

Shot placement

Despite the rapid equipment advances in recent years, with faster arrows and increased accuracy, bowhunting remains a short range method of hunting. There are certainly a few select individuals who can consistently hit their targets at ranges of 40 yards or more but for the average archer, bowhunting is a 10 - 25 yard challenge. Hunting statistics from numerous sources support this conclusion. In one study the average kill distance was 18 yards - this included some long shots that biased the average upwards. Approximately 80% of the kills were made under 20 yards. Obviously this does not mean that animals cannot be killed at longer distances it just means that we are accepting a much greater risk or a bad outcome and increased possibility of wounding an animal. And remember, in Africa, you pay full price for a wounded animal.

Each individual, motivated by ethics, should determine for himself the maximum distance at which they will attempt a shot. Remember that properly tuned archery equipment can kill 100% of the time if the hunter knows, and stays within, his personal limitations, and shoots within his effective range.

DETERMINING EFFECTIVE RANGE

Effective range is the ability to place 80% of your arrows in a 8" circle (20 cm). The following figures give some insight into the skill level of archers:



Effective range for beginners - 8 yards.

Effective range for average bowhunters - 18 yards.

Effective range for tournament level archers - 21 yards.

Most individuals overestimate their ability with the bow and arrow. We are capable of success when we shoot within our limitations but can easily miss when we attempt shots beyond our level of proficiency.

The first hurdle to overcome is the ability to accurately determine range at unknown distances. It is difficult, but critical, to accurately estimate the distance to your target.



There is little room for error. The only way you will learn to judge distances accurately is through constant practice in the field, on the range and in your back garden. The other alternative is to make use of a rangefinder or to pace off distances from your hide or treestand to a point where you will shoot at your intended target.



- **Shooting conditions.**

Shooting conditions at the range are generally ideal. Distances are known or easier to estimate, the target is stationary, you can take your time aiming, and adopt the most comfortable position. Conditions during hunting are seldom ideal. The shot might be up or downhill, the shooting window might be partially obscured with brush, the target might be moving, you might have to adopt an uncomfortable position and so on. You must therefore practice hunting under simulated hunting conditions, the more varied the better. **You must practice with the broadheads you intend hunting with as well as with all your accessories and hunting gear.**

Practice under low light conditions, in windy conditions and even in the rain. Practicing under these less than ideal conditions will eventually instill in you a confidence in your capabilities but will also make you aware of your limitations.

- **Equipment tuning**

Before attempting to determine your effective range it is imperative that your equipment be properly tuned. Correct bow setup, properly spined and tuned arrows, correct technique etc. are all vital to success.

- **Determining your effective range.**

Your effective range is dynamic. It can change. If you practice regularly it will improve. If you do not practice it will deteriorate. If you attempt long, difficult shots which result in wounded animals it will bring bowhunting into disrepute. You must be responsible.



PRACTICAL: DETERMINING YOUR EFFECTIVE RANGE

1. From a standing position shoot groups of 10 arrows starting from 5 yards at a 8" diameter (20 cm) target and move back at yard increments until you can no longer place **8 out of 10 arrows in the 8" target**. (Figure 9.1).

2. Repeat from a kneeling and sitting position to determine effective range from these positions.

Optimum range - knowing when to shoot (Figure 9.2).

When do you know when you are ready to hunt with a bow and arrow? Good question. Because you have hunted with a firearm for many years this does not qualify you to hunt with archery equipment. Shooting a bow and a rifle have a few similarities but many more differences and it is the responsibility of an ethical sportsman to get to know his equipment intimately and to use it well, before taking on the challenge of hunting - especially with a weapon that is new and unfamiliar.

Becoming proficient with archery equipment and the techniques used in bowhunting takes time. More time than it takes with a firearm - simply because the bow and arrow is generally a short range, low velocity weapon, when compared to a modern firearm.



FIGURE 1:This is what you are trying to achieve.

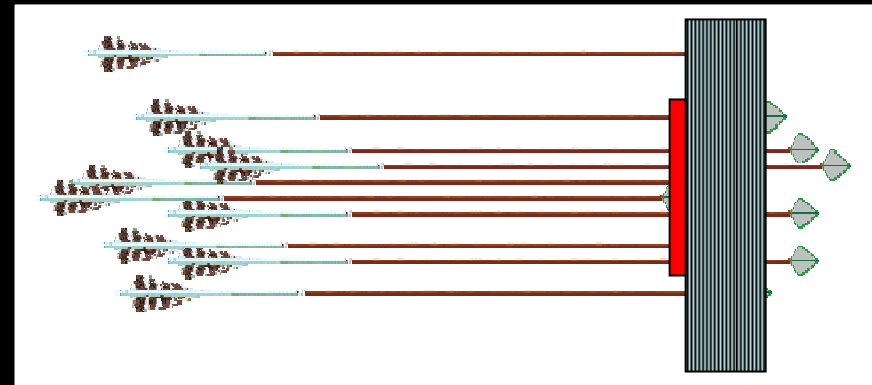


FIGURE 2:Practice under realistic conditions



You have determined your maximum effective range by placing 8 out of 10 arrows in an 8" (20 cm) target area which approximates the size of the heart / lung kill zone on an animal the size of an impala or warthog. It will be bigger on larger animals and reduced in smaller species. You started off by shooting at this "kill zone" from close range and then moving back a yard or two until you reached a point where you could no longer consistently place 80% of your arrows in an 8" circle. You will then have reached the limit of your effective range and should not attempt shots in the field at, or beyond this distance.

Effective range is the point to which you can consistently put a minimum of 8 out of 10 arrows in an 8" circle.



BUT IS THIS GOOD ENOUGH?

There is now a revised standard which is recommended that is termed "optimum range". Consider for a moment the following: Optimum range gives you a more realistic estimate for "how far to shoot" as it takes the following conditions into consideration:



- Animal behaviour
- Yardage estimation accuracy
- Animal alertness
- Hunter mental / physical condition
- Field conditions

Optimum range is defined as: The greatest distance at which you are likely to accurately estimate the distance to the target, execute a shot properly, and still have the animal in the same position when the arrow arrives as when it was shot.



HOW TO DETERMINE YOUR OPTIMUM RANGE

Determine your Maximum Effective Range (under ideal conditions). You must place 80% of your arrows into an 8" (20 cm) diameter target.

This is the range at which you would attempt a shot under ideal conditions. Conditions however seldom ideal under hunting conditions. This must be taken into account by subtracting RANGE REDUCTION FACTORS (RR) for any situation which has a negative effect on shooting conditions.

Refer to RANGE REDUCTION (RR) tables.

If there is only one complicating factor, subtract this from your Maximum Effective Range.

If there are multiple RR's subtract factors consecutively in the order:

Animal behaviour > Yardage estimation > Animal alertness > Hunter mental / physical condition > Field Conditions.

- **Animal behaviour**

The first factor to be considered is animal behaviour (see Table 1 and 3). Some animals are decidedly nervous and skittish. Not only are they more difficult to approach to within bow range but they respond with extremely fast reflexes and are prone to "string jump". These factors will mean that you will have to get up closer to that particular species. Other animals are more "laid back", less nervous and are less likely to "string jump" an arrow. This makes getting a shot at them easier and there is a smaller chance of them avoiding an arrow.



TABLE 1: ANIMAL BEHAVIOUR RANGE REDUCING FACTORS

Reasonably calm animals
(Type 1)

Hyaena, zebra, giraffe, blue wildebeest, lion, white rhino, buffalo, elephant (under certain conditions).

No RR



Cautious animals
(Type 2)

Aardwolf, warthog, giraffe, eland, kudu, nyala, sable, gemsbok, impala, roan, waterbuck, red hartebeest, blesbok, black wildebeest, duiker, steenbok.

RR = -10%



Highly strung animals
(Type 3)

Hares, black backed jackal, baboon, cheetah, bushpig, bushbuck, common reedbuck, mountain reedbuck, vaal rhebuck, springbok, tsessebe, black rhino, leopard.

RR = - 20%



• Yardage estimation

Any bowhunter knows that estimating distance accurately is one of the hardest things to do. The closer an animal is to you the more leeway you have in making a mistake in judging the range accurately. See the section on depth of kill spread or click on the hyperlink button below. Using older or slower equipment or shooting at ranges beyond 25 yards definitely introduces an added optimum range reducing factor. \if you are certain of range by having set out reference points from your hide or treestand or are able to make use of a rangefinder then there are no range reducing factors. If you are uncertain of range then this variable must be taken into consideration (Table 2).

TABLE 2: YARDAGE ESTIMATION RANGE REDUCTION

Certain of range

No RR reductions

Uncertain of range

Animal less than 25 yards away: RR = consider size of kill zone

Animal 25 - 35 yards away: RR = consider not shooting.

Animal is more than 35 yards away: RR = don't shoot.



?

Range is difficult to estimate correctly !

• Animal alertness

This is on an individual basis not the general species behaviour. There are times for example when a generally highly strung animal might be feeling very secure and will be reasonably calm and unsuspecting. Conversely, given the right set of circumstances, a reasonably sedate species might be on high alert. It is the alertness of the individual given the specific conditions prevailing at the time that the bowhunter will now take into consideration (see Table 9.3).



TABLE 3: ANIMAL ALERTNESS RANGE REDUCTION FIGURES

Relaxed

Level of alertness

No RR consideration

Not alert - very restful - no reduction.

Type 1 animal or low level of alertness = -20%

Type 2 animal or moderate level of alertness = -30% (possibility of no shot).

Type 3 animal or high level of alertness = -40% (possibility of no shot).



Level of alertness is an important consideration that must be taken into consideration.

- **The mental and physical condition of the hunter.**

It is a well established fact that mental attitude and physical condition have a profound effect on shooting form. Poor physical and mental condition equates to reduced shooting ability. Picture for a moment the overweight hunter, sweating profusely, laboring for breathe, and experiencing a bout of intense target panic trying to aim and hold steady. Or picture the hunter who is not dressed warmly and the weather turns bitterly cold. He is shivering so much that he can hardly hold the bow, never mind hold it steady. There is no way that these individuals are going to operate at peak performance. This must be taken into account (see Table 9.4).



TABLE 4: HUNTER PHYSICAL /MENTAL CONDITION REDUCTION

Relaxed / comfortable

Excited / slight discomfort

Target panic / miserable

No RR consideration

RR = -25%

RR = -50%



• **Field condition factors.**

When we determine our maximum effective range we set up ideal conditions for ourselves. We shoot when we are well rested, from a standing position, at known distances, on a flat piece of ground and under favorable weather conditions. This seldom reflects the true nature of the hunting field where we might find ourselves hunting in scorching heat, pouring rain, freezing sleet, during gusting winds, on an uneven surface, in poor light or a whole combination of factors which complicate the shot. Once again these variables should be taken into consideration (See Table 5).



TABLE 9.5: FIELD CONDITION FACTORS.

Excellent (perfect conditions) Moderate (breezy, light drizzle etc.) Poor (high wind, low light, heavy rain etc.)

No RR considerations.

RR = -35%

RR = -50% or don't shoot

• When to shoot.

We have determined our maximum and optimum range and can now make an informed decision whether to shoot or not. The following criteria help us make the final decision whether or not to shoot:

1. The animal must not be looking at you.

If you can see the animal's eye or eye it can see you and will pick up any movement in an instant. Wait until the animal is looking away for an ideal shot or if it is totally unaware of your presence - you are well camouflaged, in a treestand, wind in your favour etc. The buffalo bull on the right is fully aware of the hunter and is not presenting for a good shot.



2. The shooting lane must be clear of obstructions.

Twigs, branches, grass and other obstructions between you and your target can deflect an arrow and result in a wounded animal. The closer the obstruction to the archer the greater will be the likely deflection. In the picture on the right the zebra is looking directly at the hunter, is not presenting for a good shot and there are intervening obstructions (branches and twigs).



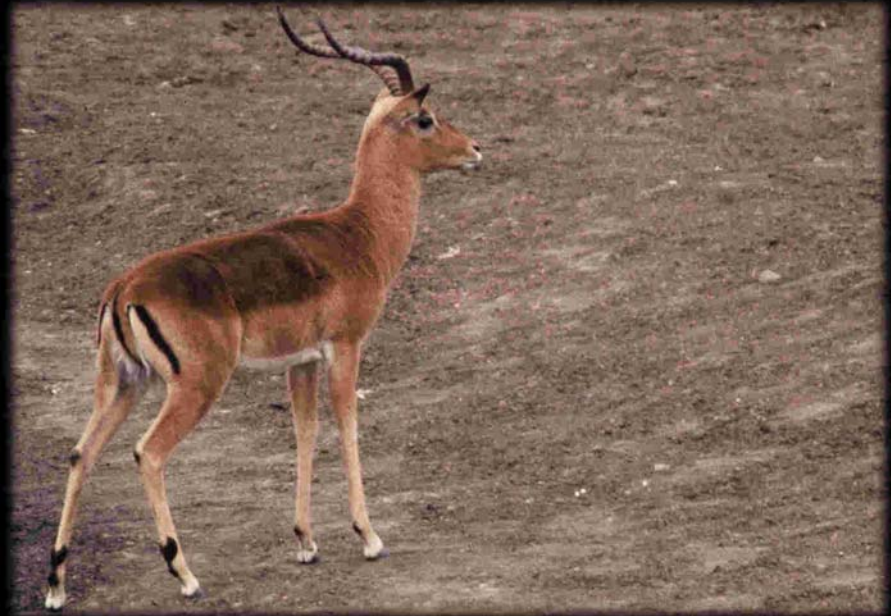
3. The animal must be within your optimum range.

After having taken range reducing factors into consideration you should be within your optimum range before loosing a shot at the animal. One of the greatest causes of wounding is attempting shots beyond the archers range of consistent accuracy. Never draw your bow when an animal can see you doing so.



4. The animal must be relaxed.

A highly strung or nervous animal is likely to “jump the string”. By learning to recognize and interpret behaviour the hunter knows when an animal is relaxed, suspicious, or on high alert. If animals are tense the slightest disturbance will spook them.



5. The animal must be standing still.

This will be discussed in detail in the section on shot placement. Suffice to say at this stage that anything faster than a slow walk is likely to end in a miss or worse still, a wounded animal.



6. Shot placement.

There are basically only two (perhaps three) archery shots that are acceptable as having a high probability of causing quick death and a humane kill. The bowhunter must not be tempted into trying a shot when the animal is standing in an unacceptable position. Ask yourself “will my arrow reach the vital zone ?” In the next section we will look at shot placement.



7. Light must be adequate.

You must be able to see your sights clearly. This will become almost impossible under low light conditions and should preclude a shot.



- **Conclusions thus far.**

Not as simple as we originally thought is it? When one realizes that there are so many variables it does not come as a surprise that there is a danger of unacceptably high wounding rates if the hunter does not discipline himself to stay within ethical constraints. Obviously one cannot carry a calculator with you into the hunting field and work out all the variables before attempting a shot. This is impractical during an actual hunt but is definitely workable during practice sessions.

Practice in the rain and under poor light conditions. Shoot from different positions and from different angles of elevation. During these practice sessions work out the optimum range reducing factors and decide whether or not you would attempt the shot. With enough practice you will eventually develop a “feel” for the shot and instinctively know whether the shot is on or not. Lets look at some examples on the next two pages. There are also some scenarios where you can test yourself.



Example 1. Your effective range is 27 yards. You are hunting impala. A shot is presented under the following conditions.

- The animal is classified as cautious (Type 2).
- The animal is 24 yards away.
- The animal is on full alert.
- The hunter is excited.
- Field conditions are excellent.
- Your optimum range will now be as follows:

Effective maximum range is 27 yards.

The animal is a Type 2: $RR = -10\% \text{ of } 27 = 27 - 2.7 = 24.3 \text{ yards.}$

The animal is less than 25 yards away therefore no range RR.

Animal is on full alert: $24.3 - 30\% \text{ of } 24.3 = 24.3 - 8.02 = 16.28 \text{ yards.}$

Hunter is excited: $16.28 - 25\% \text{ of } 16.28 = 16.28 - 4.07 = 12.21 \text{ yards.}$

Field (shooting) conditions are excellent therefore no further RR factors.

Conclusion: If the animal is at or closer than 12.21 yards the shot can be taken.

If further than 12.21 yards the shot should be passed up.



OK have you got the hang of it? Now try the following examples for yourself.

Scenario 1.

- You are hunting bushbuck.
- You estimate the animal to be 9 yards away.
- The animal is relaxed, presents a clear shot and is unaware of your presence.
- Your pulse is racing with excitement but you are reasonably under control.
- You are hunting in dense riverine bush and under low light conditions.
- Your maximum effective range is 32 yards.

Would you attempt the shot?

Scenario 2.

- You are hunting zebra out of a hide over a waterhole.
- Estimated distance to the zebra is 30 yards.
- The animal is relaxed and unaware of you.
- You are relaxed and fully in control.
- Shooting conditions are favorable.
- Your maximum effective distance is 26 yards.

Would you attempt the shot?

Answers appear on the next page.



Answer to Scenario 1.

- Your effective maximum range is 32 yards (you are a very good shot).
- Bushbuck are very shy animals (Type 3): RR = -20% so $32 - 20\% \text{ of } 32 \text{ yards} = 32 - 6.4 = 25.6 \text{ yards}$
- The animal is less than 25 yards away therefore no RR for distance.
- The animal is relaxed and unaware of your presence and presenting a good shot: No RR for level of alertness.
- You are reasonably and under control of your excitement but are not completely relaxed: RR = -25% of 25.6 yards = $25.6 - 6.4 = 19.2$ hunter physical/mental state.
- You are hunting in dense riverine bush under low light conditions: RR = -50% of 9.6 = 9.6 yards.
- Conclusion: If the animal is closer than 9.6 yards away. You estimate it is standing about 9 yards away. Take the shot. If you think it is further away than this pass up the shot.

Answer to Scenario 2.

- This is an easy one. Your maximum effective range is 26 yards and the zebra is standing at 30 yards. Go no further. It is not even necessary at this stage to even consider range reducing tables because the animal is standing further away than your maximum effective range!
- Conclusion: The shot is not on. Wait - maybe the zebra will approach closer!

