

SUCCESSION CREATES AMPHIBIAN HABITAT IN FARM PONDS OF THE EASTERN GREAT PLAINS

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Study Description

In our article published in *Ecological Applications*, we describe the habitat characteristics of farm ponds used as breeding sites by amphibians. Farm ponds have been constructed throughout the eastern Great Plains, USA, and number in the millions. In areas like our study region in southern Iowa, these ponds are now the most abundant lentic habitats available. We demonstrated that breeding occupancy differed among amphibian species and depended on the habitat components present in ponds. Using a chronosequence, we also showed that some important characteristics, like emergent vegetation cover and water pH, improved as pond succession proceeded over time.



Photo 1. Farm ponds in the eastern Great Plains can reach densities of more than 4 km^{-2} in some areas. They form “pondscapes” consisting of ponds covering a range of successional states. In the left foreground, a small older pond can be seen with a tree and extensive vegetation growing along its shallow margin. Behind the cattle barn and feedlot, several large newer ponds are visible. Photo credit: Timothy M. Swartz.



Photo 2. In hilly landscapes, ponds are constructed in the upper parts of a watershed. Bulldozers are used to clear vegetation, enlarge the basin, and form an embankment or dam along the downstream portion of the drainage. Photo credit: Timothy M. Swartz.



Photo 3. Over time, ponds fill with water and gradually take on a more natural appearance and function. Wetland plants colonize the pond and form distinct bands along the hydrological gradient of the margins. The pond pictured was built over 40 years ago and is a breeding site used by several amphibian species. Photo credit: Timothy M. Swartz.



Photo 4. Gray treefrogs (*Hyla chrysoscelis/versicolor*) are common occupants of older farm ponds. We found that they tended to breed in ponds with a circumneutral pH and high levels of emergent vegetation cover. Photo credit: Timothy M. Swartz.



Photo 5. Blanchard's cricket frogs (*Acris blanchardi*) were found in many of the same ponds as gray treefrogs. They have declined in northern parts of the central USA but remain abundant in pond-dense regions like southern Iowa. Photo credit: Timothy M. Swartz.

These photographs illustrate the article “Managing farm ponds as breeding sites for amphibians: key trade-offs in agricultural function and habitat conservation” by Timothy M. Swartz and James R. Miller published in *Ecological Applications*. <https://doi.org/10.1002/eap.1964>