Developing a geodatabase from drone acquired high-resolution imagery for vegetation mapping, habitat monitoring and ecological restoration of the Buller Coal Plateau

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Drone flights were conducted over the Buller Coal Plateau to acquire high resolution photographs for the development of a database useful for describing this unique, harsh and disturbed environment. The geodatabase provides information useful for habitat characterisation, vegetation mapping, habitat mapping, ecosystem management, landscape classification and production of map products for visualisation and geospatial analysis. Flights were conducted from 2019 to 2024 using a range of DJI drones. The 44,796 high resolution images collected were processed using ArcGIS Pro, Drone2Map and webODM to produce orthomaps covering an area of 10,594 hectares including the Buller Coal Plateau and surroundings. Vegetation surveys at 147 10 x 10 m plots provided ground-truthed information on the species present (including bryophytes) and provided the information needed to train the classification algorithms used. Machine learning approaches available in ArcGIS including SVM (Support Vector Machine) and Random Trees were used to classify the orthomaps with the vegetation types identified in the survey plots used as training samples. This high-resolution map resource provides a significant repository of baseline data to support future identification and monitoring of habitats (e.g. for lizards or weeds) and inform mining, rehabilitation and conservation planning as well as decision making.