

BUILDING BETTER WETLANDS FOR AMPHIBIANS: INVESTIGATING THE ROLES OF
ENGINEERED WETLAND FEATURES AND MOSQUITOFISH (*GAMBUSIA AFFINIS*) ON
AMPHIBIAN ABUNDANCE AND REPRODUCTIVE SUCCESS

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ABSTRACT

Compensatory wetland mitigation efforts have been broadly criticized for failing to replace lost ecological functions, even with net gains in wetland area. Of particular concern is the suitability of constructed wetlands as habitat for vulnerable taxa such as amphibians. Habitat loss and alteration are primary reasons for amphibian declines so it is imperative that constructed wetlands significantly contribute to amphibian conservation.

I surveyed amphibians in 49 constructed northern Missouri wetlands to investigate influences of wetland design and placement features on amphibian abundance. Features associated with open water ponds best explained abundances of commonly captured species. Salamanders and most hylid frogs were rarely captured and responded positively to aquatic vegetation, but negatively to fish and anthropogenic disturbance-related terrestrial habitat features. I also tested design feature and mosquitofish (*Gambusia affinis*) effects on amphibian communities in 18 experimental constructed wetlands. Mosquitofish reduced amphibian reproductive success and species richness, and they were a significant cause of ranid tadpole tail injuries. Further, mosquitofish reduced aquatic invertebrate abundance and taxa richness. Vegetation and shallow within-wetland slopes also bolstered abundances of some amphibians, and vegetation increased amphibian and invertebrate richness.

Fish-free, heavily vegetated, shallow-sloped wetlands, placed in landscapes with low anthropogenic disturbance, appear to provide the best habitat for conservative amphibian species.