

Definitions

ECOSYSTEM INTEGRITY

We have adopted a definition of ecosystem integrity as “the ability to support and maintain a balanced, integrated, adaptive biological system having the full range of elements (genes, species, and assemblages) and processes (mutation, demography, biotic interactions, nutrient and energy dynamics, and metapopulation processes) expected in the natural habitat of a region.” In other words, managing for ecosystem integrity means attempting to maintain or restore ecosystem patterns and ecosystem processes to values that are within their Range of Natural Variability.

ECOSYSTEM PATTERNS AND ECOSYSTEM PROCESSES

Ecosystem patterns are the abundance of species, biotic communities, and physical habitats, as well as their spatial and temporal distribution. Management Objectives for ecosystem patterns are listed in: Goal 1 (aquatic foodbase); Goal 2 (native fish); Goal 3 (extirpated species); Goal 4 (rainbow trout); Goal 7 (Kanab ambersnail); Goal 8 (southwestern willow flycatcher); and Goal 9 (riparian and spring communities).

Ecosystem processes are the abiotic (*i.e.*, non-living) and biotic (*i.e.*, living) functions, disturbances, or events that shape ecosystem patterns. There are physical processes (*e.g.*, fire, hydrologic, geomorphic, and climatic regimes; air chemistry, nutrient cycling), biological processes (*e.g.*, competition, predation, herbivory, parasitism, disease, migration, dispersal, gene flow, succession, recruitment, maturation), and anthropogenic processes (*e.g.*, habitat conversion, novel toxins, vandalism). Management Objectives for ecosystem processes are listed in Goal 5 (water), Goal 6 (sediment), or under Goals 1-4 and Goals 7-9 when they are specific to a particular resource.

RANGE OF NATURAL VARIABILITY

The Range of Natural Variability is the spatial and temporal variation in ecosystem patterns and ecosystem processes under which the ecosystem has evolved. The range of natural variability for ecological processes is usually defined by several characteristics such as frequency (*e.g.*, number/year), magnitude (*e.g.*, cubic feet per second), duration (*e.g.*, number of days), seasonality, and rate of change.