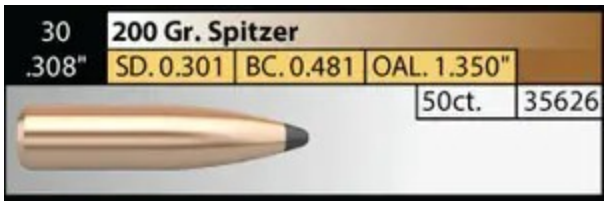
The Forgotten 200 and 220 grain .30-06 Loads

By Gary Zinn



Nosler .308" 200 grain Partition bullet. Illustration courtesy of Nosler Inc.

The .30-06 Springfield sits at the apex of the small bore, non-magnum, big game hunting cartridge pyramid. Loaded with suitable 150, 165, or 180 bullets, the cartridge is more than adequate for hunting all Class 2 game and most animals in the Class 3 category.

It is not happenstance that cartridges loaded with bullets in these three weights are by far the most popular commercial .30-06 loads. To document this, I tallied the .30-06 hunting loads listed on the MidwayUSA website, finding 31 with 150 grain bullets, 32 with 165 grain bullets and 41 using 180 grain bullets. Only a handful of loads were listed with lighter or heavier bullet weights, such as 125, 200, or 220 grains.

I have long thought of the 180 grain bullet as the "money load" for the .30-06. Such loads have been used to fell innumerable large, tough and sometimes cranky game animals since the cartridge's introduction.

However, I got to wondering if bullet weights greater than 180 grains might have some downrange power advantages over the normal 180 grain loads. I decided to do a ballistics analysis to satisfy my curiosity. Here is what I learned from a comparative analysis of 180, 200 and 220 grain .30-06 loads.

Choosing Heavy Bullet Loads for Comparison

It was not hard to determine that the most common 180 grain commercial .30-06 loads are those listed as generating 2700 f.p.s. of muzzle velocity (MV). There are very few factory loads offered with 200 or 220 grain bullets, though. With only a few commercial loads in each of these bullet weights, I was left with the tenuous conclusion that a

reasonable MV for a 200 grain bullet is 2540 f.p.s., while 2410 f.p.s. is a realistic MV for a 220 grain bullet.

The paucity of commercial loads with 200 and 220 grain bullets meant I could not match bullets of the same make and design in the three weights. This would be desirable to limit the extraneous factors that could skew comparisons of ballistic performance between loads. Faced with this issue, I decided to use reloading data to build realistic loads in the three bullet weights, thus creating a basis for a fair performance comparison.

The manual *Modern Reloading, Second Edition* by Richard Lee (Lee Precision, revised 2011) contains the most comprehensive load data tables available. The tables in the manual are compiled from published information of all major powder suppliers.

Studying the .30-06 data tables in the Lee manual, I noticed that IMR4831 powder was listed as producing strong, but not outrageous, maximum charge MV numbers with all three bullet weights I wished to evaluate. I thus decided to use the IMR4831 data for my hypothetical loads. I double checked the maximum load MV figures on the Nosler Load Data website and came up with the loads listed below. The MV values of these are modestly higher (20 to 70 f.p.s.) than the MV numbers I had observed for commercial loads in the three bullet weights.

Picking a particular brand and type of bullet was easier. Loads that are capable against large, tough animals call for a bullet that is a proven performer. The Nosler Partition bullet immediately came to mind. The Partition comes in 180, 200 and 220 grain weights in .308 caliber, so I did not look any further for a bullet for my analysis.

Here are the bullet, powder and MV combinations on which the following comparative load performance analysis is based. (MV values are rounded to the nearest 5 f.p.s. for convenience in later calculations. All MVs are from 24 inch barrels.):

- 180 grain Nosler Partition over 62.0 grains of IMR4831: MV = 2755 f.p.s.
- 200 grain Nosler Partition over 55.0 grains of IMR4831: MV = 2560 f.p.s.
- 220 grain Nosler Partition over 55.0 grains of IMR4831: MV = 2480 f.p.s.

Data sources, Evaluation methods and Calculation tools

Data sources: Besides the bullet weight and MV of each load, I needed the ballistic coefficient (BC), sectional density (SD) and cross-sectional area (A) of each bullet to do

external ballistics analyses. I used BC and SD data provided by Nosler for each bullet and took the A of a .308 diameter bullet from the *Guns and Shooting Online* Expanded Bullet Cross-Sectional Area List. The cross-sectional area of all .308" diameter bullets is .0745 square inches.

I also calculated the estimated recoil of each load. Input data needed to do this via an online recoil energy calculator are bullet weight, MV, powder charge weight and firearm weight. l assumed a field ready rifle weight (loaded, with scope and sling) of 9.0 pounds for a typical .30-06 rifle.

Evaluation methods: The key to my evaluation of the downrange killing power of these loads is the G&S Online Rifle Cartridge Killing Power Formula. This formula calculates index values of the killing power of hunting loads, using downrange impact energy, bullet sectional density and frontal area as the input variables. Calling the output variable of the formula KPS (Killing Power Score), for a given load the formula is:

KPS at y yards = (Impact Energy at y yards) x (sectional density x frontal area)

or simply: **KPS = E x (SD x A)**

For instance, consider the following .30-30 Winchester factory load: .30-30 Win: Federal 150 gr. JRN bullet, MV 2350 f.p.s. BC = .218, SD = .226, A = .0745

This load produces 1358 ft. lbs. of energy at 100 yards. Therefore, the 100 yard KPS of this load is KPS = 1358 x .226 x .0745 = **22.8**

KPS numbers generated from different data inputs (E, SD, or A) are directly comparable. This comparability can be applied to evaluate different loads for a particular cartridge, such as the three .30-06 loads for this analysis. (See The G & S Online Rifle Cartridge Killing Power Formula: Implications and Applications for further discussion of the killing power formula.)

Calculation tools: I used three online programs to do the heavy number crunching. All are on ShootersCalculator.com, including their Point Blank Range, Ballistic Trajectory and Recoil calculators. I used a hand calculator to do the KPS calculations.

Results

In the tables below, the first (.30-06) row specifies the bullet, MV, BC and SD. The second row shows the +/- 3 inch (6" target diameter) MPBR of the load and the recoil of the load in foot pounds for a nine pound rifle. (MPBRs are rounded to the nearest five

yard increment.) Next are rows showing KPS and impact energy values for the loads at 100 yards, 200 yards and the MPBRs of the various loads.

.30-06 Nosler 180 gr. Partition: MV 2755 f.p.s., BC = .474, SD = .271
+/- 3 inch MPBR = 275 yards; Recoil = 22.9 ft. lbs.

- 100 yd. KPS = 53.1 (Energy = 2631 ft. lbs.)
- 200 yd. KPS = 45.9 (Energy = 2271 ft. lbs.)
- 240 yd. KPS = 43.2 (Energy = 2139 ft. lbs.)
- 255 yd. KPS = 42.2 (Energy = 2091 ft. lbs.)
- 275 yd. KPS = 41.0 (Energy = 2028 ft. lbs.)

.30-06 Nosler 200 gr. Partition: MV 2560 f.p.s., BC = .481, SD = .301
+/- 3 inch MPBR = 255 yards; Recoil = 21.8 ft. lbs.

- 100 yd. KPS = 56.4 (Energy = 2518 ft. lbs.)
- 200 yd. KPS = 48.6 (Energy = 2168 ft. lbs.)
- 240 yd. KPS = 45.7 (Energy = 2039 ft. lbs.)
- 255 yd. KPS = 44.6 (Energy = 1992 ft. lbs.)

.30-06 Nosler 220 gr. Partition: MV 2480 f.p.s., BC = .351, SD = .331
+/- 3 inch MPBR = 240 yards; Recoil = 23.7 ft. lbs.

- 100 yd. KPS = 60.6 (Energy = 2453 ft. lbs.)
- 200 yd. KPS = 49.0 (Energy = 1984 ft. lbs.)
- 240 yd. KPS = 44.9 (Energy = 1817 ft. lbs.)

These are, in effect, "light magnum" loads. This applies to both the down range power and recoil they generate. No one who shoots a .30-06 loaded to these levels is likely to mistake the recoil for that of a common small bore cartridge.

Taking a closer look at down range power, the 220 grain load is the most powerful out to about 200 yards. The KPS values for that load exceed those of the 200 grain load within 210 yards, but the 200 grain load is stronger at distances beyond that. If one wants to have the most killing power possible in a .30-06 at ranges of 200 yards or less, a 220 grain bullet is the way to go. Significantly, 220 grains is the bullet weight Eleanor O'Connor used to shoot elephant, lion and tiger with her .30-06 rifle.

The 200 grain load does some nice things. The KPS values it generates are a consistent six percent greater than those of the 180 grain load all the way out to 255 yards. To me,

255 yards is a very respectable MPBR for a 200 grain bullet driven at less than 2600 f.p.s. MV. Anyone who must have a cartridge with more power and distance than this is looking for a magnum rifle, preferably larger than .30 caliber.

The data for the 180 grain load demonstrate why it has been so popular for so long. With a KPS value of 53 at 100 yards and KPS of 41 at 275 yards, this load carries a lot of power a long way down range. The 180 grain load was designed to be a proven standard against which heavier loads could be judged, and a stern judge it is. Yes, the heavier bullet loads are more powerful within their MPBRs, but only incrementally so. The 200 and 220 grain loads have their strengths, but they will never replace the 180 grain load.

The relative sectional densities of the three bullets should also be noted. At SDs of .271 (180 grain), .301 (200 grain) and .331 (220 grain), these .308 diameter bullets all have the ability to penetrate deeply in larger Class 2 and Class 3 animals. Whatever the bullet weight, loads that are going to be used to hunt large or potentially dangerous game should feature bonded core, partitioned, or homogeneous copper alloy bullets. (See The Sectional Density of Rifle Bullets for more information.)

My bottom line assessment is that the vast majority of hunters would never need a small bore load with more power than a 180 grain .30-06. If one really wants a bit more bullet penetration and killing power, at the expense of 20 yards of MPBR, then a 200 grain load is ideal.

Finally, if one wants all the power and penetration attainable in a non-magnum, small bore cartridge, the 220 grain .30-06 load is the way to go. Just keep shots taken at game at 200 yards or less to take full advantage of the killing power of the 220 grain bullet.

Notes for Ammo Scroungers and Reloaders

Anyone who wants to get 200 or 220 grain commercial ammo for their .30-06 will, indeed, have to scrounge for it. Browsing the Internet, I found only three 200 grain loads (from DoubleTap, Federal and Laupa) and just two 220 grain loads (Federal and Remington). I checked the .30-06 ammo listings on MidwayUSA, plus the websites of three leading speciality ammunition makers to find these.

Most serious .30-06 enthusiasts probably reload. Cases, primers and powder for loading .30-06 cartridges are ridiculously easy to come by. Load recipes for 200 and 220 grain bullet loads are adequate. For instance, the compiled load data in the Lee manual lists

ten 200 grain bullet loads with MVs between 2550 and 2607 f.p.s. For 220 grain bullets, there are also ten loads listed with MVs between 2425 and 2516 f.p.s.

Bullets weighing 200 or 220 grains are the area with the fewest options for the .30-06 reloader. 200 grain .308 bullets are made by Barnes, Laupa, Norma, Nosler, Sierra, Speer, Swift and Woodleigh. One 220 grain bullet is offered by Hornady, Nosler, Remington, Sierra and Woodleigh. The options for heavy .30 caliber bullets may not be super extensive, but these are all very good bullets.

Conclusion

I have no illusions that this article will motivate ammo makers to flood the market with 200 and 220 grain .30-06 loads. Nor is there any particular reason why everyone who owns a .30-06 rifle should suddenly begin demanding heavy bullet loads. However, anyone who encounters a hunting situation that calls for the heaviest of small bore rifle loads might find that the almost forgotten 200 and 220 grain .30-06 loads are suitable for their needs.