

Submerged Aquatic Vegetation Financing Report

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Introduction

The following report is a product of the submerged aquatic vegetation (SAV) financing project that was implemented by the Chesapeake Bay Program (CBP) Budget and Finance Workgroup in 2018. In addition to a brief description of the project process and background information, the report provides a summary description of the key issues and concerns associated with SAV recovery that were discussed during the project's three forums. Finally, we offer options for moving forward with SAV funding and financing initiatives.

Background and intention

Submerged aquatic vegetation (SAV) is an important natural resource in the Chesapeake Bay. SAV meadows and fringing beds contribute extensively to the Bay's ecosystem dynamics and provide numerous ecosystem services. These services include the provision of food, habitat, and nursery grounds for commercially and recreationally important finfish and shellfish; sustenance for resident and migrating waterfowl; uptake of excess nutrients which reduces the prevalence of algae blooms; and the reduction of wave and current energy which promotes water clarity and reduces the potential for shoreline erosion. Furthermore, SAV is an important tool for mitigating climate impacts: it sequesters carbon and buffers coastal acidification.

For these reasons and more, the Chesapeake Bay Watershed Agreement dictates an SAV Outcome as follows: Sustain and increase the habitat benefits of SAV (underwater grasses) in the Chesapeake Bay. Achieve and sustain the ultimate outcome of 185,000 acres of SAV Bay-wide necessary for a restored Bay. Progress toward this ultimate outcome will be measured against a target of 90,000 acres by 2017 and 130,000 acres by 2025.

To attain this outcome, the SAV Workgroup has identified [four primary management strategies](#), each with associated actions that were determined necessary to restore the Bay's SAV.

The "*Submerged Aquatic Vegetation Financing Strategy Scoping Project*" was implemented by the Budget and Finance Workgroup at the Chesapeake Bay Program (CBP) to provide the SAV Workgroup, as well as the Management Board, with a

framework for financing the key actions determined necessary for SAV recovery. More specifically, the goal of the project was to identify financing and funding options that would enable programmatic experts within the CBP system to engage and influence internal budgetary processes as well as external financing processes. With that in mind, the Budget and Finance Workgroup implemented three dialogue sessions, each of which included SAV issue experts as well as financing and budget experts. The intention was to focus on financing SAV priorities, and to assess the connection to other Chesapeake Bay restoration priorities.

The three dialogue sessions were progressively more expansive in participation and discussion. The three-meeting concept was successful at identifying the key issues and barriers associated with accelerating SAV recovery, as well as understanding the pertinent stakeholders and their potential impact on the financial options for consideration. Meeting #1 was a brainstorming event with a core group of technical stakeholders and an initial financial system was identified. The meeting focused mostly on assessing the SAV restoration financing problems and issues associated with funding the SAV survey and financing restoration. Meeting #2 involved more participation from management and financing to get buy in on the draft financial system. Meeting #3 involved the financial experts that vetted the financial system.

Summary Findings

A focus on two issues: SAV survey and SAV restoration and recovery. The discussions that occurred within each meeting centered around two issues: funding the SAV annual survey, and financing SAV and water quality restoration activities. Though there are certainly linkages between the two, they are in fact mutually exclusive issues as it relates to budgeting and financing. The SAV survey is primarily an internal budgetary issue and dilemma, while SAV recovery and restoration is primarily, at least in concept, an external financing issue and challenge.

The importance of the SAV survey within the Chesapeake Bay Program and SAV community. The annual SAV survey, which is conducted by the Virginia Institute of Marine Sciences (VIMS), was the primary issue of concern for many dialogue participants; and in fact, it has been a primary issue of concern within the Bay Program for some time. The sophistication of the annual survey and its results, which is funded with a combination of federal and state resources, are used by an increasing number of governments and institutions. Therefore, the cost associated with completing the survey and analyzing survey data has increased to approximately \$800,000 annually. The funding supporting the entire process is variable and increasingly inconsistent. For many participants in the three dialogue sessions, this was the primary issue and concern.

Because the survey is necessary to gauge SAV recovery (and by extension, Chesapeake Bay recovery) and informs restoration activities, financial support for the survey has become essential. Unfortunately, that support has been inconsistent over the past few

years, and as a result, there is increasing pressure to generate more public federal funding to support the survey process. As a result, the funding process has become primarily an ongoing internal budgetary concern within the CBP as well as within the jurisdictions and communities within the partnership.

Financing and funding SAV recovery and restoration is directly related to the conditions impacting that recovery. In contrast to the SAV survey, SAV recovery is, at least conceptually, an external financing issue. Specifically, the level of SAV recovery can be attributed to three primary dynamics: overall ecosystem health, measured primarily in terms of water quality; SAV restoration activity; and, protecting SAV habitat from the impacts of development activity.

1. Ecosystem health: perhaps the most significant contributor to SAV health and recovery is water quality, and as a result SAV ecosystem health is a critical indicator of overall ecosystem health. One of the consistent themes of discussion during the three dialogue sessions was the need for continued efforts to restore and protect water quality due to its impact on SAV health. Therefore, one of the most effective SAV recovery financing mechanisms is water quality restoration and protection watershed-wide.
2. SAV restoration activity: SAV restoration very closely mirrors land-based restoration processes in regard to funding and financing. Specifically, restoration activity is primarily, though not exclusively, funded and supported through public and nonprofit investment. As a result, SAV restoration activities are inextricably linked to water quality restoration activities. This connection is positive, in that funding water quality best management practices is very beneficial to SAV recovery and necessary to create the conditions needed for SAV restoration activities to succeed and for SAV to naturally expand in an area.
3. SAV habitat protection: the third mitigating factor associated with SAV recovery is impact to habitat from watershed land use. Though the total impact that watershed land use has on SAV recovery efforts was not discussed in depth during the three dialogue sessions, what is clear is that impacts from development, most specifically direct impacts from shoreline development, are real and need to be mitigated moving forward. Interestingly, the link between SAV restoration and habitat destruction from development activity goes beyond the ecological and ecosystem link; it also extends to the financing system. Specifically, the expanded use of regulatory-based financing processes through development mitigation, permitting fees, and fee in lieu of mitigation programs, would result in increased restoration activity. Though this would presumably result in a state of equilibrium, this in and of itself would take the pressure off restoration funding resources.

The true value of SAV is not included in the economic and financing systems. SAV has become a classic externality in the financing and economic systems. In other words, the value of healthy SAV habitat, though real and apparent to actors in both the public and private sectors, is not captured in the economic and financing processes. As a result, direct intervention in SAV restoration and protection will require one or more of three

financing approaches: increasing public expenditures to support restoration and protection activity (primarily a budgetary issue); establish more restrictive regulations and associated regulatory markets; and, increase private investment through the leveraging and generation of consumer markets; establish a fee or tax system on those potentially causing negative impacts to SAV (e.g. applying for permits to conduct activities that may impact SAV) or that economically benefit from SAV restoration (e.g. the crab fishery, duck hunters). Restoration success will almost certainly require the implementation of a combination of all approaches. In addition, there is a need for an institution or a financing system that can support and advance all three of these approaches.

The externality problem extends to the SAV survey itself. In fact, one of the more interesting dialogue discussions focused on the beneficiaries of the survey. Specifically, there is an assumption that the beneficiaries of the survey results and data will not pay for those data and associated analysis. However, there was little evidence that this assumption has been tested. In fact, it is entirely possible that the budgetary processes that are currently supporting the annual survey could be replaced with a supply and demand-based financing process where the survey results would be provided for a fee to users, as opposed to being published supported by public funding. Several stakeholders did express concerns with this approach, as it was perceived to run counter to the academic ethos of information sharing along with logistical challenges in matching existing federal and state funding with revenue generated through fees.

The role of the Chesapeake Bay Program and the Budget and Finance Workgroup in the financing and budgeting process. Finally, we address the project process itself. The diverse nature of the SAV recovery effort, specifically the combination of the budgeting and financing processes highlights the capacity limitations within the CBP to influence these two processes. In addition, it became very clear early in this process that the SAV project also highlighted the limitations of the Budget and Finance Workgroup. The workgroup's influence and expertise are more appropriately connected to informing the budgetary processes. Because the SAV financing process is centered outside the CBP structures, the workgroup's impact on those decisions and processes is extremely limited. Impacting the financing process requires impacting policy and decision-making in a way that is outside the Budget and Finance Workgroup's capacities and structure.

Despite these capacity limitations, the dialogue process and structure did enable the implementation team to identify the core issues and concerns associated with funding and financing the SAV survey as well as restoration needs and processes. However, the project implementation team was unable to secure the engagement of the appropriate financing expertise necessary for generating innovative and sustainable options for advancing SAV restoration and protection into the future. Though there are certainly a variety of logistical issues associated with this lack of participation, it was in large part due to the uncertain role of both the Budget and Finance Workgroup and the CBP in the restoration financing process. In other words, it was unclear how, if at all, the results from this effort would affect financing efforts moving forward.

Some Options for Moving Forward

In spite of the barriers associated with funding and financing the SAV annual survey and the recovery effort, there are opportunities for creating a more sustainable and efficient funding process. In addition, there are opportunities for expanding and improving the role and function of the Budget and Finance Workgroup moving forward. The first two opportunities or options were discussed directly during the three dialogues. The third is an ex post facto assessment of the Budget and Finance Workgroup in the financing processes.

Explore the use of a user pays, market-based funding program for the annual survey.

Perhaps the most important opportunity to result from this effort is ensuring a long-term and sustainable funding process for the annual survey. The survey itself does not represent the entire SAV recovery and restoration effort, but it is clear that the information and data that it generates are very important to many in the restoration and management community. For that reason, the survey is, at the very least, an important metric of restoration success. However, as with many parts of the water quality restoration effort, fiscal support for the survey has decreased and shifted through the years. This is not an indication of its importance, but it does require a new approach for generating program support. The most direct, and perhaps obvious way to generate that support is through a user pay system.

Though it is clear that the results of the annual survey are important, it is not clear that the value of the information generated is shared equally by those in the system that use that information. For example, on March 29th, 2017, the CBP convened the *Chesapeake Bay SAV Aerial and Ground Survey Design Workshop*; one goal of the workshop was to identify new and sustainable sources of funding to support the survey process. One of the unique aspects of the workshop was a survey of participants and special interests that occurred prior to the convening. In fact, the survey provided extremely important data as it relates to financing the annual SAV survey itself. For example, more than 80 respondents were asked to answer a series of questions related to the annual survey, and the responses to two questions stood out. First, respondents were asked “if annual SAV data becomes unavailable, would there be impacts to services that your organization provides?”¹ Of the 82 responses to the question, 67 answered no, there would be no impacts. While the responses were hedged when the respondents were asked to elaborate, it is clear that the survey data/results are important to many organizations and restoration activities but are not essential to many of those activities. This is of course one potentially important explanation as to why the diversity of funding has been decreasing while the cost of services has been increasing.

Equally illuminating was the follow up question: “do you have the financial and logistical capacity (necessary to collect SAV data)?” Of the more 70 respondents, 17% indicated that they would have the capacity. Though only a minority of respondents indicated they had the necessary capacity, it is an indication that there is at least the potential to

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leverage alternative mechanisms for generating data and information. In other words, it is reasonable to assume that there is more financial or technical capacity or potential capacity for developing and distributing SAV data than is currently supported in the system.

Our purpose here is not to argue against the value of the survey results or the importance of the process. Rather, our purpose is to suggest that there may be a more codified and systematic approach to identifying what that value really is and then implement a survey process and associated funding system that reflects that value. If it is determined through that evaluation that the existing system is most appropriate, efficient, and sustainable, then the CBP community can continue its efforts to increase federal and state funding with the assurance that the system is sound. However, if a more thorough analysis of the current system suggests that a new approach is necessary, there are a variety of funding models that should perhaps be considered. We address two.

- Create a “user pays” system. The costs associated with the annual survey are really focused on two outputs: the costs of acquiring raw data (the aerial survey itself); and, the costs associated with analyzing those data so that they are useful to policymaking, restoration activity, and regulatory enforcement. Assuming the aerial survey itself is necessary (an assumption we test below) then the primary value added provided in the current system is the data analysis. The most obvious change in the financing system would be to make this service available only to those who pay for it. This would not have to be an “all or nothing” system. Specifically, the more federal funding that is generated (assuming EPA and the federal government remain the primary supporters of the program) then the lower the charge for the analysis would be. Certainly there are policy and procurement issues to overcome, such as the limitation on program related revenue in connection with federal support, but there is plenty of precedent for working around and in conjunction with those limitations. The bottom line is in fact the bottom line. If the data produced as a part of the survey process have value, then incorporating that value into the funding and budgeting system is essential.
- Move towards a disaggregated survey process or remote sensing solution. It is possible that the technology used to gather the raw data, i.e. through aerial surveys via small aircraft, is the most efficient method currently available. However, it is also reasonable to assume that there are other technologies available to states and local jurisdictions to gather those data. Technology continues to move and advance, and the CBP should lead an effort to anticipate where those technologies will advance to on this issue and then develop a financing system that will be out in front of those changes. Specifically, the CBP should support investigations of alternative technologies to survey SAV recovery and then support efforts to aggregate those data for a broader assessment of the entire ecosystem. The use of satellite data, for example, should be considered if satellite imagery can be acquired for less than is currently paid for aerial imagery and if the resolution is adequate for data

interpretation. There are efforts either ongoing or planned to find a remote sensing solution for SAV mapping: the Maryland Coastal Bays Program recently engaged in a project with NASA to use satellite imagery to map SAV in the Coastal Bays and a STAC workshop will be convened in 2020 on SAV mapping remote sensing solutions for the entire Bay.

Explore the possibility of supporting the SAV survey through permit application fees

There are several instances where it is necessary to evaluate impacts on SAV when the state evaluates a permit request. These includes applications for clam dredging, oyster aquaculture, dock building or alteration, and shoreline alterations. The group discussed applying an additional fee to these applications that would go towards paying for the annual survey, as it provides the information necessary to do these permit evaluations. It was estimated that this type of permit numbers less than 1000 per year, so it is probably not realistic to completely support the survey through additional permit fees; this income stream would supplement existing federal and state funding. If this is deemed a viable option by Maryland, Virginia, or both, further study should be done to determine an appropriate price point for the different permit types and to more accurately estimate the annual revenue generation potential.

Require in-kind mitigation for SAV impacts

Maryland DNR is exploring requiring in-kind mitigation for SAV impacts in the state. Currently, wetland mitigation can be required when SAV is negatively impacted, but this is less than desirable both from a resource protection and cost perspective. Wetlands play a different ecological role than SAV beds, so replacing one with the other will result in the loss of important ecological functions and ecosystem services. Wetland mitigation is also often very costly, up to and sometimes exceeding \$50,000 per acre restored. SAV restoration cost is variable as well, with planting SAV plugs on par with wetland restoration but the broadcasting of grass seeds is significantly more affordable, especially when using a volunteer labor force. A potentially limiting factor, however, is the availability of seeds, with current production being limited to a few academic institutions. In response, Maryland is exploring what would be necessary to scale up production, possibly through a commercial or state supported seed production facility. Once this change is fully implemented it should have the dual benefit of decreasing costs to those conducting restoration activities in the Bay and ensuring that impacted SAV is replaced to maintain the associated ecological functions and services.

Investigate the potential for creating an external financing advisory board or task force.

Though directly engaging on external financing issues is outside the capacity of the workgroup and the CBPO, the workgroup should lead an internal effort to investigate the efficacy of an external financing board or task force. The idea of systematically engaging financing experts through this type of system became apparent as the

dialogue conversations turned towards SAV recovery, restoration, and protection efforts. Again, it is outside the capacity of the workgroup to engage on external financing issues. However, it is clear that there are a variety of innovative policy, regulatory, and institutional financing opportunities that should be pursued aggressively. In addition, an institution that is not directly connected to the restoration apparatus would have the capacity to offer objective, innovative advice on how best to move forward. One issue associated with the SAV recovery process that was discussed during the dialogue sessions highlights the need for this type of approach: establishing market-based regulatory programs to support SAV mitigation efforts.

SAV beds are very similar in many respects to other ecosystems such as wetlands, forests, and streams in that they are uniquely impacted by development activity and are therefore uniquely appropriate for market-based regulatory systems. There is an opportunity to model SAV mitigation programs on those established in these other ecosystem regulatory processes, and in fact some communities have moved in that direction. However, there is also the opportunity, at least conceptually, to connect local and state-based mitigation efforts to a broader financing system. A financing advisory board would be in a unique position to help design and recommend the innovative institutional, regulatory, and investment opportunities that would be required for and result from the implementation of this type of system. Finally, this type of regional financing system would enable Bay communities to link SAV mitigation and restoration financing with SAV survey funding, thereby creating a uniquely sustainable financing system. Again, an external financing institution would be able to lead efforts to investigate and implement this type of system.

Transition Budget and Finance Workgroup to an internal budgeting mechanism. Finally, as has been alluded to, if not stated outright, this project highlighted the need to reevaluate the role of the Budget and Finance Workgroup and perhaps adjust its structure and function moving forward. Specifically, it is recommended that the CBP consider focusing the workgroup's priorities on issues associated with budgeting and the connection to the *Chesapeake Bay Watershed Agreement* goals and implementation teams. There is no question that financing issues will have a long-term impact on each of these goals if for no other reason than the possibility that public money will continue to be limited into the future. This will require establishing processes that are efficient, effective, and multi-sectoral. Again, however, it is beyond the capacity of a workgroup within the CBP to engage on external financing issues, at least to a level that will have direct import to the committees and workgroups within the CBP. Rather, the Budget and Finance Workgroup would provide internal committees and leaders with ideas and recommendations on ensuring that existing funding can be maximized, augmented, and informed moving forward. This would be precisely what the workgroup would have the capacity and ability to accomplish, as was made clear during the implementation of the project.

Interestingly, the framework for this approach was established during the March 2017 SAV workshop. One of the stated goals of that workshop was to identify opportunities for expanding on existing SAV survey funding sources to ensure that the data and

analysis developed through that process continue to be made available. There was apparently little to no discussion related to restoration financing. Rather, the marching orders leaving the workshop was for the participants to identify additional funding sources. It is at that point that the Budget and Finance Workgroup would have had a direct opportunity to provide value to the SAV Workgroup. Rather than just look for additional funding, the Budget and Finance Workgroup could have, and should have, investigated the opportunities mentioned above. They would have been controversial and perhaps too far beyond current thinking, but the process would have set in place a new way of generating and analyzing ideas and would almost certainly have advanced the ball in regard to innovation and critical thinking. In fact, that is what the Budget and Finance Workgroup should have focused on in this project.

Conclusion

Despite the very real institutional limitations associated with this project, it is clear that the project implementation process itself may result in both a more efficient SAV funding system, as well as a more effective Budget and Finance Workgroup. There are very real opportunities for the CBPO to advance both, and to facilitate a conversation on moving financing forward in a more open and external way.