is essential to the protection of existing SAV and is an indicator of water clarity standards.	VIMS (Orth, Wilcox) (with funding support from the EPA, VA DEQ, VA CZM (NOAA), and MD DNR)	DC, MD, VA Chesapeake Bay	To be conducted annually during growing season for as long as funding is available.	$100,000 gap. Additional funds/financial partners necessary to continue project.
	Conduct workshop to Align the Chesapeake Bay SAV Aerial and Ground Surveys' Designs with Multiple Management Applications to Expand the Number and Diversity of Funding Partners	SAV Workgroup, EPA grant managers, SAV survey data users	Annapolis, MD	Within 2 year time frame	
	Continue long-term monitoring of SAV sites throughout the Bay	MD DNR, Resource Assessment Service (Karrh)	Six long -term transect sites throughout MD portion of Bay	Monitored annually during growing season	
		VIMS (Orth, Richardson)	Virginia portion of Bay, 3 eastern and 21 western shore transects	Monitored annually during growing season	
		VIMS (Shields)	York River	Monitored annually during growing season	

		FWS (McGowan)	Poplar Harbor, Harbor Cove, Lowes Point, Cabin Cove, Front Creek, Back Creek, Tilghman Island (Harris Creek side).	Surveyed three times annually in May, July, September	
		BaCo DEPS (Witcher)	Baltimore Co. waterways	Monitored annually during growing season	
	Conduct and share information on site specific surveys performed to determine the existence and health of SAV on DoD installations.	DoD	stallations where app	2016	
5. Manage invasive species (both plant and animal) that are considered detrimental to existing SAV populations (ie. Trapa natans, Mute swan).	Control Mute Swans	MD DNR	MD	On-going effort	
	Control Mute Swans	FWS	MD	On-going effort	
	Control Mute Swans	NPS	MD/VA	On-going effort	
	Manage Trapa natans (Water chestnut)	MD DNR (Lewandowski)	MD, mostly Sassafrass and Gunpowder Rivers	Removal is conducted annually during peak biomass	
		USGS (Rybicki)	MD/VA	Removal is conducted annually during peak biomass	

	Manage Trapa natans (Water chestnut)	VA DGIF	VA, Potomac River	Removal is conducted annually during peak biomass	
6. Work towards determining the economic value of SAV ecosystem services. Knowing the economic value of a resource is vital to its long-term protection.	Completed as part of TS III	UMCES (Wainger)	Chesapeake Bay	2016	
	Completed as part of TS III	GMU (Kennedy)	Chesapeake Bay	2016	
	Evaluate total value of ecosystem services in MD	MD DNR (Campbell)	MD, Chesapeake Bay	On-going effort, no completion date established	

Management Approach 3: Restore Submerged Aquatic Vegetation in the Chesapeake Bay					
Key Action** *Description of work/project. Define each major action step on its own row. Identify specific program that will be used to achieve action.*	**Performance Target(s)** *Identify incremental steps to achieve Key Action.*	**Participating Entity** *Identify responsible partner for each step.*	**Geographic Location**	**Timeline** *Identify completion date (month & year) for each step)*	Factors Influencing and/or Gap *Identify related factor or gap in Management Strategy*
7. Plant, at minumum, 20 acres of SAV seeds and propagules in appropriate high water quality/clarity areas each year until goal is reached.	Collects *Vallisneria americana* seeds, store seeds, disperse seeds (150,000 seeds per acre, surveyed for germination the following spring, then annually for persistence)	MD DNR, Resource Assessment Service (Lewandowski)	Meso and Oligohaline portion of Bay	Planting takes place annually	Restoration efforts are dependent on seed collection, storage, weather, etc.
	Collects *Zostera marina* seeds, store seeds, disperse seeds (150,000 seeds per acre, surveyed for germination the following spring, then annually for persistence)	VIMS (Orth)	Polyhaline portion of Bay/mostly James River	Planting takes place annually	Restoration efforts are dependent on seed collection, storage, weather, etc.

8. Look for opportunities to optimize conditions that would allow for the natural or assisted restoration of SAV when possible and appropriate in the course of completing other non-SAV specific projects.	For each Corp project: 1. Review site for SAV suitability. 2. Confer with MD DNR regarding SAV suitability. 3. If site is appropriate for SAV restoration, determine if natural may occur or if assisted is necessary. 4. If assisted is necessary, work with MD DNR to determine next steps. 5. Monitor for success if applicable.	USACE- Baltimore (Gomez)	Chesapeake Bay	Continuous and on-going effort	Restoration efforts will be dependent on project

Management Approach 4: Enhance Research, Citizen Involvement, and Education in the Chesapeake Bay watershed					
Key Action** *Description of work/project. Define each major action step on its own row. Identify specific program that will be used to achieve action.*	**Performance Target(s)** *Identify incremental steps to achieve Key Action.*	**Participating Entity** *Identify responsible partner for each step.*	**Geographic Location**	**Timeline** *Identify completion date (month & year) for each step)*	Factors Influencing and/or Gap *Identify related factor or gap in Management Strategy*
9. Advance knowledge in the fields of SAV Biology, Ecology, and Genetics.	Increase knowledge regarding the biology and ecology of SAV species throughout the Bay.	UMCES - HPL (Kemp, Gurbisz)	Susquehanna Flats	Spring 2016	
		AACC (Ailstock, Norman)	Magothy River	On-going effort	
		USGS (Rybicki)	Susquehanna Flats	On-going effort	
		VIMS (Orth, Moore, Duffy)	Virginia portion of Bay	On-going effort	
	Work towards determining connectivity among source beds that act as a source of	UMD (Neel)	Potomac River	2018	
		UMD (Neel, in partnership with Engelhart at UMCES-AL)	northern Bay	2016-2018	

	seed/genetic material over varying spatial scales.	UMCES - CBL (Harris)	Coastal Bays, with implications for polyhaline portion of lower Bay	May 2016	
	Further understanding of SAV reproduction and persistence strategies.	UVA (Bricker)	polyhaline/VA portion of Bay	On-going effort	
10. Advance knowledge regarding the effects of human induced stressors on SAV, including those of Climate Change.	Increase understanding of SAV community dynamics and response to stressors.	SERC (Weller, Patrick, Hannam, Orth, Wilcox)	Chesapeake Bay	Dec. 2017	
		UMCES - HPL (Kemp, Gurbisz)	Susquehanna Flats	Fall 2011 - Spring 2016	
		USGS (Rybicki)	Susquehanna Flats	On-going effort	
		UMD (Neel)	northern Bay	2017	
		UMCES - CBL (Harris)	Model - General	Aug-16	
	Determine the extent to which watershed land-use impacts SAV survival and growth.	SERC (Weller, Patrick, Hannam) Modelling component.	Chesapeake Bay	Dec. 2017	
		MD DNR, Resource Assessment Service (Karrh)	Chesapeake Bay	December 2016	
	Determine the extent to which shoreline armoring influences existing SAV abundance and distribution	SERC (Patrick, Weller, Hannam)	Chesapeake Bay	Dec. 2017	
		MD DNR, Resource Assessment Service (Karrh)	Chesapeake Bay	December 2016	
		MD DNR, Resource Assessment Service (Karrh) / FWS (Whitbeck)	Smith Island / Martin State Wildlife Refuge / Eastern Neck	2016	

	Identify and map propellar scars due to commercial fishing activities and map their recovery trajectories.	VIMS (Orth)	Lower Bay, Polyhaline areas	on going	Funding from VMRC pending approval from the Commission each year. Potential $20,000 gap.
	Determine the extent to which living shorelines impact SAV abundance and distribution.	MD DNR, Resource Assessment Service (Karrh)	Chesapeake Bay	2017	Proposal in place. Funding not yet secured. Potential $4,630 gap.
	Conduct Climate impact workshop titled: An Analytical Framework for Aligning Chesapeake Bay Program (CBP) Monitoring Efforts to Support Climate Change Impact and Trend Analyses and Adaptive Management	SAV Workgroup, CBP Climate Change Coordinator, Sustainable Fisheries Goal Implementation Team	Chesapeake Bay	2017	Dependent on STAC funding.
	Work towards determining if success rate increases if a primary colonizing species is planted first, followed by a climax species.	AACC (Ailstock)	Magothy River	On-going effort	
		UMCES - HPL (Kemp, Murray)	Chesapeake Bay	On-going effort	
	Attempt to identify the conditions under which planting multiple species in the same location are likely to increase the chances of population survival.	AACC (Ailstock)	Magothy River	On-going effort	
	Attempt to identify and select species with characteristics that maximize ecological function.	UMCES - AL (Engelhardt)	northern Bay	2016-2018	Funding
	Work towards determining the conditions	UMD (Neel)	Potomac River	2017	

11. Advance knowledge of SAV restoration techniques.	Work towards determining the conditions under which planting multiple genotypes and locally adapted genotypes are likely to increase chances of population survival.	UMCES - AL (Engelhardt)	Greenhouse, using oligohaline, northern Bay species	On-going effort	
	Work towards determining at what density and spatial arrangement SAV should be planted to maximize growth and survival.	AACC (Ailstock/Norman)	Magothy River	On-going effort	
		VIMS (Orth)	lower Bay, polyhaline areas	On-going effort	
		VIMS (Moore)	lower Bay, polyhaline areas	2018	Funding
		MD DNR, Resource Assessment Service (Lewandowski)	Chester River	2017	
	Continue SAV Modeling effort with implications for restoration and climate issues in general.	UMCES CBL (Harris)	Delmarva, with implications for Polyhaline portions of the Bay	Feb 2016	
12. Complete and publish the third Technical Synthesis of research regarding SAV in the Chesapeake Bay. This document will highlight everything that is known, to date, regarding SAV in the Chesapeake Bay.	1. Identify chapters/topics necessary. 2. Assign chapter authors. 3. Draft and review. 4. Finalize. 5. Publish as TS III. 6. Publish as individual articles.	SAV Workgroup (multiple authors)	Chesapeake Bay	June, 2016	
13. Develop a communication strategy that enhances the public's knowledge of and appreciation for SAV in the Chesapeake Bay, similar to the models used to advance oyster and other wildlife restoration efforts.	Market the importance of SAV through websites, informational signage at ramps, etc.	SAV Workgroup	Chesapeake Bay States	2018	Funding

14. The Chesapeake Bay Commission will work collaboratively with the Bay Program partners to identify legislative, budgetary and policy needs to advance the goals of the Chesapeake Watershed Agreement. We will, in turn, pursue action within our member state General Assemblies and the United States Congress. See CBC Resolution #14-1 for additional information on the CBC's participation in the management strategies.		CBC	Chesapeake Bay	Dec-18	

***Note:** As a member of the Chesapeake Executive Council and a signatory to the Chesapeake Bay Watershed Agreement, the Chesapeake Bay Commission (CBC) functions as the legislative arm of the Chesapeake Bay Program working within Maryland, Pennsylvania and Virginia and at the federal level to identify specific Bay*

Acronym Guide (for all workplans)

AACC – Anne Arundel Community College
ACFHP - Atlantic Coast Fish Habitat Partnership
ACJV – Atlantic Coast Joint Venture
AgNPS – Agricultural Non-Point Source Pollution Model
Appalachian LCC - Appalachian Landscape Conservation Cooperative
ASTSWMO – Association of State and Territorial Solid Waste Management Officials
BayFAST/CAST/MAST/VAST – Federal Assessment Scenario Tool/Chesapeake AST/Maryland AST/Virginia AST
BDJV – Black Duck Joint Venture
BKT – Brook trout
BMP – Best Management Practice
CAC – CBP Citizens' Advisory Committee
CAFO – Concentrated Animal Feeding Operation

CB – Chesapeake Bay
CBC – Chesapeake Bay Commission
CBF – Chesapeake Bay Foundation
CBIBS – Chesapeake Bay Interpretive Buoy System
CBIG – Chesapeake Bay Implementation Grants
CBP – Chesapeake Bay Program
CBPO – Chesapeake Bay Program Office
CBRAP – Chesapeake Bay Regulatory and Accountability Program grants
CBSAC – Chesapeake Bay Stock Assessment Committee
CBSSC – Chesapeake Bay Sentinel Site Cooperative
CBT – Chesapeake Bay Trust
CCWC – Choose Clean Water Coalition
CEAP – Conservation Effects Assessment Project
Chessie BIBI – Chesapeake Bay Basin-wide Index of Biotic Integrity
CNMP – Comprehensive Nutrient Management Plan
CNU – Christopher Newport University
CRC – Chesapeake Research Consortium
CREP – Conservation Reserve Enhancement Program
CSN – Chesapeake Stormwater Network
CWA – Clean Water Act
DAT – CBP Diversity Action Team
DC – District of Columbia
DCNR – Pennsylvania Department of Conservation and Natural Resources
DE – Delaware
DEP – Department of Environment
DE DNREC – Delaware Department of Natural Resources and Environmental Control
DNR –Department of Natural Resources
DoD – Department of Defense
DOEE – Dist. Of Columbia Department of Energy and Environment
DOF – Department of Forestry
DOT – Department of Transportation
DST – Decision support tool
DU – Ducks Unlimited
EC – Chesapeake Executive Council

EJ SCREEN – Environmental Justice Screening and Mapping Tool
EO Strategy – Executive Order 13508 Strategy for Protecting and Restoring the Chesapeake Bay Watershed
EJ – Environmental Justice
EL – Environmental Learning
ELCSS – Environmental Literacy Challenge for Systemic Sustainability
ERP – Elizabeth River Partnership
EPA – Environmental Protection Agency
Ex Comm - Executive Committee of the Sustainable Fisheries GIT
FERC – Federal Energy Regulatory Commission
FOD – Chesapeake Bay Program Federal Office Directors
FTE – full time employee
FWG – Forest Work Group
FWS – Fish and Wildlife Service
GIS – Geographic Information System
GIT – CBP Goal Implementation Teams
GMU – George Mason University
GSA – General Services Administration
HBCUs – historically black colleges and universities
HSCD – EPA Hazardous Site Cleanup Division
HWGIT – Healthy Watershed Work Group
ICPRB – Interstate Commission on the Potomac River Basin
IPC – Interfaith Partners for the Chesapeake
LCC – Landscape Conservation Cooperatives
LGAC – CBP Local Government Advisory Committee
LL – Local Leadership
LU – Land Use
LUWG – Land Use Work Group
MATOS - Mid-Atlantic Telemetry Observing System
MB – CBP's Management Board
MD - Maryland
MDE – Maryland Department of Environment
MDSG – Maryland Sea Grant
MOU – Memorandum of Understanding
MSP – Math Science Partnership

MS4 – Municipal Separate Storm Sewer System
MWCOG – Metropolitan Washington Council on Governments
MWEEs – Meaningful Watershed Educational Experiences
MWS – Master Watershed Stewards
NAAQS – National Ambient Air Quality Standards
NALCC - North Atlantic Landscape Conservation Cooperative
NATA – National Air Toxics Assessment
NCBO – NOAA Chesapeake Bay Office
NGO – Non-government organization
NEIEN – National Environmental Information Exchange Network
NERR – Chesapeake Bay National Estuarine Research Reserve
NFWF – National Fish and Wildlife Foundation
NOAA – National Oceanic and Atmospheric Administration
NP – National Parks
NPDES – National Pollutant Discharge Elimination System
NRCS – Natural Resources Conservation Service
NPS – National Park Service
NYS DEC – New York State Department of Environmental Control
ODU – Old Dominion University
ORES – Oyster Reef Ecosystem Services
ORP – Oyster Recovery Partnership
OSSE – Office of the State Superintendent of Education
PA – Pennsylvania
PA DEP – Pennsylvania Department of Environmental Protection
PCB – polychlorinated biphenyl
PMP -- Pollution Minimization Plan
PRFC – Potomac River Fisheries Commission
PSC – CBP's Principles' Staff Committee
QA – quality assurance
RFB – Riparian Forest Buffer
RMNs - Regional Monitoring Networks
SAV – Submerged Aquatic Vegetation
SERC - Smithsonian Environmental Research Center
SHWG – Stream Health Work Group

SRBC -- Susquehanna River Basin Commission
STAC – CBP Scientific and Technical Advisory Committee
STAR – CBP Scientific and Technical Assessment Research team
TCW – Toxics Contaminants Workgroup
TEA - Tidewater Ecosystem Assessment Division of MD DNR
TMDL – Total Maximum Daily Load
TNC – The Nature Conservancy
TSCA – Toxic Substance Control Act
UMBC – University of Maryland Baltimore County
UMCES – University of Maryland Center for Environmental Science
UMCES-CBL – University of Maryland Center for Environmental Science-Chesapeake Biological Lab
UMD – University of Maryland
USACE – U.S. Army Corps of Engineers
USDA – U.S. Department of Agriculture
USFWS – U.S. Fish and Wildlife Service
USFS – U.S. Forest Service
USGS – U.S. Geological Survey
UVA – University of Virginia
VA – Virginia
VCU – Virginia Commonwealth University
VA CZM – Virginia Coastal Zone Management
VBOE – Virginia Board of Education
VDGIF – Virginia Department of Game and Inland Fisheries
VIMS – Virginia Institute of Marine Science

Virginia DEQ – Virginia Department of Environmental Quality
VMRC – Virginia Marine Resources Commission
WG – work group
WIP – Watershed Implementation Plan
WQN - Water Quality Network