

Elephants and Ecosystems

Elephants are important. They are large, long-lived, highly intelligent and complex animals. They are under threat from ivory poaching and habitat loss. They are an essential component of African savannah and forest ecosystems. Local extinctions could lead to catastrophic ecological changes. Losing them would be detrimental to Africa, Asia and the world.

Elephant Biology and Behaviour: Exceptional in Every Respect

1. Elephants are the largest land mammals. They have proportionally very large and complex brains, combining self-awareness with a high capacity for spatial and social memory.
2. They can live to at over 70 years in the wild; there are records of Asian elephants living until 80.
3. Elephants have a very long developmental period with an extended period of social dependency on matriarchal family groups lasting 20 or more years.
4. Elephant social life is complex and extremely flexible. Females and calves live in families of two to fifty individuals, depending on the habitat and social circumstances. Large families may eventually split, or small families may join, depending on the degree of relatedness and social history among the adult females.
5. The oldest female, the matriarch, heads each family. She is the leader in every sense and the repository of vital knowledge for the survival of her family and the population. Her daily choices about when and where to lead the family affect the health and success of every family member. When a matriarch dies, whether by natural or human causes, her family may split into new sub-groups. The loss of her experience can increase the mortality risk of other family members.
6. The integrity of the family unit underpins juvenile elephant survival and reproductive success. In order to help protect and guide younger calves, immature females play a caretaking role, which reduces stress on the mothers and increases the survival of the offspring. All family members show concern for the welfare of their relatives. Surviving families members clearly "mourn" the loss of their kin, whether matriarchs or calves.
7. Female elephants can reach sexual maturity at 10-12 years. Most successful conceptions and calf rearing occurs when females are aged 15-50 years. They can continue breeding into their 60s.
8. Males leave their families from ages 10-15 and thereafter live separately in adult bull associations, often with a particular male friend. Mature males compete for females using a strategy, by which annual periods of heightened sexual activity, called *musth*, are timed to maximize success and reduce competition and conflict with age-mates.
9. The oldest, largest males are the most successful breeders. Genetic studies of a well-known population in Amboseli (Kenya) show that male reproductive success peaks in the late forties and continues at least until 60 years of age.
10. Elephants have highly complex interactions with levels of social structure beyond the family unit. They have a large vocal repertoire of over 70 individual calls, each with a specific message, and are capable of recognizing and responding appropriately to the calls of at least 100 different elephants.
11. Elephants are sensitive to the behaviour of people and are capable of distinguishing between dangerous and benign humans. Elephants generally respond to human aggression by fleeing; they will only attack if threatened at close range. Survivors of poaching attacks clearly show symptoms of trauma and stress that result in aberrant and highly aggressive behaviour. Traumatized elephants have disrupted social structures, reduced breeding success and increased antagonism towards local people.
12. Elephants have distinct personality types, such as playful (highly active and curious), gentle (with the opposite being aggressive), and constancy (predictable and popular). Leadership among elephant females appears to involve combining such traits to achieve successful negotiation among individual interests in order to affect the behaviour of others in the absence of aggressive dominance.
13. Long-term research has shown that the killing of older individuals for ivory seriously jeopardizes the viability of the population. The accumulated experience of a matriarch provides a knowledge base to steer her family through the hazards of survival in a variable ecosystem. And the prolonged breeding of old males passes on the very genes of strength and healthiness, canniness and adaptability that allowed them to reach a venerable state.

Elephants' Role in Ecosystems: Architects and Planters

14. Elephants and their ancestors have co-evolved with the ecosystems of Africa and Asia for at least 30 million years.
15. The large body size and long lifespan of elephants govern many of their ecological interactions. The demographic variables that drive population growth and decline vary over long periods of time, often measured in decades. Population size is regulated by a combination of density-dependent mortality through food competition and periodic diebacks of very young and old animals in droughts.
16. The dispersal between adjacent populations (a so-called "meta-population" landscape) is an important mechanism that reduces local population density and increases genetic diversity. The need for dispersal space argues for easements and corridors to accommodate population growth and seasonal movements.
17. Elephants' bodies are designed for movement over extensive areas with relative ease. In search of food they perforce occupy large areas of land, which today brings them into increasing contact with people and their enterprises. Hostile encounters may result in human losses as well as the compression of elephants, with localised effects on the structure of plant and animal communities.
18. Elephants eat large amounts of plant material from ground level to the tree canopy. Foraging elephants have a significant influence on the shape, patchiness and species composition of ecosystems and habitats, which are naturally in continual states of change. In this respect, the elephant is similar to other herbivores, but because of its size, it is a 'keystone species' that has a predominant and positive influence on the diversity of natural African landscapes.
19. In Africa, elephants are called the 'architects of the savannah'; their role in preventing bush encroachment has long been recognized by pastoral people. Elephants keep the savannahs open for grassland that is essential to cattle-keepers, as well as grazing wildlife and their predators. Their promotion of patchiness creates habitat edges where diversity is high. If elephants are removed, the structure of habitats changes dramatically.
20. They are also called the 'tree-planters' of the Central African forests. Elephants ingest and disperse the seeds of large, important forest tree species. Scientists have recorded 96 species in elephant dung, which can be dispersed more than 10 km from the parent tree. Many tree species can only reproduce if elephants swallow and transport their seeds. The loss of forest elephants (and other large-bodied dispersers) could lead to the extinction of the most valuable tree species in the Central African forests.
21. The links between the ivory trade and the illegal killing of elephants are clear (see KEF Fact Sheet 02-2013, *The Ivory Trade and Elephant Poaching*). Unless action is taken based on good information and sound policy, African elephants will be gone from most of their former range within our lifetimes, along with the diversity and immense value of many habitats and species.

For more information, please contact the Kenya Elephant Forum or one of elephant research and conservation organisations listed below:

African Elephants

The Amboseli Trust for Elephants
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Asian Elephants

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ElephantVoices

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