

## Kootenay (Region 4) Mule Deer: Frequently Asked Questions

### 1. What is the population size and trend for mule deer in the Kootenay Region?

In British Columbia, biologists estimate the size of most ungulate species through aerial surveys. Aerial estimation of mule deer numbers is challenging, and not currently used by the province in the Kootenays, primarily because of reduced visibility in forested habitats. However hunter success (e.g., kills/100 hunter days) can provide an index of population change during periods with constant hunting regulations and hunter access. In the East and West Kootenay, hunting regulations changed numerous times from 1986 to 2010, making interpretation of population trends difficult. In the East Kootenay, any-buck seasons were replaced by 4-point seasons (i.e., a season for bucks with at least 4 tines, excluding the brow tine, on one antler) in 2000. In the West Kootenay, any-buck seasons were shortened in 1996 and again in 2002, and a 4-point season was introduced in 2002. In 2010, both the East and West Kootenay had a combination any-buck and 4-point seasons. In addition, antlerless (doe and fawn) permits were only issued until 1996.

Recognizing data limitations, the hunter success index suggests that mule deer populations declined from the late 1980s/early 1990s until the late 1990s/early 2000s, and then increased until the mid 2000s (Figure 1). In the East Kootenay, the population appeared to decline in the late 2000s whereas in the West Kootenay, the population appeared stable during this period. Higher success in 2010 is likely due to more liberal hunting season introduced that year (an any-buck season in the East Kootenay, and an extended any-buck season in the West Kootenay).

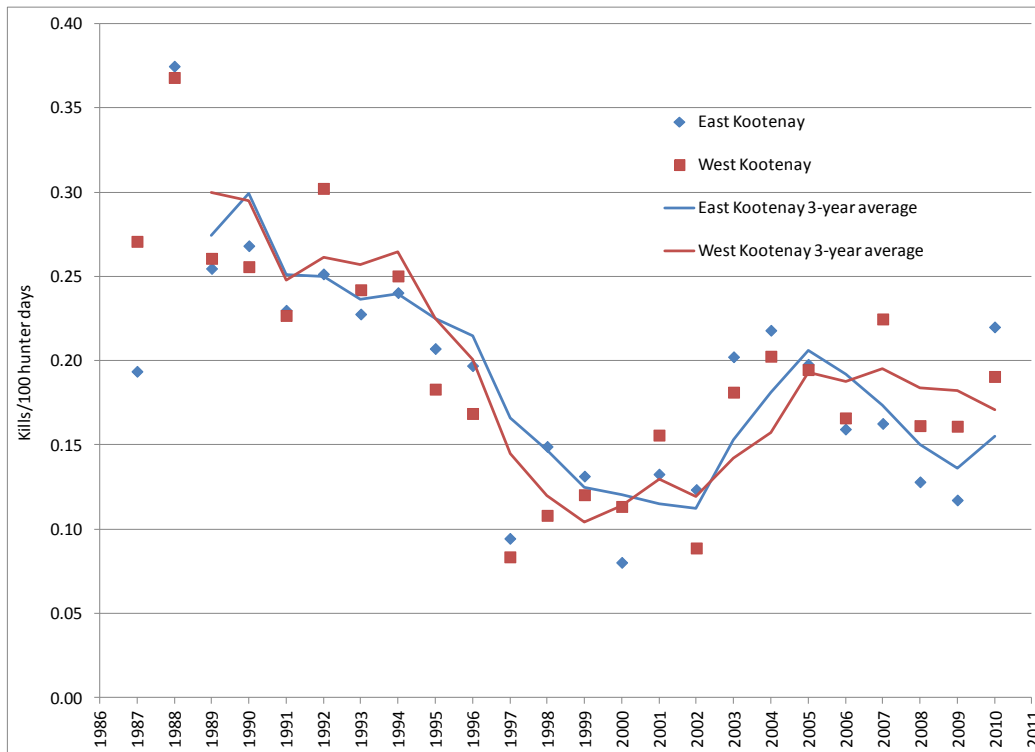


Figure 1. Mule deer (bucks, does and fawns) killed per resident hunter in the East and West Kootenay, 1987 to 2010. Solid lines represent the 3-year running average. Data are from the BC Hunter Sample.

Since hunting seasons differed substantially in the 1980s and 1990s, compared to the 2000s, we cannot compare hunter success data from these periods. However anecdotal information suggests that the current population is smaller than in the 1980s and early 1990s. Anecdotal information also suggests that the mule deer population in the Kootenays has fluctuated numerous times over the past 100 years (Mowat and Kuzyk 2009). The cause of population declines is unclear, although studies across western North American suggest that habitat quality, predation, weather, competition with elk or cattle, and antlerless harvest are all possible factors affecting mule deer fluctuations (deVos et al. 2003).

## 2. What were the past hunting seasons and harvest in the Kootenay Region?

The East and West Kootenay sub-regions had long any-buck seasons in the 1990s (Figure 2, Figure 3). Antlerless mule deer Limited Entry Hunt (LEH) permits were also available in the 1990s with seasons starting on October 10, and running to November 30 or December 10. Antlerless seasons were closed in 1997. This change was intended to increase mule deer population size in response to concerns about declines in the 1990s. Buck seasons became more restrictive (shorter seasons and 4-point seasons) in the late 1990s and 2000s to try and increase buck numbers. In 2010, an October any-buck season was implemented across the region, along with 4-point seasons in September and November.

The buck harvest in the 2000s is about half the harvest in the late 1980s/early 1990s (Figure 2 and Figure 3). Although this is partly due to more restrictive hunting seasons and fewer hunters, smaller populations are most likely a factor as well.

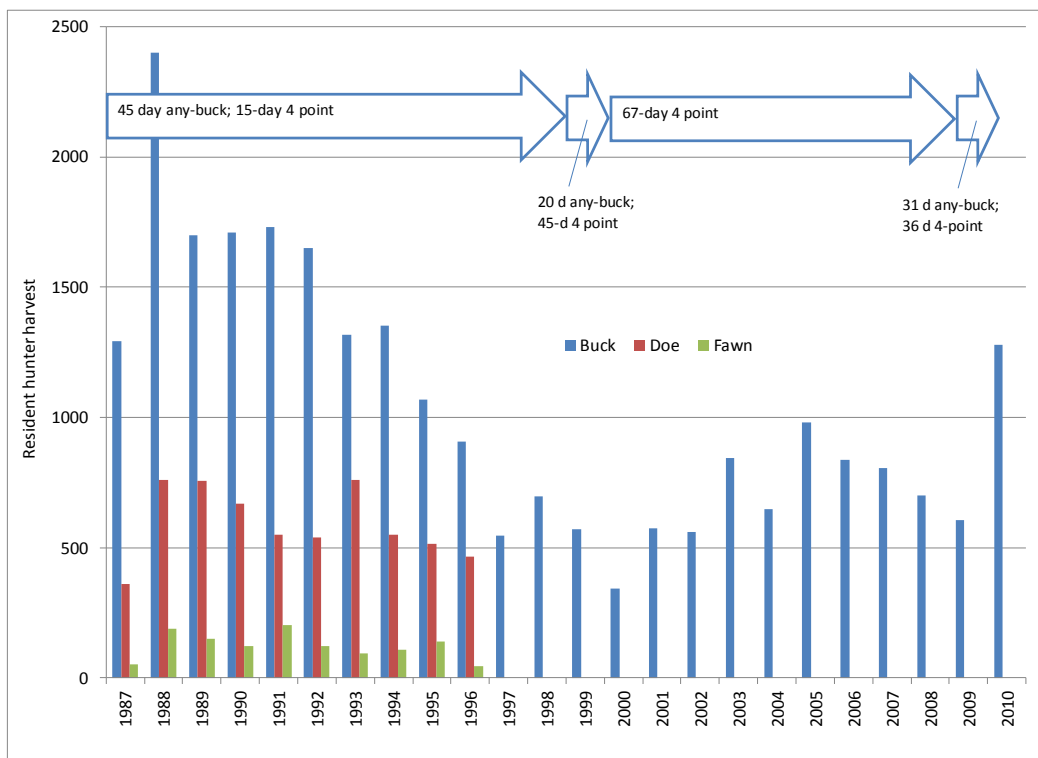


Figure 2. Buck, doe and fawn harvest by resident hunters in the East Kootenay from 1987 to 2010. Data are from the BC Hunter Sample. Buck hunting seasons are shown in blue arrows.

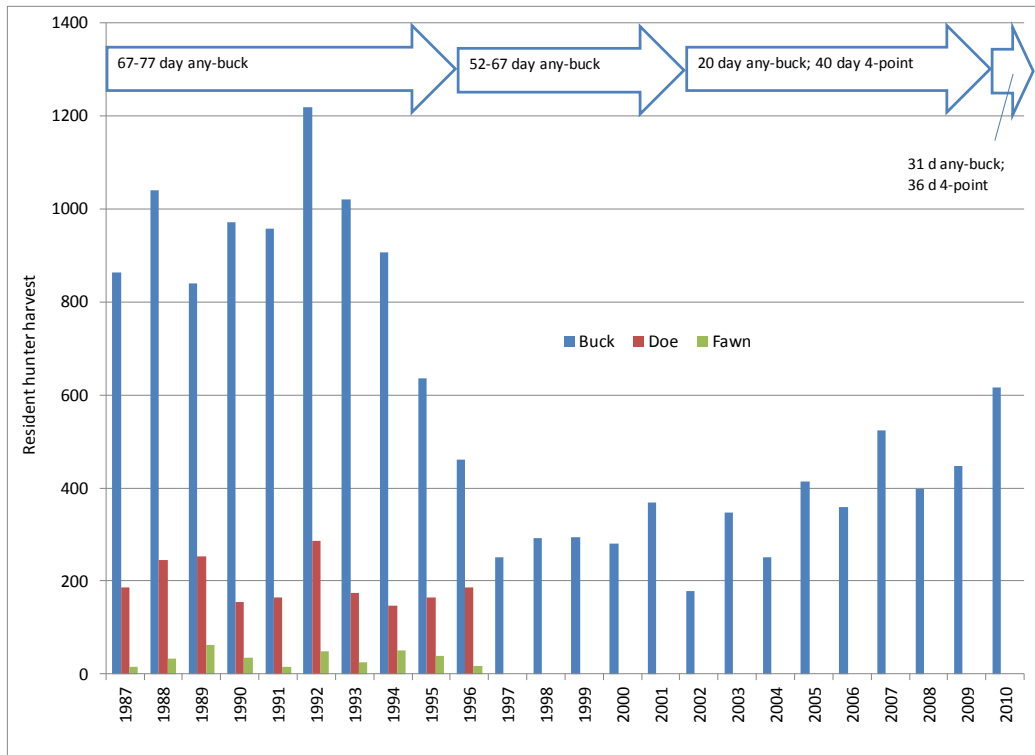


Figure 3. Buck, doe and fawn harvest by resident hunters in the West Kootenay from 1987 to 2010. Data are from the BC Hunter Sample. Buck hunting seasons are shown in blue arrows.

**3. Why was a month-long any-buck season introduced in the Kootenay Region when there was so much local opposition? Many locals feel that mule deer were finally starting to recover from lows in the late 1990s/early 2000s.**

First, it is important to recognize that hunting bucks only will not affect recruitment, and hence the viability of the deer population. After reviewing research from across western North America, Erickson et al. (2003; p. 121) concluded that:

“Although buck-only harvest may alter buck:doe ratios and age structure of the male segment of the populations, it does not reduce the reproductive potential of the population because the same number of does are still bred by remaining bucks. Hunters sometimes blame declines in the number of fawns per does on a scarcity of bucks or a lack of mature bucks available to do the breeding. However, research has failed to support a biologically meaningful relationship; the number of bucks per 100 does is unrelated to fawn recruitment the following year.”

That said, it is true that there was and continues to be substantial opposition to the any-buck season in the Kootenays. Web-based consultation in 2009 found that 74% of the respondents opposed the season. In 2012, the Southern Guides, West Kootenay Outdoorsmen and East Kootenay Wildlife Association opposed continuing the any-buck season in 2012.

However, there is also support for the any-buck season, because of substantial increases in hunter opportunity. The BC Wildlife Federation strongly supported this season, and many hunters in the region expressed a desire to hunt any buck (i.e., bucks with fewer than 4 points). In 2010, over 80% of hunters

who harvested a buck during the any-buck season were from the Kootenay Region. A sharp increase in harvest following the any-buck season indicates that many <4-point bucks were harvested in 2010 and 2011. This suggests that there is substantial interest in the any-buck season. Hunters who advocate the any-buck season may not be involved in organized clubs in the Kootenay Region, or may not express their opinions at club meetings.

Two provincial procedures also drove this regulation change. First, the Big Game Harvest Management Procedure (2010a) recommends that hunting regulations be developed to minimize regulation complexity and maximize hunting opportunities, within the constraints of conservation and other socio-economic considerations.

Second, the Southern Interior Mule deer Harvest Management Procedure (MoE 2010b) recommends an any-buck season for the month of October, and states that “before proposing regulation changes in response to buck:doe ratios, regional staff should conduct and report on herd composition surveys or other compelling information to the Wildlife Manager that regulatory changes are warranted to achieve population management objectives.”

Provincial objectives for mule deer are “to maintain sustainable harvest on broad spatial scales recognising that localised declines may occur; and maintain buck:doe ratios above 20 bucks: 100 does after the hunting season (post-hunt) within most Population Management Units” (MoE 2010b). This buck:doe ratio was not set for conservation reasons, but rather to address broader stakeholder interests. As indicated below, ratios in most MUs in the Kootenays were above 20 bucks: 100 does in 2010 and 2011, suggesting there is no reason to change the season in most of the region.

#### **4. How was the Southern Interior Mule Deer Harvest Management procedure developed?**

The Southern Interior Mule Deer committee reviewed the latest science on mule deer from across North America, and developed a draft procedure. This committee was made up of professional biologists from all regions in the Southern Interior (Regions 3, 4, 5 and 8), the provincial Wildlife Manager, and the provincial Ungulate Specialist. The draft procedure was then vetted through all provincial wildlife Section Heads, and the Provincial Hunting, Regulations and Allocations Advisory Committee (PHRAAC, with members from the Guide Outfitters of BC and the BC Wildlife Federation). Numerous revisions were made to the procedure to try and balance the interests of all stakeholders. On March 1 2010, the Director of the Fish and Wildlife Branch authorized the final procedure.

The procedure recommends that Southern Interior regions institute October any-buck seasons along with 4-point seasons in September and November. This recommendation strives to harmonize seasons and provide some opportunity for hunting without antler restrictions. Four-point seasons can maximize opportunity while limiting harvest (Kuzyk et al. 2011). As indicated above, buck-only hunting has been shown to have no impact on fawn recruitment and hence population viability, so the recommended seasons were considered low risk. Also several studies found that antler point restrictions did not increase buck age, and actually reduced mature bucks post-hunt (compared to any buck seasons) because the age structure was truncated (Erickson et al. 2003). The 4-point seasons did increase

buck:doe ratios, however, primarily because the number of hunters went down and hence total buck harvest declined.

**5. How are mule deer monitored in the region? Will the data collected tell us if hunting is negatively affecting buck:doe ratios?**

We are monitoring mule deer in the region, and across the Southern Interior, with post-hunt helicopter composition surveys to gather buck:doe ratios because they are the performance measure in the harvest procedure. Surveys in the Kootenays were conducted in 2009 (prior to the October any-buck season), and will continue until at least 2013 (three years following implementation of the October any-buck season). Survey methods were developed through consultation with the Southern Interior Mule Deer committee, the provincial Ungulate Specialist, and the provincial Wildlife Manager, and closely follow recommendations by the Western Association of Fish and Wildlife Agencies Mule Deer Working Group (Keegan et al. 2011).

We survey important mule deer winter ranges in both the East and West Kootenay with 3 experienced observers (plus pilot) in a jet ranger helicopter. Surveys are conducted after the hunting season closes in mid November, or as soon as snow levels provide complete ground coverage. November surveys ensure that bucks have not dropped their antlers, and that bucks are associated with does (Keegan et al. 2011). If surveying in December, we cover higher elevation, rugged terrain, where buck groups may be spatially segregated from does and fawns. We fly systematic transects 200 to 400 m apart (depending on forest cover) from low to high elevation. Mule deer observed are classified as <4-point bucks, 4-point bucks, does, fawns or unclassified.

By monitoring buck:doe ratios in conjunction with harvest, we are able to understand broad population trends as well as the effects of buck-only hunting. If ratios within a Game Management Zone drop below the management objective of 20 bucks:100 does (as indicated by at least three lines of evidence, including successive composition surveys, population modelling or strong anecdotal information) biologists will consider regulatory changes to improve buck:doe ratios. If buck harvest declines over time, while buck:doe ratios remain constant, we can conclude that hunting is sustainable but deer population are declining because of other factors (e.g., habitat loss, predation, etc.).

We will refine monitoring methods as new information and techniques become available (e.g., sightability corrections for mule deer in BC).

**6. What were the results of mule deer monitoring following implementation of the October any-buck season?**

After the any-buck season was implemented, sampled management units within the Cranbrook Game Management Zone (GMZ) had low post-hunt buck to doe ratios in 2010 (5 bucks:100 does in MU 4-03 only) and 2011 (6 bucks:100 does; Table 1). Despite low buck ratios, fawns:100 does were relatively high in 2010 (30:100) and 2011 (41:100). In the Fernie GMZ, ratios overall were above 20 bucks:100 does, but were below the management objective in MU 4-21 during the 2011 survey. In the Nelson GMZ, ratios

were above 20 bucks:100 does both years and in both MUs sampled. In 2011, surveys were attempted in MU 4-08 but were terminated due to insufficient snow.

**Table 1. Post-hunt buck to doe ratios by Management Unit (MU) and Game Management Zone (GMZ) in the Kootenay Region. Surveys were conducted post hunt (November or December) on select winter ranges. Sampling intensity within MUs varied among years, hence sample size does not indicate deer densities.**

MU	2010 sample	2010 bucks: 100 does	2011 sample	2011 bucks: 100 does
403	111	5*	196	2*
420	Did not survey		32▼	24▼
426	Did not survey		72▼	8*▼
<b>Total Cranbrook GMZ</b>	<b>111</b>	<b>5*</b>	<b>299</b>	<b>6*</b>
421	188	23	220	16*
422	185	45	145	27
402	223	41	131	56
<b>Total Fernie GMZ</b>	<b>596</b>	<b>37</b>	<b>492</b>	<b>28</b>
406	117	26	214	30
407	18▼	67▼	121	25
<b>Total Nelson GMZ</b>	<b>135</b>	<b>31</b>	<b>327</b>	<b>28</b>

\*Below management objective of 20 bucks: 100 does.

▼Below minimum recommended sample size (n = 100).

We suspect that ratios in MU 4-03 are particularly low because of high road access for hunters and a large number of elk hunters in the area. Many elk hunters may harvest mule deer incidentally since the any-buck season overlaps the antlerless elk LEH and 6-point bull elk season in October.

We also surveyed mule deer prior to implementing the month-long any-buck season (winter 2009-10). However a lack of snow meant we could not survey until late December and early January. Spatial separation of bucks from does and fawns, and potentially antler drop, resulted in buck:doe ratios that were lower than in winter 2010-11, following the October any-buck season. Hence we believe the actual 2009-10 ratios were higher than the observed ratios.

Reports and data for composition surveys in all years can be found at:

<http://a100.gov.bc.ca/pub/siwe/details.do?id=4633>.

### **7. How did the harvest change under the any-buck season? How is hunting opportunity expected to change over time under an any-buck season?**

Compared to 2005-2009 (prior to the October any-buck season), the harvest in 2010 increased by 78% in the Cranbrook GMZ, 57% in the Fernie GMZ and 41% in the Nelson GMZ. Hunting opportunity in the Kootenays increased following implementation of the any buck season as measured by number of hunters (20% increase) and hunter days (24% increase).

Wildlife staff in the Kootenay Region developed a population model to assess the potential impacts of 4-point versus any-buck season under different levels of hunting pressure, and with different mule deer population trends (stable, increasing or decreasing). The model assumes a constant harvest rate and

demonstrates that under both an any-buck and 4-point season, the annual buck harvest and buck:doe ratios will eventually stabilize (if population growth parameters are held constant). Any-buck seasons result in a higher annual harvest and lower pre- and post-hunt buck:doe ratios compared to 4-point seasons. In areas with high hunting pressure (e.g., lots of roads, close proximity to a city, etc.) harvest is higher and buck:doe ratios will hence be lower. Buck:doe ratios can drop below the management objective of 20 bucks:100 does even with a 4-point season, if the hunting pressure is high.

#### **8. Is the Kootenay Region planning changes to the hunting season in 2012 and 2013?**

For 2012 and 2013, we are proposing to change the October any-buck season in the Cranbrook GMZ (MUs 4-3, 4-4, 4-5, 4-20, and 4-26) to a 4-point season. Although this deviates from the Harvest Procedure, harvest data and population modelling suggest that reducing or cancelling the November 4-point season will not sufficiently reduce harvest to recover buck:doe ratios. The proposed change is designed to increase buck ratios, and not for conservation reasons, since there was no evidence that recruitment was affected by the any-buck season. In the Cranbrook GMZ, fawn:doe ratios were higher than other areas in both 2010 (30 fawns:100 does) and 2011 (41 fawns:100 does) despite the low buck:doe ratios.

We are also proposing to shorten the November season across the region by 5 days (November 10<sup>th</sup> closing). The November 10-15 buck harvest averaged 21% of the total buck harvest from 2005 to 2010 in the East Kootenay (the season closed on November 10 in the West Kootenay prior to 2010, so data are not comparable). In addition, a large snowfall in mid November could force mule deer to migrate out of the mountains early, which could lead to a substantially higher harvest. An earlier closing date would also align the Kootenay season with the Okanagan, and avert some over harvest if hunters from the Cranbrook GMZ shift to the Fernie GMZ (following removal of the any-buck season from the Cranbrook GMZ).

If monitoring indicates that a more liberal season can be sustained (i.e., buck to doe ratios remain above, or increase to, 20 bucks:100 does), we will propose lengthening the 4-point season back to November 15<sup>th</sup>. We will also propose reintroducing an any-buck season (possibly for less than 1 month) in the Cranbrook GMZ, if monitoring data suggest this could be sustainable.

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