

Course- WL- 707 Terrestrial Wildlife
Management
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Management

7th Lecture

Wildlife and Water

Water and wildlife

Water is necessary dietary component, participating in many chemical and physical processes in animals. In addition, animals require water for evaporative cooling in hot environments. Water requirements of few wildlife species have been studied in controlled environments. In addition, the stresses of dry seasons have been indicated by concentration of animals around water sources and by increases in mortality during drought. However, for most species, we know surprisingly little about their water requirements for survival or their probably greater requirements for successful reproduction.

Wildlife responds to water deprivation in three ways. Elephants will dig in dry river bottom, exposing water for themselves and other species. Mobile species, like doves, will migrate to water sources. But some wildlife must abandon waterless ranges during dry seasons, concentrating around surface water. Such concentrations are usually disadvantageous because local forage supplies may be overused or trampled, the numerous animals may attract predators and may be forced to use habitats where predators have advantages, and concentration may facilitate transmission of disease and parasites.

Water requirements

We are sometimes unrealistic and anthropomorphic in assuming animals in arid environments are water stressed. Water requirements of animals will vary with weather conditions and according to the seasonal pattern of physiological functions. Water intake must be increased in hot weather to replace that lost by evaporative cooling. The demands of reproduction can also increase water requirements. However, although field observations have indicated poor reproductive performance by wildlife during drought, the relative roles of inadequate water and of poor nutrition, common during drought, in depressing reproduction have not been clear. Water

requirements vary greatly among species since some animals are adapted to arid environments. Adaptation to aridity include;

Nocturnal and fossorial habits

Many desert adapted species avoid the demands of evaporative cooling by confining activity to times and places with lower temperature and higher humidities.

Concentrating excreta

Desert adapted species produce dry feces and have powerful kidneys that concentrate urine, reducing water loss for these function.

Labile body temperature

Some species normally allow their body temperatures to rise during the heat of the day. The excess heat loss is at night by convection, conduction, or radiation. This reduces water requirements for evaporative cooling.

Morphology

A large body size and abundant insulation can prevent heat uptake and provide mass for thermal inertia, in mammals, insulation is usually greatest on back to protect skin from the sun. Other body parts may be scantily haired to enhance the heat loss by convection. These body parts may be enlarged, like jackrabbits ear, to expose heat; or they may be associated with mobile appendages or hair patterns that increase air movements, enhancing heat loss by convection.

Use of metabolic water

Oxidation of carbohydrates and fats produces water to augment intake.

Water storage

Some species are physiologically adapted to withstand temperature reductions in body fluid levels. They may also be able to rehydrate quickly at a source of water. Ruminants have an advantage in that water can be stored in the rumen. Desert bighorn sheep can withstand losing 30 percent of their body water, mostly from the rumen, and can rehydrate quickly by refilling the rumen. (Turner 1973).

Mobility

Birds have the advantage of flight in visiting water sources distant from their feeding, roosting, or nesting sites. Doves may migrate daily to water.

Pattern of reproduction

The reproductive seasons of the most desert wildlife are timed to avoid the driest period of the year. This actually enhances reproductive success in that both water availability and forage quality are best at critical times. A capacity to produce numerous young in occasional years for good, moisture is also an advantage in deserts.

Water supplies

Water sources include surface water (fresh water, salt water, and snow), dew succulence and metabolic water. Salty or brackish water can be used only by species having mechanisms for excreting excess salts. Succulence is water in food. In deserts water availability may vary greatly among years and among seasons. Although deserts tend to have one or two seasons when precipitation is expected, some years pass without moisture. Man is primarily influence of water availability. Historically, man have concentrated around water in arid areas. Springs have been diverted or developed for livestock or for human use.

Management of water

Numerous cisterns and catchments, traditionally called guzzlers, have been constructed to accumulate and store water for desert wildlife. These structures usually include a wide, impervious apron to catch water from occasional precipitation. The apron directs water into cistern that is usually covered to reduce evaporation. Wild birds and mammals ay enter the cistern to drink or the water may be directed to trough where flow s controlled by a flotation valve.

Guzzlers have been constructed primarily for game birds, such as Chukar partridge and desert quail, and for desert bighorn sheep and deer. Enthusiasm for constructing guzzlers has been high because the projects have provided physical evidence of accomplishment. Guzzlers can be photographed. If the construction of guzzlers is to benefit wildlife

1. The stored water must be accessible to the animals.
2. Water must be limiting factor in their habitat.
3. There must be no other equally limiting habitat requirements.