Michael Rosenzweig has written one of the fundamental books of this decade (Rosenzweig 2003), and it has an important meaning for wetland scientists whose work addresses conservation topics. What Rosenzweig calls the “3rd R” is reconciliation ecology,2 his term for a view of human land use practices that blend those human uses with habitat elements that support species in the same landscapes.

The premise underlying Rosenzweig’s approach is that the number of species that can exist in a given land area is a function of the area: smaller areas have fewer species and larger areas have more species, all other things being equal. This is called the “species–area (SA) relationship,” and it has occupied Rosenzweig throughout his professional career (see, for example, Rosenzweig 1995). In essence, the number of species, S, occurring in a given landscape area, A, is a power function of the general form:

\[ S = A^z \]  

so that the relationship is linear, with slope \( z \), on double-log plots.

Rosenzweig presents enough of the science underlying this relationship in Chapters 8 and 9 of his book to enable non-specialists to follow the discussion of the SA relationship, because of course everything else is not equal; for example, the exponent, \( z \), differs for continent-scale versus state-scale versus county-scale SA relationship plots.

The real message for conservation science lies in the basic SA relationship. Because the species richness is a function of habitat area, a decrease in \( A \) means that there will be an ultimate decrease in \( S \). This decrease would not be expected to happen over a short period of time when the populations of many of the species are very large; the period of “relaxation” to the new relationship could take hundreds of years. Basically, a reduction in \( A \) in equations 1 and 2 will inexorably lead to a reduction in \( S \) as the biota “relaxes” toward the new relationship based on the smaller habitat area.

Rosenzweig argues that, because of the long relaxation time, North American species diversity reflects a species–area relationship that is based on the habitats that were present on the continent at the time of human settlement. Since the human colonization of the continent (especially since its settlement by Europeans) large areas of the continent have been altered significantly, to cropland, to urbanized areas, through intensive forestry and mining, through modification by exotic species, and so forth. Therefore a “relaxation” to lower species diversity awaits, based on the proportion of those original habitats that remains and the slope of the SA relationship.3

This should be of great concern to wetland scientists. For example, it is widely reported that more than 90 percent of the wetlands that were present in the State of California at the time of European settlement have been “lost” or “destroyed” (Dahl 1990). Such a habitat loss, if Rosenzweig is correct, should be associated with a substantial risk of endangerment for wetland-related plant and animal species. This does appear to be correct. For example, the website for the South Bay Salt Pond Restoration Project (http://www.southbayrestoration.org/) reports that “more than 50 plant species found in the Bay marshes at the turn of this century are now

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2 The other two “Rs” are: (1) reservation ecology, which is a scientific endeavor focused on figuring out how to use conservation science to design landscapes and management practices that will maintain species diversity, and (2) restoration ecology, which uses scientific knowledge to assist in restoring damaged or degraded ecosystems.

3 The slope, \( z \), in equations 1 and 2 varies between about 0.1 within biogeographic regions to about 1.0 among continents; see the books for additional information.