

Importance - “Restoration is the acid test of our ecological understanding.” A.D. Bradshaw

Restoration ecology represents attempts to utilize well known principles of ecology into a practical application focused on long-term recovery of damaged systems. The term “Restoration Ecology” is generally acknowledged as being first coined in the late 1980’s by John Aber and William Jordan so while the concepts that form the backbone of this sect of ecology may not be new, the academic discipline that we know today as restoration ecology is still in its infancy, having only seen rapid growth in popularity and research in the last 25 years. Infancy provides a considerable challenge at large to the ecological community of practice and can be seen throughout the literature with such basic questions as; What is the purpose or goal? Should function or structure take precedent? Is “fixing” the habitat enough? What ecological principles are selected to be the drivers of the “restoration”? Do we have adequate knowledge of these ecosystems to develop methods to repair those systems? Once committed, how is success determined? These questions touch the surface and, quite admittedly, leave ecologists scratching their heads as to how to tackle what is becoming a growing need for guidance on goals for restoration that are based on sound theoretical and empirical science. As to the importance of the field, as stated by Hobbs and Harris 2001, “the extent of human-induced change and damage to Earth’s ecosystems renders ecosystem repair an essential part of our future survival strategy.....If restoration ecology is to be successfully practiced as part of humanity’s response to continued ecosystem change and degradation, restoration ecologists need to rise to the challenges of meshing science, practice, and policy. Restoration ecology is likely to be one of the most important fields of the coming century.”

A.D. Bradshaw identifies many different restorations that can be applied to; ecosystems (functions), habitats (place), and quality (perceived attributes of importance) with attention always focused on processes because “without this the communities of organisms in which we are interested cannot persist.” Ecological understanding and successful restoration are inexorably linked as an attempt to reconstruct a system will both test our understanding and reveal gaps in our theoretical knowledge, the “acid test” of our understanding.

In regards to the papers, I have selected 4 papers that I believe are relevant, well cited, and interesting representations of restoration ecology that include a “bedtime story” presidential address by A.D. Bradshaw on restoration in Europe, a commentary on conceptual frameworks for restoration ecology, a review on alternative states and positive feedbacks in restoration, and a research paper on a 2010 marsh restoration with implications on combating global warming in coastal communities.

Selected Readings:

Bradshaw, A.D. (1983). The Reconstruction of Ecosystems. *Journal of Applied Ecology*, 20, 1-17.

Hobbs, R.J. and D.A. Norton. (1996). Towards a Conceptual Framework for Restoration Ecology. *Restoration Ecology*. 4:2, 93-110

Suding K.N., Gross, K.L., and G.R. Houseman. (2004). Alternative states and positive feedbacks in restoration ecology. *Trends in Ecology and Evolution*. 19:1, 46-53

Stagg, C.L. and I.A. Mendelsohn. (2010). Restoring Ecological Function to a submerged Salt Marsh. *Restoration Ecology*. 18:S1, 10-17

Working Bibliographies that failed to make the final cut:

Hobbs, R.J. and J.A. Harris. (2001). Restoration Ecology: Repairing the Earth's Ecosystems in the New Millennium. *Restoration Ecology*. 9:2, 239-246.

*Bradshaw, A.D. (1996). Underlying principles of restoration. *Canadian Journal of Fisheries and Aquatic Science*, 53, 3-9.

*Bradshaw reiterates much of what is stated in his presidential address 13 years prior in the above 1996 citation but it didn't contain quite the same level of entertainment or historic value. It does provide a slightly new condensed format and, of course, 13 years of advancement in thought, so if you are feeling extra enthusiastic....