

The swampy meadow: from an enigmatic perception to a better understanding

By

Barbara Mactaggart^{1,2}, David Goldney^{1,2}, Johannes Bauer¹, Andrew Rawson^{1,2,3} *

Terminological confusion

At the time of European settlement in Australia, a valley landform feature, recognised by the relative absence of trees, vegetative cover of grasses, rushes and sedges, and at times disconnected pools, was commonly ascribed as chain of ponds and meadows. More recently Prosser (1991) adopted the term swampy meadow, as he reasoned not all valleys or swampy meadows contain the discontinuous pools associated with the chain of ponds. He generally afforded them with the description of being a swampy alluvial valley floor without a continuous channel, and vegetated with sedge and tussock grass. While this characterisation is useful, it does not adequately consider the associated hydrological, geomorphological and ecological processes. This can lead to confusion when a plethora of other terms, including the chain of ponds, dell, wet meadow, cut and fill landscape, and marsh, are used synonymously or interchangeably with the term swampy meadow. The degree of similarity is often questionable, and opportunities are lost when similarities with other landforms, such as mires and marshes are not explored or understood.

Vague descriptions

Clearly, there are problems with the very descriptions of the landforms the terms are meant to label. They have often been described but not necessarily defined, and are also dependent on the user's interest, background, scientific discipline, country of origin and the inherent morphology of the landform. To illustrate, the term wet meadow has been used to label landforms ranging from a large freshwater dunal wetland in the south coast of New South Wales (NSW); a montane meadow of sedges and rushes in California; a Swiss lake marsh; meadow in the Czech Republic; semi-marsh wetland in Greece; waterlogged meadow in Denmark; and beaver meadows in North America.

Chain of ponds is a term widely used in Australia and is often adopted as a swampy meadow synonym. While this may be appropriate in some cases it does not always apply. Upon examining the journals and letters of early explorers and settlers to Bathurst it became evident that their use of the term chain of ponds was often to describe remnant pools in rivers during low flow conditions (Mactaggart, 2006).

Limits for knowledge transference and system understanding

The use of terms with uncertain characterisations and definitions affects our ability to transfer knowledge and hinders our capacity to understand the complex nature of the swampy meadow. The geomorphology of cut and fill landscapes, for example, is well understood and forms the basis of their characterisation. Their hydrology and ecology, however, is highly variable. Mires and marshes, on the other hand, have variable geomorphologies although tend to be well understood and characterised on the basis of their hydrology and ecology. A direct comparison between terms then becomes problematic. Further, exploring the literature and understanding the science behind other terms will aid our overall understanding of the swampy meadow. Recognising the swampy meadow as a complex landform is an important conceptual development that partly depends on our ability to recognise common features shared by, for example, cut and fill landscapes, marshes, bogs, fens and wetlands.

An additional problem, one of perception, has the potential to influence conservation initiatives and management practices. An uninformed viewer may not recognise a swampy meadow, nor have an understanding of the evolutionary processes that significantly alter its morphology in time and space. Such a limited perception, together with a view that gullies and creeks are natural and permanent landscape features, would adversely impact on the capacity to determine appropriate restoration goals.

Impacts on conservation and protection

Furthermore, definitional clarity is imperative within the legislative framework. Within the *NSW Rivers and Foreshore Improvement Act (1948)* the definition of a river includes '*any stream of water...flowing in a natural channel*'. Paradoxically, when a swampy meadow is in a degraded form with a continuous incised channel, it may be protected with the definition of a river. However, in its natural state, the imprecise definition of a swampy meadow and its general failure to be included in the legislation generally means that these landforms have little or no protection.

Defining the swampy meadow

There is often a conflicting basis for the constructing of a definition and is dependent on the user's perspective, the purpose for the definition, and how specific or general the definition needs to be. Another significant problem is the variability of the swampy meadow, in both time and space. If a swampy meadow system is continually impacted to a point where it is increasingly incised, is it a gully or a swampy meadow? This may become a legal and a management issue with the ultimate endpoint dependent on the amount of time and resources allocated to reinstate aggradational processes. Overall, the definition of a

swampy meadow should be meaningful and transferable across countries, disciplines and user groups. Too coarse a definition, and there is a risk of excluding a range of swampy meadow types, and too coarse a definition, the characterisation becomes meaningless.

The definition of a swampy meadow developed by Mactaggart *et al* (2006) enables it to be differentiated from other landforms, to be applied across a range of scales; be inclusive of the many variable types; be capable of recognising specific evolutionary forms; and reflect a multi-disciplinary approach when considering morphological and process-orientated characteristics.

Thus, a swampy meadow can be defined as:

A low energy, valley fill landform system, without a continuous channel and with or without disconnected pools, but commonly with multiple flow pathways; able to modify local scale water flow dynamics; maintaining permanently or periodically saturated soils from surface water ponding or shallow groundwater thus enabling plant production to be maintained for varying periods under drought conditions; an accumulator of organic matter or peat; being dominated by hydrophytic herbaceous perennial grasses, sedges and rushes; a system which can exhibit phases of aggradation and incision, over a range of spatial and temporal scales.

*

Barbara Mactaggart^{1,2}, David Goldney^{1,2}, Johannes Bauer¹, Andrew Rawson^{1,2,3}

¹University of Sydney, Orange, NSW; ²Charles Sturt University; ³NSW Department of Natural Resources

References

Mactaggart, B. G., 2006. When history leads us astray: Examining historical documents for the reconstruction of swampy meadow/chain of ponds in the New South Wales Central Tablelands, Australia. Unpublished manuscript under review Australian Geographer.

Mactaggart, B. G., Bauer, J. J., Goldney, D., Rawson, A., 2006. Problems in naming and defining the swampy meadow - an Australian perspective. *Journal of Environmental Management*, In press.

Prosser, I. P., 1991. A comparison of past and present episodes of gully erosion at Wangrah Creek, Southern Tablelands, New South Wales. *Australian Geographical Studies*, 29(1), 139-154.