

This topic can be found at:

<https://forums accuratereloading.com/eve/forums/a/tpc/f/4711043/m/2861098911>

michael458

03 November 2009, 22:20

### Terminal Bullet Performance

What you will see below is a repeat of a recent post I did on the 45/70 penetration thread.

I have some information that I would like to share, but to be honest it really needs to be on a thread unto itself. It is my hope that we can all learn from this, that we can have reasonable, logical, and intelligent conversation and share ideas, concepts and experiences in which we all can maybe learn something concerning terminal performance. It is an area that I have a great deal of interest in because in the end I believe that when it comes down to it, it's not the rifle, the cartridge, the bullet that does the work once it strikes the target. But since there may be many of you that have not been involved in the 45/70 penetration thread, I want to set the record straight right up front so that hopefully we avoid wasting time and energy where we do not need to. So those of you that have not seen this post please read, those of you that have can move forward, at least as soon as I can post part two! I apologize for the length of this post, however I want no misunderstandings concerning this thread, and rather just nip some things before they begin. For those few that have seen this post, I apologize again, just skip over!

michael458

one of us

Posted Nov 1, 11:06 AM Hide Post

I make no claims at being any sort of expert at all concerning terminal performance of any bullets, nor terminal ballistics. I do claim to be an "avid" student of terminal ballistics however, and strive to learn as much as possible, either from others that are capable and experienced, or by my own tests and research both in the "lab" as I call it and in the field.

As stated there is no test medium that will exactly duplicate animal flesh. This is true, and rather "common" knowledge. Most hunters never test a bullet or load except by shooting game in the field. Shooting animals in the field is never a satisfactory way to conduct true and proper test work, no two shots can be alike, one may hit bone, another soft tissue, one straight on, one at an angle. This does not mean one cannot learn from field tests, quite the contrary, but this is not the arena in which to begin test work! I do not wish to go to the field "ignorant" of how any of my equipment may or may not perform, I would much prefer to have some prior knowledge of how a bullet may or may not work long before possible costly, and unethical "failures" occur in the field.

Again, for those who cannot comprehend the written word---No Test Medium Exactly Duplicates Animal Tissue! However, proper test medium will give one reasonable comparisons not only between different bullets, but will give us some insight into how a bullet may or may not perform in the field. There are many test mediums that can and have been used, Ductseal, Clay, Wooden Boards, Gelatin, wet news print, water, sand, dirt, and probably other materials I can't think of right now. Many years ago I tried some different mediums but settled on wet news print as it was readily available, reasonably easy to work with, and I believe a reasonable medium in which to put reasonable stress on a bullet for test purposes. I also decided that this would be the only medium that I would test with as I could record and keep data concerning performance, I could see wound channels, measure penetration, retain fired bullets for study. By gathering this data one could later correlate this back to findings in the field on animal tissue. Now one can do this with nearly any reasonable medium, but one has to stay with that medium and collect quite a bit of data over the years to be able to correlate the two. By "reasonable medium" I mean a test medium that will have some relevance to what you intend to accomplish in the field on targets you intend to destroy! For instance, if you are a hunter, then why would you want to test on cold rolled steel test medium??? If your intentions are to test armor piercing ammo, then by all means you need to test on a steel medium.

Being an avid student--not an expert--I have become better over the years at collecting and using my data. Twenty years ago it was enough for me to just shoot a bullet into the mix and see that it did not break up and then go hunting. Wound channels and penetration was looked at, not recorded. Ok it works, lets go to the field. Over the years I developed into recording even the impact velocities most of the time, depth of penetration, retained weight, noted wound channels-not really gathering volume of, and other information I deemed important to know. As much as possible I would also study these same bullets in animal tissue when it was possible to recover and study. There are many that exact depth of penetration, or wound channels could not be gathered, but where I could I did record this information as best as possible, and then correlate the data back to the test work done BEFORE the field tests. Over roughly a 12-15 years of shooting various critters in the field I have been able to study and gather some data that gives me a very reasonable correlation between the test work and the actual field tests on animal tissue.

There are no absolutes in our shooting world. There are far more variables to consider in the field with animal tissue and one would be a fool to say that each and every bullet will perform exactly in the field as it does in the test medium. The test medium gives us consistent medium in which to work with, it does not have bones (although this can be injected into the mix) it does not have many of the various issues that you will run into in the field. There are no absolutes! But, if one is persistent with collecting proper data, then one is able to "predict" how most bullets may or may not perform in the field, if using a reasonable medium that is pertinent to the field tests.

Field work and tests on animal tissue is the number one priority, and is without doubt the most important and the one that counts the most. This is where the metal hits the meat, this is the one that can either give you success or failure. But I can tell you this, I would not go to the field to test or shoot animal tissue with zero knowledge of how a bullet may or may not perform. It is pure ignorant and stupid to do so in my opinion.

There are some people, that believe that no valuable information can be "learned" from doing prior test work in any medium. Those people are "correct"---Those people with that attitude cannot learn anything! In the meantime the rest of us common folks can usually learn a great deal from test work done prior to field trails.

This is true with any sort of bullet, expanding, solid, and non conventional bullets.

I do not have the time nor inclination to test everything there is. I mostly work with bullets that I intend to use in the field. Keep in mind, this is my personal data, I am not testing for you--I am testing for me, I do not wish to go to the field ignorant and stupid, and suffer possible failure in the field due to that. I also do not go to the field (normally) with bullets that have failed or performed less than expected in the test work in wet print medium. I have in my more ignorant youth done this on a few occasions, I did not

listen to my test work, and I had those same miserable failures in the field every single time! Fortunately I am a decent student and sometimes I even learn from my mistakes. I take test work pretty seriously, regardless of whether it is simple load data when working up loads, cartridge development, bullet design and development, and of course terminal performance data. After all, it is the bullet that will make you successful or not. It is good to know the operating ranges of different bullets, especially with today's high velocity capable cartridges, and I think even more important with our big bore cartridges, which may be used in somewhat dangerous circumstances.

I shoot mostly big bore cartridges from 416-.500 caliber, and have paid a lot of attention to 458 and my own .500 caliber cartridges over the years. In particular the .500s in which proper dangerous game bullets had to be designed, as there were none available on a commercial basis. I dabble in other calibers from time to time, mostly .338, .358 and recently .366. Very little but some work done in small bore under .338 caliber.

You will see a reasonable variety of bullets available on my shelves.





I have a passion for Winchester M70s as most of you know, but I do love the lever guns, and the single shots, mostly Winchester 1885s and Ruger #1s. All of which are in bigger bore diameters.



I have an outdoor range behind my house with test benches at 50 yds, 100 yds, and 150 yds. Very little work is done there anymore, as I do most of the research and test work on my personal 50 yard indoor range with test benches at 25 yds and 50 yds. I have 3 chronographs set up to collect data at both these points and also one down range should I need to collect impact velocities.





The range is a complete facility set up to do load data and various other types of test work, which does include pressure tests when desired or needed.

I have over the years of doing the test work been fortunate enough to be able to put bullet to animal tissue, and be able to create some "rules of Thumb" to correlate back to the terminal performance tests done with my wet print mix, which for the last 5-6 yrs has consisted of a mix of 65-70% wet news print and 30-35% catalogs/magazine mix. This just happens to coincide with an

increase of 30-35% tougher than wet news print alone. The paper of the catalogs/magazines being thicker, glossy, and tougher overall. The following is a "rule of thumb" only, but from bullets recovered from animal tissue I find that one can expect from 80% to 100% more penetration in animal tissue than this wet print mix I use, for expanding bullets. For solid bullets one can expect 30-35% deeper penetration in animal tissue than that of the wet print mix. This data base is continuing to grow each year, as stated I consider it a "rule of thumb" and NOT an absolute! For expanding bullets I have found that a bullet tested in wet print mix expands and reacts very close, very similar, and sometimes indistinguishable from those found in animal tissue. How it expands and performs in the wet print mix is almost identical in every case to what a bullet will look like when recovered from animal tissue. Exceptions being bullets hit by bone. At times I add items that will put some bullets under more stress than normal wet print mix. I do this by adding some pieces of wood about 2-4 inches inside the front of the mix. No, this is not bone, but it does tend to put a particular bullet under more stress than normal to see how it reacts. It might just tell me if a bullet will break up on a 2X4 then it will for sure break up on bone, which is more dense and solid than a normal piece of pine 2X4 or even sometimes a 4X4. I have also stressed some solids with a piece of fiberboard up front (after initial positive tests in wet print mix alone) which is extremely dense, more so than bone, just to see if I could stress the bullet to the point of failure to penetrate properly. If it failed this test--THEN IT MIGHT BE POSSIBLE--MIND YOU "POSSIBLE" it could fail in the field. A bullet that could pass all the stress tests, would be very very likely to be successful in the field. However, as stated, there are no absolutes!

I have been able to collect a good many samples to be able to compare wet print bullets with animal tissue bullets;



Recovered from Eland-Kudu-Giraffe

Reported 32-36 inches of penetration

**416 B&M**  
**350 Barnes X**  
**73/AA 2520**  
**Muzzle Velocity 2417 fps**  
**21 yd Impact Velocity 2387 fps**  
**18 inches Penetration**  
**Retained Weight 350 grs**



**458 Lott**  
**500 Swift A Frame**  
**Muzzle Velocity 2260 fps**  
**25 yd Impact**  
**24 Inches Penetration**  
**Wet News Print Only**  
**Retained Weight 494 grs**



Recovered From Elephant

**458 Lott**  
**500 Swift A Frame**  
**Muzzle Velocity 2270 fps**  
**Buffalo @ 40 yds**



**458 Lott**  
**500 Barnes FN Solid**  
**Muzzle Velocity 2275 fps**  
**Buffalo @ 40 yds**



458 B&M

Buffalo Australia 2009

500 Woodleigh 2130 fps

450 Swift A--2210 FPS

450 Swift A--2210 fps

450 Swift A--2210 fps



**458 B&M  
450 Swift A Frame  
Muzzle Velocity 2156 fps  
50 yd Impact**

**20 inches Total Penetration  
Retained Weight 445 & 449 grs**





500 MDM  
470 SSK HP  
95/H-322

Muzzle Velocity 2409 fps  
20 yd Impact Velocity 2352 fps  
24 Inches Penetration  
Retained Weight 357 & 356 grs



500 MDM

470 SSK HP - 2425 fps

Buffalo Australia 2009

Impact inside 50 yds

Impact 75 yds +-





These are but a few examples, I have many many more in from which to draw, and in nearly every case, correlating data can be drawn between wet print bullets to animal tissue bullets. Factors such as impact velocity in the field needs to be taken into account also.

My experience in the field includes calibers such as 6.5X55, 6.5 WSM, 308 Winchester, 300 Winchester, 300 Dakota, 338 Winchester, 358 STA, 35 Whelen, 38/55, 416 Remington, 416 B&M, 45 ACP, 45 Colt, 45/70, 458 Winchester, 458 B&M, 458 Lott, 50 B&M, 500 MDM. Of these calibers my percentage of animals taken is 8.78% with calibers of .308 and less, 27.03% taken with calibers from .338-.358, and 64.19% taken with .416-.500 caliber. By far the majority of my field experience is with the larger bores. As for my test work although I have tested many different bullets in several calibers, my main interests lie in 338-.500 caliber, and by far leans toward the large bores also. 71% of animals I have taken are with Winchester rifles. Some data to show where my interests are.

It is my hope that I will be able to continue to learn, study, and advance in my studies. Again none of this makes me an expert by any stretch of the imagination. I have done enough to have some fairly reasonable opinions on some matters. I shoot regular, each week. If I am in a serious load data session then I may have several sessions a week, shooting anywhere from 150-250 rounds a week, mostly big bore cartridges. Last year one way I was able to keep up with how many rounds went down range, either in the field, but mostly on the range, I had purchased 5000 Fed 215 primers--90% of which are used in 416 calibers and up, and also 5000 Fed 210 Primers in February of 2008. Those 5000 Fed 215s ran out in July of 2009, and I had fired 3000 of the Fed 210s--which for the most part were in cartridges such as the 50 B&M Super Short and 50 B&M Alaskans, along with some in other minor cartridges. That is 8000 rounds of rifle shooting in 17-18 months roughly. Now I do admit that was a bit much, but I was also doing a tremendous amount of work on my own various cartridges in 416 B&M--458 B&M--50 B&M--50 B&M Alaskan--50 B&M Super Short--and the 500 MDM during this time.

I really do not care if you agree or disagree with my methods, or any of the work I do here. I do not do it for you! I do not do it for \$\$\$. I am not in the gun, bullet, cartridge, business in any way, shape, form, nor fashion! I do this for myself, my own curiosity, to further my knowledge, to increase my potential for success in the field, and because I enjoy it most of all! Not for you! For those that are willing to learn, or would like for me to share my information I am more than happy to do so, it is in my nature to help anyone I can if desired. But what I will not stand for is for someone with very little test experience, or none, to attempt to discredit the things I choose to do. If you do not agree, fine, no issues with that, state it and move on. I stand behind the work 100% on the basis as I have stated several times. I have stated many times, see above this post, no test medium is equal to animal tissue, it is a test to compare performance of different bullets, if you do enough of this with nearly any reasonable test medium, then you can correlate data between animal tissue and test medium of your choice. Again, there are no absolutes, but I choose to NOT be ignorant when going to the field, what you choose is up to you, and really I could care less what you choose to do. This is my choice.

I keep complete data records and separate files on every rifle being shot and tested from the first shot to the last on each rifle. All load data is recorded after each range session, or field test and kept on separate spreads sheets per cartridge, divided within that per rifles individual data. These are all on computer, and backed up daily to two other hard drives. In addition books are kept in hard copy and new sheets printed out with each new entry within the cartridge/rifle category. One cannot possibly keep up with such a data base by memory. There are many times I refer to a file folder on a rifle just to see where and what it is sighted in for

last. But the info is there and available when I need it.

Also as most of you know SSK Industries (AKA JD Jones & Company) does all my work for my rifles. I have been extremely fortunate to become closer to JD and have learned a great deal from a true master, with experience most of us could only dream about, both in shooting, test work, and field experience. In many ways I think JD has taken me somewhat under his wing and I have to say that it has been a pleasure learning from him too! Without his assistance and that of Brian Alberts with SSK I would be far more ignorant, and many of the great bullets we have designed together for my .500s would be far less effective than they have proven to be. To be associated with such great people as that has been a wonderful and great learning experience for me. I have also had the great pleasure to be able to assist JD when he wanted some samples of other things tested both here at my range and in the field. There have been several occasions I have had this opportunity and it has been a pleasure for me.

Michael

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**analog\_peninsula**

**03 November 2009, 22:37**

That's very impressive, Michael. As you've so eloquently demonstrated, there are opinions and informed opinions; the two are not identical.

analog\_peninsula  
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It takes character to withstand the rigors of indolence.

**michael458**

**03 November 2009, 23:15**

Today's test work! I was spurred on a bit to do a couple of tests, actually repeat some with 458 Lott, and add some with the 458 B&M. The goal was to use some big bore solids at different velocities, which we did, but really did not prove a whole lot, except once again to confirm some prior data gathered on these particular bullets anyway.

I wanted to test a 500 gr Woodleigh from 458 Lott--was hoping for 2200 fps or so, but only got 2100 fps with the load I used. I wanted to also compare this velocity to a lower velocity in the 458 B&M. Not as low as I wanted, but 1827 fps was what I got. In addition the 500 gr Barnes Banded FN Solid in 458 Lott at 2209 fps and the same bullet in 458 B&M at a reduced 1815 fps. In addition to these tests I wanted to test the new Barnes 330 gr Solid made for the 458 Socom in the 458 B&M. POI for this solid is the same as all 350 gr bullets I use in the 458 B&M and would make a good addition for those loads.



The rifles used are shown below.



Winchester M70 458 Lott

22 inch Barrel

Winchester M70 458 B&M

18 Inch Barrel

The shooting was done at the 25 yd bench, actual impact was 22 yds. Velocity was recorded at the front end, and then again at impact.





The test medium was fresh and soaked well, 62 inches of mix in the box.



First up was the 458 Lott with the 500 gr Woodleigh FMJ and the 500 gr Barnes Banded FN, both loaded with 82/RL 15. Muzzle velocity was lower with the Woodleigh at 2100 fps and 2051 fps impact at 22 yds. Muzzle Velocity was 2209 fps with the Barnes, and 2160 fps at impact.





If you see the phone books on top of the box that is to prevent the Woodleigh from leaving the top of the box when it veers off course. Yes, I already know what the Woodleigh is going to do, as I have tested them before. Maybe I can prevent damage to the range!

As expected the 500 Woodleigh started to veer off course at 31 inches exiting the medium to the side of the box at 35 inches as you can see below.



The 500 Barnes Banded FN zipped thru the entire 62 inches of test medium and exited the back of the box, 2X6 and into the impact berm not recovered. Penetration was straight through and through.



Now for the reduced loads in the 458 B&M. the 500 gr Woodleigh with 63/AA 2520 gave 1827 fps at the muzzle and at impact 1776 fps. It went to 24 inches before it started to veer off course, it found a void down the side of the box and out the top at 35 inches, hitting the target behind the box sideways.



The 500 Barnes Banded FN at 1815 fps at the muzzle and 1780 fps at impact once again drilled straight completely through the 62 inches of medium, exiting the back of the box and into the berm behind, not recovered. I was somewhat surprised, I expected it to come up a bit short, but was wrong. I do believe that had velocity been lower it would have stopped in the box, as it was just making it's way through with little disturbance at the end.

The last test was in the 458 B&M with the 330 Barnes Banded FN solid. With 72/RL 10X it started at 2331 fps and impacted at 2281 fps. They drove straight and true to a total penetration of 50 inches. Not bad for a little bullet and far better than the 500 Woodleigh FMJ.

Now what did this tell us? Something most of us already know, once again--Nose Profile is everything! The 500 Woodleigh becomes unstable, veers off course, and penetration is severely effected. We also learned that the lower velocity it penetrated much less, before going off course, a little more velocity kept it going a little further. Proving that with this RN design, more velocity will keep it stable longer. With RN bullets this challenges the "garrett" tests seriously.

Of course the 500 Barnes Banded FN far exceeded the 500 Woodleigh FMJ RN, this comes as zero surprise and has been repeated many times. The 500 Barnes fired from the 458 Lott hit with far more authority at 2209 fps than from the reduced load in the 458 B&M at 1815 fps. Both penetrated straight, both exited box. It is my belief that even lower velocity that the box would have contained it. I will most likely attempt lower velocity in the near future to also challenge the "garrett" tests. I am pretty positive that if I can get down in the 1500 fps range the bullet will be recovered in the box, and for sure putting the nix on garrett.

Of little surprise, but none the less pleased with the results is the 330 Barnes banded solid. At 2331 fps it did far better than the 500 gr Woodleigh. With a small Sectional Density of only .225 as compared to the mighty 500 Woodleigh FMJ RN with an SD of .341 the little Barnes exceeded the Woodleigh by an easy 35-38% increase in penetration. What is the most important aspect of SOLID PENETRATION? NOSE PROFILE---NOSE PROFILE---NOSE PROFILE! All other factors including Sectional Density--Velocity--barrel twist--construction and materials, are in the back seat, being driven by Nose Profile!

Michael

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analog

Thank you! Very well said, why does it always take me 10'000 words to say the same damn thing????

I do type rather well however!

Michael

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**jetdrv**

**04 November 2009, 00:36**

Fascinating stuff! You are obviously totally dedicated and well funded.

Some very impressive data. I'll take a long look at the Barnes solid when working up loads for my .458 Win. Wish you could find the time to test the new Hornady DGS solid in .458. That would be very informative.

**michael458**

**04 November 2009, 01:02**

Alf

Thank you for your opinion. Noted.

Michael

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**.458 Only**

**04 November 2009, 02:31**

quote:

Originally posted by michael458:

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Michael

But did it do better than the 500gr Barnes Banded? I think that's the point if SD isn't that important!

To compare apples to apples, and not to oranges, then the design of the bullets have to be the same. When the 330gr Banded is compared to the 500gr Banded, which penetrates best? If it's the 500gr Banded then SD (hence, weight), momentum and kinetic energy are the determining factors, NOT nose profile! Right?

That 330gr Banded might surprise a lot of folk if fired from the Ruger in 45-70, eh?

Bob

[www.bigbores.ca](http://www.bigbores.ca)

"Let every created thing give praise to the LORD, for he issued his command, and they came into being" - King David, Psalm 148 (NLT)

**shootaway**

**04 November 2009, 02:45**

This tests shows that flat nose solids out perform RN solids buy alot.I will only use FN solids from now on.I think that the new Hornady solids are flat nose,if I am not mistaken.I think I'll order a couple of boxes of those.In another test I've seen,I think that Woodleigh RN bullets outpenetrated Barnes RN solids.This confused me because I thought the test was done with Barnes FN bullets.Anyways,if Hornady makes FN solids,that will be great because they will be much easier on the rifling compared to

monometals.

**michael458**

**04 November 2009, 03:46**

458Only

Yes Bob, as you know from the posts on the 45/70 thread, SD was a consideration and discussed.

In the case of the 330 and the 500 Barnes Banded Solid, they both appear to have the same nose profile, same construction, same material, same everything, except one weighs 330 grs the other 500 grs, thus the 500 gr having a higher SD, and of course the 500 gr penetrated deeper than the 330 gr bullet. SD wins when all else is equal. I agree. Also pointed out with my .500 caliber bullets the 510 gr and the 550 gr. Regardless of velocity, the 550 penetrates deeper every single time, because all else is equal.



We also must take note that not all FN bullets are the same, therefore not equal. Not all RN bullets have exactly the same RN profile, therefore not equal. You can only use these terms in a general manner, not specific. In at least one case recently I encountered in a smaller caliber, the RN out penetrated the FN by a considerable margin. In this case the flat meplat is too small to be of consequence.

Jetdrv

Thank You. For the 458 Winchester take a good look at the 450 gr version. That can be run in 458 Winchester to 2250 fps or so and it works great, even down to 2100 fps. I have used it.

I have tested the Hornady DGS in 480 gr version. It did about as well as the Woodleigh FMJ did. The meplat is a bit small on this version.

Now do keep in mind, yes the FN bullets tend to win big time in the lab, if my rifles work with them (and they do-they are Winchesters) then that is what I am going to be shooting in the field-no ifs ands or buts!! That does not mean the RN versions will not work in the field. They have for a century done the job, they can continue to do so. Just means the FN versions are superior, no questions about that, and that is what I use, and will continue to use. You will continue to get good reports from the field with the RN versions. But if you can shoot the FN solids, then you can be close to certain your bullet will do what is asked of it--They do for me, so I suspect they will for you too!

Michael

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**.458 Only**

**04 November 2009, 03:49**

Michael,

I should have added that I, along with others, appreciate all the work you've done. It saves us a lot of time and \$\$ 🙌👍. Plus, it has given some good insights. 🤖📊

Penetration, though, isn't the end game, standing alone, anymore than SD or nose profile is. Quick termination of the animal is. As long as there is enough penetration to the target (vital area), and the bullet does its work by scrambling the brain/CNS, or there's immediate loss of blood pressure to the brain by a bullet that destroys heart and/or lungs, that bullet has succeeded in its mission.

I've seen big game animals drop to lung shots, where no other vital organ or bones were impacted and they never regained consciousness, and in some cases the bullet never exited. One shot kills with no CNS impacted. On the other hand, I've had some complete pass-throughs where the bullet never expanded and the animal ran off for 20 to 40 yards. They were dead but didn't know it. But, I wouldn't want a big bear coming my way for 40 yds after a hit that would eventually be fatal! We learn about bullets from media testing for sure, but, as you've pointed out, the REAL test is REAL game!

Bob

[www.bigbores.ca](http://www.bigbores.ca)

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**michael458**

**04 November 2009, 04:39**

Bob

Yes, this does not need to be a solid only discussion! I do not intend that, just that today I was doing some new test work on some solids, confirming some old test work. I would very much like to discuss expanding, and other non-conventional bullets and the floor is open for that.

I have done quite a bit of work with various expanding bullets, and some not so conventional bullets too. I have also used a few on critters, so please guys, open floor let's discuss some of the bullets we have used, what animal reactions were when hit (an area of great interest to me currently) in which I term as "energy transfer" to target. All good stuff.

Tomorrow I can post some bullet performance and what I saw from animal reactions.

But like I said, floor is open, have something to add please do so.

Michael

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**capoward**

**04 November 2009, 05:36**

quote:

Originally posted by analog\_peninsula:  
That's very impressive, Michael. As you've so eloquently demonstrated, there are opinions and informed opinions; the two are not identical.

+1

Another very articulate report Michael...Keep up the good work.

Jim 🤖📊

"Life's hard; it's harder if you're stupid"  
John Wayne

**Extremist458**

**04 November 2009, 11:48**

Michael458 I can say you do know what you are talking about, more then most, but there are a few things that have not been considered when comparing the Garrett test with your. I believe the reasons you have stated are very much true, in regards to the Nose profile being of such great importance to penetration, but a few factors remain unmentioned.

For instance, the faster you drive the bullet, the faster it rotates and therefore stability goes up. This could very well be the difference you see in velocity with the same bullet. The Barnes solids are usually too long to be well stabilized with standard twists,

but when shooting against the Woodleigh of shorter length to weight (Higher stability factor), it uses a round nose so is inherently worse. Not debating your finds, just dissecting. You have ample ground to stand on, and I very much agree with. I would also like to add a thank you for proving, not just speaking.

What I think Randy Garrett had done (and we have spoken quite a bit) is try something you have not yet. He tested bullet speed vs weight with neither being constant. What I'm getting at is that if you drive the same 500 grain bullet slower, you cannot reasonably assume you will get better penetration, but if you add weight to slow it down, keeping the energy level the same, then it will improve. Up to a certain point, which he has found to be around 1600. So if you take all the power that rifle can muster, not just down-load, and stuff a 700 grain bullet (of something dense enough to stabilize), then it will out penetrate the 500 grain. This is why Randy chose the 540 grain, even with such little power as the .45-70. He chose pure lead because it makes the bullet as short as possible while adding weight, and then found ways to make the lead harder and tougher. He also found the length of the bullet has a lot to do with penetration. Hence why the 330 grain did so well! Out of proportion to it's weight. This is something most people don't think about. If you could make a 500 grain bullet only as long as a 400, then it would also improve penetration. This weight forward is fairly well understood, so I apologize if I sound like I'm preaching to the ignorant, I don't mean to be.

Point of Garrett's research was to open all possibilities of improvement. His work has shown that you can take frontal brain shots on an Ele with a lead bullet .45-70 guide gun! Now I know it's not the end-all be-all example of bullet design, but it has shown us a lot. You take the Barnes bullets, with no other changes, and make them heavier, they would become fantastic penetrators. Now since that cannot be done, we have to look at what we can control. We don't need excessive weight, if we use proper design and faster speed! That opens up a lot of doors! I know I'll get flack for that one, but it is very much true. I will even go so far as to say Barnes could do much better with turning their nose into a truncated cone and opening up the meplat a bit. Then just add the drive bands and you have a GS Custom bullet! Interested as to why those were not tested against the Barnes in this test? I don't really like to argue, or go too much into a debate with so many variables, so I will just send michael458 a message. Thank you, and I hope I helped.

-Extremist

"Pain is weakness leaving the body" -Instructor

Victory in life is dying for what you were born to do.

"I hope you live forever" -300

"Never judge an enemy by his words, he might turn out to be a better shot than a writer"

<http://www.gscustomusa.com>

**jetdrv**

**04 November 2009, 12:38**

quote:

Thank You. For the 458 Winchester take a good look at the 450 gr version. That can be run in 458 Winchester to 2250 fps or so and it works great, even down to 2100 fps. I have used it.

Thanks. I'll do that, particularly as I am interested in loading the 450 A Frame as my primary soft. The previous owner of my rifle has had good results with them regarding accuracy and velocity.

**michael458**

**04 November 2009, 14:44**

Extreme

I think you have done much better at explaining what garrett's intentions are than he has done himself. Here on AR it spawned I think some folks into thinking he was saying that across the board, lower velocity meant deeper penetration. Which is not the case, if the same bullet is used. Using a different bullet in the two, then yes, that is possible. And I know what he was trying to do, get the 45/70 up to muster. Much of those controversies were before I was even a member of AR, and really I did not pay much attention to it anyway, and was not a point of contention for me. Back in the day when I was heavy into playing with 45/70, I would have loved to had some of those bullets he used. Instead I was stuck with the Cast Performance, and True Shot bullets, which are good bullets, just not enough weight. Another thing, the Marlins I was using at the time would not work so well with the long heavy bullets.

As for the Barnes solids, which happen to be the ones I use most in the 416s and 458s, I have never had any issue with them being stable in the Winchesters, even shooting the older design RN versions. Always extremely accurate, but of course the FN is more stable during terminal penetration than the RN.

For stability I have to refer back to my first .500 caliber rifles which were done in 1:18 twist rates. My first .500s were 1:18 twist rates. All seemed great during all the load data workups, accuracy work ups and so on with bullet weights from 325 to 512 grs in the first 50 B&Ms. Even terminal tests with expanding bullets was going very well too, no issues there. But when I started looking for a solid that's when everything went to hell in a basket! In particular with the round nose design we started with. Finding the light for caliber 405 gr Brass RN bullets extremely unstable during terminal penetration I went to the copper alloy we now use, and increased the weight to 512 grs. I was pretty convinced at the time this would solve the issue. Penetration in my test medium went from 28 inches with the 405 to 36 inches with the 512. Neither of them stable in the 1:18 twist barrels, with both starting to veer off course at 25 inches. In fact neither would stay within the confines of the box. This was not acceptable performance to me.

Well .500 caliber barrels are not all that easy to come by, we use only PacNor barrels. But none the less within a couple of weeks we managed to quickly put together a rifle with a twist rate of 1:12. Now the 512 gr RN was driving to 42 inches total penetration up from 36 inches. It was now stable to roughly 90% of it's overall penetration before starting to veer off course as it lost velocity, and momentum, and become unstable at that point. The 1:12 had made a real and decent increase in stability and therefore penetration. However, still not satisfied, especially having compared these to the new 450-500 gr 458 caliber Barnes FN bullets. I was about a year behind Barnes on the learning curve with making a move to the FN solids. Having just come off a hunt in Tanzania where I shot 3 buffalo and a hippo with a 500 Barnes FN in 458 Lott, and noticing a considerable difference in reactions of these animals with this bullet as opposed to the older RN Barnes I decided it was time to look at some .500 caliber FN designs. What we discovered was that even a very much lighter bullet, with considerable less SD but now with a flat nose would out penetrate the heavier RN bullet by serious margins, and on top of that stable to 100% of it's entire penetration! I was sold immediately on the



new designs. Now for giggles and grins I tested the new flat nose bullets in the older 1:18 twist rate. Knowing that I had terminal stability issues with this twist I wanted to see how bad the flat nose design would do in comparison to the RN. I was taken completely by surprise, and received very near the same exact results in terminal penetration as I did in the 1:12 twist barrels. The only difference at all was the bullet with a .300 meplat become somewhat unstable during the last 2 inches of penetration. The other bigger meplat, to around .350 caliber showed no instability and had 100% straight line penetration with the slower, less stable twist. The flat meplat it appears does far more for stability than other factors, including marginal twist rates for terminal penetration. While twist rates are extremely important, it is very obvious that other factors can and do become extremely relevant in terminal performance of solid bullets.





Another slight issue with the garrett work is that a lot of experienced folks do not believe the 45/70 is a good and proper heavy cartridge--heavies being buffalo, hippo, elephant. Yes, it will and has put all three on the ground, but so has bows and arrows. Now if I had to choose between a stick and a 45/70 then I will do the 45/70- 🍌 I happen to think 45/70 comes up a wee short for that mission overall. I have shot cape buffalo with 45/70, not hippo or elephant of course. To be honest it was a little short of impressive. But I understand what Randy was after, and is to be commended for the work, not really condemned, and probably had he presented a little different then it might have been accepted for what it is, or was. Me personally I have no beefs, nor have I really put much thought into it.

Now, you also mention why I did not test the GS Custom bullet? The reason is that I don't have any to test, nor the NorthForks, and probably some other designs that I don't have in stock. Remember, I only test bullets that I think I am or might use in the field, and not just testing bullets one against the other. I test to find what will work best for me and the cartridge/rifle combination that I intend to use. I have nothing at all against GS or NorthFork, I happen to think they are fine and proper bullets, I just never felt the need for them being satisfied with the performance I am getting currently with the bullets I use. In the photo below you will see a .458 caliber bullet, I think 475 grs in brass that JD designed, goes way back to the old days with JD and some other designs he used, this FN bullet is extremely good and penetrates as well as the Barnes design bullet, exits the box 100% of the time (need a bigger box it appears).



Oh no worries, I don't take you post as an argument, in fact it gave some insight to garretts motives. Thanks.

jetdvr

I just come off a shoot in Australia for buffalo with the 500 MDM and 458 B&M. The 458 B&M is equal to the 458 Winchester, just in a much smaller rifle with 18 inch barrel. I used the 450 Swift and the 450 Barnes Banded for that work and they performed excellent. I think the 450 Swift was just a tad over 2200 fps and I slowed the Barnes down to 2175 fps to make same POI at 50 yds. It was a great combination and worked extremely well. Go see:

<http://forums accuratereloadin...4711043/m/3981035711>

Michael

<http://www.b-mriflesandcartridges.com/default.html>

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**Rug** **04 November 2009, 15:08**

Michael that is a awesome load shop and setup you have there. Keep up the good work

**michael458** **04 November 2009, 17:40**

jetdvr

Below you will see some of the 450 Swifts at 2200 fps used on buffalo that were recovered.

458 B&M

450 Swift A--2210 fps

Buffalo Australia 2009



photobucket

458 B&M

450 Swift A--2210 FPS

Buffalo Australia 2009



photobucket

Below some comparisons to earlier test work done with the 450 Swift.



None of the 450 Barnes Solids were recovered.

Rug  
Thanks!

Michael

<http://www.b-mriflesandcartridges.com/default.html>

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**buffalo**

**04 November 2009, 17:53**

again Michael - AMAZING 😊

You are truly serious about what you are doing.. A pity that you dont live nearby - otherwise I would have visited you quite often I guess 😊

I am very fond of bullet testing myself and use the same media as you do (wet prints). But it is impossible for me to do it in such structured way as you do..

Keep up the good work and please let us know your results also in the future, thanks..

Best regards  
Ulrik

**jwp475**

**04 November 2009, 20:54**

quote:

Originally posted by ALF:

quote:

What is the most important aspect of SOLID PENETRATION? NOSE PROFILE---NOSE PROFILE---NOSE PROFILE! All other factors including Sectional Density--Velocity--barrel twist--construction and materials, are in the back seat, being driven by Nose Profile!

I will absolutely and categorically challenge this statement! So let the shitstorm be unleashed 😊

1. We cannot divorce SD from the ballistics event, it is central and it is 100% critical to each and every one of the 3 main areas of ballistics !

A bullet has mass, velocity and interacts via it's frontal surface area with it's immediate environment..... you cannot negate any of these 3 paramaters.

2. The reason SD as a factor is seen not to have any value is because SD is wrongly defined here on AR as it is in most leading manuals and books.

3. Nose profile has no effect of whether a projectile causes cavitation or not when fired into fluids or "fluid like in behaviour" materials.

Fluid cavitation is independend of nose profile or shape.... it's dependent only on whether boundry flow occurs and then directly on the vapour pressure and pressure density of the fluid.

Shall we commence ?

I have also seen that a flat point of lower SD out penetrates a round nose of a higher SD every time.

JPK has reported that the 450 North Fork Flat point out penetrates the 500 round nose by a considerable margin on Elephants.

There is simply more to it than SD. Nose profile is definately an important factor.

---

A 9mm may expand to a larger diameter, but a 45 ain't going to shrink

Men occasionally stumble over the truth, but most of them pick themselves up and hurry off as if nothing had happened.  
- Winston Churchill

**Extremist458**

**04 November 2009, 22:01**

All right, all right, I have to say something here. I hate to bring this up, but that JDJ 475 is damn near a copy of the GS custom bullet, only brass (and the secant moved forward). Look, I hope this doesn't flame this thread, but Even the NorthFork bullets have evolved into nothing more then a GS Custom FN with only more bands! Take a look at their earlier work and you will see big differences from what they offer now. Even Barnes changed their solids to mimic the GS FN. Take a look at 5 years ago, then 3 years or so, when they added their own version of drive bands. GS has been making those since 1993, and patented and incorporated since 97. Just wanted to point that out.

Now, since some like copper, and some don't, I will only mention, rather then debate the entire subject, that those bullets have been shot through ele skull and recovered in the neck, .22's through zebra skull at 4,700fps, and plum through about everything that walks. Trauma is excellent, better then the Barnes, and penetrations equal, maybe even better. And if you want speed, then GS is the way to go. I can honestly drive my .30's-.458's 200-300fps faster then Barnes, easily! So I would love to see them tested by you Michael458. I can think of no one (unbiased) on here more qualified to do so, as all of us can see. And your testing would really show proof of what you and I have already discovered. Besides, who doesn't love testing!

Link, with a link back to here!

<http://www.gsgroup.co.za/galloweElephant.html>

<http://www.gsgroup.co.za/ulrik.html>

<http://www.gsgroup.co.za/johnharrisele.html>

And take a look at the gorgeous woman behind the rifle!

<http://www.gsgroup.co.za/galgina.html>

-Extremist

"Pain is weakness leaving the body" -Instructor

Victory in life is dying for what you were born to do.

"I hope you live forever" -300

"Never judge an enemy by his words, he might turn out to be a better shot then a writer"

<http://www.gscustomusa.com>

**michael458**

**04 November 2009, 22:44**

quote:

All right, all right, I have to say something here. I hate to bring this up, but that JDJ 475 is damn near a copy of the GS custom bullet, only brass (and the secant moved forward)

No man, it's ok, JD has been using that design since the 1970s in the JDJ cartridges and in some of his early handgun designed bullets. But regardless of who did what, still works damn good.

All the bullet makers are coming around these days and we have a lot of good choices out there now. No doubt!

I like the copper too--I chose the copper alloy for my .500 caliber solids, get a little more weight for the same bullet, about 5-6% more weight. I have shot those into some pretty tough stuff and no deformation at all, of course my velocity rarely exceeds 2200-2300 fps with those anyway.

Certainly I have never heard anything but positive about the GS Custom bullets and the North Forks, although I have never needed or felt the need for them, but I am quite sure they would test very well and do a great job. Be happy to do so, will begin a little search and see if I can get my hands on some from somewhere.

I see now that I am going to need another box as 62-64 inches is not enough to trap some of these "Ultra Solids" we have and intend to get! Currently I have had the following track completely thru the 62 inches mix, 2X6 backside, and lost in the berm;

1. 510 gr .500 caliber solid at 2100 fps
2. 550 gr .500 caliber solid at 2200 fps
3. 475 gr .458 caliber JDJ solid at 2150 fps
4. 500 gr .458 caliber Barnes Banded FN at various velocity from 1800-2250 fps
5. 320 gr .366 caliber Woodleigh FMJ at both 1800 fps and 2300 fps
6. 156 gr .264 caliber Military FMJ RN at velocity from 1800 fps to 2200 fps.

These were pulled from old military stock and reloaded. Bullet???

I was surprised however!

So far, as my memory serves, these are the only solids to ever pass completely thru the entire box. Now in my opinion anything that can track straight thru the box and exit will accomplish any mission needing penetration that you would ever encounter in a hunting situation. If in others opinion that the old standby 500 gr RN .458 bullet was adequate, then these are Ultra Solids.

Since it appears that I may do some heavy penetrators I am having a new box built now, another double of the one I have currently, that would give us 125+ inches of mix material to work with! Surely we can stop some of these "Ultra Solids" in that?

If anyone happens to have a line on a few GS Customs or North Forks let me know, don't need but a few to give it a go.

Michael

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**RIP**

**04 November 2009, 22:54**

quote:

Originally posted by Rug:  
Michael that is a awesome load shop and setup you have there. Keep up the good work

michael458,

Ditto above,

You got more "stuff" than most of us.

I heartily agree that artificial test media offers predictions of bullet ability in live game. Scientific terminal ballistics study is impossible without reproducibility. Live game impacts are infinitely variable in their variables, impossible to standardize conditions from one shot to the next. But, you already said that ...

My Iron WaterBoard Buffalo is out to pasture.

I too have done some self-satisfying testing.

My impression is that sectional density (mass versus XSA by whatever measure), velocity, and nose shape (and bullet material/construction is included here) are all of primary importance.

Any one can defeat the others in a certain test.

Regarding solid penetration by two nondeforming FN solids with same nose shape, one light, one heavy:

You cannot win the penetration test with higher velocity alone UNLESS THE MEDIUM IS SELECTED TO SHOW LINEAR RESISTANCE INCREASE WITH VELOCITY INSTEAD OF EXPONENTIAL.

Live game is not linear.

Regarding soft point expansion: Sectional density is what drives expansion.

SD is too important to relegate to the ash heap.  
Shitstorm over nose shape versus sectional density?  
Would that be "brown-nosing?"  
Alf is in rare form!  
Hilarious! 🤔

DRG says: "Kiss my liberal grits!" 😊

**Extremist458**

**04 November 2009, 23:10**

Ah, just thought about something. I have a few extra's that have been around my shop for years. I think 450 .458's. Would be good for you to test! Give me a call and I'll walk through the shop and see what I have.

-Extremist

"Pain is weakness leaving the body" -Instructor

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"I hope you live forever" -300

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**Extremist458**

**04 November 2009, 23:14**

And I thought you might like to see this picture. This one got me started with GS custom bullets and has stayed with me since.

On the left in the picture are two 458 bullets that were fired into a steel drum filled with wet sand. Speeds were 2700 fps and 2300 fps from a 460 Weatherby rifle. The middle bullet picked up a layer of steel on the nose from the lid of the drum. The right hand bullet is the final production version of the bullet with the driving bands optimised for minimum pressure / maximum speed.

What really took me was the way the bullet expands, maintains straight line travel and weight forward, and refused to fail. With all brass bullets, especially heavy ones, they will eventually fail. I have even seen them tumble and brake in two, but more than anything, they do not do what this bullet does. Moves the weight even more forward, shortens (all qualities that aid penetration and straight line performance) and expands to do damage where it's needed; the insides. In the case where these bullets have encountered bone, they do do what any solid does, simply punch through. So it is this sold me on them back in 2001.

-Extremist

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**michael458**

**04 November 2009, 23:24**

RIP

Thanks a bunch! All those not quite in the know, pay attention to RIP, he has a lot of terminal performance study backing him up, and I listen to what RIP has to say, you should too! He also brings up excellent, technical points that I sometimes bypass, forget, or too ignorant to remember!

One before I forget---"Regarding soft point expansion: Sectional density is what drives expansion."

How true!

I have not quite sent SD to the ash heap, yet, as you see from above, two solid bullets, exact same material/construction, exact same NOSE PROFILE, and everything equal including velocity, then the SD factor kicks in and wins every time. But too much beyond that I might be getting close to the fire with SD-- 🤔

Nahh man, no shitstorms here I think, see that as a waste of valuable time, far better spent trying to learn something. There is a great deal of knowledge out there available, not from adverts from the manufacturers, from ourselves. Put our knowledge together.....well it should be obvious. We have people that are shooters here, have done a lot of hunting, putting bullet to flesh, putting bullets to test, experience in all arenas are great sources of knowledge we can obtain, what is the point of having a shitstorm over ignorant points? No one wins, makes good entertainment I imagine for some I guess?

RIP, your opinions and knowledge are important to all of us, please stay with the thread and continue to contribute!

Extreme

Send me a PM and I will get info to you. And for sure, I have seen all the GS Custom site and photos, don't have to convince me they are good and proper bullets! I am quite sure they are! If you happen to have some spare 450s in .458 that will be perfect, can run them in 458 B&M and in 458 Lott, give them a little workout.

Michael

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you, nor anyone else.

**michael458**

**05 November 2009, 00:42**

Some very important points have been brought to my attention that I need to get sorted out. It seems I stated somewhere, and I remember doing so, that I had never had a 45/70 out penetrate any of my 458s, Winchester, B&M, or Lott! Well, that's BS and not exactly true! I simply was thinking in a "straight line", you might say. What I should have stated is that I never had a 45/70 out penetrate any 458 with good solid FN bullets in both 45/70 and any various 458.

I have in fact had several bullets in 45/70 caliber, and for that matter some in 45 Colt that have out penetrated "some" 458 caliber solids--for instance take most any round nose bullet in 458 caliber, fired from a 458 Win B&M or Lott and you will get somewhere around 30 inches of penetration in the mix before it starts off course. There have been many instances where with the 45/70 bullets of FN design, cast performance and such, at 1700-1800 fps I would get deeper penetration, straight line penetration into the 40 + inches. A good bit more than the typical RN 458 caliber FMJ fired in any of the 458s.

So please forgive my misstatement as I was thinking FN to FN, but did not state it that way! My mistake! But a very good point that JWP475 brought up to me, thanks for setting me straight John!

John and I had a great conversation just now and lord knows we covered a lot of ground in a short period, but we talked about some really good points that need to be covered in terminal penetration. Both solids and expanding bullets.

One of the things we talked about, and I confirmed with John was the fact that some of our bigger cast bullets used in 45/70 and other calibers sometimes tend to shear off the meplat upon penetration. I have had this happen several times, in the "lab" and in the field, and when hitting bone on some occasions, below you can see some examples of this.



**45/70 Marlin Guide  
420 Cast Performance  
Muzzle Velocity 1920 fps  
Buffalo @ 60 yds Shoulder  
Retained Weight 270 grs**



Below is an example that did not hit bone.

**45/70 Marlin Guide  
420 Cast Performance  
Muzzle Velocity 1920 fps  
Buffalo @ 40 yds  
Retained Weight 388 grs**



Have to watch that meplat and how sharp it is I think for better performance. ????

Far from being an expert in this area, but some have heard me say this before, some not,

but the handgun shooters have been on to this flat meplat and penetration for a long time, I figure going all the way back to Elmer! They have known for a very long time that in handguns this big flat meplat up front will drive straight, deep, and true. I am not sure why we rifle shooters have been so far behind the times????

We do have someone on AR that is rather much an expert in this area of terminal performance, Whitworth, where are you, please stand up? JWP475 from talking to him this afternoon would be in that same class too!

Michael

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**jwp475**

**05 November 2009, 01:32**

I enjoyed our talk today. Michael458's test and field result are very close to being exactly the same as mine. RIP's test are also very close. There is no magic here just certain basic facts that hold true, if one does not misinterpret what they are seeing. SD is important, but is not the only factor at play, nose shape and profile also plays an important part to straight line deep penetration. That is the only reason that a wide flat point out of a 475 or 500 revolver will out penetrate a round nose solid out of a 458 win or Lott in wet print and at times on game as well.

---

A 9mm may expand to a larger diameter, but a 45 ain't going to shrink

Men occasionally stumble over the truth, but most of them pick themselves up and hurry off as if nothing had happened.  
- Winston Churchill

**capoward**

**05 November 2009, 02:01**

Very informative thread...thanks!

Jim 

*"Life's hard; it's harder if you're stupid"*  
John Wayne

**dean119**

**05 November 2009, 02:06**

You gotta love the SAF 400 and 450s in the 458.

**michael458**

**05 November 2009, 02:33**

Hey Guys, I am going to retire from the thread just now, but tomorrow morning's topic is going to cover velocity and expanding bullets, and start to cover some non-conventional expanding bullets.

Almost all my buds that hang around the lab and compound here have heard this a 1000 times if once from me. Velocity is not always your friend! This is a subject we can cover, and have some excellent examples to work with.

Another section I want to get into is a little new to me, and took me a long time to come around to, and that is some non-conventional bullets, RIP is a true expert in this area of terminal performance. Just the opposite of the above statement is called for here, in this instance, Velocity is your friend.

All of this in keeping with our Big Bore forum.

This is moving in a very good direction, thanks to good people! Ok, getting dark here on the east coast, time to go to roost!

Michael

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**shootaway**

**05 November 2009, 02:41**

Michael, did it ever occur that the model 70 did not feed a FN round from the left side of the mag? There must be a reason solids were made round nose for so many years. I don't think someone has to be a genius to figure out that FN solids outpenetrate RN solids, if that is the case. Could 36 inches of almost straight line penetration be enough or more than enough?

**fourbore**

**05 November 2009, 02:44**


quote:

Very informative thread...thanks!

A BIG +++ one, thank you.

**Whitworth**

**05 November 2009, 06:06**

Hello Michael! Great post! I may have to take a drive south with some of my hog legs and some special loads and do a little testing..... 

"Ignorance you can correct, you can't fix stupid." JWP

If stupidity hurt, a lot of people would be walking around screaming.

Semper Fidelis

"Building Carpal Tunnel one round at a time"

**Extremist458**

**05 November 2009, 10:21**

Not quite an expert on cast bullets, but getting close! I've shot a lot of hard casts in the .45-70, and that is a good place to start. Within the same guide lines as Randy Garrett, heavier is the way to go here. Unlike the brass bullets, leads can be made fairly heavy and still be well stabilized in standard twists. So the use of a 420 on Ele is a bit odd, but I can surely appreciate the test! Used Randy's rounds and had spectacular results, but I can do better with handloading. His bullets are ultra tough, seeing he uses a good amount of silver in his alloy, and that is the issue you are looking at in the picture above. You just can't push a Cast Performance that fast. Too much antimony (spelling) and not hard enough. Randy's bullets test out around 25, where the CP's only 18-19. But you cannot buy his bullets for handload (that really sucks), so I moved on to Bear Tooth bullets. They use a good alloy with a little better characteristics than CP, but they design better! As JWP475 will agree, their 525gr. Pile Driver is just about as good as it gets. Might be a tad big on the meplat, as they intentionally made it as big as you can get and still cycle reliably in the Marlin and Winchester levers, but it has paid off. I have a load that will push that sucker at 1830fps (it's on Reloaders Nest) and it is and absolute hammer! Have shot it through 26" of hard pine board and gallon after gallon of water. No question, best lead bullet for that cartridge...but that only makes my list as #2.

If you want to push the bullet any faster than around 1800, then lead just won't do, and cup and core just doesn't work when you absolutely need it, so copper is the way to go. My best load for my 1895XLR is the GS 400 gr. FN. I can push it over 2200fps with at least 2 different powders, maybe even 3, and it keeps its sharp edges when I need it. Have pushed it faster with the 350 grain version and got a bit of expansion, but it literally turned it into a Wad Cutter on Impact! Very nice.

With any of the bigger guns you shoot, lead cannot handle it, but I really like that picture of the sheared nose 420. never seen that before. Now if there were only a tungsten cored bullet...

-Extremist

"Pain is weakness leaving the body" -Instructor

Victory in life is dying for what you were born to do.

"I hope you live forever" -300

"Never judge an enemy by his words, he might turn out to be a better shot than a writer"

<http://www.gscustomusa.com>

**michael458**

**05 November 2009, 14:59**

Shootaway

Win M70 not feed left side? I don't recall ever having that issue. Sometimes a follower can move forward during recoil and cause a problem, but that is an easy fix. All of the M70s I work with do not have an issue with the bullets I am using. Now I am sure we could search around and find a bullet that they won't feed, but that would be true of anything. I have little experience with other big bore rifles, but a few of my Ruger M77s will not come close to feeding a FN solid. I have a 510 Wells built on the big M77 and that thing won't feed nothing flat. Now I am quite sure that can be sorted out, but I will never carry that 11 lb monster to the field so I really don't care if it feeds them or not.

Yes for the bolt guns many of them will only feed RN. If that is what I had, and no fix, then if I wanted the best and straightest penetration possible, I would hand feed a good flat nose up front, and follow behind with RN. That would be one possible. I think this is one of the main reasons on the Hornady DGS that you see such a small meplat on the bullet--so it will feed proper. But RN bullets were being used long before feeding would have been an issue for bolt guns I think.

Could 36 inches of ALMOST straight line penetration be enough? Of course, it has been adequate for a 100 yrs--I stated so in a post above. More than enough? Never more than enough with this type. Yes it has worked and will continue to work, but there will always be issues with the POSSIBILITY of the design going off course on the real thing in the real world. I hear many many times about shooting elephants with these things but missing the brain! Well I wonder how many of these times that it really is just a poor shot placement issue, and how many times it is actually a bullet that strays off course?????? This we will never know for sure, unless elephant is recovered and sometimes they are, and sometimes it is found out for sure the bullet did veer off course and miss! The problem is for some reason a lot of guys will never admit to it and will always adhere to the thought that there is nothing wrong with the RN it has worked a 100 yrs and it will work now! Not me buddy, a bullet screws me over, don't give a damn how good I like it, I am going to scream it! If you are talking buffalo then yes it would be adequate in most cases.

Personally this is just me--I will never in my life take another round nose solid to the field. I want to know that to the very best of my ability that my equipment is going to give me the best chance possible to succeed for the mission at hand. For the heavies, that is a proper designed FN Solid!

Whitworth

Thanks! Well load up, get in the truck and head this way when you can sort it out! But wait until I get the second box built!!! 🚚

Extreme

Way back when I was playing with the 45/70 a lot, the 420 Cast Perf is what I had to work with. Even Cast Perf had not put out the better designed 460 gr bullet yet. In the guide guns I could not get a 500 to stabilize either. Now remember, I had no intentions of shooting anything other than some monkeys or maybe a few lesser critters with the 45/70. But I did shoot a buffalo, and the elephant was only a test to see what would happen! I shot the elephant with one of my 458 Lotts. So back in the day, there was not much of a choice of bullets that we have today for the 45/70. Later I moved to the 460 Cast Performance, slightly less meplat, did not shear, and also the True Shot I think 430 gr bullet did very well, little less meplat, did not shear. Also in the Marlins I had issues with overall length and some of the larger bullets. Today, I made my Winchesters into Guide Guns, and left 45/70 behind in favor of my 50 B&M AK-- .500 caliber. I have some proper solids for that, matter of time before going to the field with them!

Buffalo--Capoward--Fourbore

Thanks I glad you approve and don't be shy about contributing, I am sure you have some good insight, share it.

Dean

You right! I have relied on the Swifts in many many situations, never been disappointed.

Michael

<http://www.b-mriflesandcartridges.com/default.html>

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Live Outside The Box of "Conventional Wisdom"

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**Whitworth**

**05 November 2009, 15:46**

Thanks, Michael -- still figuring out the parameters of the test -- I will sed you and e-mail.

"Ignorance you can correct, you can't fix stupid." JWP

If stupidity hurt, a lot of people would be walking around screaming.

Semper Fidelis

"Building Carpal Tunnel one round at a time"

**jetdrv**

**05 November 2009, 16:15**

quote:

Originally posted by michael458:  
jetdrv

Below you will see some of the 450 Swifts at 2200 fps used on buffalo that were recovered.

458 B&M

450 Swift A--2210 fps

Buffalo Australia 2009



photobucket

458 B&M

450 Swift A--2210 FPS

Buffalo Australia 2009



photobucket

Below some comparisons to earlier test work done with the 450 Swift.



None of the 450 Barnes Solids were recovered.

Rug  
Thanks!  
Michael

Michael,

Many thanks. I am a big fan of the A Frame, having used them in .375 H&H and 7mm Rem, both with excellent results and phenomenal weight retention, as well as excellent penetration. The 160 A Frame really shines on PG in the 7mm at ranges to over 300 yds. I am not much of a big game hunter, having arrived on the African hunting scene late in life, but I have taken two buffalo with the 300 gr. A Frame with sterling results.

I think the combination of velocity, SD, penetration and mushrooming effect on the .458 450 grain makes them ideal for the .458 Win and I intend to do a lot of work on them in the near future. Thanks so much for your reply and the photos. Keep up the great work!

jetdrv

**michael458**

**05 November 2009, 18:27**

jetdrv

More than welcome, glad the information is of some use to you!

I too am a big A Frame fan, having used them on critters from .308 caliber, 338, 358, 416, 458. Never failed, not once.

We truly live in a time with the best bullets that have ever been produced in the history of shooting! But it took a long time to get here. We are not finished yet either!

Do keep me posted on success with your 458. I happen to be a pretty big 458 caliber fan.

Michael458

<http://www.b-mriflesandcartridges.com/default.html>

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**Charles\_Helm**

**05 November 2009, 19:11**

quote:

The flawed reasoning and pseudoscience regarding the mechanisms of penetration of rigid bodies in biomaterials, displayed here defies logic.

Well it did get you to de-lurk and post. 🌐

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[Some Pictures from Namibia](#)

[Some Pictures from Zimbabwe](#)

[An Elephant Story](#)

**michael458**

**05 November 2009, 19:24**

Next area of study.

Velocity is NOT ALWAYS your Friend! Well this one is pretty easy to grasp once you see. Many of you already know this to be a fact, some still in the learning process, and nothing wrong with that. I too am still in the learning process, and hope to be for a very long time! Stop learning, get ignorant!

It is particularly important to know how your "Expanding Bullets" work, and at what velocity they will work the best, for the job you have for them. For example while a particular bullet may do very well, large expansion at a higher velocity, it's penetration will most likely be less. What might do extremely well on thin skinned game at a higher velocity, could be dangerous on a thicker skinned dangerous game animal since penetration could come up short. Know thy bullet!

Penetration IS EVERYTHING! Don't matter what you do, if you can't get to the vitals and destroy vital tissue, or break bone to disable, then everything else is a moot point. Penetration is a must! You will not always have the perfect broadside lung shot, unless you are willing to pass up a lot of opportunities. As with the solids it is the same with expanding, there are only 3 ways you will solve the problem #1-Penetration #2-Penetration and last but not least, #3 Penetration!

How much velocity is too much??? Excellent question, Michael! Until you test you will not know, many bullets are not the same, even ones by the same manufacturer. I test everything before going to the field with something I have no experience with. Not a big bore, but I am playing with my 9.3 B&M currently as my new medium rifle. Now I have zero experience with 9.3 caliber, and 9.3 caliber bullets, but I have now tested most all the bullets I intend to possibly use in the field, with an exception of a few to be done in the near future. With the ones tested, I now know their strong points, weak points, and any limitations they may have. Each bullet may work a little different at different velocities, see below;



405 Remington FN .458 Caliber

45/70 1800 fps



Velocity is not always your Friend!

45/70 1600 fps

458 Winchester 2800 fps



photobucket



45/70 405 Woodleigh FN Soft

Muzzle Velocity 1834 fps

50 Yard Impact

Retained 398-398-397



458 Winchester 405 Woodleigh FN Soft

Muzzle Velocity 2350 fps

50 Yard Impact

Retained 350-380-294

photobucket



As it is plain to see you must know what the operating velocity is with each bullet you might use in the field. Too much velocity can and will cause you to fail in your endeavors in the field! Whether through lack of penetration by too much expansion, or a breakup of your bullet that causes a lack of penetration!

Some years ago I got turned on to a 400 Woodleigh PP in 458 caliber. In 458 Winchester and 458 Lott running velocities from 2325 fps up to over 2500 fps. I was getting tremendous amount of expansion, it was explosive in the test work and transferring a tremendous trauma and energy to the test medium, wet print. Wound channels were impressive to say the least! Well, I did not pay near enough attention to "Penetration", and I should have, I was only thinking of how much "energy transfer & Trauma" this would cause to a lion or bear or leopard, thin skinned dangerous game.

I used this bullet in 458 Lott for an impala and a kudu. Animal reactions were drop on the spot, I was correct, a tremendous amount of "energy & trauma transfer" occurred, but penetration was coming up short!!! This really got me to thinking about the extremely sinewy, tight, heavy muscles in a lions chest, frontal shot! Well, fortunately I remembered and was once again taught a valuable "penetration" lesson and actually learned from it before becoming lion crap, or bear crap!



Early this year I had a little bear hunt planned for Russia. As it happens it was cancelled 2 days before leaving, not by me, but by the outfitter. Well I was pretty well prepared, and I was taking my light stainless 458 B&M. I had done a lot of work with it, and had originally planned to use a 350 Barnes X at 2400 fps and change, extremely accurate and performance was great. Then I started thinking "energy transfer" again, and of course referred right back to that wonderful 400 Woodleigh! Only this time I was smarter! Slow it down and see what it does? So I took it to 2150 fps and tested, results were much better, and I felt like I would still get that "energy & trauma transfer" to target. This hunt was supposed to be pretty close any way so the results are below;



Although I didn't get to try it out I am confident that it would have worked well. Of course the 350 Barnes would have also done a great job too! Yes, the 350 Barnes does give deeper penetration, and at 2400 fps or more would have been excellent transfer of energy and trauma to intended target.



Michael

<http://www.b-mriflesandcartridges.com/default.html>

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