

Abstract

An Integrated Approach to Mapping and Describing Ecosystems

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Historically there have been various approaches to describing, classifying and mapping ecological systems. Ecological descriptions and maps have been based mainly on vegetation or have been compiled from data of various independently conducted vegetation surveys, soil surveys and other resource efforts. We compare the similarities between the USDA-NRCS ecological site descriptions and USDA-Forest Service ecological types and map units. Commonly, soil surveys are used as the baseline polygon map to which Ecological Site Descriptions (ESD) are assigned. An ESD is assigned to a soil map unit based on a typical soil pedon. It is assumed that the ESD and soils were consistently mapped together in the soil survey project area and that the site reflects the ESD potential.

The USDA Forest Service, Southwestern Region, uses an integrated approach where ecological components (climate, soils, geology, geomorphology and vegetation) are described collectively and simultaneously at a location where the ecological type is stable, functioning, diverse and undisturbed. Ecological types are mapped and described along an environmental gradient. Climate classes have been established and described along the gradient. Soil temperature and moisture regimes have been established for each climate class through monitoring and interpretation of NOAA weather station data and are correlated to life zones. Key indicator plant species are assigned to the climate classes within life zones and diagnostic soil properties. Personnel who describe and map these ecological types are soil scientists with skills in plant taxonomy, landscape ecology, geology and geomorphology. They are also skilled in the associated protocols for data collection and digital soil mapping. Botanists, geologists, ecologists and geomorphologists are consulted and part of the quality assurance process. The resulting ecological type is from the integrated soil, plant, climate and landform data collection process. Data are collected simultaneously by the same person(s), at the same plot location, at the same time. This results in a better understanding of the cause and effect relationship among climate, soils and vegetation. This also results in a more accurate ecological site description and map.