



# Blacktail Brethren

By Jim Heffelfinger

## THE COMPLICATED "MULE DEER"

What we call the "mule deer" is a strictly North American deer species that shares the continent with its eastern cousin the white-tailed deer. Like the whitetails, the mule deer looks a little different in some parts of its range and so it has been diced up into as many as 11 different categories called subspecies. Most of these are not really different enough to represent valid divisions of the species, however two of these categories in the Pacific Northwest are physically and genetically different enough to be legitimate subspecies. These two subspecies of mule deer are even referred to with a different name: the black-tailed deer.

We know very little about the evolutionary history and splitting of mule deer, black-tailed deer and white-tailed deer from the fossil record. Most of the fossils in the northern half of the continent were ground up under the churning action of the glaciers, leaving scant evidence of when and where these deer lived prior to the arrival of humans.

Three main theories have been advanced to explain the complicated physical and genetic relationships of our North American deer we group in the genus *Odocoileus*. The first theory is that a primitive type of deer split into a western type (blacktails) and an eastern type (whitetails) during the Pliocene (2-5 million years ago). As this theory goes, mule deer then originated as an off-shoot of the primitive blacktail line, becoming larger and more elaborate in antlers and body markings as they spread out into the fertile habitat left when the glaciers receded. This theory is not unreasonable, but its weakness is that blacktails and mule deer are very different in some genetic aspects (mtDNA), and they would have to be separated for a very long time to explain the differences. It is unlikely that just by spreading out into newly unglaciated areas would create this large genetic difference.

Early genetic analyses showed that mitochondrial DNA (mtDNA) from whitetails and mule deer is basically the same

and together they both are very different from blacktails. This odd genetic relationship was unexpected because mule deer and black-tailed deer are the same species (different subspecies) but whitetails are a different species. This early evidence spawned a second theory that proposed mule deer are a relatively new species that is a hybrid between female whitetails and male blacktails brought together after the retreat of the glaciers at the close of the Pleistocene 10,000 years ago. Because mtDNA is inherited through the female line, that would explain why whitetails and mule deer had the same mtDNA.

This second theory that the mule deer is a hybrid continues to show up in popular media, but there are several reasons that make this very unlikely. Later genetic work showed that when you look at nuclear DNA (the DNA that comes 50% from mom and 50% from dad), you see mule deer and blacktails are closely related as subspecies and very different from whitetails. You would not see that if mule deer were blacktail



x whitetail hybrids. Also, genetic analyses and a few fragmentary fossils indicate mule deer has been around a lot longer than just the last 10,000 years. Additionally, it is widely known that hybrids between blacktails or mule deer and their whitetail cousins have low survival, which means those hybrids would have had a hard time surviving and taking over the landscape. Hybrids would need to have a dramatic survival advantage over other deer in order to expand and occupy most of western North America.

Photo: Scott McCorquodale



*Forest practices often determine the overall quality of the habitat and thus the density of deer that can occupy it.*

Because blacktails are so different from mule deer when we look at mtDNA, those two types of deer must have been separated from each other for a very long time. A continent-wide genetic research project I was involved in found that blacktails were isolated along the west coast of Oregon and Washington during a long period when glaciers were at their maximum. Mule deer were isolated in the southern part of North America that was free of glaciers. When the last Ice Age ended these two types of deer were brought back together along the Cascades running through central California, Oregon, Washington, and into British Columbia.

The blacktails, represented by the Sitka and the Columbian black-tailed deer in the Pacific Northwest, do appear to be physically different from all other "mule deer" because of their black upper tail surface, smaller body size and antlers, and a shorter metatarsal gland on the outside the rear legs. Record-keeping organizations like the Pope and Young Club and Boone and Crockett Club recognize typical and non-typical entries for three record-keeping categories for this species of big game: the Sitka black-tailed deer, Columbian black-tailed deer, and all other mule deer.

## THE BLACKTAIL BROTHERS

### Columbian Blacktail

The Columbian black-tailed deer live from northern California, through Oregon and Washington up through southern British Columbia on the west side of the Cascades. Their habitat is primarily coastal rainforests dominated by Sitka spruce, western hemlock and western red cedar with stands of Douglas fir, grand fir, and Pacific silver fir. These wet coastal forests receive 50-80 inches of precipitation each year. This subspecies is the larger of the two forms and looks more like mule deer than their smaller Sitka relatives. These are the blacktails that were translocated from Oregon to the Hawaiian island of Kauai in 1961 and now number at least 1000 animals there. Columbian blacktails should not to be confused with Columbian whitetails that are listed as a threatened species and live in lower elevation portions of western Washington and Oregon.

### Sitka Blacktail

The other blacktail subspecies lives in coastal rainforests from the central coast of British Columbia northward through the southeast Alaskan panhandle and coastal islands. This is a smaller and darker form that lives in a maritime coastal environment and has a distinctive double white throat patch

or bib. Sitka have also been introduced onto Kodiak Island, Prince William Sound, Haida Gwaii (Queen Charlotte) Island, Afognak Island, and Yakutat in Alaska.

The Sitka black-tail can be differentiated from the Columbian genetically. The genetic differences of the Sitka may be partly due to the lower levels of genetic diversity it has because it is made up of many small populations partially isolated

from one another in the island coastal environment. In some cases, new populations were started with just a few founding individuals who swam to a new island. But, the physical differences between Columbian and Sitka blacktails, in addition to the genetic differences, indicate these two forms of blacktails have evolved on a somewhat different path and can legitimately be considered different subspecies.

Coastal rainforests of Alaska and British Columbia where Sitka live do not have the vegetation diversity that the Columbian blacktail enjoys. Forests in most of Southeast Alaska and coastal British Columbia are dominated by western hemlock and Sitka spruce that may see the moisture equivalent of 200 inches of rainfall each year. The Sitka name is sometimes confused with sika deer from Japan and other east Asian countries, which are sometimes seen in the US as feral animals or purposely released exotics.

## COASTAL VS. INLAND ECOLOGY

Both of these subspecies have adapted to a cool wet northern climate with 30-200 inches of precipitation. This sounds like it would produce an overload of food and nutrients, but high amounts of annual precipitation actually washes out nutrients like nitrogen from the soil. To deal with deep snows at higher





*The double throat patch is one of the distinguishing characteristics of the Sitka black-tailed deer.*

elevations some populations migrate to low elevations. Migration is costly so animals only migrate if it offers an advantage. In fact, some coastal populations can be entirely migratory while others are not, and some populations may have individuals that migrate while other members of the population do not. Some island populations of Sitka blacktails only have to shift elevationally on the same mountain to get out of the snow, but they actually move very little in terms of map distance.

The genetic and physical differences between Sitka and Columbian black-tails were probably shaped by the environment and not simply isolation from one another. The Sitka lives in a coastal marine and island environment whereas in the southern part of blacktail range, the Columbian blacktail occupies habitat similar to mule deer (and interbreeds with them). The coastal marine environment seems to have shaped a smaller and darker deer of the coastal rainforest just as the tropical rainforest did similarly to the white-tailed deer in Central America.

Columbian blacktails are well adapted to dense high-canopied conifer forests, but they still need early successional habitats created by logging and fires in Western Washington and northwest Oregon. These habitat disturbances open the forest canopy and allow the growth of shrubs and weeds that deer

rely on for nutrition. Forest practices often determine the overall quality of the habitat and thus the density of deer that can occupy it. This is the typical relationship with habitat of other mule deer subspecies throughout their range in North America.

In Alaska and British Columbia, Sitka live in areas of uneven-aged old growth forests dominated by western hemlock and Sitka spruce dominated by long periods of heavy snow. Here the generalization about needing disturbance to improve habitat does not apply. Winter severity (deep, persistent snows) in the northern part of blacktail range is substantially greater than in the south. Winter weather in these areas is one of the main drivers of deer population fluctuations where a single severe winter can nearly decimate island Sitka black-tail populations. Sustained persistent deep snow can make it impossible for deer to move around and makes them waste critical winter energy reserves.

In this situation, it is important that the closed canopy of old growth forests be retained in order the intercept snow that would otherwise make the forest floor uninhabitable due to deep snows. Even with a seemingly closed canopy, the forest still has small opening from windfalls or branches falling to the forest floor to provide important forage patches for the deer.

## MANAGEMENT AND SURVEY

Forest management practices can have an enormous impact on black-tailed deer populations as in other forested environments. In addition to timber harvest practices, chemically treating commercial timberlands to reduce competition with valuable timber can eliminate important deer forage on the forest floor in the form of weeds and shrubs. Other stressors such as the spread of invasive plants species and increase of woody vegetation that crowds out desirable forage species. The southern part of blacktail range is seriously impacted by too much human disturbance and not enough habitat disturbance promoting the growth of vigorous shrubs and weeds. Too much timber harvest in the northern Sitka habitats reduce the productivity of the habitat from a deer's perspective. Managing deer habitat in blacktail range requires a local knowledge of what is best for the deer so management can be tailored appropriately.

In general, a holistic approach to ecosystem conservation and management is a good thing, but in some cases the needs of deer take a back seat to other species. Agencies are obligated to conserve habitat for threatened and endangered species, but unfortunately these species often need less forest disturbance rather than more and this can reduce the carrying capacity of the habitat to support deer.

## CURRENT STATUS

Columbian blacktails in Oregon are below the long-term statewide management objectives since declining between 1998 and 2004, according to Don Whittaker, the Ungulate Coordinator for Oregon Department of Fish and Wildlife. Since that decline, which mirrored mule deer declines in many states, the Oregon blacktail population has remained relatively stable for the last 14 years. Harvest trends for blacktails in western Washington have decreased recently, and remain below population objectives. Populations here could be increased if forests were managed for more disturbance and habitat loss from





*Columbian black-tailed deer are well adapted to dense high-canopied conifer forests.*

human encroachment could be minimized. Populations on the island of Kauai in Hawaii range from 1000-1200 on public areas with an unknown additional number on private land. Major wild fires in 2012 severely impacted the deer habitat leading to severe harvest restrictions. Hunters harvest 30-60 Hawaiian Columbian blacktails annually, but management of blacktails on Kauai mostly revolves around limiting their damage to endangered native plant species.

Sitka blacktails in Alaska vary in density from area to area with mainland densities generally lower overall than on islands. In Southeast Alaska, populations are rebounding from severe die-offs in the face of two harsh winters between 2006-2009. Milder winters since 2010 has resulted in increasing or stable populations in most areas. In Southcentral Alaska Sitka blacktails are at the northern extreme of their range and even more susceptible to winter die-offs. According to Karin McCoy, Alaska Department of Fish and Game, an exceptionally bad winter of 2011-2012 resulted in winter mortality as high

as 50-70% in some areas such as Prince Williams Sound, northern Kodiak Island, and western Afognak Island. Since then, deer populations are recovering with mild winters in 2013-2016. In British Columbia, blacktail populations appear to be impacted by predation and reduced habitat quality, but trends seem to have stabilized from 2014-2017 according to Gerry Kuzyk of British Columbia's Ministry of Forests, Lands, and Natural Resource Operations.

#### BEHOLD THE BLACKTAIL

The two "mule deer" subspecies we call blacktails are fascinating west coast versions of the mule deer we all love. They have a unique and still somewhat mysterious evolutionary Ice Age history. Despite the amazing and spectacular landscapes they live in and their unique ecological adaptations, they still don't seem to get the respect and attention they deserve. Its time that deer enthusiasts turn their attention to the west and give a nod or lend a hand to the mule deer's black-tailed brethren of the coastal rainforests.



*Jim Heffelfinger is a Certified Wildlife Biologist who has worked for the federal government, state wildlife agencies, universities, and in the private sector.*

*Jim has authored or coauthored more than 220 magazine articles, dozens of scientific papers, and 20 book chapters in regional, national, and international publications. He is Chair of the Mule Deer Working Group, Full Research Scientist at the University of Arizona, Professional Member of the Boone & Crockett Club, and currently works as Wildlife Science Coordinator for the Arizona Game and Fish Department.*