

This topic can be found at:

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

Todd Williams

31 July 2013, 02:32

Terminal Bullet Performance

I appreciate the nod there Michael. As I've said many, many times, THIS is without a doubt, the best, most informative, most relevant, and most useful thread on the entire forum. It amazes me to continue finding guys who haven't checked out the information contained here.

Those of us who have read it, and thanks to you and Sam, have learned and gained tremendous insight into how bullets can be optimized. That statement goes for those notorious few who refuse to admit and acknowledge their enlightenment as well! 🙄

7MMNut

31 July 2013, 03:08

quote:

Originally posted by michael458:

quote:

Originally posted by capoward:

Michael,

That is a nice elephant. And if I haven't said it previously - that Bastogne stock really looks good on the .458!

Jim,

Welcome to the thread!

Cappy..... None of these photos really show how good this stock is, and I have not photographed the rifle at home with this stock. It really looks great, and when I get home I will take some real proper photos of the rifle as it is now.... I swear this little gun has been a workhorse of a rifle, and has won a very special place with me at this point..... It is the most perfect 458 caliber rifle I have ever owned or had pleasure to work with.

I got a funny from Phil earlier today... He found my "Sling Page" on the B&M site, although he thought I looked funny in all the photos, he liked the way I worked with the sling..... HEH.....

As I keep telling all of you, "Slings Are For Shooting First and Primary" "Carry is only a Secondary Use".....

Note Purpose of Sling..... Momma caught me shooting at something, I think this was when I was shooting at the buffalo cow.... I LOVE THESE SLINGS.... .. The two I used recently on the lever gun and the 458 worked fantastic, and I would absolutely not go to the field without one. This BS about getting caught on brush while hunting DG is pure horse shit from BS that don't know what a sling is for and how to properly carry and use one in the field.....



Rhodes, mighty kind words, I do appreciate them greatly.... I know Sam does as well, we have talked much about these sort of things and the reason we do what we do....

JDT500.... Welcome buddy to the thread..... And on this thread, Michael could care less whether its a double, single, lever, or bolt gun,

BULLETS don't care and neither do I..... We have a good double crowd of chaps here, Todd comes to mind first, of course Sam, and many more, all are welcomed..... Bore Size does matter... HEH HEH.....

Gees, ONE MORE DAY, and we Leave on Thursday.....



M

Nah Michael the laugh was on me. I thought I had perhaps come across something new in how to use the sling to tame the recoil. And then afterwards found out on your website, you'd beat me to it and bettered it.

pagosawingnut 31 July 2013, 05:02

Great pics, as usual, a great hunt report. Hell you may single handedly change up conventional thinking on bullet design and performance. Great job.

JDT500 31 July 2013, 07:12

Hi lion hunter,
I made a brief attempt at 510 gr BBWs but at 2250 fps I was getting a 4 inch crossing in my 500. Wasn't sure I could get them to regulate in time and the 570's were half an inch at 50 in very short order. I still have some 510s and now that the dust has settled I hope to give it another try so I'll be ready for the next time 😊. You double guys may know...if I push velocity won't the crossing get greater not less? Seems that's the impression I get from reading Graeme Wright. I like the notion of sledgehammer size at 2400fps. Any thots or experience welcomed. Jim

JDT500 31 July 2013, 07:29

7mmnut,



Thanks for the kind welcome. I know I'll fit in on this thread cause you won't find a bigger bore than me.

7MMNut 31 July 2013, 08:22

quote:

Originally posted by JDT500:

7mmnut,

Thanks for the kind welcome. I know I'll fit in on this thread cause you won't find a bigger bore than me.



Well it wasn't me that gave you the welcome, it was Michael. But nonetheless welcome.

With the level of knowledge around here and my being new to big bores, I'm more of a sponge for information than providing. Hope to change that with some contributions from range experience with the CEB's.

RIP 31 July 2013, 16:07

JDT500,
Yes, push the bullets faster in your double (sxs) and they will cross and shoot to lower POI. What was your velocity for the 570-grainers?
Hey! You are already a lesser bore than me. 🤔
Before finding ar.com, I could not even spell "big bore."
Now I R one.

JDT500 31 July 2013, 23:13

Pushed the 570s at 2050 more or less. R-I less than a half inch. If I'm gonna have to slow the 510s done to that the I can't see the point,RIP. and it's good to know I have company 🍻🍻🍻 in the big bore arena

RIP 01 August 2013, 05:41

Yep, not surprising, 570-grainers shooting to regulation at about 2050 fps in a 500 NE. Good as it gets with a BBW#13 brass solid. 🤔

Let me perfectly boring:

The 75%-bullet-weight saw in the sxs double is only good for getting a plinking or small game load that shoots close to regulation.

You end up shooting a lighter bullet at slower velocity, to counteract the lesser recoil, hence lesser muzzle rise, with greater barrel time to get on target. What a big bore!

JDT500 01 August 2013, 07:27

RIP, that seems to be it. A big bore to be sure. I'm not up to we gong and soldering. Guess I'm stuck with 6 ft of penetration, two barrels and a big boring 570 gr 500. Heavy sigh 🙄

JDT500 01 August 2013, 07:28

Don't you hate auto incorrect. Creates a whole new language

michael458 04 August 2013, 21:19

Well boys, back home now and trying to catch up with everything, including real work, you know, the one that actually pays the bills around here..... 🤔
Ahhh, not so bad so far, getting there and all is running smooth so far.....

We still have things to look forward to, in a couple of weeks we have Brent and Paul leaving for Zimbabwe, both after buffalo. Brent is taking two rifles, his 500 MDM and his new 458 B&M SA... Paul is taking his new 458 B&M, and is his very first trip to Africa, so he is in for a real treat, and we look forward to bullet reports and rifle reports and such as that coming up by probably the end of the month or so.....

I am sure there are many other folks out in the field as well, and when I hear, I will report and post, but hopefully many here will report themselves.....

Well, soon as I get caught up this week, I got to get ready to go again. We are off to Australia to do some buffalo reduction with Paul Truccolo again. I am taking that tiny little 416 B&M and giving it a workout, along with the remodeled, shortened, Myrtle 500 MDM..... Should be interesting I think..... I will be most interested in the 416 B&M and the new 225 gr Raptor at 2900 fps... Penetration here in the test worked showed deeper than the 458 250s, and we know how well they turned out, so I have high hopes of this bullet really doing something special in 416 caliber, even though most 416s are for rats and such, maybe we can make something of this rat shooting caliber????



Michael

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boom stick

05 August 2013, 00:35

Thank you for all the reports Michael. We will try to be patient 😊

250 grain .458 = .170 SD
225 grain .416 = .186 SD

.185 the Goldilocks SD in high velocity light for caliber Raptors?

Maybe there needs to be a 275 grain .458 .187 SD 🎣🐟

577 BME 3"500 KILL ALL 358 GREMLIN 404-375

we band of 45-70ers (Founder)
Single Shot Shooters Society S.S.S.S. (Founder)

capward

05 August 2013, 01:13

The more I ponder Michael's comments the more I'm falling into line with his thinking.

The double-ended BBW#13 ESP Raptors are great below .366 caliber; it's a very optimal design for the single bullet hunter who needs the occasional FN solid but predominately will use the HP end with installed Talon Tip. Once we hit .366 caliber I personally believe that Dan's LR Raptor design is the top dog for the Talon Tipped longer range bullet design.

Just sayin...

Jim 🎣

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

ddrhook

05 August 2013, 02:47

quote:

Originally posted by michael458:

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Michael

NOT Rats, we shoot elles and buffaloes with 416's--

silly person



michael458

13 August 2013, 01:20

I found this upstairs, on Kebco's hunting report.. Yes, I stole it, and thought it relevant here. I found it interesting... Apparently Kebco shot a buffalo with a Hornady DGS... 450 Nitro I believe, not sure what weight Hornady DGS... either 480 or 500 gr?? At any rate, it turned around backwards and almost exited backwards.. Obviously not "Terminally Stable".....

Just FYI..... And if Kebco gets pissed, I will give it back to him.....



He posted it anyway to begin with..... I just thought it interesting.....



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srose 13 August 2013, 01:50

Maybe that's all it penetrated!!!!!!!!!!!!

michael458 13 August 2013, 02:19

quote:

Originally posted by srose:
Maybe that's all it penetrated!!!!!!!!!!!!



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boom stick 13 August 2013, 06:22

Twist?

577 BME 3"500 KILL ALL 358 GREMLIN 404-375

we band of 45-70ers (Founder)
Single Shot Shooters Society S.S.S.S. (Founder)

RIP 13 August 2013, 09:54

Doc M,
Not bad for what is essentially a round nose solid.
It did not flip until the terminal few inches or the base would have been deformed ... or would it, that is a stout steel jacket, eh?
Maybe it only made it that far because it flipped midway and got stable enough to go straight like a wadcutter FN after the flip, ending up as a "hide-cutter."

A Verney-Carron 450 NE double probably has the standard CIP twist of 1:381mm = 1:15". That is one reason the old granddaddy of all NE cartridge double rifles was so effective and spawned a herd of me-too double rifles.
Not a bad twist.

□
Celebrate the "Special" doing something "special" despite severe handicaps. 🙌👍

Rhodes

13 August 2013, 13:55

Reminds me of the story I read where an old time African PH, not having any solid rounds, only softnose and came across some Ele so he pulled the softs and reverse them. Giving him square nose, full patch, copper jacket rounds for his clients to take their trophy. Apparently it worked!

michael458

13 August 2013, 13:39

Hornady DGS..... Looking back on test work I find that both the 500 gr and the 480 gr have a undersized meplat.... 55% of caliber. We know that now two of the factors must come into play for a poorly designed, and undersized meplat to assist in terminal stability.

Twist Rate

Velocity

As RIP says, since this was a double, I speculate that the twist rate is rather slow, at least in terms of attempting to stabilize the DGS with it's undersized meplat. 450 NE can't push enough velocity either to assist in terminal stability. So at times, what we see here is inevitable.

The DGS suffers in a few short comings.... Meplat size being the #1 Deficiency. 55% of caliber will not self stabilize during terminals, other factors must be present to stabilize for deeper penetration. At some point, it will go unstable regardless, twist and velocity will get it deeper before instability over takes. Remember... we need 65% of caliber meplat to overcome other factors, such as twist rate and velocity. Another short coming of the DGS is construction, this bullet is ugly under extreme stress, remember the big balls with the T'Rex Tests?

Nose Profile is not bad. Just not enough meplat.

quote:

Maybe it only made it that far because it flipped midway and got stable enough to go straight like a wadcutter FN after the flip, ending up as a "hide-cutter."

RIP..... Very possible.

You know, no one on Kebco's report even makes mention of this, even after seeing it. Jorge is the only one asking anything about bullets! Good for Jorge!

I am pretty much over these sort of things these days, but it does remind me of all the folks who have their "Favorite Bullets", and how these bullets did not always show good in the test work here, and we always hear this "I used them for years and I never had a problem" "I never had one turn, veer, or fail in any way".... Blah Blah Blah..... And other assorted BS... Problem is, most of those weenies would not know if they had a problem or not! If it's dead, then they did not have a problem! This buffalo was dead too, or he would not have allowed that photo to be taken, eh? But I for one, see a problem here, and its one that we identified some years ago right here!

Not all the DGS tested poorly of course, some tested well here with my rifles. Some tested extremely poor. We must remember the Factors of Terminal Penetration of Solids Always, because within these "8 Factors" we can ALWAYS IDENTIFY why a Solid Failed, or Why a Solid succeeded....

#1 Meplat Size % of Caliber (65%-70% Optimum)

#2 Nose Profile

#3 Radius Edge of Meplat

#4 Construction & Material

#5 Nose Projection

#6 Barrel Twist Rate

#7 Velocity

#8 Sectional Density

These are the 8 Absolute Known Factors involved with Terminal Penetration of Solids. It is possible there is another one lurking that I have not been able to identify as of yet, and may never at this point. But 99% of the time, by understanding how these factors relate to each other, one will be able to use these factors to identify most all issues, or successes.

In the instance of this particular issue with this particular Hornady DGS..... Meplat size is the determining factor, followed by twist rate, and velocity.

Michael

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srose

13 August 2013, 17:56

Michael,

I'm sure you have probably done it but if not you should do a few penetration tests shooting softpoints base first. It would be interesting I think. I have shot them this way but never into test media like you use.

Sam

416Tanzan

13 August 2013, 21:28

a head's up:

make sure you back off several grains of powder since the bullet will be seated deep into the case and may engrave the lands when loaded.

+- + + + + +- +

"A well-rounded hunting battery might include:

500 AccRel Nyati, 416 Rigby or 416 Ruger, 375Ruger or 338WM, 308 or 270, 243, 223" --
Conserving creation, hunting the harvest.

drewhenrynt

15 August 2013, 10:50

Well Michael, I finally went and done it. I just took delivery of two boxes of 825gr .620 NonCons. Hell of a hollow point! Now I gotta lure a great big pig inside an old car, shoot through the trunk, and hope to recover the bullet somewhere in the radiator. This thing really needs a "tip" and a 13 degree boattail.

We Band of Bubbas
N.R.A Life Member
TDR Cummins Power All The Way
Certified member of the Whompers Club

michael458

15 August 2013, 15:09

Drew.....

HEH... About time.... That is a wicked bullet..... Keep us posted on how you like it.....

I finally dug out the bullets I recovered from critters on my recent trip, logged them in, tagged them and even have some photos for you.....

Start off with some 250 gr 458s.....



458 B&M

1:14 Twist Rate 18" Barrel

7/2013

250 Socom NonCon HP

Muzzle Velocity 2900 fps

Cow Buffalo

Enter Rt Side behind Shoulder

Found on far side under skin



250 Socom NonCon HP
Muzzle Velocity 2900 fps

Cow Buffalo

Enter Rt Side behind Shoulder

Found on far side under skin





Some of the 250 #13s did not exit, and were not found. Most of the 250 Socoms exited. All exited plains game, including zebra. Just as in the test work here, the Socom gave just a little extra penetration of the main bullet.

This was the only 450 gr #13 Solid from the 458 B&M recovered. This was found in the rear section of that big hippo that was brain shot with the 250 Socom. This was just a backup shot, and not needed, but done anyway. Point of right shoulder---to rear left estimated 6 ft.



That first hippo with the 50 B&M Alaskan, I hit him 4 times with the 405 #13 Solid at 2120 fps. Recovered 3 of those bullets, one of which contacted some heavy bone as you can see.....

**50 B&M Alaskan
1:12 Twist Rate 18" Barrel
7/2013**

**405 BBW#13 Solid
Muzzle Velocity 2120 fps**

**Hippo 15 yards
~~X3~~ Estimated 4-5 feet**

photobucket



Another solid was recovered from the buffalo I took with the 50 B&M Alaskan. The rest exited, but this one hit point of shoulder and found on right rear... It also hit some heavy bone up front and took a beating... But even so, completed its mission just fine.

**50 B&M Alaskan
1:12 Twist Rate 18" Barrel
7/2013**

**405 BBW#13 Solid
Muzzle Velocity 2120 fps**

**Buffalo 20 yds
Front Left shoulder to Rear right
hip**

**Estimated 5 feet
Dead Straight**



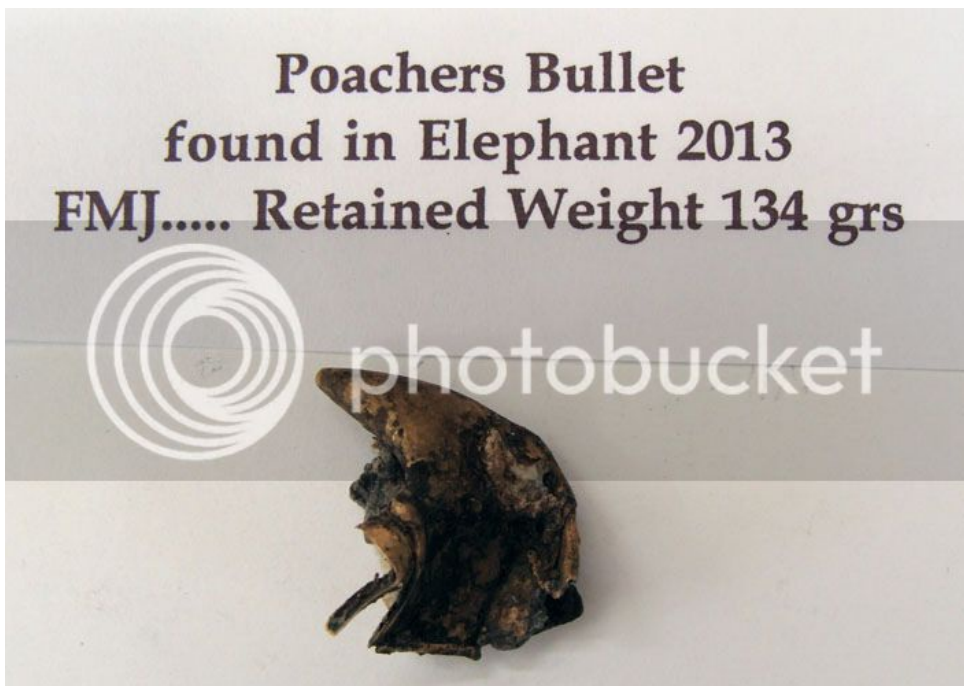


Construction and Material IS important, and an important factor in solid penetration. A lesser solid, say a FMJ component bullet would not have faired so well.....

Below is the first shot on that buffalo taken with the 50 B&M AK... 365 gr #13 HP NonCon, behind the shoulder shot.. As you see, it clipped a rib pretty hard on entry, and continued to the far side, and even cut a full caliber hole on the far side, but just did not have enough velocity at that point to jump out of the skin....



The elephant was taken with a 458 B&M, 450 gr #13 Solid at 2210 fps... This bullet went through right shoulder... heart... Exited left shoulder and may still be going..... However, a Poacher bullet was found in my elephant.... Appears to be .308 caliber, too mangled up to say for 100% sure, and was without doubt a pointy FMJ that I have 100% confidence that it veered and tumbled. It was found under the hide on entry on the left shoulder, penetration not much, 2-3 inches, and had caused a huge lesion about 4-5 inches diameter. Not an expert on this, but would guess about a month old or so.....



Michael

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srose **15 August 2013, 17:01**

Nothing like real animals to test bullets. Amazing that even brass gets torn up hitting bone and what not. Just think of what a similar weight cup and core bullet would look like!!!!

michael458

15 August 2013, 17:10

quote:

Originally posted by michael458:
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Muzzle Velocity 2900 fps
Cow Buffalo

Enter Rt Side behind Shoulder
Found on far side under skin



458 B&M

1:14 Twist Rate 18" Barrel
7/2013

250 Socom NonCon HP
Muzzle Velocity 2900 fps
Hippo Brain Shot
Found in back of skull



Some of the 250 #13s did not exit, and were not found. Most of the 250 Socom exited. All exited plains game, including zebra. Just as in the test work here, the Socom gave just a little extra penetration of the main bullet.

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Front Left shoulder to Rear right
hip
Estimated 5 feet
Dead Straight**





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**Poachers Bullet
found in Elephant 2013
FMJ..... Retained Weight 134 grs**



Michael

Since we turned ANOTHER PAGE.... I did not want anyone to miss these....

M

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michael458

15 August 2013, 17:11

quote:

Originally posted by rose:
Nothing like real animals to test bullets. Amazing that even brass gets tom up hitting bone and what not. Just think of what a similar weight cup and core bullet would look like!!!!

Exactly.....

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boom stick

16 August 2013, 00:34

That 365 and 405 in the BMAK did a fantastic job. Anything you would change or do diferent?

[577 BME 3"500 KILL ALL](#) [358 GREMLIN](#) [404-375](#)

we band of 45-70ers (Founder)
Single Shot Shooters Society S.S.S.S. (Founder)

RIP

16 August 2013, 08:15

Interesting terminal bullet pictures. RIP-ed those critters efficiently. 🙏🙏

Re. the long-suffering, poacher-wounded elephant:
The bullet looks like a black-tip AP .308 that flipped over and opened up its tail like an umbrella/drag 'chute.
Black-tip AP 50 BMG hitting water will do the same thing, swims with the fishes shallowly, briefly, then sinks slowly.

michael458

16 August 2013, 15:28

quote:

Originally posted by boom stick:
That 365 and 405 in the BMAK did a fantastic job. Anything you would change or do diferent?

As for the design of these two bullets..... No, I would do nothing different, as both performed exactly as I had anticipated.

Buffalo for any expanding or trauma inflicting bullet is the Ultimate Challenge for any bullet. In any traditional lever gun, we are limited by the pressures we run... 45000 to 50000 PSI in modern traditional actions.... in this case specifically Marlin 1895 and Win/Brown M71s.... In my Marlin 50 B&M AKs I had to be one grain less powder and about 50-75 fps less than in the M71s. And I pushed the M71 to MAX... I tried one more grain of IMR 4198 above what I used, and it was getting sticky. So max in the M71 with the 365 was 2175 and with the 405 2120 fps.... The 365 is a balancing act between weight and penetration, and velocity and trauma/penetration. I could have used a heavier HP or NonCon, and got a bit more penetration but probably some less trauma.... Really, in the end, not sure it would have made any difference at all in this particular buffalo, as the 365 cut a caliber hole in the far side, but just could not make it out. Some would say perfect performance, and I could not argue that point.

Personally however should I hunt ole buff with the 50 B&M Alaskan in the future, I would go with straight up 405 #13 Solids and rely on that 67% meplat, 2120 fps, and deep penetration to do all the damage. Use the 335 and 365 #13 HP NonCons for everything less than buffalo..... I like "Penetration".... Period!

Michael

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Dresden

21 August 2013, 17:24

I worked at Alliant Tech Systems for many years, we made 25mm and 30mm munitions for the military. The penetrating portion of the projectile was either Tungsten or Depleted Uranium. The shape of the penetrator was very similar to these new bullet shapes,I and my shooting friends at work never thought to make bullets like that, but we hunted Deer in Minnesota.

boom stick

22 August 2013, 06:59

I am curious about how light weight BBW13 solids penetrate compared to a bowl nose BBW13. All things the same but a concave nose like the Hydro Woodleighs.

[577 BME 3"500 KILL ALL](#) [358 GREMLIN 404-375](#)

we band of 45-70ers (Founder)
Single Shot Shooters Society S.S.S.S. (Founder)

I Bin Therbefor

22 August 2013, 07:49

quote:

Originally posted by Dresden:
I worked at Alliant Tech Systems for many years, we made 25mm and 30mm munitions for the military. The penetrating portion of the projectile was either Tungsten or Depleted Uranium. The shape of the penetrator was very similar to these new bullet shapes,I and my shooting friends at work never thought to make bullets like that, but we hunted Deer in Minnesota.

I was under the impression that depleted uranium was used because when it hit armor plate it sheared into a wedge shape and continued to do so during its entire pene^{???}etration. A sort of self sharpening wedge. 😊

michael458

23 August 2013, 16:04

quote:

Originally posted by boom stick:
I am curious about how light weight BBW13 solids penetrate compared to a bowl nose BBW13. All things the same but a concave nose like the Hydro Woodleighs.

Same concept as the North Fork FPS and CPS..... Which we have done.

However, long before I started this thread, I did something similar with the Lehigh 510 gr Copper Solid I used before BBW#13s.... in .500 caliber.... JD had David do a shallow cup point in that 510 gr .500 bullet. Testing there was zero difference between the standard flat nose and the shallow cup in penetration depth or stability... because the cup was shallow.

John at North Fork explains this concept perfectly. The CPS.. Cup Point Solid.... fools the medium, any medium, animal or test, into believing the meplat is much larger than it is, because of more surface area up front, the cup point. Imagine taking the surface area present in the North Fork CPS and flatten that out into a flat surface how large the meplat would be..... Then you begin to understand how it works.

Two things.... With added Surface Area it does produce more trauma inflicted. It also has to penetrate LESS because of larger surface area in contact with test medium.....

**458 B&M
1:14 Twist Rate
450 North Fork FPS
72% Meplat
Muzzle Velocity 2266 fps
22 yd Impact Velocity 2177 fps
56 Inches Dead Straight line
Penetration**



photobucket



**458 B&M
450 North Fork CPS
Muzzle Velocity 2289 fps
22 yd Impact Velocity 2191 fps
Bullets Did not Expand
40 Inches Straight Penetration**



photobucket



Michael

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

The New Word is "Non-Conventional", add "Conventional" to the Endangered Species List!
Live Outside The Box of "Conventional Wisdom"

I do Not Own Any Part of Any Bullet Company, I am not in the Employ Of Any Bullet Company. I do not represent, own stock, nor do I receive any proceeds, or monies from ANY BULLET COMPANY. I am not in the bullet business, and have no Bullets to sell to you, nor anyone else.

Need to shoot those Cup Points faster and make them expand some!

Is North Fork Copper (FPS and CPS) "full hard" instead of only "half hard" like a GSC FN solid?

Heat treating difference or is the North Fork alloyed with some trace metals, not pure copper?

Does the Cup interfere with cavitation at the leading nose surface of the bullet and thus make for more drag and tissue destruction?

Yes that would be another way of saying it causes a greater surface contact at the nose ...

Alf might say more wetting of the nose? 😊

Sorry.

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Above is the .395 Tatanka loaded with
Copper GSC FN .395/340-gr and Brass S&H FN .395/330-gr solids.

Fired with the same powder charge, and seated as shown above (less case capacity with brass bullet than with copper bullet):

The GSC FN gave a little over 2700 fps and scored 7 on the IWBB-2-boards-per-waterbucket scale.

The S&H FN gave a little over 2800 fps and scored 8.

The Copper FN nose expanded noticeably on initial impact with water.

The Brass FN nose expanded only a few thou in diameter, by caliper measure.

Sorry.

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S&H Brass stopped in the second board behind the 8th bucket, higher velocity made it more explosive in the first water bucket too:

Sorry.

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GSC Copper expanding FN stopped in the first board behind the 7th bucket.

Sorry.

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Here is another Copper Cup Point, custom made for/by member Andre' (aka Jeffery in Denmark) for his 500 Jeffery, a 550-grainer that I shot at just over 2300 fps (5-yard chronograph velocity 2306 fps), impact was at about 25 yards, and it still expanded. Pure, "half hard" copper?





Above is before and after firing into the IWBB-3-boards-per-waterbucket scale, a tougher scale, where it scored a 5. This the backstop behind the 5th bucket.
Bullet was found lying on the ground beneath this board:



Entry area, first waterbucket exploded, and entry-ported board cracked up. Frozen water drips on the stainless steel square tubing and angle iron buffalo skeleton:



First bucket entrance wound on left, and exit wound from back of the bucket on right, the latter being in the biggest fragment remaining from that first bucket:



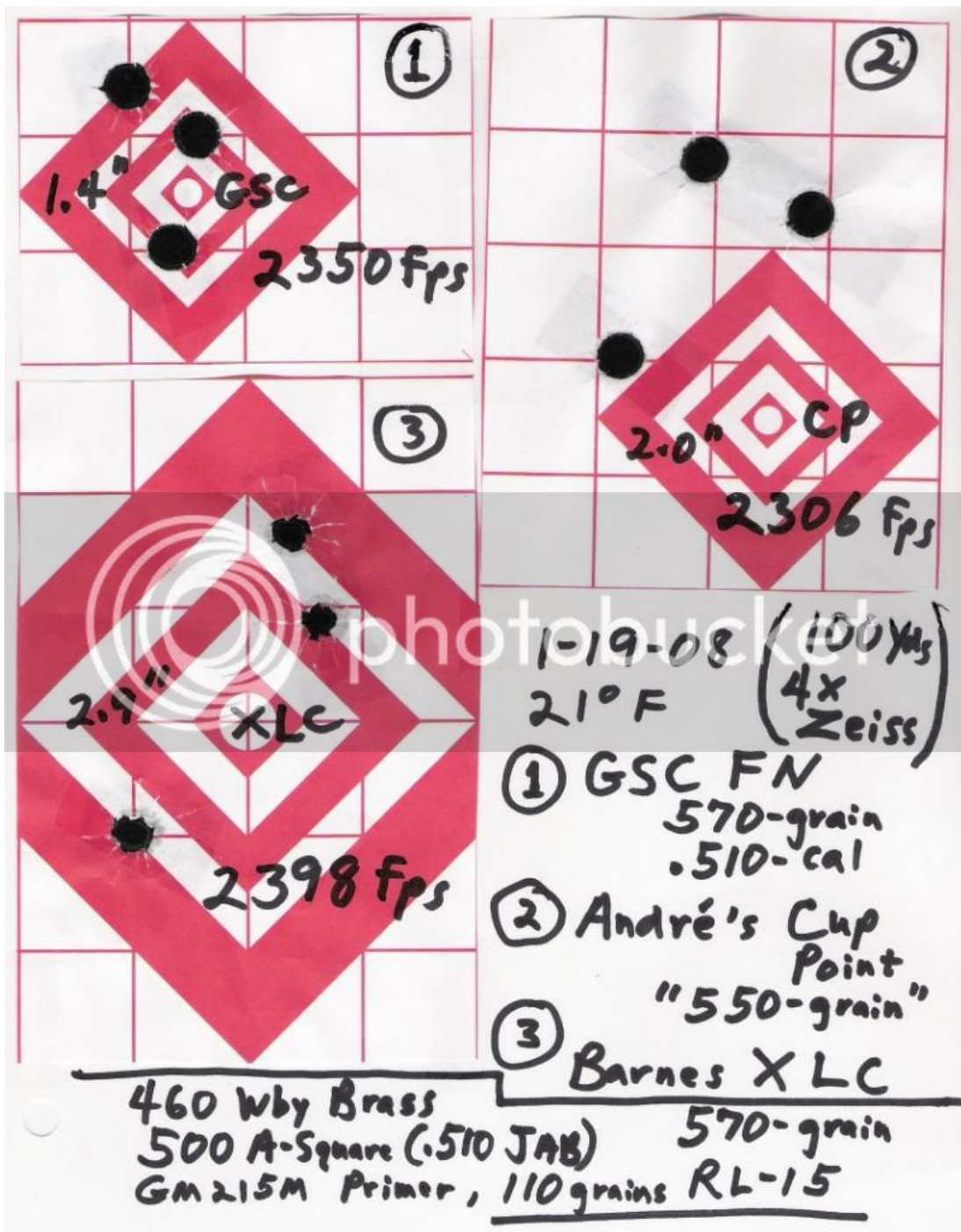
Final (5th) bucket entry wound:



Backend of the IronWaterBoardBuffalo-3-boards-per-waterbucket scale, 10 compartments 10" deep each, 100" from nose to tail:



Shot with 23"-barreled 500A2 aka .510JAB, 1:10" twist:



RIP

24 August 2013, 21:08

OK, so water is harder than wet newspaper on the initial high velocity impact.
Water's resistance to bullet increases exponentially with velocity of bullet.

The paper pulp fibers and print ink chemicals (surfactants) break up the water surface tension/internal adherence ("visco-elasticity" 😊), and make the mix softer than water alone.

That may be why water will expand a copper cup point and wet pack won't?

Similar bullets, similar velocities (Doc M's North Fork CPS and Andre's Custom Copper Cup Point, both impacting about 2200 fps): One expands and the other doesn't.

If it is not a difference in bullet materials (1) and/or designs (2), then it is a difference in the resistance of the impact medium (3) at that velocity.

Or all three factors are at play.

And there is a 4th: Sectional Density.

Greater SD will make an expanding bullet expand more at any given velocity in any given medium.

.458/450-grain SD = .306
.510/550-grain SD = .302

So SD is not a factor here (North Fork vs. Andre's Cup Point).

If the Resistance of water impact medium is a function of Velocity squared (V^2): $R = fV^2$

For a first-order medium like wood or dry newspaper: $R = fV$

For wetpack? $R = fV^X$ where $(1 < X < 2)$?

Game animal impact medium is not quite as tough as wetpack, so the exponent for game animals is Y , and $1 < Y < X < 2$.

The Iron WaterBoard Buffalo combines two media: Wood exponent = 1, water exponent = 2.

At high velocity in the head end of the buffalo, the water resistance is high, and wood resistance is low.

At the low-velocity tail end of the buffalo, water resistance is low, minimal, but the constant resistance of the wood then dominates. So the variable resistance has a changing exponent that goes from 2 to 1 as it traverses the buffalo, but this is in a uniform, repeatable manner.

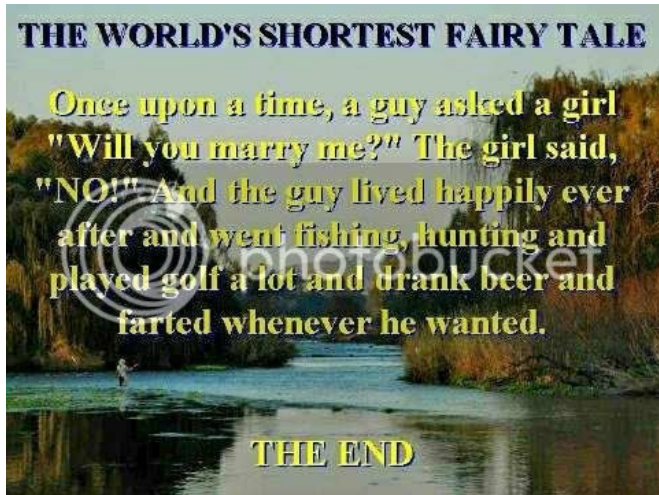
This is not quite like a real game animal, where the exponent must be bouncing around between 1 and 2, variable all along the bullet path, unpredictable, and different for each shot with any change in animal position or bullet placement.

So, Wetpack is repeatable, good. Nonlinear, but with constant exponent: Repeatable.

Iron WaterBoard Buffalo is good too. Nonlinear, but with repeatably varying exponent: Repeatable.

Real game animal is bad for penetration testing. Nonlinear but with non-repeatable variance of exponent: Non-repeatable.

Captain Obvious here.



I have 3 Penetration Scales for the IWBB, each with 10 compartments that are each 10" deep (100" long buffalo), one waterbucket (approx. 9" of water travel per flat-sided bucket) in each compartment backed by board(s):

1. Single 1/2"-nominal plywood board per waterbucket: IWBB-X
2. Double boards per waterbucket: IWBB-XX
3. Triple boards per waterbucket: IWBB-XXX

New Scoring refinement:

Each bucket penetrated fully = 1.0

A bucket penetrated on one side only, even if backside of bucket is dented = 0.5

Additional points for boards in compartment:

First backing board stop, not penetrated = 0.0

First board penetrated, stop in second backing board = 0.25

First and second boards penetrated, denting or stopping inside third board = 0.50

Bullet protruding from backside of third board of compartment but not penetrating next bucket = 0.75

S&H .395/330gr FN @2800 fps: IWBB-XX Score = 8.25

GSC .395/340gr FN @2700 fps: IWBB-XX Score = 7.00

I am guessing the IWBB-XX Score if multiplied by 10" would be close to DocM's WetPack inches of penetration:

S&H brass FN: 82.5"

GSC copper FN: 70"

I do not think his WetPack of 6-feet depth will contain the S&H. 😊

Andre's .510/550gr Cup Point at 2200 fps impact:

Tougher Scale, IWBB-XXX Score = 5.0

Half way through the IWBB-XXX.

I was hoping to load a 570-grain Brass or Copper FN solid in a 50 BMG

and see how much velocity it takes to get to the tail end,

IWBB-XXX Score = 10.00 if it touches the board behind the 10th waterbucket.

But at greater than 2800 fps, even the brass will expand or maybe even shatter ...

I would want to start testing at 2800 fps impact, no more.

Purely academic interest. 😊

.510/570gr GSC FN at 2800 to 3000 fps from a 50 BMG?

SD = .313

.408/385gr GSC FN at 2800 to 3000 fps?

SD = .330

Monometal copper won't shatter but the nose will expand considerably.

Higher SD of the .408 would make the nose expand more ...

Trade-offs.