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NATURAL VS. MAN-CAUSED DEATHS OF WILD ANIMALS IN NATIONAL PARKS

> For everything there is a season, . . . a time
> to be born and a time to die.
>
> --- Ecclesiastes 3; 1-2

All populations have birth and death rates. Population numbers remain stable when deaths equal births. Characteristically, more young are born each year than are needed to maintain stable numbers.

Deaths due to natural causes are highly age-specific and are mostly the oldest adults and weakest young in a population. The strongest young and middle-age adults consistently survive conditions that cause the weakest young and oldest adults to die. The primary cause of most adult deaths is physiological old age or senescence. Deaths of young are mainly due to competition with adults for space or food, and the effects of periodic severe weather. Deaths finally occur from secondary causes. Carnivores regularly die from a lack of food (starvation). Herbivores may finally die from undernutrition, from illnesses, or by being too weak to escape from predators. Diagnosing these final causes of death is difficult and usually it is only possible to state that an animal died from natural causes. Herbivores rarely die from an absence of food, and attributing their deaths to starvation is usually an incorrect diagnosis.

No living creature escapes death, but it is possible to have man-caused deaths occur in advance of deaths that would otherwise occur from natural causes. A complete substitution of man-caused for natural deaths is rarely attainable because the density-independent effects of severe weather continue to cause the deaths of both young and old animals.

Whether a natural or man-caused death is "best" for wild animals can be a matter of personal feeling. However, a more definitive basis exists for assessing whether natural or man-caused deaths of wildlife are more appropriate within national parks such as Yellowstone. Here it is necessary to consider first the purpose of a national park, and second, the ecological consequences of substituting man-caused for natural deaths in parks.

The purpose of Yellowstone Park is to preserve nature and provide for the public enjoyment of same in ways that retain natural conditions. Here nature is a collective term for native plant and animal life and natural environments as an integrated whole, or ecosystem. Natural conditions can be defined as those where modern man is not changing the flow of energy or cycling of nutrients within an ecosystem; or altering the distributions, behavior, or population dynamics of wild animals.

About 1% of the park's 2.2 million acres is taken up by roads, facilities for visitors, and administrative units. The remaining 99% is undeveloped wild land. With the possible exception of the gray wolf, representative populations of all native wildlife species occur as yearlong residents. The park additionally serves as summer range for elk and mule deer that spend the winter and are hunted on adjoining state lands. Because man's influences on the park's resident wildlife have been greatly reduced in recent years it is possible to conclude that Yellowstone Park is presently one of the most complete natural ecosystems remaining in the United States.

Figure 1 shows an ecological system where nutrients cycle through plants, wild animals, and an environment, and deaths only occur from natural causes. Such systems become unnatural to the extent that modern man adds or takes away nutrients, or manipulates the deaths of animals or plants. This diagram also shows that death is necessary to recycle nutrients, transfer nutrients from herbivores to carnivores, and more fundamentally, to sustain and renew life. Obviously the concept that something is wasted if it is not eaten or used by man is inappropriate in a natural ecosystem.

Figure 2 illustrates the relative proportions of plants, herbivores, and carnivores within natural ecosystems. The system becomes unnatural if man reduces plants that sustain wild herbivores; reduces the numbers of herbivores that sustain native predators and scavengers; or directly reduces carnivores. Unnatural conditions also occur if supplemental food is provided to wild animals. This practice changes the natural distributions and behavior of fed species, the way their populations are regulated (artificially high densities increase deaths from competition and other social interactions), and increases parasite loads and the incidence of communicable diseases.

Additionally, substituting man-caused for natural deaths in parks changes the behavior of an exploited species to the extent that they become more wary and less visible to park visitors and may not use all available space or food. There are also indications that reducing natural deaths of less fit young from competition can cause a population of wild animals to be less adapted to its environment than it would otherwise be.

In summary, individual animals die, but populations persist over time because births replace deaths. Deaths from natural causes are characteristic of natural ecological systems. Substituting man-caused for natural deaths in parks changes the behavior of exploited species, changes the relationships between herbivores and carnivores, and more fundamentally changes natural ecosystems to man-modified systems. Such changes are inconsistent with the fundamental reasons for establishing national parks. Substitutions of man-caused for natural deaths would be consistent with an objective of managing wild animal populations to provide recreational hunting and food for humans, and this is the usual objective in areas other than national parks.

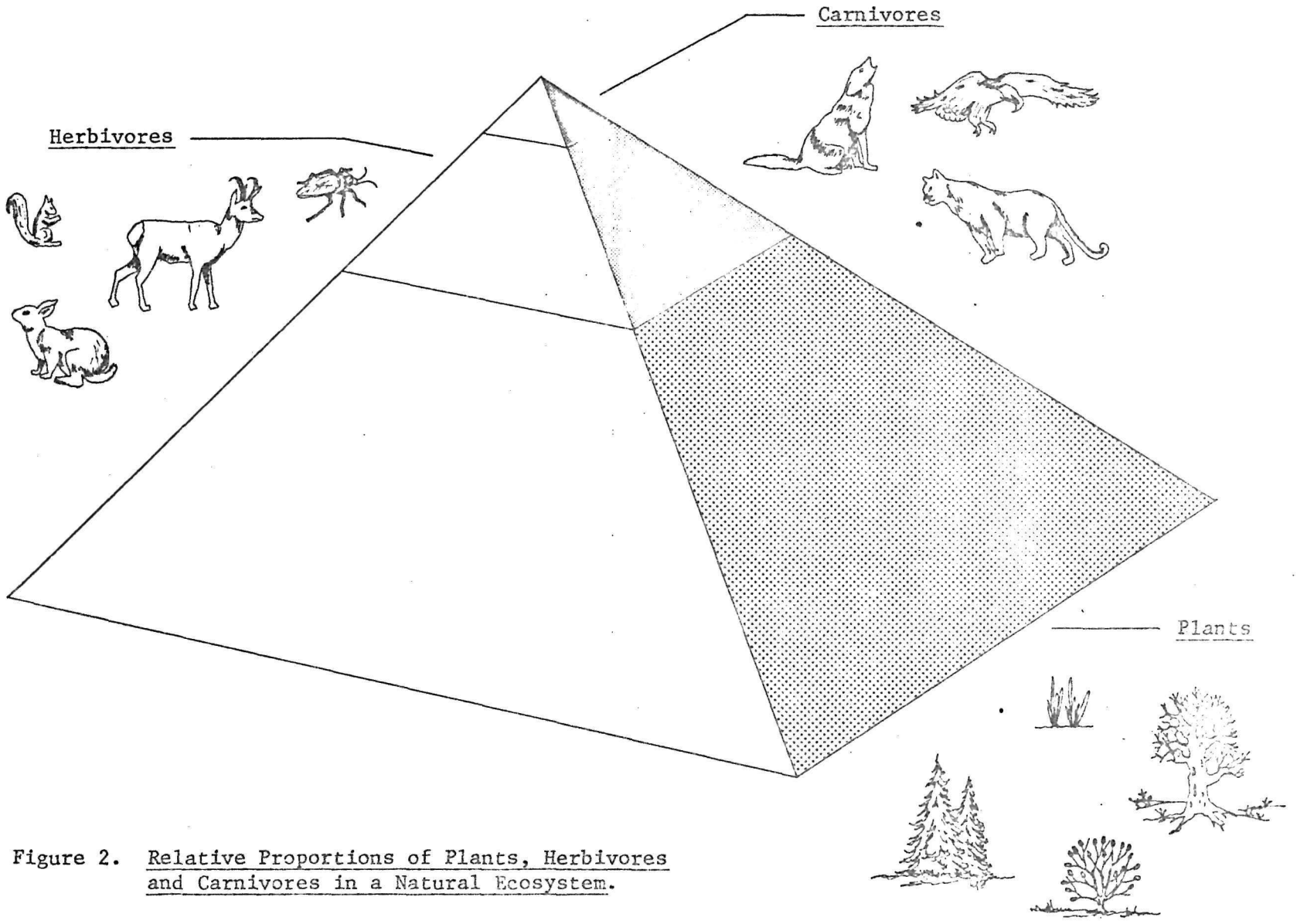

Figure 2. Relative Proportions of Plants, Herbivores and Carnivores in a Natural Ecosystem.

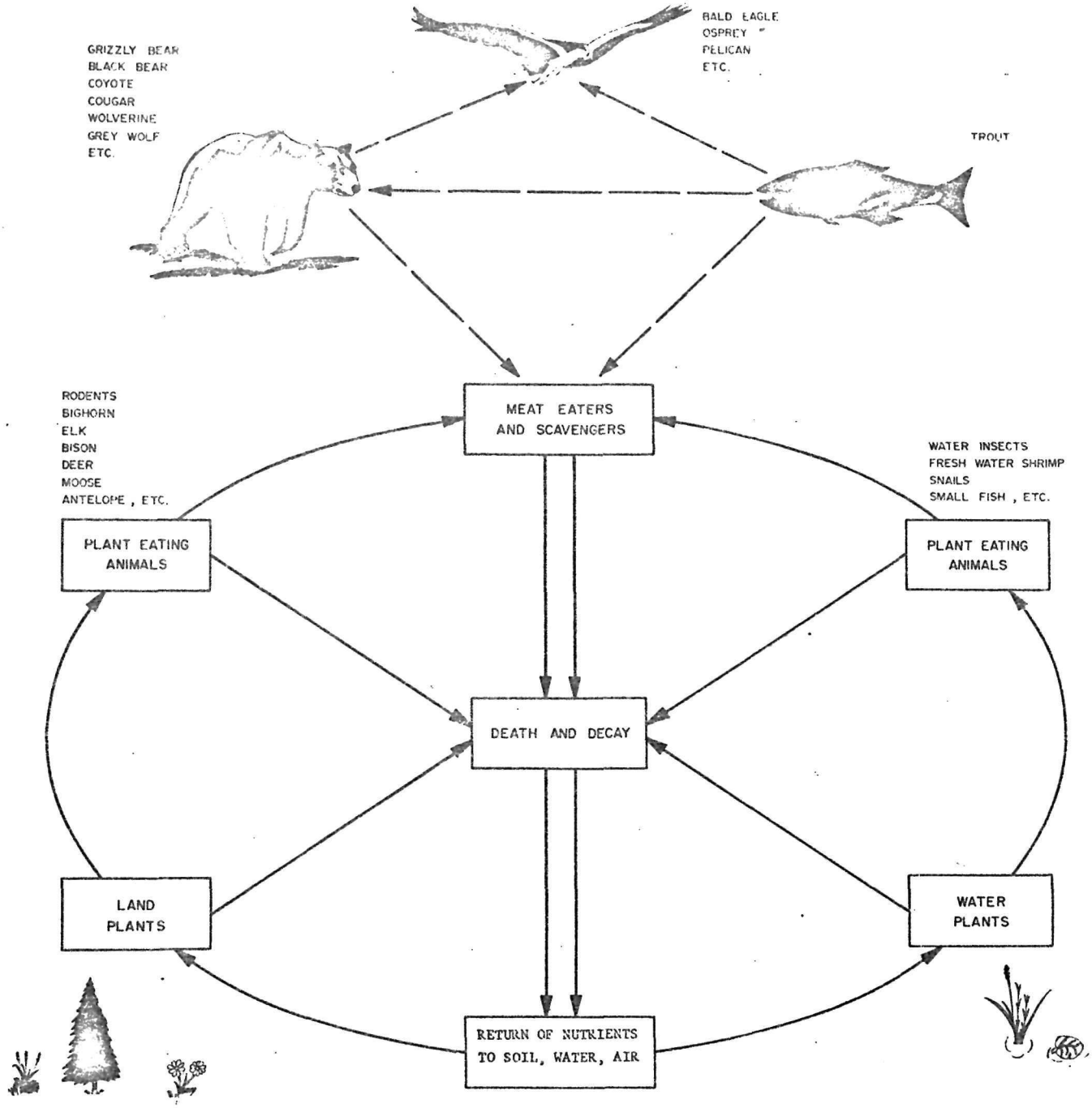

Figure I — YELLOWSTONE ECOSYSTEM

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