Virginia Institute of Marine Science
CCRM
Center for
Coastal Resources Management

special report

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Recommendations for Implementing the Tidal Wetlands Mitigation-Compensation Policy

No-net-loss can be difficult to achieve when long standing practice has been to accept small losses as a matter of routine. The Virginia Marine Resources Commission (VMRC) recently promulgated a Mitigation-Compensation policy that seeks to change this practice (see page 2). Wetlands boards are now confronted with the need to finally achieve the no-net-loss goal that has been espoused at the state and federal levels of government for years. Implementation of the new policy is raising lots of questions. In response, the Center for Coastal Resources Management (CCRM) at the Virginia Institute of Marine Science offers the following recommendations for the decisions confronted in implementing the policy.

Tidal wetlands under the purview of local wetlands boards and the Virginia Marine Resources Commission (VMRC) include both vegetated and non-vegetated wetlands. The guidelines promulgated by VMRC specifically identify the types of tidal wetlands found in Virginia and rank them in terms of overall ecological value. Both vegetated and non-vegetated wetlands are considered valuable, with non-vegetated wetlands performing a number of important functions. While this information was developed over 30 years ago, it is still scientifically defensible and it remains useful for current decision-making. ***We recommend that VMRC and wetlands boards consider both vegetated and non-vegetated wetlands in implementing the no-net-loss policy.***

CCRM Recommendations

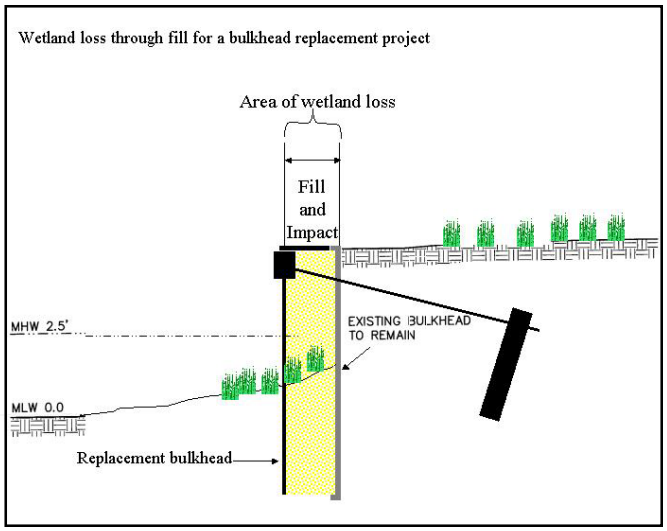
- *impacts to both vegetated and non-vegetated wetlands should be considered*
- *avoidance of impacts should be the primary objective*
- *compensation ratios generally need to be greater than 1:1*
- *onsite compensation should be treated like creation of a private wetlands bank*
- *monitoring of compensation sites should extend for at least 10 years*
- *in-lieu fees should be set at approximately 5 times the cost of an acre of undeveloped riparian land for every acre of wetlands filled*
- *properly designed and sited "living shoreline" projects should require no compensation*

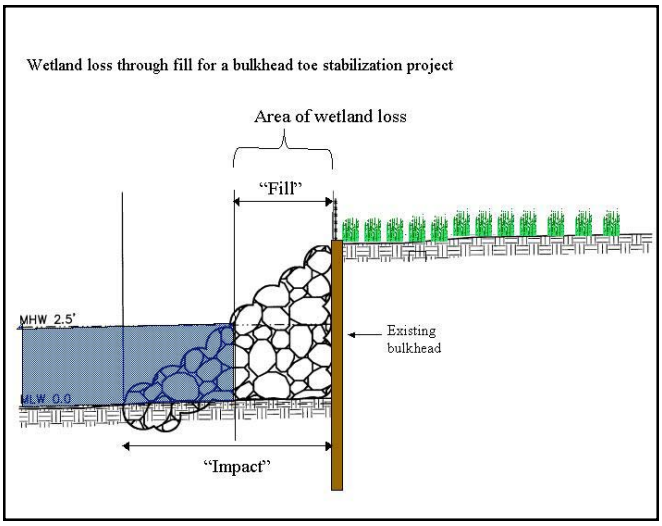
Sequencing

The guidance for regulation of wetland losses contained in the law and promulgated by VMRC calls for strict adherence to the "sequencing" protocol. Under this approach, the first and highest priority in regulatory decisions is to avoid resource losses whenever possible. In general, wetlands are permanently lost from the aquatic ecosystem when they are filled to create upland. Redesigning projects to avoid fill is a management strategy that has been frequently ignored in an effort to accommodate property owner desires, minimize project costs, and reduce needs for regulatory oversight. ***We strongly recommend avoidance as the simplest and most assured means of achieving no-net-loss.*** (See diagrams - wetland loss through fill.)

While avoidance of fill is the first and most practical way to achieve no-net-loss, simply moving proposed shoreline structures landward to get out of jurisdictional wetlands is not always an optimal strategy from an environmental perspective. Our understanding of processes along shorelines has advanced, and we now recognize there are times when loss of the riparian buffer can be as detrimental to the overall system as loss of intertidal wetlands. CCRM is currently developing guidance to identify these circumstances and help make appropriate decisions from the ecosystem perspective.

Avoidance of wetland loss can and should involve much more than simple relocation of project elements. The first question should always be "Is the project necessary?" Too often this question is simply bypassed, and the option of avoiding loss of wetlands by not constructing the project is never really considered. Inappropriate and unnecessary structures are evident along many shorelines in Virginia. Permitting





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Summary of key Mitigation-Compensation Policy elements:

A. Three criteria must be met for authorization of an activity which destroys wetlands:
   1. All reasonable mitigative actions, including alternate siting, which would eliminate or minimize wetlands loss or disturbance, must be incorporated into the proposal.
   2. The proposal must clearly be water-dependent in nature.
   3. The proposal must demonstrate clearly its need to be in the wetlands.

B. There are three compensation options for unavoidable wetlands loss. The sequence of the options should be as follows:
   1. On-site,
   2. Off-site within the same watershed or mitigation bank in the watershed,
   3. Payment of an in-lieu fee.

The policy specifies details for consideration in the use of the various approaches. For on-site and off-site compensation (wetlands creation) these include:

- A detailed plan
- Pre-planting elevation inspection
- Performance bond
- Appropriate replacement ratio
- Compensation in advance, or concurrent with, approved activity
- Siting in a non-aquatic community
- Nonvegetated wetlands should be treated on an equal basis
- Monitoring
- Perpetual easement over compensation area.

The Commission's Guidelines for the Establishment, Use and Operation of Tidal Wetland Mitigation Banks in Virginia details the requirement for the mitigation banking option. Unless otherwise demonstrated, the mitigation bank must be located in the same U.S.G.S cataloging unit or adjacent unit in the same watershed as the authorized activity to be acceptable compensation.

The use of in-lieu fees as the final option requires demonstration that on-site or off-site compensation is not practical and no mitigation bank is located in the project watershed. The fee amount should be no less than the cost of compensation acreage or purchase of approved bank credits. Fees collected should be traced to the eventual use in wetland restoration or creation projects.

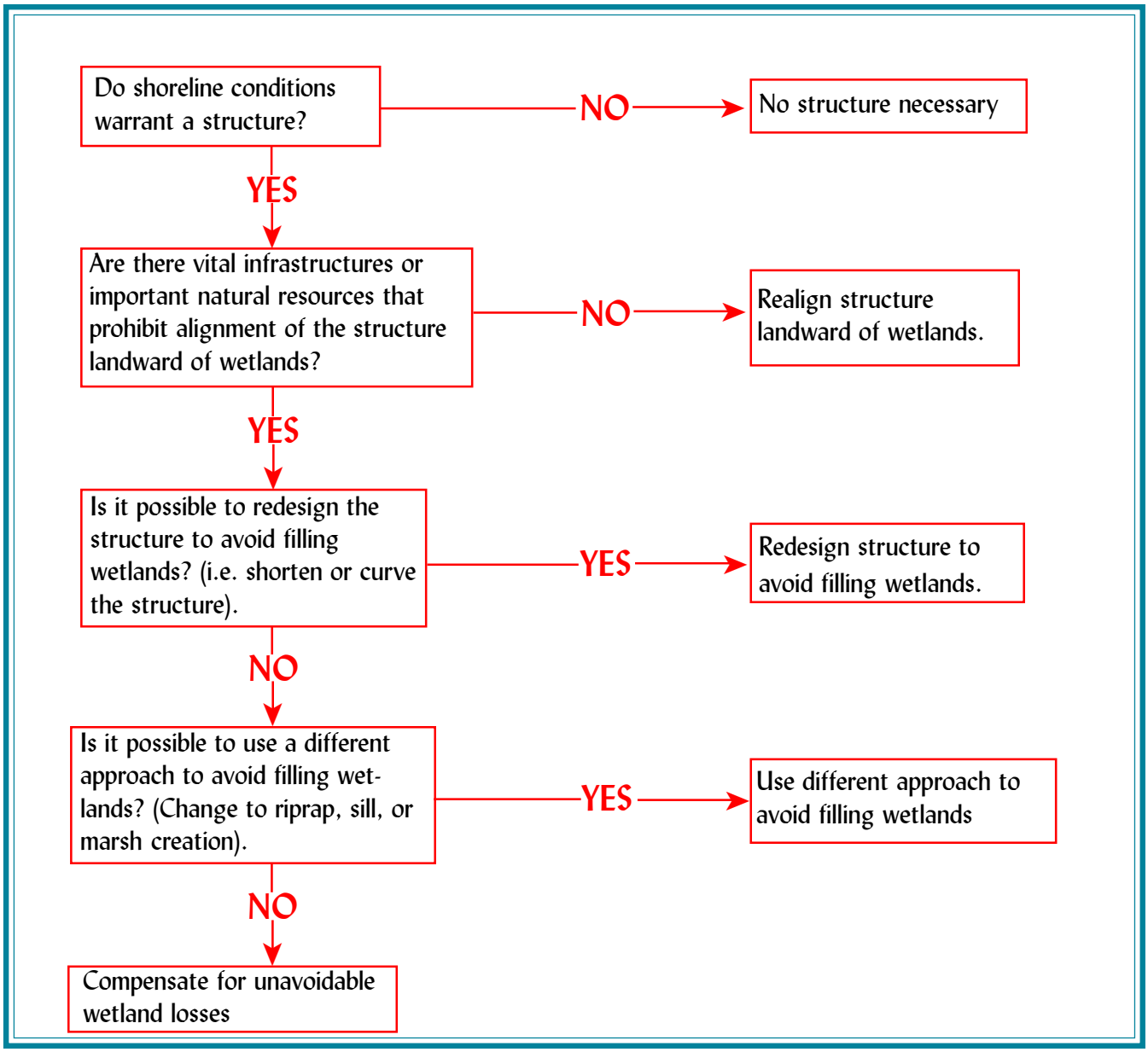
such projects makes achieving no-net-loss much more difficult. (See unavoidable fill decision tree below.)

Minimizing wetland losses associated with necessary projects has generally been part of wetland board discussions. Unfortunately, most boards have operated with the understanding that some minor losses were acceptable. The cumulative result has been a slow but constant loss of wetland resources. VMRC's no-net-loss policy now directs boards to require compensation for even these small losses. The universal question is how should this be accomplished.

CCRM recommends three options: 1 - on-site compensation (i.e. establishment of a private wetlands bank); 2 – offsite compensation or use of a commercial wetlands bank; or 3 - collection of a fee that the locality will use to offset cumulative wetland losses from a number of projects.

On-site compensation

A common strategy in compensation for wetland losses has been the requirement for an applicant to create equivalent wetlands on the project site or nearby. It is the opinion of the CCRM scientists who



have worked with this option over the past 30 years that it has generally not succeeded in generating significant compensation. There are many reasons why this is the case, but basically they all result in a very low probability that the compensatory wetlands will achieve a sustainable level of function. In view of this circumstance, ***we believe wetlands boards should generally require compensation at a ratio of greater than 1 acre of created wetlands for each acre of filled wetlands*** (see box below).

In addition, to reduce the risk that wetlands created on-site will fail without proper design and monitoring, ***we recommend that wetland boards treat every proposal to replace wetlands onsite or nearby just like the creation of a private wetlands bank*** (see box below). At a minimum this should involve a requirement for long-term monitoring and reporting. ***We strongly recommend requiring monitoring to ensure success for a period of at least 10 years.***

Offsite Compensation and Wetland Banks

Offsite compensation involves creating a replacement wetland on another piece of property that may or may not have similar characteristics to the filled site. Commercial wetland banks are wetlands created specifically in anticipation of selling the compensation "credits" they represent. Some wetland banks are already in existence, although they are not available for use in all areas. There are explicit guidance and requirements for establishment and operation of these banks, and once established they afford a project applicant and a wetlands board a relatively certain success in replacing lost wetlands. However, it is important for boards to remember that 1000 square feet of natural marsh along a shoreline cannot always be replaced by 1000 square feet of created marsh in a wetland

The amount of wetlands it takes to replace lost wetlands should consider:

- the degree to which created wetlands can perform the same functions as the lost wetlands;
- the probability that created wetlands will be successfully established and sustained; and
- the length of time it will take created wetlands to reach their maximum level of function.

In general, created wetlands cannot fully match the performance of natural wetlands for many years, if ever. This is due in part to the time required to develop the biogeochemical conditions found in natural wetland soils. At best this can take several years, more typically it requires decades. Additionally, wetland creation is often not completely successful because of the difficulty in fully replicating natural hydrologic conditions, and the challenge of controlling invasive or less desirable plant and animal species. The result can be significant reductions, for significant periods, in functions such as habitat services and water quality modification.

The most direct way to compensate for these temporary and/or permanent reductions in services is to create more than one acre of wetlands for every acre of wetlands lost. Assuming a relatively high probability of success in establishing created wetlands, and allowing 3 to 5 years to achieve maximum performance potential, most projects would require compensation ratios around 1.5 created acres for every 1 acre lost.

CCRM is developing guidance to assist wetlands boards in estimation of appropriate compensation ratios. In the interim we recommend boards strive for greater than 1:1 compensation whenever possible.

bank. Wetland functions are affected by the surrounding landscape and so achieving no-net-loss of function can require a greater than 1:1 ratio of created to filled wetlands. The VMRC and CCRM have had guidance for this evaluation available for some time.

CCRM recommends that wetland boards use this guidance to establish the compensation ratio requirement whenever a project will use either off-site compensation or a commercial wetland bank to achieve no-net-loss.

If on-site compensatory mitigation is proposed, the following criteria, as outlined in the *Guidelines for the Establishment, Use, and Operation of Tidal Wetland Mitigation Banks in Virginia* (http://www.mrc.virginia.gov/regulations/bankguide.shtm; developed jointly by VMRC and VIMS), are recommended for planning and monitoring of the mitigation site in order to increase the likelihood of success.

Planning Requirements

When considering approval of on-site mitigation, local wetlands boards and VMRC should request a prospectus from the applicant that includes information on the objectives for the site and how it will be established and monitored, and should include the following:

a. Site goals and objectives;
b. Ownership or other legally responsible party;
c. Mitigation site size and wetland community type(s), as defined by the Commission's Wetlands Guidelines, including baseline conditions, site plan and specifications;
d. Reporting protocols and monitoring plan;
e. Contingency and remedial actions and responsibilities;
f. Financial assurances to include a performance bond or letter of credit to remain until the wetland has become established according to the established success criteria;
g. Provisions for long-term management and maintenance, including the establishment of a protective easement for the mitigation site

Success Criteria

Local wetlands boards and VMRC should use the following performance standards to determine the level of success of on-site tidal mitigation:

a. A mitigation plan including specific marsh design and final elevation plans.
b. Establishment and verification of proper tidal hydrology and substrate elevations relative to on-site tidal datum and satisfactory planting of mitigation site with proper wetland vegetation which clearly demonstrates an initiation of the wetland community type(s) specified in the mitigation plan.
c. Minimum of 80% survival of plantings after the first growing season. If plant mortalities exceed 20%, the sponsor will have to replace those plantings or implement other remedial actions specified in the mitigation plan.
d. Minimum 50% plant cover after one growing season.
e. Natural increase in the accumulation of organics in the site substrate.
f. Natural recruitment of plant species within the site.
g. Increasing primary production during the first three years.
h. Utilization by typical primary and secondary consumers.
i. Utilization by higher consumers (birds, mammals, fish, etc.).

In-lieu fees

It is likely that the most useful strategy for wetland boards will be establishment of a fee structure that allows applicants to compensate for unavoidable loss of wetlands by paying into a fund. The concept of "in-lieu" fees has been around for some time. There are both advantages and disadvantages to their use, but they are a practical means for addressing multiple small losses. The biggest challenge for a well-intentioned board is to establish the fees at a level sufficient to fund projects that will provide significant and ultimately equivalent ecological values. Because the rate at which fees may be accumulated will vary widely, and because project designs and costs may also vary widely, there is no set formula for determining the appropriate fee structure. ***We recommend that localities using in-lieu fees establish the rate at approximately 5 times the cost of an acre of undeveloped riparian land for every acre of wetlands filled.*** (See box below).

An in-lieu fee system operates by accepting money in place of actual construction of compensation. The rationale is that accumulation of fees from many individual projects to fund fewer large compensation projects is likely to produce more significant and more successful compensation.

Operation of a successful in-lieu fee program involves administrative costs, land acquisition costs, site improvement costs, and monitoring costs. Typically, compensation projects are not undertaken until sufficient funds have been accumulated. This results in an interval between fee collection and use during which project costs usually escalate. As a consequence of these factors, it is important that in-lieu fees be established at a high enough rate to ensure they can realistically fund future compensation. Generally this will be significantly higher than the cost of land alone.

A recent estimate of potential costs in the urban area of southeastern Virginia, resulted in a recommended fee of $51.32 per square foot of lost wetlands. This was based on administrative costs and site development costs in an area where riparian land values currently approach $1,500,000 per acre. In other areas of more moderate land values, we have recommended that fees be set at approximately 5 times the value of undeveloped riparian land.

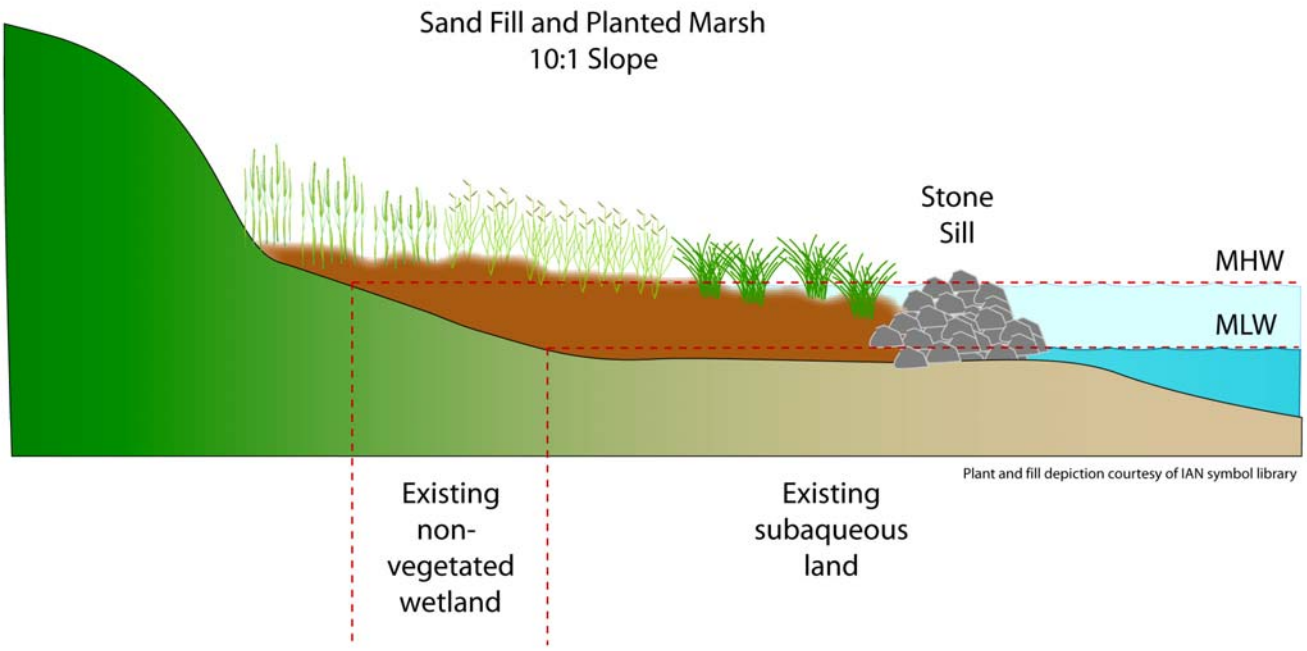
As an example, if land costs are $100,000 per acre, our recommendation would result in fees of about $11.48 per square foot. At this rate, the total in-lieu of fee for a wetland loss of 1000 square feet would amount to $11,480.

Living Shorelines

One of the most recent trends in shoreline management has involved installation of "living shorelines." This practice uses intertidal marshes combined with low-profile riprap revetments on the water-side of the marsh to stabilize shorelines and minimize erosion risks. There are numerous advantages to these structures when compared to traditional bulkheads or rock revetments. They are not suited to all shoreline environments, but where wave energies are low to moderate they should be considered.

Properly designed living shoreline projects may involve fill or conversion of some wetland areas. The low profile riprap revetment will generally cover non-vegetated wetlands or subaqueous lands. If a marsh must also be created, an even greater intertidal or subaqueous area could be converted. The issue that arises for a wetlands board is how to deal with the impacts associated with construction of a living shoreline. It is our opinion that in a properly designed and sited living shoreline project, the conversion of wetlands is beneficial. CCRM is developing guidance to assist wetlands boards in making this assessment of proposed projects. For projects that are deemed appropriate, ***we recommend that wetlands boards require no compensation for properly designed and sited living shoreline projects.***

Typical Living Shoreline Treatment

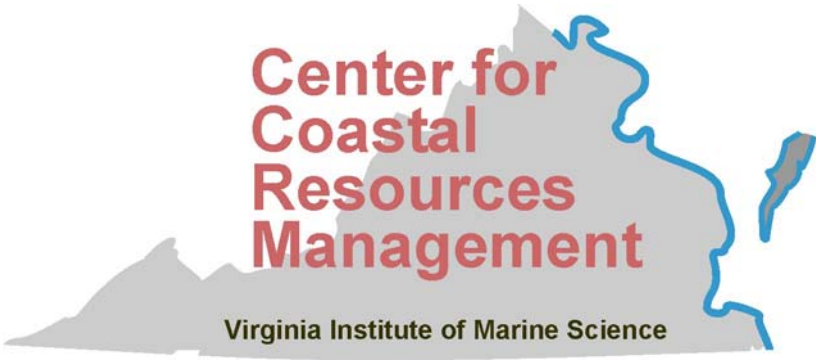


Elevations & planting widths will vary depending on site conditions.
Extent of channelward encroachment depends on extent of landward design.

Established living shoreline

Planted shoreline

Graded embankment and planted marsh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