New Hampshire
Office of Energy & Planning

WETLANDS MITIGATION/ RESTORATION ISSUES

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Introduction

Research into the functions and values inherent in wetlands has generated increasing concern with respect to the importance of protecting these vital natural areas. Wetlands function as flood storage areas, groundwater recharge/discharge systems, and wildlife habitat. They also absorb pollutants, provide nurturing areas for commercial fisheries, provide nutrients to coastal areas, and provide recreational opportunities (hunting, fishing, bird watching, photography, etc.) for the general public.

The absence of land suitable for development in coastal areas has resulted in more proposals to dredge and fill existing wetlands in order to accommodate increased growth. The potential profit to be derived from developing these wetland areas more than compensates for the initial costs of alteration. Thus, not only are developers willing to invest in alteration, but they are also proposing the use of wetlands mitigation, (specifically enhancement and/or creation) as incentive for obtaining permits. Due to the advent of such proposals and the absence of state regulations that govern wetlands replication, the Office of Energy and Planning and the New Hampshire Wetlands Board realize the need for a policy that deals specifically with this subject.

This report will examine those issues that need to be addressed in the development of state regulations that govern restoration and creation (mitigation) in tidal wetlands. (Many of these issues can also be applied to freshwater wetlands.) Any questions concerning this report should be addressed to the New Hampshire Coastal Program.

Mitigation Defined

The Council on Environmental Quality defines mitigation (40 CFR 1508.20) as actions that avoid, minimize, reduce, rectify, or compensate for the adverse impacts of development.

During the present New Hampshire wetlands permitting process, every effort is made to avoid, minimize, or reduce negative impacts while a project is still in the planning stages. Therefore, it can be stated that some types of mitigation are already employed effectively.

However, actions that purport to rectify or compensate for adverse impacts remain controversial. (Examples of rectifying and/or compensatory activities may include restoring degraded wetlands, enhancing existing wetlands, or the actual creation of new wetlands.) It is these types of mitigating actions that require special attention in order to insure that wetland areas are adequately protected.

Mitigation Controversy

There are a number of reasons why wetlands enhancement and creation are controversial, most of them scientific in nature. Although the theory of creating new wetlands or expanding existing wetlands seems sound, there is a distinct lack of scientific research that documents the success or failure of these types of mitigation efforts. On the surface, an artificially created wetland may look natural, but it remains to be proven whether such an area can function as effectively as a natural wetland. Due to the complex nature of wetlands, it seems reasonable to assume that it would be difficult at best, to reproduce the biological, hydrological, chemical, and geological conditions that allow a wetland to function in a natural state.

And, even if these things can be accomplished, it may take several years or even decades.

Another aspect of wetland creation/ enhancement that needs consideration is the type of wetland destroyed vs. the type of wetland created. Although a wetland may have several different functions, (flood storage, wildlife habitat, groundwater recharge) not all wetlands have the same functions, nor do they carry out those functions to the same degree. An example of this would be a wetland that has a high wildlife habitat value but a lesser value with respect to flood storage. Is it in the public interest to replace such a wetland with an artificial wetland that has an altogether different function, or one that has the same function but to a different degree? In any case, it would seem that a conservative policy would be most effective in dealing with the creation of new wetlands.

There is also another mitigation strategy which should be addressed when examining the issues, that of wetlands acquisition. Acquisition of wetlands on another site and turning ownership over to a public (or private non-profit) land management/conservation agency in return for permission to alter an existing tidal wetland is sometimes proposed. The option to consider this type of mitigation strategy could be useful in granting permits for public agencies that propose projects that are found to be in the public good. However, private developers should not be able to use this technique, as it would result in a loss of tidal wetlands without an overriding public benefit.

Criteria For Considering Mitigation

There is also some concern among state planners and resource managers that without specific regulations to deal with enhancement/creation, developers may offer these types of mitigation as justification in disturbing wetlands. Therefore, it becomes even more important to develop criteria for determining when it is appropriate, or not appropriate, to consider mitigation.

The State of New Jersey has enacted coastal regulations that specifically deal with wetlands mitigation (National Wetlands Newsletter, vol.8, no.5, Sept-Oct. 1986). According to these regulations, the New Jersey Division of Coastal Resources (DCR) will not even consider mitigation unless it has been proven that the proposed project meets the following criteria:

1. It is water dependent;
2. It has no prudent or feasible alternative non-wetland site;
3. It will result in minimum feasible alteration or impairment of natural tidal circulation; and
4. It will result in minimum feasible alteration or impairment of natural contour or the natural vegetation of the wetlands.

These criteria seem to be sufficiently stringent; however, it should be noted that according to New Hampshire Wetlands regulations, alteration of tidal wetlands may only be permitted if there is proven to be an overwhelming public good associated with the project. Therefore, the entity that is usually granted a permit for a project that will result in the alteration of tidal wetlands is either a state agency or a local government. Private developers are effectively prohibited from dredging/filling tidal wetlands due to the fact that these projects are not associated with public good, but with private gain.

In the case of public agencies (i.e. Department of Transportation) that propose to alter a wetlands area, even for an overwhelming public good, mitigation may be used not only as an option but as a requirement. It would seem that if such development will take place, then the agency/municipality involved could be required to show good faith by providing for the enhancement, creation, or acquisition of wetlands. This method would allow public projects to be constructed either without a net loss in wetland areas or with greater protection afforded those remaining wetlands. The protection of existing wetlands is found to be in the public good (RSA 438-A:1-b) and should be the main objective of any mitigation plan.

Replacement Ratio

As previously mentioned, the actual creation of new wetlands is still in the experimental stage. When permitting development in wetlands on the basis of replication, much consideration should be given to the amount of replacement wetland that will be required. (This also applies when using enhancement or acquisition strategies, although it is not as controversial.)

According to Shisler and Charette (1984), the minimum replacement ratio that should be allowed in most instances is 2:1. That is two artificially constructed acres of wetland for every acre altered or destroyed. The reasons for this ratio are as follows: (1) it has been found that replacement wetlands, at least in the beginning, do not function the way that natural wetlands do; and (2) by requiring that more wetlands are replaced than destroyed, at least theoretically, there should be a net gain in wetlands (if survival rate is high). Any regulations that govern the use of mitigation techniques must also clearly address the issue of replacement ratio.

Note: N.J. regs. allow for less than a 2:1 ratio if size applicant can prove. to the satisfaction of the DCR, that the project is likely to be a success.

Unique Or Environmentally Sensitive Areas

A mitigation policy that governs development in wetland areas found to have unique or special characteristics should also be addressed. In this category could be those wetlands designated as prime wetlands by the State Wetlands Board (WB) in accordance with WB regulations (Chapter Wt 700). These types of wetlands are already designated as areas needing extra protection and may be poor candidates for (construction type) mitigation. All tidal wetlands are extremely valuable and deserving of protection; however, it should be noted that there are some designated prime wetlands in coastal areas and these areas should be covered in the regulations.

Ownership and Monitoring of Replacement Wetlands

If mitigation in the form of restoration, creation, or acquisition is allowed, then regulations must designate responsibilities for ownership and monitoring of replacement wetlands. This is especially critical if the mitigation area is off-site (away from the project site).

Developers (public or private) of construction projects could be required to turn over ownership of replacement wetlands to the proper state agency (or a private, non-profit, conservation organization). This would insure their continued management and protection (at some cost to the state). However, ownership could also remain in private hands as long as protection of these areas is assured. It may be advantageous to develop regulations that have the flexibility to assign ownership on a case-by-case basis.

Monitoring of replacement areas is also an issue that needs to be considered. Newly created or enhanced wetlands will fall under the jurisdiction of the State Wetlands Board; therefore monitoring will also be the responsibility of the Board. Due to the experimental nature of wetlands construction, it is especially important to document the success or failure of mitigation efforts. This type of surveillance will have a direct bearing on the ability of the Wetlands Board to make future decisions on the effectiveness of mitigation measures. Monitoring and surveillance will require many hours of fieldwork and data analysis to be considered accurate, and this could have a financial impact on the Board (manpower and administrative costs).

Types Of Replacement Wetlands

When considering the effectiveness of mitigation techniques it is necessary to address the type and location of replacement wetlands. Construction of wetlands of a similar type at the same site as the proposed project (in-kind and on-site), are generally considered to be preferable to wetlands of a different type or at a different location (out-of-kind, and off-site). However, in some instances it may be beneficial to allow the

construction of wetlands that will provide a more valuable environment (i.e. for wildlife habitat). This would be especially effective in instances where a project will cause a minor impact on an existing wetland or a moderate impact in a low value wetland (NH Coastal Program: Final Emerging Coastal Issues Paper, 1986).

Flexible regulations that allow the consideration of different types of mitigation will enable the Wetlands Board to make determinations on a case-by-case basis. This would benefit the public good by facilitating a net gain in high wetland values. An example of mitigation standards that allow flexibility and "administrative discretion" are those developed by the State of New Jersey (National Wetlands Newsletter, vol.8, no. 5, Sept.-Oct., 1986). These regulations could be used as a model in developing mitigation rules for the New Hampshire coast.

When Should Mitigation Occur?

If mitigation measures become a permit requirement, then it becomes necessary to decide at what point during project development, mitigation will take place. New Jersey regulations require that "mitigation be performed prior to or concurrent with the wetland disturbance." This stipulation takes advantage of the fact that the Division of Coastal Resources will be able to enforce mitigation requirements more effectively during those time periods. Again, this is an area that needs consideration in order to determine what will provide the greatest benefit to the public good. New Hampshire wetlands managers may determine in some situations that mitigation measures need not take place until after construction is complete.

Negative Mitigation Impacts

There are some potential negative impacts that may result from mitigation efforts if those efforts are not carefully controlled. In an extensive study on artificial salt marshes, Shisler & Charette (1984) determined that, in many instances, other high value habitats (i.e. mud flats, marsh fringes) were used as the locations for marsh construction projects. Not only does this result in the loss of other types of valuable and productive wetlands, but the vast majority of marshes constructed in these areas fail due to high energy wave exposure, sedimentation or human disturbance.

On a similar note, the N.J. Division of Coastal Resources has specified in its mitigation regulations that, "the creation of wetlands from existing intertidal and subtidal shallows is not an acceptable form of mitigation." All tidal wetlands are valuable to the coastal environment and it is in the public interest to insure that one type of wetland is not constructed at the expense of existing wetlands (of a different kind), as this will result in an overall net loss in high value wetlands.

Mitigation Planning

Mitigation regulations should consider guidelines for the submission and review of mitigation plans. Project developers can, and should, be required to submit information that describes in detail the type of mitigation proposed, site location, ownership, impacts of mitigation, etc. If information requirements are standardized, then developers will know what is expected of them and Wetlands Board staff will be able to make decisions based on the best available information.

Construction/Restoration Guidelines

In order to insure that mitigation projects are completed in a manner that facilitates project success, guidelines should be developed for the physical construction or restoration process. According to Shisler & Charette (1984), guidelines for the construction of artificial wetlands and the restoration of disturbed wetlands could greatly improve the success of mitigation efforts. The New Jersey DCR is currently developing a mitigation handbook that will provide this type of guidance (National Wetlands Newsletter, vol.8, no.5, Sept.-Oct., 1986). Once this final guidance is issued, it will be useful to wetlands managers and scientists concerned with construction/restoration mitigation.

Sea Level Rise Mitigation

When considering the issues surrounding wetlands mitigation and the regulation of mitigation activities, it may be useful to include a discussion on sea level rise (SLR).

It is widely accepted that relative sea level is rising and will continue to rise, bringing with it shoreline changes and wetlands alteration. Most scientists agree that wetlands will respond to sea level rise by migrating landward. This becomes a problem when, due to development and existing physical barriers, there are no open upland areas to accommodate wetland migration. Perhaps, in the permitting of development, the acquisition of upland areas (or development rights to those upland areas) to provide "buffer zones" (areas for future wetlands migration) can be presented as an option. Developers could then be granted a project permit while also addressing public benefit by providing for the future continuance of valuable wetlands.

Federal Mitigation Policies

Various federal agencies have addressed the issue of mitigation and the application of mitigation techniques to wetland areas. These agencies include the U.S. Fish & Wildlife Service, the Environmental Protection Agency, and the U.S. Army Corps of Engineers. When considering the development of state mitigation regulations, it may be helpful to review established federal policies. The following is a summary of each agency's viewpoint on mitigation (National Wetlands Newsletter, vol.8, no.5, Sept.-Oct., 1986).

U.S. Fish & Wildlife Service (F&WS)

In general, the U.S. Fish and Wildlife Service has a conservative policy regarding the implementation of compensatory types of mitigation (restoration and creation). This stems from the fact that previous efforts have been ineffective due to lack of permit compliance or lack of technical expertise. However, the Service does encourage other mitigation techniques such as avoiding or minimizing damages.

The U.S. Fish & Wildlife Service adopted the Council on Environmental Quality's definition of mitigation and in 1981 was the first federal agency to develop a written policy on mitigation (1981, 46 Fed. Reg. 7644-7663). This policy places emphasis on the following:

- Compensation mitigation is the least favored type (because it is preferable to avoid damage than to try and make up for it after damage has been done).
- Creation of replacement wetlands can be useful, but on a small scale.
- In creating new habitat, the emphasis should be on high quality fish and wildlife habitat.

The U.S. Fish and Wildlife Service also contends that the publishing of a mitigation policy has "led to an increased emphasis on technical considerations" when developing construction type mitigation projects. This is an advantage in that wetlands restoration and construction techniques may be more carefully planned and carried out.

Environmental Protection Agency (EPA)

Like F&WS, the Environmental Protection Agency takes a conservative approach to compensatory mitigation projects. EPA shares the concern over scientific uncertainties of mitigation techniques. EPA policy also incorporates the CEO definition of mitigation, and does so in a "step-wise" fashion (i.e. avoid, then minimize, then rectify, then compensate).

According to EPA policy, the purpose of mitigation is to provide the greatest amount of protection possible to existing wetlands. For this reason, compensation types of mitigation are considered viable only if damage to wetlands is shown to be unavoidable (i.e. there is no other practical site for the project).

Army Corps of Engineers (COE)

Corps mitigation policy is somewhat less conservative than the other two agencies. COE operates on the assumption that mitigation

techniques can lessen the adverse impacts of a proposed project and facilitate the construction of many necessary projects. The Corps is also guided by the CEQ definition of mitigation but, unlike the EPA and F&WS, the Corps does not consider it necessary to consider mitigation steps in any specific order.

The Corps of Engineers does solicit the comments of other federal agencies (EPA, F&WS, National Marine Fisheries Service) when reviewing mitigation proposals and may incorporate those comments into the decision-making process. This provides for somewhat of a coordinated effort. The Corps will also be publishing a written mitigation policy in upcoming final regulations on implementing section 404 of the Clean Water Act (National Wetlands Newsletter, vol.8, no.5, Sept. - Oct. 1986).

Conclusion

In order to successfully implement a state mitigation policy, it is necessary to examine the issues that surround the mitigation controversy. Although mitigation techniques are potentially useful, there is also a limited amount of scientific information available on the success of artificial (replacement) wetlands. Existing natural wetlands should not be traded indiscriminately for the construction of artificial wetlands in order to allow development to proceed, especially if there is little public benefit to be gained through the development.

A successful mitigation policy depends upon several things: an adequate mitigation plan, monitoring and enforcement of permit conditions, and long-term monitoring of replacement wetlands to determine success/failure rates. A mitigation policy should also be flexible enough to allow a case-by-case review of plans and to allow for the use of "administrative discretion" when making decisions on permitting development on the basis of mitigation.

It is found to be of great public benefit to protect and preserve wetlands in their natural state, and to insure that there is no net loss in wetland values. In order to carry out this purpose, it is evident that a mitigation policy must be thorough and well thought out. A review of existing mitigation policies (state and federal) and literature can provide valuable insight into the potential benefits and drawbacks of construction mitigation techniques.

Summary

The following is a summary of the mitigation issues discussed in this paper:

- The Definition of Mitigation
- The Mitigation Controversy
- Criteria for Considering Mitigation
- Wetlands Replacement Ratio
- Mitigation in Unique Natural Areas
- Ownership and Monitoring of Replacement Wetlands
- Types of Replacement Wetlands
- When Should Mitigation Occur
- Negative Mitigation Impacts
- Mitigation P1anning
- Construction/Restoration Guidelines
- Sea Level Rise Mitigation
- Federal Mitigation Policies

Note: This paper is not intended to be an exhaustive study of wetlands mitigation; rather, it is a synopsis of those issues that need to be addressed in the state regulatory process.

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