Small wetlands important in maintaining ecological diversity

by Brid Nowlan

Many of our regulatory systems, especially nationwide permits, assume that small wetlands are expendable. A recent study* casts doubt on that assumption; it found that most natural wetlands are small and that these, supposedly isolated, small wetlands are vital to maintaining ecological diversity.

This study considered isolated depression wetlands in the southeast United States, using data from a 304 square mile Savannah River site. A total of 371 wetlands were identified, ranging in size from 0.5 acres to 193 acres. Most of these wetlands were small: 46.4 percent were 3 acres or less; 87.3 percent were 10 acres or less. Wetlands less than 0.5 acres were not surveyed, so the data for small wetlands are conservative. A similar study in Maine also found that most natural wetlands are small, with 62 percent of wetlands in that study being smaller than 10 acres.

The importance of small wetlands as amphibian breeding sites has been well documented. Small wetlands also act as population sources for amphibians. They may be equally important for populations of species that are less mobile than mammals or birds, such as specialized wetland plants and aquatic insects.

While the loss of any wetland, regardless of size, reduces the total number of sites for amphibian breeding, the loss of small wetlands may also reduce the number of source populations because the increased distance between wetlands no longer allows for recruitment of amphibian juveniles from one wetland (the source) to another. In this way the possibility of local extinctions is increased. In the study area in South Carolina, the loss of all wetlands smaller than 1.2 hectares would increase the "nearest-wetland distance" by 41.3 percent (640 feet); the loss of all wetlands smaller than 4.0 hectares would result in a 138.1 percent increase (2,102 feet). The authors conclude that the loss of a majority of small wetlands could severely impede source-sink processes and place remaining wetlands at increased probabilities of local amphibian population extinction.

While a simple calculation can show that a greater loss of wetland area results from the loss of a large wetland than a small one, size is not the only important factor. This study proposes the view that the number of individual wetlands is more important to address the abundance and distribution of individual wetland populations, necessary for maintaining species and genetic diversity. Therefore, wetland abundance, rather than wetland area, is related to critical processes of ecological and evolutionary change.

The authors recommend that wetland regulations should not focus on size, but on the distribution of wetlands, both locally and regionally, and try to protect ecological connectivity and the source-sink dynamics of populations.

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