

Human and Amphibian Preferences for Dry and Wet Stormwater Pond Habitat

What kind of ponds make the best habitat for homeowners and frogs? Some answers to this question have emerged from two surveys. Resident attitudes toward stormwater ponds in the Champaign-Urbana area were recently sampled by Emmerling-DiNovo (1995). The study area, located in east central Illinois, included seven residential subdivisions that employed two different stormwater management strategies—large wet ponds and dry detention basins. The ponds were large, ranging from two to 12 acres in size. Most of the wet ponds had rectangular shapes and had little shoreline vegetation. Similarly, the dry detention basins were flat and rectangular and had a mown grass cover. All ponds had common access and were maintained by a homeowner’s association. The flat and level landscape of the study area had few water features.

Emmerling-Dinovo surveyed over 140 homeowners in the affluent subdivisions (mean annual income of \$90,000). The respondents all owned single family homes, and had lived in them for an average of eight years. The survey was structured to compare the attitudes of homeowners toward wet and dry ponds and queried not only residents who live adjacent to ponds, but also those that do not. In addition, the survey asked homeowners to rank the value of ponds relative to other amenities in the subdivision. Survey results indicate that residents clearly preferred wet ponds over dry ponds. For example, slightly over 82% of all respondents were willing to pay a premium to live next to a wet pond. By contrast, 67% percent of residents were unwilling to pay any premium to live next to a dry pond, and 10% felt that such a lot should be discounted.

Residents were asked to estimate the value of lots adjacent to and distant from both wet ponds and dry ponds. Results are portrayed in Table 1. On average, wet ponds were perceived to add four to 24% to the value of an adjacent lot. In contrast, dry ponds were felt to subtract from three to 10% from the value of an adjacent lot. The wet pond premium is consistent with that reported by U.S. EPA (1995) for 20 stormwater wet ponds and wetlands in other regions of the country. It is also comparable to the results of a similar homeowner survey of two residential subdivisions in Ontario, Canada. Baxter *et al.* (1985) found that 17% of residents who were distant from wet pond but living within the same subdivision would be willing to pay a premium to live next to one; and, nearly half of all residents who lived next to one felt it enhanced their property value.

The survey revealed an interesting sociological phenomenon—the existence of “wet” people and “dry” people. “Wet” people, who live in subdivisions with wet ponds, exhibit the strongest preferences for living next to wet ponds, and express the greatest disdain for dry ponds. When asked what they liked most about their neighborhood, 63% of “wet” people identified the wet pond. On the other hand, “dry” people, who live in subdivisions with dry ponds, did not exhibit very strong preferences for either wet ponds or dry ponds. In addition, “dry” people valued natural areas, wildlife and recreation less highly than “wet” people.

The attractiveness and image of the subdivision, along with potential resale value, were the three primary factors considered in purchasing a home according to the survey. If these factors were held constant, however, the presence of a wet pond was very important in individual lot selection. For example, over half of

Table 1: Pond Premium or (Discount) for Lots Adjacent to, or Distant from Wet and Dry Stormwater Ponds (Emmerling-Dinovo, 1995)

Location of Survey Respondent	Wet Pond Premium	Dry Pond Discount
Next to Wet Pond	23.9%	(-9.9%)
Distant from Wet Pond	13.4%	(-10.2)
Next to Dry Pond	7.8	(-2.5)
Distant from Dry Pond	4.4	(-8.9)

the respondents indicated that the presence of a pond had a strong or very strong influence on their selection of a lot. In fact, wet ponds outranked five other common subdivision features—natural areas, cul-de-sacs, golf courses, public parks, and the unloved dry pond. (see Table 2). What is perhaps the most striking about the Emmerling-DiNovo survey is that the poorly landscaped and geometrically simple wet ponds scored so highly. How much more value might they have had if they were designed with more natural shapes and better landscaping?

Amphibians such as frogs, toads and spring peepers, also exhibit similar preferences for living next to wet ponds compared to dry ponds, according to a survey by Bascietto and Adams (1983). These wildlife researchers conducted an evening call count of frogs and toads at 14 stormwater ponds in Columbia, Maryland. The ponds were divided into three categories: wet ponds, dry ponds, and dry ponds with streams (Table 3). As might be expected, dry ponds without streams were very poor amphibian habitat, with only one species recorded in the call survey (the American toad). On the other hand, wet ponds and the dry ponds with streams were much better habitat with five species frequently recorded. Wet ponds were favored by more true frogs, whereas toads and tree frogs preferred dry ponds with streams. The greatest amphibian diversity occurred when ponds had shallow pools, gentle slopes, dense emergent vegetation, and adjacent forest habitats.

The clear implication is that wet ponds are a better habitat than dry ponds and provide an important link to increased diversity. A designer that makes a wet pond more attractive to both amphibians and humans can expect to increase the marketability of his or her subdivision.

—TRS

Table 2: Comparative Ranking of Preference to Locate Adjacent to Six Common Subdivision Features in Illinois Residential Subdivisions (Emmerling-DiNovo, 1995)

Locational Factor	Mean Score
Adjacent to wet pond	4.44
Adjacent to natural area	4.27
On a cul-de-sac	3.83
Adjacent to a golf course	3.67
Adjacent to public park	3.10
Adjacent to dry pond	2.05

Respondents were asked to rank each factor from 0 to 5, with five being the most preferred.

References

- Bascietto, J., and L. Adams. 1983. "Frogs and Toads of Stormwater Management Basins in Columbia, MD." *Bulletin of MD Herpetological Society* 19(2): 58-60.
- Baxter, E., G. Mulamootil and D. Gregor. 1985. "A Study of Residential Stormwater Impoundments; Perceptions and Implications." *Water Resources Bulletin* 21(1): 83-88.
- Emmerling-Dinovo, C. 1995. "Stormwater Detention Basins and Residential Locational Decisions." *Water Resources Bulletin* 31(3): 515-521.
- U.S.EPA. 1995. "The Pond Premium." *Watershed Protection Techniques* 2(1): 302-303.

Table 3: Amphibian Species in Stormwater Ponds Frequency of Occurrence During an Evening Visit (Bascietto and Adams, 1983)

Amphibian Species	Wet Pond	Dry Pond with stream	Dry Pond without stream
American toad	0.23	0.20	0.28
Fowler's toad	0.0	0.12	0.0
Grey Tree frog	0.23	0.45	0.0
Bull frog	0.13	0.0	0.0
Green frog	0.62	0.40	0.0

Frequency of occurrence at each site during individual evening call surveys at 14 stormwater ponds (N= 4 to 5 of each type shown). Spring peepers were also noted in earlier surveys of wet ponds and dry ponds (that had flowing water).