



## Cartridge Selection for Precision Shooting

Cartridge selection is really the first thing that should be considered when wanting to acquire a new rifle. The most common method of buying a rifle for any reason is by selecting the rifle first, “the platform” and then the scope. Some consideration is given to the cartridge and the projectiles that may be needed for the task.

If the following 5 steps were to be considered with attention to each area, things can be a little easier and potentially cheaper down the track so costly mistakes can be avoided.

- Step 1. Select your cartridge for what you want to do.
- Step 2. Select the type of projectile you will most likely use.
- Step 3. Ascertain the twist rate required to stabilise this projectile.
- Step 4. Select the Telescopic Sight needed for the style of shooting.
- Step 5. Select the rifle or “platform” you like to launch this projectile.

Cartridge selection is really the first obvious choice for entering into a new rifle purchase. The first question you ask yourself is, “What do I need for the job I have to do”.

There are so many factors that can affect this decision. In fact with all the information at hand today from the net, word of mouth and advertising, it is remarkable that any decision can be made. Some of these factors are;

- Minimum calibre required for humane destruction
- Size of the property or range template
- Availability of factory ammunition
- Availability of reloading components
- Recoil of the rifle
- Down-range energy and performance
- Accuracy or inherent accuracy of the cartridge
- Cost of ammunition and reloading
- Case life if reloading
- Life of the barrel
- Selection of factory rifles that support the cartridge
- Common distances to the target likely to be encountered
- Number of cartridges used per shooting occasion

and the list goes on...

When all these factors and more are considered, then some sort of mental picture can be drawn as to what cartridge “road” you will be driving down. Some decision making paths are easy in this

selection process. Other paths dictate what cartridge you are going to use and in some areas, the projectile style and weight is chosen for you, I.e. Full Bore Rifle Competition.

### Hunting

Let's say you are a keen hunter and you wish to undertake pig (including large boars) shooting on private property and the ranges you are likely to be shooting are around 200 – 500m. Accuracy is obviously one of the main considerations here along with a fairly hard hitting round. If cost is going to be an issue here and the hunting frequency will be low, with minimal numbers shot, then the choice is really determined by the availability of the cartridge. 270Win, 7mm Rem Mag, .308Win, 30-06 and 300Win Mag are obvious choices here. If the numbers of pigs shot increase and reloading is on the cards then things can change. Cartridges like 6.5/284, 257 Weatherby Mag. 7mm WSM's, 7mm Dakota, 300 Norma Mag in addition to the ones above can be considered. One thing to note though, the more exotic the cartridge, the less variety in the selection of "off the shelf" rifles.

Exotic or not, all the cartridges mentioned above have enough grunt to deliver their respective range of projectiles with enough kinetic energy to do the job at distance, even for the largest boar. Some may need a more well placed shot than others.

Below is a table to show you how cartridge selection can be done for a hunter who wants a good choice of projectiles and rifle availability. There are, of course variables that can change this like the purpose and construction of the projectiles within the calibre range, so this table ignores the terminal performance of individual projectiles and only takes into account the average kinetic energy rating. Each Cartridge is given a scale from 1 – 10.

1 = poor and 10 = very good.

Small to Medium Sized thin skinned animals

Figure 1.1

Factor/ Calibre	200m	500m	Recoil	Factory ammo cost	Common	Good barrel life	Available rifles	Projectile range	Total Score /80
6.5/284	10	9	8	2	3	5	5	8	50
257 Weath	10	7	6	3	3	6	3	5	43
270 Win	10	7	7	7	7	7	10	6	61
7mm WSM	10	9	6	4	4	6	4	10	53
7mm RM	10	9	6	4	7	6	8	10	60
.308Win	8	3	8	9	10	9	10	10	67
30-06 Spr	10	5	6	7	9	8	10	10	65
300WinMg	10	9	4	5	8	7	9	10	62
338LM	10	10	3	1	7	5	8	9	53

This table is by no means perfect, but does highlight that when a certain set of circumstances are put into print, variables can often become interesting. The 500m factor, kind of rules out the .308Win for humane one shot kills on boars. However, the 270 Win, 7mm Rem Mag, 30-06 Springfield and the 300 Win Mag do stand out for this hunters requirements. The trade-offs are high recoil, and ammunition cost. The three highlighted cells display the three top cartridges for this task.

A precision shooter who likes to hunt but reloads his own ammunition, and uses a custom rifle would obviously ignore some of the scores in the availability and recoil range and pay more attention to the projectile availability range which can bear heavily on his decision. A good choice of

projectiles means that there is more choice for precision projectiles such as Berger Hunting VLD's and Hornady Amax etc.

### Long Range Target/Recreational Shooting

When the “results driven” area of Long Range Precision Shooting is considered, everything needs to change. We are no longer considering shooting wild boars now but are focused on hitting targets at serious ranges in differing environmental conditions. The next table will look somewhat different. With the same cartridges mentioned, in this table with the columns, cost, common, barrel Life and available rifles removed, things get a little clearer. Let's face it, hitting your target with a much higher probability at distance comes at a cost. Here comes that term again...trade offs. The three highlighted cells display the three top cartridges for this task.

Figure 1.2

Factor/ Calibre	500m	1000m	Recoil	Projectile range	Total Score /40
6.5/284	9	8	8	8	33
257 Weath	7	6	6	5	24
270 Win	7	5	7	6	25
7mm WSM	9	9	6	10	34
7mm RM	9	8	6	10	33
.308Win	5	5	8	10	28
30-06 Spr	5	6	6	10	27
300WinMg	9	8	4	10	31
338LM	10	9	3	9	31

Now let's get into large medium skinned game like Camels in the Australian outback. These creatures have large powerful muscles and thick bones to carry their 700kg bodyweight. These animals can be effectively despatched with a .308Win cartridge at close range when hit in the right place. However when hunting these animals, like most other feral game in Australia, they rarely wait around to get shot. Not all shots at game are going to be perfect. The terminal effects(1) of a .308Win 175gn projectile vary dramatically when comparing a hit to the side of the head at 100m to a hit to the back of the shoulder at a 45 degree angle at 600m. Below is a table(2) that compares the range of cartridges and effectiveness on camels on chest/shoulder shots in a hunting situation.

Figure 1.3

Factor/ Calibre	200m	600m	Energy at Target Col 1 + Col 2	Case Reliabi lity	Proj Construct Heavy game	Case life Reload	Avail able rifles	Projectil e range	Total Scor e /70
.308Win	4	3	7	10	6	9	9	9	50
300WM	9	7	16	5	7	6	9	9	52
300RUM	9	8	17	7	7	8	6	9	52
338RUM	9	9	18	8	10	8	6	8	58
30/378	9	8	17	7	7	4	3	9	47
338Norm	10	10	20	10	10	9	2	8	59
338LM	10	10	20	10	10	8	8	8	64
8.59 Titan	10	10	20	10	10	8	2	8	58

Note: The column shaded in grey is not included in the final score. The value in this column represents the values of columns 2 and 3.

The data in figure 1.3 displays the results for some 30 calibre and 338 calibre projectiles. This data illustrates the effectiveness of heavier .338 calibre projectiles specifically in the 250 and 300 grain range.

Selecting a cartridge for a rifle is not a simple task, as it involves many factors. The two most important areas of scoped rifle shooting are the cartridges chosen and the optical instruments used to deliver the goods. The rifle comes third. We make no apologies about that.

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## References

1. **Litz B. Lethality of Long Range Hunting Bullets. Applied Ballistics for Long Range Shooting. 2nd ed. Cedar Springs: Applied Ballistics LLC; 2011. p. 235 - 241.**
2. **Haas M. Ammo Guide Interactive. Mike Haas; 2004 [cited 2011 November 9]; Available from: <http://www.ammoguide.com>.**