

CHAPTER 5

REHABILITATION VERSUS: RESTORATION, RECLAMATION, AND REVEGETATION

As the impact of disturbance has been increasingly documented, several terms have come into usage for describing rehabilitation efforts. The terminology is important insofar as a uniformity of terms will facilitate communication, convenience, as well as theory development and testing.

5.1 Rehabilitation

‘Rehabilitation’, as defined by the United States National Research Council (1974), implies that the disturbed land will be returned to a state and productivity level in accordance with an approved land use plan, ensuring that the system remains in a stable ecological state; that it does not contribute to further environmental deterioration; and is consistent with the surrounding aesthetic values (Wali, 1992). This seems to be the generally accepted definition of the term which clearly conveys the mission it was intended for: rehabilitating ecosystems after disturbance for the dual purpose of (a) arresting or avoiding further deleterious effects on surrounding ecosystems, and (b) having a beneficial economic and/or aesthetic use.

Harris *et al.* (1998, p 17) on the other hand, defines ‘rehabilitation’ as “...a term often applied to areas which formerly had no growth at all, but with careful fertilization and landscaping works may be used to grow a limited number of plant species.” This statement refers to systems which are not self-sustaining such as sports fields and agro-forestry plantations – the term is rarely used in the United Kingdom. Coppin *et al.* (2000) state that ‘rehabilitation’ has a broadly similar meaning to ‘reclamation’, though it implies that the after-uses should conform to the land use on the site prior to any mining and quarrying activities.

5.2 Restoration

According to the United States National Research Council (1974), ‘restoration’ implies that the conditions of the site prior to disturbance will be replicated after a development activity such as mining had ceased (Wali, 1992). This term is widely used to describe the restoration of paintings, monuments etc. and refers to a return to the original as closely as possible. On a grand scale restoration is expensive and time-consuming. It requires a thorough base of knowledge to answer the fundamental ecological question: *Why do species grow where they do?* In addition, the paucity of land and water resources in many countries is such that few

can afford to restore ecosystems to their original state. Harris *et al.* (1998, p 18) on the other hand, refers back to the 1994 definition as described by the Society for Ecological Restoration: "...ecological restoration refers to the process of repairing damage caused by humans to the diversity and dynamics of ...ecosystems." The society further describes land restoration as the process by which a specific area of land under construction is returned to its original state prior to degradation of any sort, i.e. back to a fully-functioning self-sustaining ecosystem.

Coppin *et al.*(2000) defines 'restoration' as restoring the original land-use or vegetation, or even the same landform. It is also applied to active mineral operations where after-use is developed by the mineral operator as part of the site activities, rather than starting with an abandoned or derelict site.

5.3 Reclamation

'Reclamation' implies that a site is habitable to organisms that were originally present or to others that approximate the original inhabitants (Wali, 1992). This term has traditionally been used by soil scientists when reclaiming salt-affected soils for agriculture and has most recently and frequently been used when reclaiming surface-mined ecosystems. In the United Kingdom the term is most widely considered to be the first step in their definition of 'restoration', indicating the process by which degraded soils are returned to a state where they may be prepared for growth –such soils being characterized by a lack of structure and nutrients, but also without any chemical impediment to growth such as the presence of inorganic contaminants (Harris *et al.*, 1996). According to Coppin *et al.* (2000), reclamation describes the process of creating a land-use, which may be hard (industrial, commercial) or soft (agricultural, amenity) on a site where mining and quarrying operations have ceased.

5.4 Revegetation

Coppin *et al.*(2000) defines 'revegetation' as the process of vegetation establishment and aftercare undertaken as part of reclamation, rehabilitation, or restoration.

It is clear from these term definitions, that there still exists a debate in various parts of the world over the correct terminology to be utilized for the process of "rehabilitation." The term 'rehabilitation' is however, the most widely accepted as it is a more flexible concept than either 'restoration' or 'reclamation' which imply abiding by the rigid criteria of replicating the

original state, whereas ‘rehabilitation’ merely aims to get as close as practically possible to such an original state. It allows for the complete integration of all processes (reclamation, restoration and revegetation) to aid in an eventual integrated plan and model, assisting in the return of a disturbed area to resemble its original state as closely as possible. The most important facet that should be remembered when evaluating a rehabilitation process or model is the fact that in conjunction with the principles of sustainability, it requires that land utilized for mineral extraction, waste disposal or processing should be returned to some sustainable beneficial use once the operations have reached the end of their life-cycle. Returning land to beneficial use – either the original state or some new purpose – can therefore be described as ‘rehabilitation’ involving reclamation, land restoration and revegetation. Figure 26 depicts the different options for the improvement of a degraded ecosystem expressed in terms of the two major characteristics of structure and function. Used in the proper sense, restoration implies bringing the ecosystem back to its original or previous state in terms of both structure and function. There are then a number of other alternatives as mentioned above, including rehabilitation, in which this previous state is not totally achieved but replaced by something different – usually termed reclamation. ‘Mitigation’ could also be considered as an alternative. The schematic presentation is in figure 26.

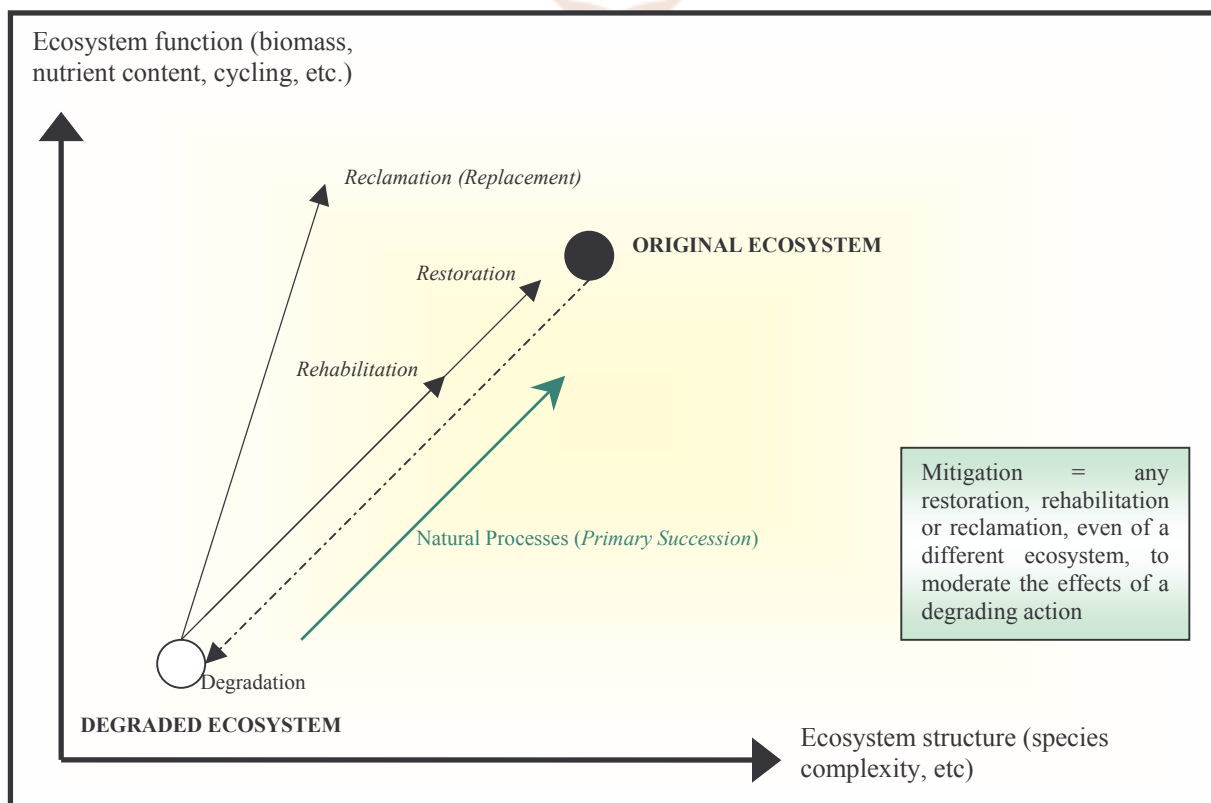


Figure 26: Options for improving degraded ecosystems (Bradshaw, 2000)