Monitoring Muleys

How FWP figures out mule deer population trends and harvest recommendations, and why biologists say now is the time to issue more B licenses in southeastern Montana. BY TOM DICKSON

MULTIPLYING Mule deer populations in southeastern Montana (FWP's Region 7) were devastated by the brutal winter of 2010-11, reaching a low point in 2012. Since then, numbers have rapidly increased, as the relatively fewer remaining deer had plenty of browse, and three mild winters created abundant vegetation. FWP biologists say that now is the time to start harvesting more does, so herds don't overbrowse their habitat.

It was five long years ago, but Dean Waltee vividly recalls what the winter of 2010-11 did to mule deer in southeastern Montana. "The record cold and snow we saw that year decimated mule deer populations in our region and throughout eastern Montana," says Waltee, at the time the Montana Fish, Wildlife & Parks biologist in Broadus. FWP Region 7's mule deer population, the state's largest, bottomed out in 2012 but has since rebounded to where it had been and beyond. Biologists attribute the increase to three consecutive mild winters, the replacement of older deer that died with younger, more productive deer, and a cutback by FWP in antlerless mule deer harvest. By spring of 2016, biologists estimated the population had grown to 47 percent above the long-term average. "We haven't seen numbers like this since the late 1990s," says John Ensign, FWP Region 7 wildlife manager.

Because of the rapid increase, FWP wildlife biologists say now is the time to start moderating the population growth by issuing more B licenses, or tags, which allow hunters to harvest additional antlerless deer. That will prevent muleys from overpopulating and eating themselves out of house and home.

Boosting antlerless harvest this fall is a smart move, say FWP officials. But to many hunters, issuing more B tags seems illogical. If deer numbers are increasing, they ask, why not let the population continue growing and then hold it at a high level year after year?

CREATING CONFIDENCE

"We haven't always done the best job of explaining to the public how mule deer management works," says Waltee. "Basically, what we do is survey mule deer populations and estimate mule deer harvest, and then use that information to decide on appropriate harvest levels for the upcoming fall hunting season."

Twice each year biologists count, from airplanes, the number of deer in large survey areas across Montana's mule deer range. "We can't go out and count every deer. That's literally impossible," says John Vore, chief of FWP's Game Management Bureau. "What we and many other states do is count deer in areas representative of the region's habitat, private and public land ownership, and public hunting access. That and other information tell us whether the overall mule deer population trend from year to year is increasing, decreasing, or staying stable."

Biologists fly over the state's 101 survey areas between December 1 and January 15 to determine the proportion of bucks, does, and fawns. They fly the same areas again from March 15 through April 30, when deer are concentrated in open areas during spring "green-up," to see how well fawns and adults survived the winter.

Hunters who don't see as many deer as biologists report may wonder if the surveys are focusing too much on private property, where deer numbers might be higher than on public land. Vore says that's not the case. In the state's main mule deer regions of central and eastern Montana, 41 percent of the

LEFT TO RIGHT: SHUTTERSTOCK; ROD SCHLECHT

HOW THEY KNOW FWP tracks mule deer population trends by monitoring deer during aerial surveys in winter and early spring (above left), through winter phone surveys of hunter harvest (above center), and at hunter check stations (above right). Department biologists have also radio-collared and tracked 1,134 mule deer over the past several years to see how well the animals survive and where they travel.

survey areas are on public land or private Block Management Area property. "That's a higher percentage of land open to free public hunting than exists in the regions as a whole. So we are surveying representative areas accessible to all hunters," Vore says.

Still, isn't it possible that deer move far from the survey areas by the time the fall hunting season rolls around—which might account for why some hunters don't see as many deer as FWP says are out there? "We looked into that," says Justin Gude, chief of FWP's Wildlife Research and Technical Services Bureau. Biologists tracking radio-collared deer found that one-third stay in survey areas during the fall, while the other two-thirds move away from the wintering areas only three miles on average. "Where we see the deer in the winter is pretty much where they will be next fall," says Gude.

> "All that information gives us confidence that we know what's going on with the mule deer population."

Another way FWP takes the pulse of mule deer populations is by monitoring hunter harvest at check stations and with winter phone surveys. "That harvest information almost always tracks with what we saw in the aerial surveys," says Gude. "If our winter and early spring surveys show an upward trend in deer numbers, we usually see more hunters with deer in the back of their pickups the following fall."

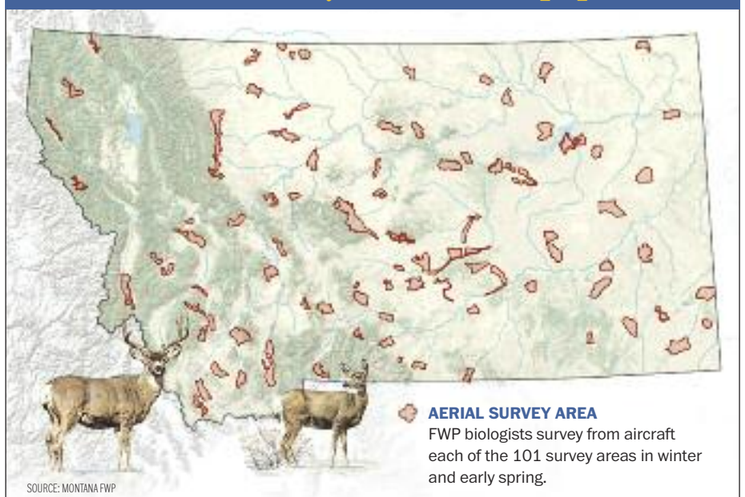
Another way biologists assess deer numbers is by regularly talking with landowners about wildlife populations they see on their property and by monitoring and addressing game damage complaints. What's more, over the past several years FWP has radio-collared and tracked 1,134 mule deer to see how well the animals survive and where they go. "All that information, added to the harvest data and aerial surveys, gives us confidence that we know what's going on with the mule deer population," says Vore.

THE OVERBROWSING EFFECT

Even though FWP biologists know that mule deer populations in southeastern Montana are rebounding, how can they know for sure when to start increasing antlerless harvest to scale back that recovery? A 34-year-long experiment in the region provides answers.

Muley populations rise and fall naturally

Biannual aerial surveys of mule deer populations



SOURCE: MONTANA FWP

PARTS REPRESENTING THE WHOLE It would be impossible to count all of Montana's mule deer. So FWP instead counts deer in survey areas representative of each region's habitat, private and public land ownership, and public hunting access. By adding survey information to harvest data, biologists know if a deer population is increasing, decreasing, or staying the same and thus can recommend appropriate harvest quotas.

GOT THEIR DEER Mule deer numbers have been down in western Montana since the 1980s largely because of elk and whitetail population increases and conifer expansion. Still, hunters find muleys, as shown here. The 2015 statewide harvest of 14,733 mule deer was slightly below the long-term average. In Region 7, the number of mature bucks has been down in recent years. But the overall population is booming, which bodes well for buck hunting in the next several years.

CLOCKWISE FROM TOP LEFT: MONTANA FWP; ERIK PETERSEN; JOHN WARNER; HUNTER HARVEST PHOTOS FROM FWP GAME CHECK STATIONS; DONALD M. JONES; LUKE DUBAN/MONTANA OUTDOORS

The "adaptive harvest management" approach

Since 1998, FWP has followed an "adaptive harvest management" (AHM) approach for mule deer in Montana. Like a similar process long used for waterfowl management, AHM is based on decades of research and experience and allows FWP to accurately detect changes in mule deer populations and respond quickly with appropriate hunting regulations.

FWP's AHM document—the agency's mule deer management "bible"—recommends restrictive, standard, or liberal harvests each year based on two main criteria: how the number of fawns per 100 adults each spring compares to the long-term average, and how the springtime deer population compares to the long-term average. Biologists also consider factors such as deer age structure, winter survival, buck-to-doe ratios, habitat conditions, and hunter preference and satisfaction.

"This year our Region 7 mule deer population was well above the long-term average, but fawn production wasn't quite high enough to trigger the full liberal harvest package," says John Ensign, FWP regional wildlife manager in Miles City. "To stay as true as possible to the AHM prescriptions while still proactively addressing burgeoning deer populations, we decided to issue 7,500 B licenses this year." ■

based largely on how weather and habitat conditions affect deer survival and reproduction. A major factor is the amount of forage (forbs, or wildflowers) and browse (shrubs) available to deer each year. When summer vegetation is lush, deer put on a thick layer of body fat to help them through the following winter. When plant growth is sparse, a hard winter can cause large numbers of malnourished deer to perish or, in the case of does, reabsorb developing fetuses.

Deer population extremes are a problem. When overabundant, mule deer overbrowse shrubs such as mountain mahogany and bitterbrush, which can take years to recover. "Because continual overbrowsing reduces the amount of browse through time, it slowly reduces the number of deer the habitat can sustain," says Waltee, now the FWP biologist in Sheridan. "That's what we're seeing in southwestern Montana."

Hungry deer also cause problems for landowners by raiding hay bales and grazing pasture. "Population extremes are always a problem for someone," says Waltee. "Too many deer, and landowners get mad. Not enough deer, and hunters get mad."

Wildlife biologists can use hunting regulations to moderate deer population extremes, but only if timed correctly. "Before 1982, our mule deer hunting regulations here in Region 7 were 'reactive,' meaning we would wait too long to increase antlerless harvest when populations were increasing," says Melissa Foster, FWP wildlife biologist in Baker. Foster explains that when a deer population increases naturally due to several years of abundant vegetation, it eventually exceeds the land's "carrying capacity," or ability to support that many deer. "It might seem that having a lot of deer is great for hunters, but in the long run it's not," she says. With less browse available, undernourished does produce fewer fawns, leading to depressed populations over the long term. "The land can't sustain a super high deer population for extended periods," she says.

> "Invariably a too-high deer population leads to a crash."

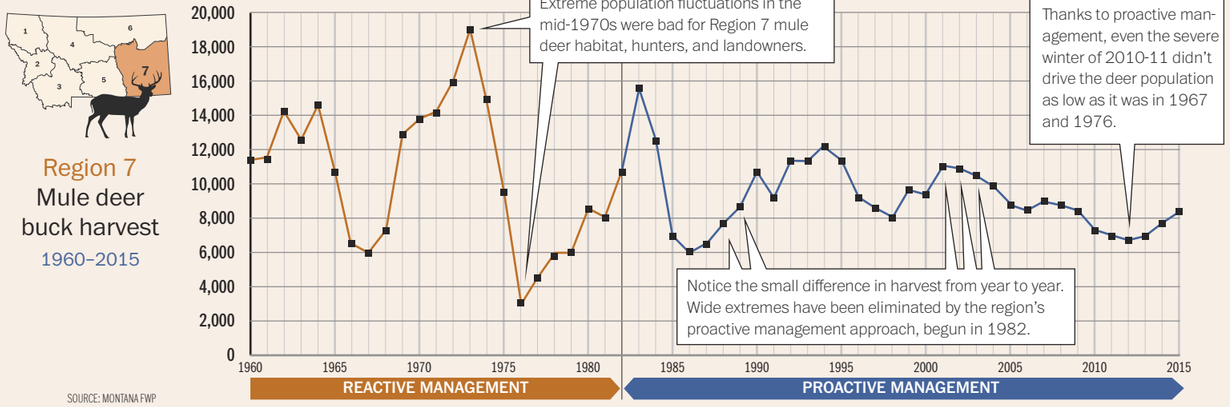
The most striking example of this boom-bust effect came in the early 1970s. Mule deer numbers in Region 7 were skyrocketing because FWP had restricted antlerless harvest, even during years of abundant browse. In 1973, hunters harvested a record 19,335 mule deer bucks. During the next few years, FWP finally increased antlerless harvest, but by then the population was already dropping naturally, as mule deer found little left on the landscape to browse. Coming too late, the increased antlerless harvest accelerated the population decline. By 1976, the buck harvest had plummeted to just 3,498, a decrease of 82 percent. "That's a prime example of reactive harvest management," says Waltee. "In hindsight, we now see that the increased antlerless deer harvest came two years too late to prevent severe habitat stress and an extreme population decline."

IRONING OUT THE EXTREMES

Starting in 1982, Region 7 made two major mule deer management adjustments. One was to change from setting seasons and issuing licenses for each of 35 different hunting districts to creating a regionwide season and issuing licenses valid across the region. "It's like we became one big hunting district," explains Ensign. Under this approach, biologists, hunters, and landowners working together can quickly increase hunting pressure in areas with high deer densities and decrease it in areas with too few deer. And they can make these adjustments during the deer season, rather than waiting a year to adjust regulations for the following season. "If a

Tom Dickson is editor of Montana Outdoors.

NO MORE BOOMS AND BUSTS **In the 1960s and '70s, Region 7 mule deer populations fluctuated widely. That's because FWP was increasing antlerless harvest too late to prevent overabundant deer from eating themselves out of house and home. The region switched from this "reactive" management approach to a "proactive" strategy in 1982. By increasing doe harvest *before* deer numbers get too high, FWP has ironed out population extremes, benefiting habitat, landowners, and hunters.**



SOURCE: MONTANA FWP

Why mule deer are declining elsewhere in Montana

Mule deer in the Judith Mountains near Lewistown. The spread of conifers, elk, and white-tailed deer in much of Montana is displacing mule deer herds.

While the mule deer population in southeastern Montana is booming, numbers elsewhere in the state—and throughout the West—remain lower than several decades ago. They will likely stay that way. The population decline stems largely from a decrease in quality habitat available to mule deer in central and western Montana caused mainly by:

1. The spread of conifers: Douglas fir, Rocky Mountain juniper, and other conifers have spread across mountainsides and foothills. The conifers outcompete the forbs, shrubs (such as mountain mahogany, antelope bitterbrush, and sagebrush), and young quaking aspen that mule deer eat. This "conifer expansion" has been caused by decades of fire suppression and reduced tree cutting on federal, state, and private lands.

2. Competition from elk and whitetails: Elk and mule deer share much of the same habitat. Though their diets don't overlap completely, an elk eats three times more than a mule deer and is better able to reach browse in deep snow. In much of Montana's prime mule deer country, elk numbers are now three or four times greater than they were in the 1980s, and they have taken over areas previously dominated by mule deer. For instance, in several hunting districts in southwestern Montana, winter elk counts have increased from a total of about 4,000 in 1980 to more than 17,000 in 2015. Mule deer numbers in those same hunting districts have declined by 64 percent.

Mule deer also face competition from white-tailed deer, which generally do better in areas altered by human development.

"The increase in conifers, elk, and whitetails in mule deer country is the new normal," says John Vore, chief of FWP's Game Management Bureau. "We'll never have muley numbers in western Montana like we did in the 1980s unless we can magically change all that and make everything like it was 40 years ago." ■

From Cottonwood Bench looking west toward the Snowcrest Range near Dillon, 1921. Nearly a century ago, the foothills of the Snowcrest Range were devoid of conifers, providing abundant sagebrush and young aspen for mule deer.

A recent photo shows how Douglas fir and other conifers have expanded across the range, due to lack of fire and tree cutting. The conifers outcompete the shrubs and forbs that mule deer eat, reducing population size.

CLOCKWISE FROM TOP: BARBARA TIMMS; LARRY DEARS; JOHN WARNER; MONTANA FWP; MONTANA FWP

"The increase in conifers, elk, and whitetails in mule deer country is the new normal."

landowner has too many deer, we can direct hunters to that property as soon as he calls," says Ensign. "We didn't have that kind of flexibility under the old system."

Region 7's other big deer management change was to begin issuing more B tags when fawn production and populations started taking off, rather than waiting until numbers reached a peak. "In the past, by the time hunters said, 'Jeez, you've got a lot of deer out here,' those populations had already stressed the habitat and were starting to decline," says Ensign. "Using this proactive approach, we increase harvest a few years before populations would otherwise hit their peak. That way vegetation stays healthy, fawn production remains steady, and we reduce those wide population oscillations."

The proactive approach has ironed out the extreme mule deer population highs and lows across Region 7 (see graph, page 24). "That in turn allows hunters to predict and plan for the coming years, and it also reduces game depredation on farms and ranches," says Ensign. He notes that landowner complaints in Region 7 have steadily declined over the past three decades to just 20 percent of what they were in the early 1980s (see graph below).

Vore says that Region 7's proactive management approach could work in other regions, and for whitetails too. "For instance, many whitetail hunters in Region 1 (northwestern Montana) don't want us to issue B tags until the population is at its peak," he says. "But by then it's too late, and there are too many deer. That leads to the crashes we've seen in the past."

WELL DONE Hunters hoping for more moments like this will benefit from proactive mule deer management that keeps herds and the landscape healthy and sustainable.

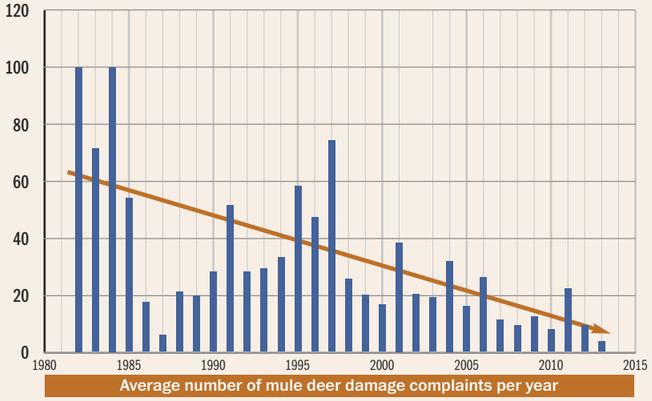
To prevent a collapse in Region 7, FWP is increasing the number of B licenses available this fall, based on an "adaptive harvest management" process the department uses for deer management (see sidebar, page 23). In July, the Montana Fish and Wildlife Commission approved selling 7,500 regionwide B licenses for 2016, up from zero just two years ago. The commission will also allow the region to issue up to 11,000 B licenses in the future if surveys show continued growth in fawn production, fawn recruitment (young deer that survive their first winter), and overall deer numbers. Hunters usually fill about half of those tags, Vore adds.

Hoping that high deer numbers can be sustained, some hunters wonder if FWP is acting rashly. "The belief is that we can 'protect the herd' by not harvesting does," says Waltee. "But invariably a too-high deer population leads to a crash. There's simply not enough habitat to support high deer populations year after year."

Such a plummet is likely if Region 7's burgeoning mule deer population continues rebounding at the current pace. "Having lots of deer is great for hunters in the short term, but already we're seeing habitat degradation," says Vore. "Within a year or two, those increasing numbers of deer will be back hammering the habitat again, and we don't want that."

FEWER PROBLEMS FOR RANCHERS Since 1982, FWP has reduced mule deer population overabundance in Region 7 by increasing doe harvest at the right time. One result: Depredation problems in southeastern Montana have declined to just a fraction of what they were 40 years ago. "Our challenge is to continue using this proactive management approach, which to some may seem counterintuitive," says Dean Waltee, FWP wildlife biologist. "Often hunters don't want us to issue more B licenses until the deer population is obviously too high. By then it's too late, and both landowners and the habitat are inundated by deer."

Region 7
Landowner complaints about mule deer
1982–2013



SOURCE: MONTANA FWP

ENSURING A HEALTHY FUTURE The mule deer population in Region 7 (southeastern Montana) is young, as abundant yearlings have replaced older deer that died in the winter of 2010-11. If these fertile deer reproduce at current rates, they could overwhelm the land's carrying capacity and cause depredation problems for ranchers and farmers. FWP is taking steps to keep the population from growing too big.

LEFT TO RIGHT: LISA DENSMORE BALLARD; ERIK ARGOTTI; DONALD M. JONES