

GLOSSARY

Active adaptive management: see Adaptive management

Adaptive management: integrates research, planning, management, and monitoring in repeated cycles of learning how to better define and achieve objectives. It is built on the assumption that natural systems are complex, our knowledge is imperfect but we can learn from purposeful, documented objectives and actions (Rogers, 2005). Active adaptive management is characterised by testing and investigations into how a system functions. In strategic adaptive management future objectives are set; these objectives are expected to change with increasing knowledge of the system in question.

Allometry: relative changes in proportions, of morphological body parts or physiological measurements. Changes can occur during the evolution of the species or in the growth of the individual.

Animal rights (see also **Animal welfare**): the viewpoint that nonhuman animals are entitled to certain basic rights and should not be used by humans or regarded as their property.

Animal welfare (see also **Animal rights**): the viewpoint that humans may use nonhuman animals for food, clothing, entertainment, and

in scientific research so long as unnecessary suffering is avoided.

Anthropocentric (the antonym is **biocentric**): value orientation which focuses on human uses and benefits from nature as defined by the Rio Declaration on Environment and Development in 1992.

Assemblage: see Species assemblage

Biocentric or **ecocentric** (see also **anthropocentric**): value orientation which considers society as part of nature and emphasises the non-use values of biodiversity. Includes both the traditional African world-view and more western models.

Biodiversity (a contraction of **biological diversity**): the full range of natural variety and variability within and among living organisms, and encompassing multiple levels of organisation, including genes, species, communities, and ecosystems. Noss (1990) developed a definition of biodiversity which includes composition, structure, and function: 'composition has to do with the identity and variety of elements in a collection, and includes species lists and measures of species diversity and genetic diversity. Structure is the physical organization or pattern of a system, from habitat complexity as measured within communities to the pattern of patches and other

elements at a landscape scale.

Function involves ecological and evolutionary processes, including gene flow, disturbances, and nutrient cycling.'

Bottom-up control (see also **Top-down control**): the ecological scenario in which abiotic resources and primary productivity control the dynamics and processes within a community or ecosystem.

Browse (see also **Graze**): verb - to eat leaves, buds, twigs, shoots of trees and shrubs; noun - woody vegetation.

Browsing-lawn: a short-grass patch created in response to grazing pressure.

Bull: adult male elephant.

Bush encroachment: an increase in the relative dominance of woody plants in a savanna or grassland.

Calf: young elephant, generally less than 4 years old.

Calving interval: the time that elapses between births.

Carrying capacity: the maximum population of a species that can be sustained in a specific area.

CITES: the Convention on International Trade in Endangered Species of Wild Fauna and Flora is an international agreement between governments signed in 1975. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival (see www.cites.org).

Command-and-control: a management approach in which protected area

managers attempt to stabilise, maintain, and engineer the ecosystems they manage. Also known as 'management by intervention.'

Complexity: deals with partly and often poorly predictable patterns in systems. This uncertainty is pervasive in ecosystems and social-ecological systems. Complexity involves the study of linkages between system components/ processes, and the feedbacks which these generate, which in turn cause trajectories into differing system states separated by so-called thresholds, invariably characterised by lags and emergence of interactions across scales.

Confidence limits: an upper and lower statistical value which reflect the probable range in which the true value lies. When confidence limits are apart, estimates are imprecise.

Congeners: refers to species belonging to the same genus.

Conspecific: refers to individuals of the same species.

Consumptive use: the reduction in the quantity or quality of a good available for other users due to consumption (MA, 2005).

Coppice: re-growth of damaged woody vegetation.

Cow: adult female elephant.

Culling (Definitions from the National norms and standards for the management of elephants in South Africa, DEAT 2008):

- a. in relation to an elephant in a protected area or on a registered game farm, an operation executed by an official of, or other person designated by, the responsible person to kill a specific number of elephants within the area in order to manage elephants in the area in accordance with the management plan of the area; or
- b. in relation to an elephant that has escaped from a protected area and has become a damage causing animal, an operation executed by an official of, or a person designated by the issuing authority to kill the elephant.

Damage causing animal (National norms and standards for the management of elephants in South Africa, DEAT 2008): refers to an individual elephant that

- a. has caused and threatens to cause losses to stock or to other wild specimens;
- b. has caused and threatens to cause excessive damage to cultivated trees or crops or natural flora or other property;
- c. presents an imminent threat to human life; or
- d. alone or in conjunction with other elephants is materially depleting agricultural grazing.

Decision maker: a person whose decisions, and the actions that follow from them, can influence a

condition, process, or issue under consideration (MA, 2005).

Density dependence: an effect on either the birth or death rate in a population that is sensitive to the number of animals in the population per unit area, for instance, a birth rate that declines as the population size increases, or a death rate that goes up as the population size increases.

Ecological climax: a theory that the end point of the process of succession is a relatively stable community of predictable species that is in equilibrium with environmental conditions.

Ecosystem: a dynamic complex of plant, animal, and microorganism communities and their non-living environment interacting as a functional unit (MA, 2005).

Ecosystem process: refers to a physical, chemical or biological action or events (or series thereof) that link organisms to one another and their environment.

Environmental indicator: a parameter which signifies the condition of the environment or the impact of a perturbation or disturbance on a system.

Eruptive growth: the rapid growth of a consumer population in a system, until some peak density is reached, followed by a period of rapid decline due to the large discrepancy between available resources and consumer density.

Extinction: the irreversible condition of when a species or genus is no longer in existence anywhere in the world (as compared to extirpation).

Extirpation: the loss of a local population although the species still lives elsewhere (as compared to extinction).

Facilitation: an interaction between two species in which one or both benefit but neither is harmed. In a mutualistic interaction both species benefit. In commensalism one species benefits and the other is unaffected.

Family unit: related adult females and their immature offspring.

Fitness: the reproductive success of individuals of a particular genotype. This is a relative measure, calculated relative to the other genes or organisms that are present in the population.

Forage: noun – the plant material eaten by grazing animals; verb – the act of searching for food.

Gestation period: period between conception and birth of a calf. Gestation lasts 22 months in African elephants, which accounts for approximately 50 per cent of the intercalving period. This means that for a period of up to two years after calving cows do not show an oestrous cycle.

Gonadotropin releasing hormone (GnRH): a hormone produced by the hypothalamus: in the brain. GnRH binds to the pituitary gland and stimulates it to produce

luteinising hormone (LH) and follicle stimulating hormone (FSH) and therefore controls the functioning of the ovaries.

Graze (see also **Browse**): to eat grass, forbs, etc. (i.e. herbaceous).

Heterogeneity: a measure of the diversity and variability of parts or processes within a system. Spatial heterogeneity refers to the diversity of parts, usually called 'patches' (habitat/vegetation class), within a defined area. Temporal heterogeneity refers to the diversity between different parts within an area over time. Pattern is a key component of heterogeneity.

Hierarchical patch dynamics: a paradigm for viewing ecological systems which includes spatial and temporal dynamics and the explicit linkage between scale and heterogeneity. Ecosystems are seen as consisting of a hierarchy of 'nested' patches of resources which occur in mosaics; these patches change in time and space. Both environmental stochasticity and biotic feedback interactions can cause instability and contribute to the dynamics observed at various scales (Wu & Loucks, 1995).

Hindgut fermenter: non-ruminant herbivore, such as elephant, in which breakdown of cellulose occurs in the caecum and large intestine.

Home range: the home range of an elephant represents the area it traverses in its normal activities of

- food gathering, mating, and caring for young. Home ranges can be measured at various time scales (e.g. monthly, seasonally, annually), and provide a measure of elephant spatial use in relation to various biotic and abiotic factors. Rainfall apparently plays an important role in determining home range size and location.
- Human–elephant conflict(HEC):** situations where elephants and humans come into conflict, e.g. crop-raiding, attacking livestock or humans.
- Hypothalamus:** a small and important organ in the centre of the brain that interprets signals from the environment and controls body temperature, breathing, heart rate and reproduction. Emotional signals are translated into hormonal and other changes and brain signals.
- Immunocontraception:** a method of using an elephant's immune response to reduce fertility by controlling or preventing conception and pregnancy.
- In situ:** in the original place.
- Inherent value:** refers to a value that exists as an intrinsic characteristic of a thing simply due to its existence and independent of its usefulness to humans.
- Inter-calf interval:** interval between births by a given female; in elephants usually ranges from 3 to 9 yrs depending on environmental conditions.
- Inter-musth:** periods between bouts of musth, shown primarily by younger (25–35 years) males, which seem to go in and out of musth more than older males.
- Jacobson's organ:** area located in the roof of the mouth that is sensitive to olfactory cues, especially those associated with urine.
- Juvenile:** sub-adolescent individual; in elephants this is often divided into young juvenile (2–5 years old) and old juvenile (5–10 years old).
- Keystone species:** A species that has major ecological effects on its habitat and, therefore, on other species living in the same area.
- !Kung:** a southern African people living in the Kalahari Desert in Namibia, Botswana and in Angola who traditionally followed a hunting and gathering lifestyle.
- Landscape:** an area of land that contains a mosaic of ecosystems, including human-dominated ecosystems (MA, 2005).
- Landscape Functionality Index:** a simple indirect measure of the change or degradation in landscape function. The index is derived following the methodology of landscape function analysis (LFA) (Ludwig *et al.* 1997).
- Life history:** the complete suite of traits that an organism has; it may change through the organism's life.
- Matriarch:** mature female who acts as leader of a family unit; typically the eldest and most experienced individual in the group.

Megaherbivore: a terrestrial herbivore that attains an adult body mass in excess of 1 000 kg. This group includes elephants, rhinoceroses and hippopotamuses.

Metapopulation (see also **Source-sink**): a group of spatially separated populations of the same species which interact through dispersal. A metapopulation is considered more stable than one single population.

Mortality: referring to the death-rate, or loss, in a population; includes factors such as disease, accidents, starvation and predation.

Musth: period of heightened sexual activity in mature elephant males characterised by urine-dribbling, strong odour, increased aggression, swollen temporal glands, temporal gland secretion, and elevated testosterone levels.

Oestrus: a phase of the reproductive cycle which occurs in sexually mature elephant females; associated with ovulation and the time that conception is most likely to occur. Only during this period do elephant females permit copulation by males; they usually show a preference for older males, especially those in musth. Oestrus cycles in elephants are approximately 12–17 weeks, and last 2–6 days.

Overpopulation: when an organism's numbers exceed the carrying capacity or the stocking density of the area.

Pachyderm: historical name for large, thick-skinned hoofed mammal (e.g. elephant, rhino). This is not a taxonomic grouping.

Piosphere: area around a water source that shows ecological effects (i.e. damage), owing to proximity to that water source.

Policy maker: a person with power to influence or determine policies and practices at an international, national, regional, or local level (MA, 2005).

Population (biological): a group of individuals of the same species occupying a defined area. All the elephants in a region, including sub-populations of females and their offspring, plus the adult males; they may all have some contact with each other, especially during the wet season when large aggregations may form.

Population (human): a group of people in a given area.

Population density: average number of elephants per unit area in a region; usually given as elephants.km⁻².

Precautionary principle: this is an approach to uncertainty, it provides for action to avoid serious or irreversible environmental harm in advance of scientific certainty of such harm (Cooney, 2004).

Proboscidean: a member of the order Proboscidea. Refers to elephants and elephant relatives with a long, flexible snout, such as a trunk.

Recent: the present period, or the Holocene (the past 12 000 years).

Recruitment: increase in a population, usually as the result of births exceeding deaths; may also be augmented by immigration.

Refugia: locations where conditions for organism survival are maintained, and where species can persist.

Res alicuius: belonging to someone.

Res nullius: belonging to no one.

Res omnium communes: common to all but belonging to no one.

Res publicae: in public ownership.

Res singulorum: belonging to an individual.

Res universitatis: belonging to corporate bodies

Ringbarking: the complete removal of a strip of bark around the outer circumference of a tree, usually leading to the death of the tree.

Rogue: vernacular term for a particularly aggressive and dangerous elephant, most often a bull. The animal may be sick or injured and may also be in musth.

Ruminant: a mammalian herbivore with a four-chambered stomach (called a rumen) and even-toed hooves. Food is partially digested in the rumen and regurgitated for additional chewing, thus a ruminant is referred to as an 'animal that chews its cud'.

Scientific Round Table (or SRT): a panel consisting of 18 internationally recognised elephant scientists, convened in January 2006 by South African minister of environmental affairs and tourism, Marthinus van Schalkwyk, to advise

on policies regarding elephant management.

Scoline: a compound formerly used during the culling of elephants. Scoline was used to render the target elephant immobile before a brain shot was administered.

Senescence: deteriorating physical condition, owing to old age.

Sexual dimorphism: physical or behavioural differences between the sexes.

Source-sink (see also Metapopulation): a model used to describe how variation in habitat quality may affect the population growth. Source patches are high-quality habitat in which a population will increase. Sink patches are low-quality habitat that would not be able to support a population. When an excess of individuals occurs in the source area, individuals move to the sink, allowing the sink population to persist.

Species assemblage: a set of species co-occurring in a particular area.

Species Survival Commission: an IUCN commission tasked with gathering information regarding the current status of plant and animal species. The Species Survival Commission consists of specialist groups, each of which focuses on a specific taxon.

Stocking density: the number of animals per unit area of managed land.

Strategic adaptive management: see Adaptive management.

Sub-population: families that occupy distinct dry-season home ranges but may mix freely in the wet season.

Succession: (see Ecological climax) the process by which organisms replace each other over time at the site.

Succinylcholine chloride: see **Scoline**

Sustainable use: the use of natural resources in such a way that: 1) populations of the species are biologically viable for the long term, 2) declines in biodiversity are avoided. Use such that the potential to meet the needs and aspirations of future generations is not compromised.

Taxonomy: branch of science dealing with the classification of organisms.

Temporal gland: a gland located midway between the eye and ear, which resembles salivary tissue and secretes temporal gland secretion. It swells significantly in males during musth.

Temporal gland secretion: there are two types of secretions: 1) a watery and short-term secretion in males, females and young which signifies social excitement or stress; or 2) a more viscous and durable secretion which occurs in males only and which signifies musth.

Thresholds of Potential Concern: the upper or lower limit for an environmental indicator which triggers for decision-making when it

is reached. Two actions can occur: (1) a management intervention to moderate the cause of the exceedance or (2) a recalibration of the threshold.

Top-down control (see also **Bottom-up control**): the ecological scenario in which ecosystem processes or dynamics are determined by predators or herbivores.

Translocation: the process of capture, transportation, and release of animals into a new area.

Ungulate: a hoofed animal.

Urine-dribbling: leakage of urine from the sheathed penis, shown by males in musth. During full musth bulls may lose more than 300 l of fluid per day in this manner.

Vagrant: see **Rogue**.

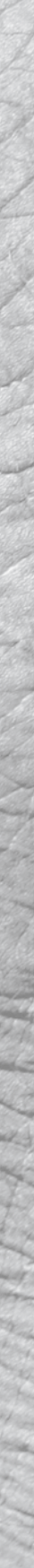
Weaning: cessation of nursing; usually starting at 1–2 years and usually completed by 4–5 years in elephants; occasionally continues until about 8 years.

Wild elephant (definitions from the National norms and standards for the management of elephants in South Africa, DEAT 2008): an elephant that –

- a. is not a captive elephant or is in temporary captivity, pending release into a limited or an extensive wildlife system; or
- b. is in a limited or an extensive wildlife system.

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INDEX

This index lists terms and subjects mentioned in the text; figures and tables are not indexed. Animals are listed under their common and scientific names, while for plants only scientific names are used. Abbreviations used: CBNRM – community-based natural resource management; KNP – Kruger National Park; TFCA – Transfrontier Conservation Area. (Compiled by Marthina Mössmer)

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