



Kaibab Plateau:

(Part 2)

Transition from Quantity to Quality

By Jim Heffelfinger

If you followed the first part of this story in the last issue, I detailed the great lengths to which early biologists went to control and reduce the over-abundant deer population on the Kaibab Plateau in the 1920s. At the time, most areas were struggling with fast-disappearing wildlife and dwindling big game abundance so it was a new challenge to figure out how to have less deer. The high deer densities on the Plateau were causing obvious and widespread damage to the deer browse and this situation brought the brightest minds together from the new profession of wildlife management. The challenge was not to save the deer, but to save the habitat from the deer.

Curiously, the intense predator removal efforts continued throughout all these desperate attempts to drastically reduce the deer population and save the habitat from destruction. During the period of the most frantic deer population reduction efforts (1924-30) there was a reported removal of 107 lions, 1,849 coyotes, 19 wolves, and 434 bobcats. In

hindsight, they clearly should have let the predators help them during that part of the Kaibab's history.



Antler size and age of bucks currently being harvested on the Kaibab Plateau are exceeding the Alternative Management Guidelines developed as part of an extensive public process. Photo by George Andrejko

A PERIOD OF RECOVERY

By most accounts, it appears that the Kaibab herd was reduced enough by 1934 to allow a recovery of the browse. With the help of several wet years in the late 1930s, deer body condition improved and browse plants showed vigorous annual growth. Lessons learned on the Kaibab – both biologi-

cal and political – set the stage for the further refinement of deer management throughout the West.

The Kaibab deer population continued to recover and increase through the 1940s, and by 1950, the deer population on the Kaibab Plateau was high enough once again to require a reduction in numbers to protect the winter range from overuse. Doe hunts during this period were reinstated to help control the deer population. With this period of abundance, deer trapping and translocation began again. In the fall of 1950, a large corral trap was also built to surround Slide Tank on the west side winter range. Over the next decade about 300 deer were trapped in large corral traps and translocated from the Kaibab but this was not significant enough to aid in reducing the population and there are very few records on how the animals fared in the places they were moved to. The number of hunting permits was increased as more and more damage was detected on the winter range browse,



but the herd continued to grow. In the winter of 1954 the plateau experienced another deer die-off and, combined with the hunts, reduced the deer herd by about two-thirds. After that, range conditions improved and the body weights of deer started to increase again as the herd recovered. The herd grew once again through the late-1950s and into the 1960s before declining somewhat unexpectedly once again between 1966 and 1976.

TRANSITION FROM POPULATION CONTROL TO MANAGEMENT

After the decline in the early 1970s, research activity increased in an attempt to learn more about the herd and what made it fluctuate. Either because of, or in spite of, the research, the deer herd again increased through a very high period in the mid-1980s due to high precipitation, reduced cattle grazing, and buck-only hunting. This increase in the deer population forced the Arizona Game and Fish Department to split the hunts into a east side and west side hunt in 1983. The east side hunt was managed as a trophy hunt with less permits.



NPS Rangers ear tagging and aging a deer for translocation to the Navajo Nation. Desert View Subdistrict, Grand Canyon National Park, December 20, 1961.

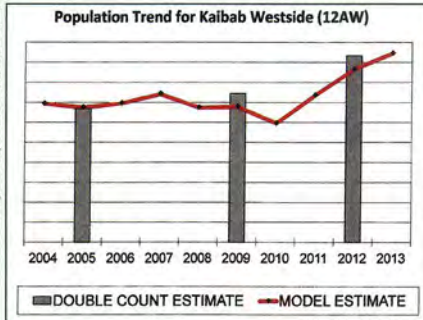
Drier conditions returned through the 1990s and, predictably, the Kaibab deer herd declined during this time. Originally, the Kaibab Plateau became famous for quantity, but with the development of modern wildlife management informed by science, we can now do a better job of managing abundance and demographics (sex ratios and age structure) of the deer population. Big antlers are not grown on nutritionally stressed bucks and so no trophy deer management program is successful without ac-

tively keeping the population within the capacity of the habitat. Since much of the nutrition that goes into early antler development comes from body storage, bucks must come off winter range in decent condition; this means making sure we don't have too many deer for the available winter browse in "bad" years. Antlerless hunts have been recognized for 90 years as the most effective tool for managing the number of deer on the landscape.

CURRENT MANAGEMENT

Herd Population Surveys

Each year, December through early February, surveys on the ground lead by Wildlife Manager Todd Buck, classify 600-1000 deer to determine buck:doe ratios and fawn:doe ratios. Surveying herd composition from the ground allows managers to spend more time accurately classifying groups of deer. Surveying at this time of year not only yields more accurate buck:doe ratios, but it also assures the ratio used in making management decisions represents the lowest point in the annual cycle, right after the hunts.



The deer population on the Kaibab Plateau has been increasing in recent years because of high fawn recruitment and a management goal to allow for controlled increase.

The fawn recruitment on the Kaibab is the highest in Arizona and, in terms of productivity, this population behaves more like a Rocky Mountain population than a typical southwestern deer herd. For the last 3 years surveys have recorded as many fawns as does in the count (100 fawns:100 does). This level of recruitment increases deer populations as the survey data shows is indeed happening.

In addition to annual herd composition (ratios) surveys, the Arizona Game and Fish Department (AZGFD) also conducts a special helicopter survey every 4 years to arrive at a population estimate of the Kaibab deer population (GMUS 12AB). This aerial survey uses a technique called the simultaneous double count that allows biologists to estimate the percent of deer not seen during the survey. Using this survey method is very expensive and can't be done every year, but allows for a periodic tracking of deer abundance.

The aerial survey is a direct way to estimate the deer population, but biologists have long used computer population models to indirectly estimate deer populations and to simulate how they will react to different management actions. AZGFD uses a revised version of the commonly-used "POP2" model that relies on historic survey and harvest data to run through millions of calculations to simulate deer population fluctuations over a predetermined span of years. These models were not designed to tell you exactly how many deer you have in a population, but rather to give the wild-

life manager an indication of whether the deer population is increasing, decreasing, or stable. Models such as these are only as good as the data used to make them run, but they do provide a useful tool to predict what will happen to the population under different harvest scenarios.

In 2005 deer experts from several states and representatives from conservation organizations met on the Kaibab Plateau to discuss the management of the population just as they did in 1924. One of the outcomes of that meeting was direction from the Arizona Game and Fish Commission to grow this population 5-10% and continually monitor the habitat and deer herd for signs of overpopulation.

Habitat Monitoring and Improvement

One way to monitor where the deer population is in relation to the habitat carrying capacity is to monitor the condition of the browse plants on winter range for signs of overuse. Forage monitoring has always been an important part of deer management on the Kaibab Plateau. For many years, the management plan for this herd stated that antlerless hunts will be considered when deer browsing of cliffrose twigs (an important shrub) on winter range exceeded 50% before mid-March.

A new winter range monitoring protocol began in 2009 and was based on a method used in Utah for decades. This current method collects data from 21 permanent plots scattered across Kaibab winter range and in each plot measurements are taken for the percent of the ground covered by important plants (canopy coverage) and also measures of health and reproduction of the browse plants. The biggest challenge on the winter range is degradation caused by invasive weeds and altered fire frequencies. Cheatgrass is the primary threat, but there is now a large area of Russian thistle expanding at an exponential rate.

In 2007 the AZGFD and federal agencies initiated an aggressive landscape-scale plan to improve forage on 25,000 acres of Kaibab deer habitat.

This includes rangeland drill seeding, woody plant "pushes," and pinyon-juniper restoration efforts. Improvements are certainly being made, unfortunately, the post-fire seeding efforts were not very successful, with most of the regeneration occurring naturally rather than from all the native seed planted. There is a comprehensive plan to add 13 new waters to the Kaibab winter range that is almost complete with 11 of those now operational and supplying water to mule deer. Additionally, there is a new plan on the east side that includes 6 new waters and 5 water redevelopments. Several natural fires in recent years have made great strides in rejuvenating the shrub community and helping the landscape carry more deer.

In an effort to evaluate the benefits of these habitat treatments, 30 does were collared in 2012 with GPS collars that record their exact location several times each day. Once these data are downloaded by biologists, the locations can be compared to habitat features and treatments to see where the deer are spending most of their time. Letting the deer teach the biologists is always much more fruitful than the reverse. Knowing what areas deer find important tells us a lot about the relative value of habitat treatments such as burns, pinyon-juniper removal, cliffrose "topping" and other methods to improve food and cover for deer.

Harvest Management

Since 1924, the AZGFD has collected harvest information from the Kaibab deer population by running a mandatory hunter check station on the Plateau. All deer harvested must be physically inspected at this station so data can be collected on age structure, antler characteristics, body condition, signs of disease, genetics, and more. This provides important information directly from the harvested deer and is a valuable resource for managers.

Body weights are one piece of information from the check station that is used to help manage the herd. AZGFD researchers Clay McCulloch and Ron Smith analyzed many years of body

weights, habitat condition, and environmental variables to conclude that field dressed weight of yearling bucks dropped below 95 pounds when the population was at or above carrying capacity. They suggested this should be a trigger for managers to reduce the deer population when yearling weights dropped below that benchmark. For the past decade the average yearling weights have exceeded this level indicating the population is not above what the habitat can currently support.

To supplement the body weight information, the AZGFD now captures deer every 3 years to assess body condition in the spring (after their stay on winter range). This was done last in 2012 and will be repeated next in the spring of 2015.

Although indications are that the Kaibab deer population does not currently exceed carrying capacity, antlerless tags are offered to manage the growth of the population between 5-10% and to provide youth opportunity. Only 350 antlerless tags for juniors are offered for the fall of 2014, but with 3 consecutive years of 100 fawns per 100 does managers will be monitoring this closely to avoid over-running the habitat's carrying capacity. This part of Kaibab mule deer management still has the same tendency to cause controversy as it did 90 years ago.

Because the Kaibab Plateau (12AB) is such a special place for hunting giant mule deer, there are unique management guidelines used to maintain an age structure worthy of its historical reputation. One of the guidelines calls for the harvest in the late trophy hunts to consist of 55-75% bucks 3 years old or older. That bar is being met nicely with the 2013 harvest being 58-83% bucks 3+ years old. Since antler size generally peaks after 5 years of age, the guidelines also state that 20-30% of the late seasons' harvest must be at least 5 years of age. Again, the 2013 harvest was 25-58% bucks 5 years old or older.

Hunt guidelines for the Kaibab aim for a hunt success in the late November seasons of 50-70% and yet it was 77-83% in 2012. Percent of Kaibab Plateau bucks with at least 4 antler points was 27-40% in early hunts (late October) and 84-91% in the late hunts (late November).

Lacking adequate nutrition a buck cannot express his full genetic potential for antler growth. No deer population can increase forever, so managers must remain vigilant for signs of too many deer on the range.

Hunt Guidelines and current population data for Kaibab Plateau (12AB) late mule deer hunts.

Management Guideline	Goal	Currently
Fawns:100 Does	>60	102
Bucks:100 Does	>30	32
Hunt Success	50-70%	77-83%
Bucks 3+ years old	55-75%	58-83%
Bucks 5+ years old	20-30%	25-58%
Yearling weight (lbs.)	>90	100
Population Trend	Increase 5-10%	Increasing
Bucks with 4+ points per side	N/A	84-91%

This is not an official management guideline, but gives a good indication this herd has plenty of older-age bucks. Not everyone can take home a Boone and Crockett class buck in any area, but the current management on the Kaibab Plateau is obviously sending a high percentage of happy hunters to the taxidermist.

PRESERVING THE LEGACY OF THE KAIBAB

The early management struggles with the Kaibab mule deer herd taught us in a graphic way that too many deer can damage the habitat and hamper the population's ability to bounce back from a die-off. After seeing the habitat damage that the Kaibab deer population eruption caused, Aldo Leopold wrote: "While a buck pulled down by wolves can be replaced in two or three years, a range pulled down by too many deer may fail of replacement in as many decades." Deer over-population reduces the health of individual deer and good nutrition is one of the foundations of producing trophy deer.

Although the quantity of deer on the Kaibab is not the same as past years, the quality certainly rivals the "Good 'ol Days" whenever that was. Because of the productivity of this herd, it could serve to offer abundant opportunity to deer hunters, but instead continues to be managed with a conservative harvest under "alternative" management guidelines.

Any population can be managed many different ways. The knowledge gained through the decades allows for a more informed management of this deer population. Management goals determine what the buck:doe ratio and buck age structure will look like. A lot of people care deeply about the Kaibab Plateau and want to see the continuation of its legacy of producing some of the finest specimens on the continent. With the continued stewardship of management agencies, assisted by hunters and conservation organizations, we can work together to preserve the legacy of the Kaibab for our children's children.



Editors note: Jim Heffelfinger is an adjunct assistant professor at University of Arizona, Professional Member of the Boone & Crockett Club, Chair of the WAFWA Mule Deer Working Group, and a game biologist for the Arizona Game & Fish Department.

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