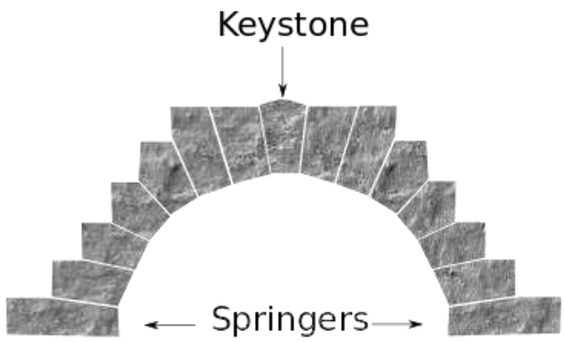
JANUARY 1 – 14, 2020 NATURAL HISTORY NOTES
By Dick Harlow

KEYSTONE SPECIES

"A **keystone** (also known as capstone) is the wedge-shaped stone at the apex of a masonry **arch** or typically round-shaped one at the apex of a vault. In both cases it is the final piece placed during construction and locks all the stones into position, allowing the **arch** or vault to bear weight."



Voussoir stones of an arch, © Wikipedia

The role that a **Keystone Species** plays in its ecosystem is analogous to the role of a keystone in an arch. (see above diagram). While the keystone is under the least pressure of any of the stones in an arch, the arch still collapses without it. Like the arch, an ecosystem may experience a dramatic shift if a keystone species is removed, even though that species was a small part of the ecosystem by measures of biomass or productivity. It has become a popular concept in conservation biology, alongside flagship and umbrella species. Although the concept is valued as a descriptor for particularly strong inter-species interactions and it has allowed easier communication between ecologists and conservation policy makers, it has been criticized for oversimplifying complex ecological systems. But then we humans do try to over-simplify!

A **Gray Wolf** in Yellowstone National Park. Credit... Danny Green/NPL/Minden Pictures

KEYSTONE SPECIES are species that keep this planet functioning as a biological entity!

Some examples of Keystone Species are: Wolf, Sea Otter, Wildebeest, Starfish, Bass, Wild Dog, African Lion, to name a few.

By definition – "A **keystone species** is a species which has a disproportionately large effect on its natural environment relative to its abundance, a concept introduced in 1969 by the zoologist Robert T. Paine. Such species are described as playing a critical role in maintaining the structure of an ecological community affecting many other organisms in an ecosystem and helping to determine the types and numbers of various other species in the community. Without keystone species, the ecosystem would be dramatically

different or cease to exist altogether. Some keystone species, such as the wolf, are also apex predators."

A perfect example of how the environment was, how it changed and how it changed back again when the Gray Wolf was first in Yellowstone National Park, to its elimination from Yellowstone to its return to Yellowstone. The wolf controlled the over population of the Elk and their over-grazing which thus allowed vegetation to survive. This also allowed for birds to use the forest like they used to and allowed for other animals to function more appropriately in the Yellowstone ecosystem.

Sea Otter, *Enhydra lutris*, with a red Sea Urchin,
NOAA Climate.gov

Without the Sea Otter controlling the Sea Urchin population, there would be fewer kelp forests that the sea urchin favors; thus, there would be fewer fish and other organisms that use kelp for food and protection. The kelp provides a home to many marine vertebrates and invertebrates.

Cheetah, *Acinonyx jubatus,* two brothers,
Serengeti National Park, Tanzania, Africa – 1980.

Cheetahs are a Keystone species in the African savanna. Cheetahs are a top predator on the savanna and are able to use their adaptations for speed to hunt down grazing animals such as gazelles or zebras. Cheetahs along with African Lions, and African Dogs help control the population of these grazing animals and thus help prevent grazing animals from overpopulating.

To name a few other Keystone species consider the Wildebeest, Starfish and Bass.

Lose them along with other Keystone species and the various ecosystems losing their specific Keystone species, will unravel. As the smartest animal on the planet we should be able to figure out a way to protect Keystone species.

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OBSERVATIONS

MAMMALS

Meadow Vole – tunnels and runs
Red Fox – observed and tracks in the snow.
Coyote – calling, howling, tracks in the snow.

Weather Tidbits

Month of JANUARY 15-31, 2020
All Measurements taken at solar noon (1230 EST).

PRECIPITATION

Total Precipitation: 25.0 mm or 0.98 inches

Overcast Days: 10