NORFOLK DISTRICT REGULATORY BRANCH
WETLAND MITIGATION POLICY

Problem: Compensatory mitigation, especially creation of wetlands in an attempt to compensate for the functions and values of lost wetlands, is an important part of the Corps' regulatory permit program and also, to varying degrees, its other civil and military functions. Unfortunately, a methodology for determining how many acres of new wetland Y must be created to offset all of the functions and values of lost wetland X is (depending on who one talks to) beyond the state of the art, impractical due to time and money, and/or disputed by various "experts". Resulting recommendations of Corps staff, as well as the Federal advisory agencies, are subject to personal (and agency) bias and yield variable results. In addition to not meeting the goal of equal replacement of functions and values, this variability can cause animosity or embarrassment; whether from neighboring permit applicants having to mitigate (seemingly) similar lost wetlands at different ratios, or from having Corps construction or O&M projects mitigate lost wetlands at different ratios than privately funded projects. Short of advancing the science to the point where a workable methodology exists to quantitatively compare all the functions and values of different wetlands, it would be useful to standardize our recommendations to reduce variability.

This proposed policy was created by a task force of environmental scientists in Regulatory Branch to serve as a framework for recommending compensatory mitigation ratios for regulatory permit applications. As stated above, though, it would be beneficial for Norfolk District to have one such policy for all of its activities. This draft is therefore in the process of being coordinated with Planning Division (Environmental Analysis Branch) and Engineering Division (Civil Programs Branch) to see if it could be adopted (with or without changes) as a District policy. If it can be, the opportunity would then exist for coordinating the Norfolk District policy with adjacent districts and/or our Federal advisory agencies to create a unified, regional policy.

Givens:

1. Any wetland [re]creation will take some time (years) before it reaches functional maturity, even if it is totally "successful".
2. "The objective of wetlands compensatory mitigation is to provide, at a minimum, one for one functional replacement to achieve no net loss of wetland value. In the absence of more definitive information on the functions and values at a specific site, a minimum of 1 to 1 acreage replacement may be used as a reasonable surrogate for no net loss of functions and values." (Answer A5 at the back of the February 1990 Corps/EPA MOA)

3. "[H]owever, the MOA clearly recognizes that mitigation which is not appropriate or practicable will not be required, nor will each permit be required to achieve no net loss of wetlands." (ibid at A1)

Assumption: That wetlands of similar structure will take similar lengths of time to develop their functions and values. This assumption establishes the foundation for treating marshes differently from shrub swamps, which are in turn treated differently from forested wetlands, at least in terms of mitigation ratios. Also, it allows all (or certainly most) marshes, for instance, to be treated similarly (within certain ranges), when determining mitigation ratios. Nothing here is intended to say, necessarily, that a Typha marsh has the same functions and values as a Spartina marsh; simply that a newly planted Typha marsh and a newly planted Spartina marsh take about the same amount of time to eventually acquire 100% of their functions and values, and that it takes a Taxodium swamp a substantially different amount of time to eventually acquire 100% of its functions and values. While exceptions are, of course possible, this assumption is certainly more true than not.

Variables: 1. Planting stock (seed vs. sprig vs. plug vs. cane vs. sapling)
2. Planting method (spacing, fertilizer)
3. Planting time (spring, summer, fall, winter)
4. Site suitability (elevation/hydroperiod, soil type)
5. Surprises (bird/animal grazing, Phragmites invasion, vandalism)
6. Structural replacement goal (emergent marsh, shrub, forest)
7. Functional replacement goal (habitat, productivity, water quality)

There are three stages of wetland compensatory mitigation (planning, construction, and post-construction) and these variables are spread out over all three. Overall project success is dependent upon successful completion of all three stages.

Ratio Rationale:

1. Restoration: Theoretically, restoration (rehabilitation of a wetland area which had previously been converted into an upland area) offers the greatest chance for compensatory mitigation success and usually should be chosen above other compensation options. If the area was once a wetland, it should be capable of being restored to a wetland with a relatively high chance for success. (It is worthwhile to point out that opting for restoration over creation only addresses one of the seven variables listed above (item 4) and, while restoration usually minimizes difficulties due to elevation and soil type, recreating hydroperiod in a nontidal situation may involve more than simply plugging ditches.) For purposes of this proposal, it is assumed that replacement will be in-kind, which is to say

emergent wetland for emergent wetland, shrub for shrub, and forested for forested. Our suggested restoration ratios will most often fall into ranges of:

A. Emergent: 0.5:1-1.5:1 Literature suggests that, if done correctly and with close plant spacing, success is very likely and functional maturity may be quickly achieved (erosion protection, % cover, and primary productivity in 3-5 yrs.; nutrient cycling, secondary productivity in 4-10 years). The MOA recognizes that "the ratio may be less than 1:1 where the functional values associated with the area being impacted are demonstrably low and the likelihood of success associated with the mitigation proposal is high" (MOA at III B). Evidence of low functional value, which would result in a replacement ratio closer to the 0.5:1 ratio, could include the absence of, or lack of opportunity to perform, various functions (erosion protection, fish and wildlife habitat, primary productivity, food chain support, water quality enhancement or protection). It could also include factors less closely associated with wetland functions (e.g., hazardous waste or toxic substance pollution, invasion by Phragmites, high rate of erosion). (For a replacement ratio <1:1, of course, the replacement wetlands would have to perform more wetland functions, or not be situated in an area of high erosion, etc.) In certain cases, it is also possible that a replacement wetland can be designed to be habitat for a rare plant or animal species which was not present in the original wetland. Indicators of high functional value, which would result in a replacement ratio closer to the 1.5:1 ratio, could include the presence of, or opportunity to perform, most of the various wetland functions. Ratios even greater than 1.5:1 could include, in addition to the above, special attributes (e.g., presence of threatened/ endangered species which are dependent on wetlands).

B. Shrub: 1:1 - 2:1 While emergent wetlands are probably more productive, shrub wetlands have a unique physical structure that makes them attractive or even essential to certain animal species. Planted shrubs generally take longer than emergents to reach their characteristic structure (height and cover) and the factors which influence the establishment of shrub wetlands are less well documented than for emergent marshes, so they would generally be planted at a somewhat higher ratio. Factors which would influence specific ratios would be similar to those explained above for emergent wetlands.

C. Forested: 1.5:1 - 2:1 Most of the things said about shrub wetlands would also pertain to forested wetlands, with the addition that since it takes longer to create a forested wetland habitat, there are more opportunities for failure. Offsetting this somewhat are: (1) that while newly planted saplings take longer than shrubs to reach their characteristic mature structure, the saplings and small trees create a "shrub" structural habitat in the interim years which may have substantial wetland value, and (2) silvacultural techniques for many forest types are well documented, and some transference to forested wetlands is assumed. If successfully (re)created, the 1.5:1 - 2:1 ratio range would guarantee at least 1:1 functional replacement over the long term, which is the current goal

of the Corps (as elaborated in the Mitigation MOA). It becomes difficult and arbitrary to justify more than 2:1, because even 100:1 or 100,000:1 would not create any forested wetland habitat until the trees mature, and after they mature the higher ratios would result in extraordinarily more than the goal of 1:1 replacement of functions and values. Factors which would influence specific ratios would be similar to those explained above for emergent wetlands.

One point to consider has to do with dryer forested wetlands (PFO1A), especially those on Acredale-type soils. In theory, at least, there is some place on the continuum between the driest wetland forests and the wettest, upland forests, where the functions and values of both environments are indistinguishable. There is considerable (though not unanimous) expert opinion that PFO1A wetlands on Acredale-type soils are very near this point. Trying to [re]create exactly the same wetland environment would be very chancy, because of the time involved but mainly because an extremely small deviation in the hydrology could result in either a wet upland forest or a PFO1B, C, or E wetland forest. In either event, the result would be interpreted by some to be a "failure". Disregarding the values of the wetland functions performed by PFO1A forests in Acredale-type soils, a wetter moisture regime would provide a greater number of wetland functions (all other factors being equal). Compensating for a red maple/sweet gum/loblolly pine temporarily saturated wetland with, for instance, a seasonally inundated green ash/swamp chestnut oak wetland could very well qualify for a lower replacement ratio than 1.5:1. Compensation with emergent or scrub-shrub wetlands (out of kind) is another issue and is beyond the present scope of this proposal.

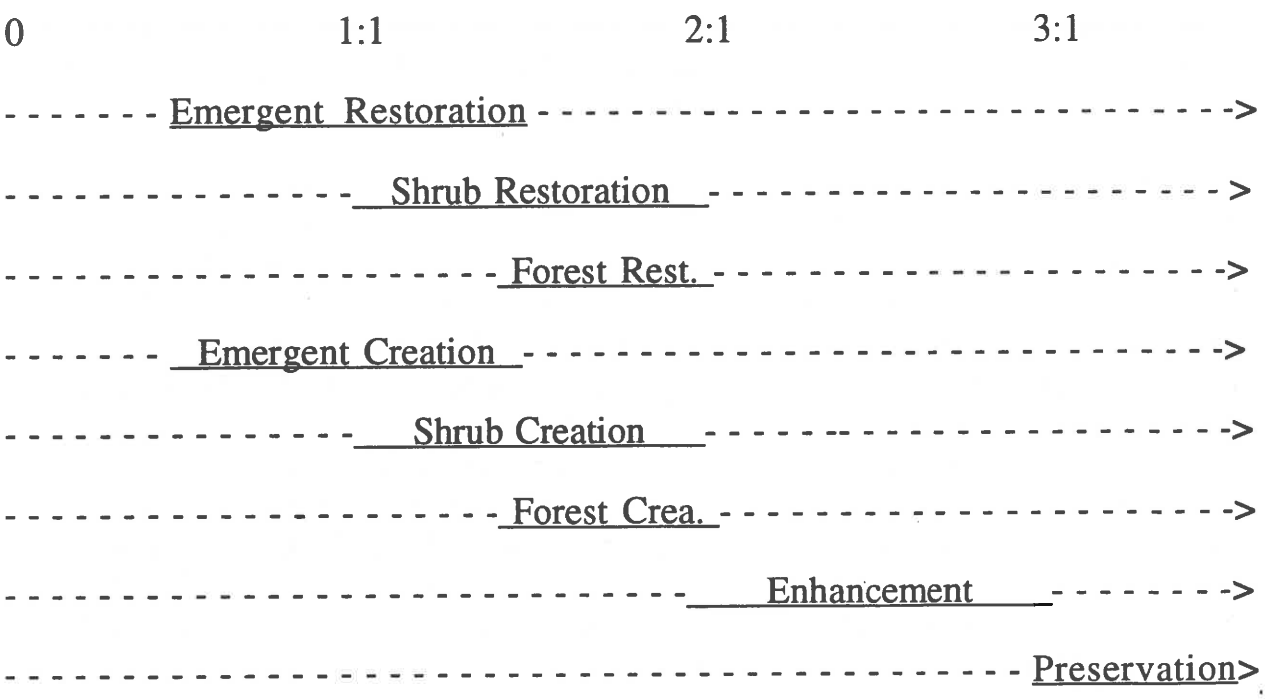
2. Creation: The generally recommended ratios are the same as for restoration. This may at first seem inappropriate because of the (assumed) higher chance of success for restoration. This is taken into consideration by choosing restoration over creation when both alternatives exist. A restored wetland will not reach maturity or functionality any quicker than a created one. When restoration isn't feasible, it would only be punitive to require higher ratios for creation. Creation will usually cost more than restoration anyway, due to the mechanical excavation and grading needed to achieve adequate elevations and sources of hydrology, and often due to the need to make soil amendments not needed for recreated wetlands.

3. Enhancement: The higher ratios for enhancement are due to the fact that enhancement takes place in a wetland which already (presumably) has wetland values. Enhancement usually involves at least some disturbance of the existing wetland and its values, and there is always the risk that the enhancement could fail. Even at higher ratios, enhancement should not be chosen over restoration or creation except in unusual circumstances. Since upland development often

eventually occurs right up to the edge of wetlands, purchasing and preserving an upland buffer around a wetland to be enhanced should be considered as part of a mitigation plan. (Plugging drainage ditches and planting wetland species in "PC" croplands might be considered enhancement by some, but we will consider it to be restoration for purposes of these mitigation guidelines.)

4. Preservation: Even at very high ratios, preservation should generally be pursued only after restoration, creation, and enhancement have been investigated. Because of current wetland laws and regulations, there are relatively few situations where preservation could be said to prevent a significant wetland from being destroyed. Preservation may prevent a wetland from having its functions and values diminished, though (e.g., preserving a forested wetland that would otherwise be timbered). Since upland development often eventually occurs right up to the edge of wetlands, purchasing and preserving an upland buffer around an existing wetland could also, in some cases, be found to be acceptable mitigation, or at least part of an acceptable mitigation package. Significant documentation should be requested to show that other, preferable options do not exist. When preservation is considered, large contiguous blocks or entire (or substantial portions of) watersheds, would generally be preferred to discontinuous or narrow strips of wetlands.

SUGGESTED SCALE OF APPROPRIATE WETLAND COMPENSATION



Dashed lines represent possible ranges and solid lines represent the expected ranges (e.g., 80-90% would fall within solid line ranges). In any specific case, the appropriate ratio can vary from 0 to infinity. "[A]ppropriate" mitigation is based solely on the values and functions of the aquatic resource that will be impacted" (MOA at II B). Once the appropriate ratio is determined, a decision must be made as to what is the practicable ratio. "[U]nder the Guidelines, appropriate mitigation is required only to the extent that it is practicable" (ibid at A8). The Guidelines define the term practicable as meaning "available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes." Although not mentioned specifically, it is reasonable to assume that what is practicable compensatory mitigation is subject to the same caveat as the requirement to choose the least environmentally damaging practicable alternative: "so long as the alternative does not have other significant adverse environmental consequences" (40 CFR 230.10 (a)). For this reason, it would normally not be practicable to propose or accept compensatory mitigation in upland areas of high habitat value.