An assessment of long-wall mining subsidence on internationally important floodplain meadows: II. A model for the prediction and quantification of impact and mitigation[1]

R. N. Humphries[2] and P. R. Benyon

Abstract: The floodplain meadows of the River Derwent are legally protected as a Special Area of Conservation and their wetland bird assemblages of a Special Protect ion Area. Consequently, following the designations, further mining activity under the Lower Derwent Valley floodplain and the future of the Selby Mine Complex was dependent on either there being no significant impact of long-wall mining on the extent and type of floristic composition or that mitigation was possible by either controlling water levels or their replacement elsewhere. This second paper considers the nature of the subsidence-induced changes in hydrology and distribution of plant communities, and in particular on *Alopecurus pratensis – Sanguisorba officinalis* (MG4) mesotrophic grassland. A regression model is developed which enables the quantification of the extent and degree potential impact and mitigation required. The model is able to determine and quantify the mitigation by either defining the water-level control necessary to maintain the floristic composition or the extent of the affected communities to be recreated as compensation.

Additional Key Words: MG4 grassland, inundation grasslands, Lower Derwent Valley

---