

Wetland mitigation banks are unable to replace many of the native plant species found in natural wetlands

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Abstract:

The U.S. Army Corps of Engineers regulates development projects that negatively affect natural wetlands by requiring that permittees fund or conduct wetland mitigation to compensate for wetland losses. The Corps' preferred method of compensation is wetland mitigation banking, in which large wetland restoration projects are constructed by third-party bank sponsors to provide mitigation for multiple development projects. To achieve the national goal of no-net-loss of wetland resources, the wetlands produced in banks must adequately compensate for those affected by approved development. Previous studies have used vegetation-based metrics to compare plant communities in mitigation wetlands to those in existing natural wetlands; however, few have examined if mitigation wetlands replace the specific plant species that are lost due to permitted development. To assess banks' ability to replace the native plant species found in natural wetlands, and to examine how regulatory conditions affect species replacement, we compared the plant species present in 13 banks within the Chicago District of the Corps to those in more than 2,000 natural wetlands that may be impacted by permitted development. To do this, we developed a novel modeling approach to simulate the destruction of natural wetlands and the accompanying purchase of mitigation credits from banks as compensation. We found that banks successfully replaced fewer than 40% of the native species present in natural wetlands that were 'destroyed' under typical regulatory conditions in our simulation. While changes to certain policy conditions in our model produced a moderate increase in species replacement by banks, wetlands in banks simply did not contain many of the native species present in the natural wetlands for which they may be used as compensation. Average replacement was greater for species that are highly tolerant of anthropogenic disturbance than for conservative species with high fidelity to undisturbed natural communities. Our results also suggest that there may be differences between the wetland community types present in impacted natural wetlands and those produced in banks. This study documents the limitations of certain wetland mitigation practices and indicates that improving the equivalence between natural and mitigation wetlands should be a greater priority in wetland mitigation policy. Additionally, our simulation model serves as a novel approach to analyzing mitigation outcomes that could be used in other studies wishing to compare the resources present in natural habitats to those in mitigation projects. Co-author: Jeffrey Matthews, University of Illinois at Urbana-Champaign