

Synthetic biology and NPS policy

Management application of synthetic biology, whether at the cell, organism, population, or ecosystem level, constitutes human intervention, intervention that at the outset is contrary to policy for most management programs for natural zones of National Park System units. Synthetic biology may be within policy for addressing some problems in cultural zones of parks. Given the growing intensity and rate of change to park biota and ecosystems because of climate change, landscape fragmentation, exotic species, and other factors, park managers may find that application of synthetic biology elements may be an appropriate intervention for solving environmental problems. For example, parks already are using exotic species as biocontrol agents to reduce impacts of other exotic species, and some parks are considering use of cross-species breeding or genetic engineering to help develop blight-resistant chestnut trees to permit restoration to the eastern deciduous forest of the presence and function of the chestnut. In the future, park managers may need to consider whether to construct, or accept the unmanaged development of, novel biological communities to facilitate conservation of rare species at risk of extinction from change-forcing factors. These types of decisions will require determinations of which policy components take precedence over others to facilitate achieving desired park conditions, while recognizing that desired park conditions will constitute the best approximation of what would have been natural in the absence of the human-caused forcing factors.

—John G. Dennis, Deputy Chief Scientist, NPS Natural Resource Stewardship and Science