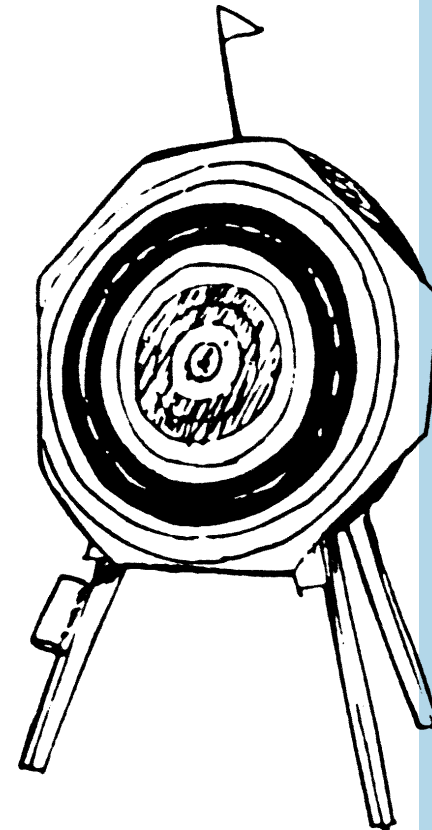


AMO  
FIELD PUBLICATION FP-4  
2000

# ARCHERY AND BOWHUNTER RANGE GUIDELINES



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**ARCHERY MANUFACTURERS AND MERCHANTS ORGANIZATION**

4131 NW 28TH LANE, #7  
GAINESVILLE, FL 32606  
(352) 377-8262 phone  
[www.amo-archery.org](http://www.amo-archery.org)

**Paul H. Davison**  
Councilman, Southeastern Section,  
National Field Archery Association

## INTRODUCTION

In 1991, as part of a nationwide program to develop new and more places for bowhunters and recreational archers to learn, practice and demonstrate their skills, the American Archery Council (AAC), under principal sponsorship of the Archery Manufacturers and Merchants Organization (AMO), began providing some basic guidelines for the acquisition and development of archery and bowhunter ranges. The fourth and most popular booklet in the series was Archery and Bowhunter Ranges Guidelines, revised most recently in 1995, and now out of print. The fifth booklet, Cost Sharing the Development of Archery Ranges, revised most recently in 1994, was published by the AMO as a comprehensive guide to sources of financial and advisory assistance. Although still somewhat useful, the guidelines listed in both booklets are out of date.

The original Archery and Bowhunter Ranges Guidelines defined range, target butt, and safety design criteria for virtually every indoor and outdoor archery game offered by the major, competition-oriented, archery and bowhunter organizations in the United States. The amount of detail describing the games in this document is substantially reduced, and is limited to summaries of those games sanctioned by the National Field Archery Association (NFAA) in the USA, and to subtle variations of these games sanctioned worldwide by the International Field Archery Association (IFAA). The range design criteria presented, however, are little different from that published in the original Archery and Bowhunter Range Guidelines.

These guidelines contain very little original material. All target and round descriptions are merely summaries of official rules and regulations documented in the NFAA Constitution and By-Laws and the IFAA Book of Rules. Specific shooting and scoring rules are not delineated herein. Furthermore, these guidelines do not address any aspects of commercial archery range development; such as, design specifications, drawings, financing, construction, insurance and retail management. To be more emphatic:

***THE GUIDELINES HEREIN ARE NOT INTENDED TO BE STAND ALONE. NO ATTEMPT SHOULD BE MADE TO SET UP A RANGE OR COMPETITIVE ARCHERY PROGRAM WITHOUT CONTACTING AND/OR JOINING THE NFAA OR OTHER IFAA AFFILIATED NATIONAL ORGANIZATION.***

### SPECIAL NOTICES

There are no restrictions on the reproduction and distribution of this material; however, it will be appreciated if acknowledgment is made of its source, its author, and its sponsors (NFAA, IFAA and AMO).

These guidelines are summarized and updated range guidelines originally documented in Archery and Bowhunter Range Guidelines, published by the author and the Archery Manufacturers and Merchants Organization (AMO) during the period 1992-1995.

These guidelines are presented for information only, and are not to be treated as officially certified design specifications. Neither the author, the NFAA, the IFAA, nor the AMO assume any liability for the use or misuse of these guidelines.

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# Fun and Exciting Archery Games

**An Archery Activity for Everyone**

**TARGET:** The most commonly practiced form of archery, target tournaments are held both indoors and outdoors. The archers shoot from a line which runs parallel to and is a designated distance from the target faces. Targets are comprised of multi-colored concentric circles which each have point values. A shot in the innermost circle scores the highest point value (usually 10), while a shot in the outermost circle scores the fewest (usually one). No points are awarded for a shot that misses the target. Target divisions include the recurve (Olympic) bow, compound bow and barebow. Events at the Olympic Games are in the outdoor target discipline, using the recurve (Olympic) bow only, and are shot at a single common distance, 70 meters (230 feet).

**FIELD:** A challenging outdoor discipline in which the archer takes on the terrain along with the target, field archery has widespread participation. A course is set up with 24 targets which are marked with the distance to the shooting line. The distances to another 24 targets remain unmarked. Three arrows are shot on each target for a total of 144. The targets are placed with such difficulty that the shots do not resemble target archery. Many of the shots are made uphill or downhill and require consideration for obstacles. Field events are held for the recurve (Olympic) bow, compound bow and barebow divisions.

**3-D ARCHERY:** Targets in 3-D events are life-size replicas of a variety of wildlife. These events combine the skills of determining distance to the target, determining what part of the target to hit and the actual shot. The majority of these events are outdoor, but several indoor tournaments exist. Most archers who compete in these events use a compound bow. Archers competing in the typical 3-D tournament walk a course and shoot 40 arrows at 40 different targets. The tournament is usually held over either one or two days.

**SKI-ARCHERY:** (aka Ski-Arc): A relatively new discipline, Ski-Archery combines archery with cross country skiing. It is performed much like the Olympic Biathlon, which features rifle shooting instead of archery. Bows are carried in a special backpack by the archers while they are skiing. The course is 12 kilometers long for the men and eight for the women. One end of four arrows is shot every four kilometers, and, in one of those ends, the archer shoots from a kneeling position.

Targets are 16 centimeters in diameter and are positioned 18 meters from the shooter. Each shot is either a hit or a miss. For every target missed, the archer must ski a 350 meter penalty circuit before leaving the target site. The first athlete to complete the course is the winner.

**ARCATHLON:** A summer arcathlon event is a combination of target archery shooting and running, a challenging experience. The athlete is required to run a course and stop at prescribed points to shoot at fixed targets. The typical course is between 5 and 12 km. Athletes make three shooting stops, shooting four arrows at each. The typical event consists of a one-mile run followed by four arrows shot from a standing position, then another one-mile run followed by four arrows shot from the kneeling position, then another one-mile run followed by four arrows shot from the standing position.

Bows are normally stored at the shooting range, but competitors have the option of carrying them. Targets are 16 centimeters in diameter and are positioned 18 meters from the shooter.

**CROSSBOW:** Crossbow events are held in target (indoor and outdoor) and clout. Outdoor target events are shot at a 60-cm, 10-ring multi-colored target face. Indoor rounds are shot at a 40-cm, 10-ring target face. In the clout round, six ends of six arrows are shot from 165 meters at a 48-ft diameter target on the ground.

**FLIGHT:** Shooting for distance is the objective of Flight archery. Two types of arrows, regular flight and broadhead flight (arrows with cutting heads, suitable for hunting), are used and can be combined with many types of bows: standard recurve and compound bows, crossbows, flight bows that have an extended handle and a large overdraw, "primitive" bows and the "footbow". Records are kept for each combination of bow, arrow and shooter class sanctioned by the NAA's Flight Committee. In a flight tournament, each archer shoots four ends of six arrows. Each end may be in a different class. A different bow can be used for each class or the archer may shoot the same bow for all four classes. Note that the world's record for the footbow is over a mile!

**CLOUT:** A rarely practiced discipline, most archers take part in clout archery only for fun. Basically, it is a test of trajectory skill, the same talent used in the lighting of the flame at the 1992 Summer Olympic Opening Ceremonies. In clout archery, the target (15 meters in diameter) consists of five concentric circular scoring zones on the ground, which are outlined on the ground. The innermost circle is worth five points, and scores decrease to one point in the outermost circle. Each archer shoots 36 arrows at the target, 165 meters away for men and 125 for women.

## PART II

# Outdoor Range Layout

### And Size Requirements

#### General

Safety is the overwhelming factor dictating range size. The actual shooting lane dimensions account for only a very small fraction of the total area requirement. Terrain is also quite important, especially in the layout of field and bowhunter ranges. Proper use of terrain can alleviate many safety concerns, particularly in providing natural backstops and buffers.

#### Field Archery Range

The development of a good field archery range always starts with a well thought-out plan.

1) Make a surveyor-type sketch of the property showing significant contours, creeks, etc. Better yet, use a large scale topographical map. 2) Make a preliminary range layout on the topo sketch or map, considering all the safety criteria described below. [Be conservative!] 3) With three teams of two people each, stake each target's shooting line and target butt position carefully with respect to:

- The current target's orientation (distance and direction).
- The previous target's orientation, particularly the location of its target butt.
- The next target's orientation, particularly the location of its shooting line.

Hopefully, these steps will provide some assurance that you can actually have a good and safe range before committing lots of labor and dollars.

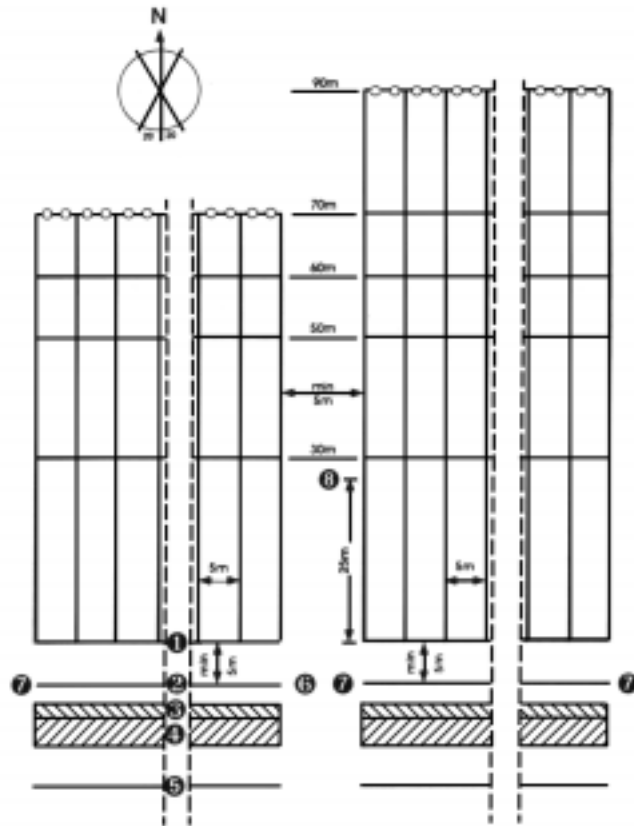
The NFAA has four size-related guidelines for laying out a field range (the NAA's requirements are similar, but not as definitive):

If the target is not backstopped (either fabricated or earthen), 25 yards or one-half of the target distance, whichever greater, shall be cleared behind the butt.

[Note: This guideline was formulated in the recurve era. Today, it is suggested that "more-the-better"]

A minimum clearance of 25 to 50 (safest) feet, depending on terrain and target distance, shall be provided between any path or shooting lane paralleling another shooting lane. Fifteen yards (45 feet) is a good compromise.

The target lanes must be sufficiently wide to support two archers shoot-



**FITA Outdoor Target Archery Range Layout**

- |                      |                         |                        |
|----------------------|-------------------------|------------------------|
| ① SHOOTING LINE      | ③ EQUIPMENT AREA        | ⑥ DIRECTOR OF SHOOTING |
| ② WAITING LINE       | ④ SITTING AREA          | ⑦ JUDGES SEATS         |
| ⑤ SPECTATORS BARRIER | ⑧ LIGHTS/DIGITAL CLOCKS |                        |

ing simultaneously side-by-side. Four-wide is highly recommended for the longer walk-up targets, which always seem to take longer to shoot.

In summary, and for initial range layout planning, the recommended safety zones to each side and behind field archery target butts are:

Target Distance	Half-Width at Butt	Depth Behind Butt
Up to 30 yds	15 yds	25 yds
30 to 50 yds	One-half target distance	25 yds
50 to 80 yds	One-half target distance	One-half target distance

The foregoing safety guidelines assume that in no case should an errant arrow cross the range boundary, even if the adjoining property is uninhabited. In other words, all the safety buffer zones must be included within the total range area requirements.

As mentioned before, terrain has a significant influence on field archery range layout and size. Ideally, the targets are laid out such that the archer never has to walk back on the lane just shot. [Exceptions are targets about 30 yards and less.] These walk-back targets require less land, but are an aggravation during tournaments because of the time wasted waiting for the lane to clear. More walking is required, too. "Walk-throughs," as on a golf course, are always preferred.

A reasonably shallow (and dry) gully, ravine, arroyo or similarly hilly terrain can be a great asset to a field or bowhunter range. Shooting from bank-to-bank, back-and-forth, across the gully not only provides natural backstopping, but reduces area and shooting-time requirements. Box gullies or canyons, which may be considered "waste areas" by others, are ideally suited to the field archer or bowhunter. On the other hand, waste areas subject to flooding are really only suited for large tournaments using temporary facilities. Flood plains are too flat and too risky. [Foam butts and 3-D targets float!]

Field ranges are often laid out in 14-target "loops," where all of the shots are outward, away from the center of the loop. This arrangement requires more land area because the center of the loop is not used, and because a large buffer area is needed around the perimeter. With judicious planning, however, the central core could contain a clubhouse and/or parking lot. In any case, the range should be laid out such that the Target 1 (and 15) entrance and Target 14 (and 28) exit are near the clubhouse or assembly area.

With the right terrain and under perfect conditions, a safe, 28-target field range, with no long walk-backs and with no fabricated backstops, but with a 10-target practice range, clubhouse and modest parking lot, can fit on about 20 acres. Thirty acres is more comfortable. 28-target ranges with lots of walk-backs and backstops can fit on as little as 15 acres. 14-, 42- and 56-target field range

size requirements are proportional to the 28-target requirement, considering that about two acres is needed for a nice practice range, and about one acre is needed for the parking lot and building(s). For initial planning purposes, a rule-of-thumb is one acre per target.

### Target Archery Range

Outdoor target archery range size requirements are easy to define because: (1) terrain is not a factor, and (2) all targets are walk-backs. Factors relating to a "first class" outdoor target range layout are:

- The ground should be flat, free of obstructions, and the shooting direction should be within 45° of true north in the Northern Hemisphere (shooter less likely to face sun).
- Each shooting lane should be no narrower than 10 feet or about 3 yards.
- Safety (buffer) lanes along the side boundaries should be no less than 15 yards.

The safety area behind the target at the longest distance should be no less than 40 yards. Five yards minimum is recommended behind the shooting line for the competitors, plus at least another 5 yards for bow racks, chairs, etc.

A 10-target range would fit nicely on a standard soccer or football field, including side and end zones.

### 3-D Range

As with field archery ranges, the actual land area required between the shooting stakes and targets is a small fraction of the total 3-D range area required. Although the distances shot on a 3-D range average less than those shot on a field range, there are several factors which make the total area requirements greater:

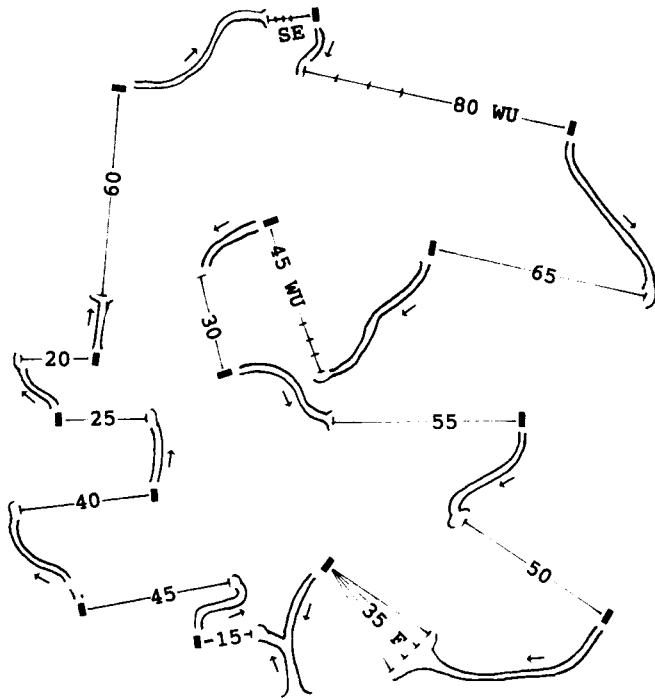
- Arrow speed as well as the probability of arrow ricochet are higher for the 3-D archer than for the field archer.
- Since fabricated backstops are not desired (for the sake of realism), the safety zones should be at least twice the size suggested for a field range. Earthen backstops, however, either man-made or natural, will help quite a bit.
- Paths to and from the target should never be along the sight-line between the shooting stake and target. Again, for realism and fairness to all, more area is required to preserve the natural habitat behind and in front of the target.

A 3-D range is rarely shot the same way twice. That is, either the targets or stakes, or both, are relocated for each tournament. This practice obviously requires a land "reserve" not needed for a permanent range. (Remember,

however, 3-D ranges with permanent butts or man-made earthen backstops do not have the same freedom of relocating the targets for each shoot. Only the stakes can be moved.)

Ideally, the animal targets should be matched with their habitats. If you use a large variety of targets, then you need a large variety of habitats; thus requiring more land area.

In summary, a rough estimate of the land area required for a bowhunter range is 50% more per target than for a field range. A typical field range requires about an acre per target; therefore, a typical unmarked bowhunter range needs about 1.5 acres per target. Therefore, a 20-target range needs 30 acres minimum. The more the better, however.



A fun and challenging range can be designed using the available topography. Make sure in the design that safety considerations are always followed. Never position targets in the way of archers, and make sure that safety emergency equipment has full access to your range.

## PART III

# Outdoor Target Butt & Backstop Construction

## And Size Requirements

### Field Archery

The minimum size requirements for field archery butts are based on the target faces being shot. For example, the following table relates butt dimensions with target configuration:

Distance	Critical Target	Minimum Butt Dimension
Up to 15 yds	4 x 4 - 20-cm	36" x 36"
15 to 35 yds	2 x 2 - 35-cm	30" x 30"
35 to 40 yds	2 - 50-cm	30" x 42"
40 to 80 yds	Group 1 Animal	42" x 42"

Considering that a compressed bale of excelsior is about 15" x 15" x 42", two-bale butts are barely adequate for field targets from 15 to 40 yards (assuming no vertical Group 1 Animals). Butts three bales high are required for the "snake eyes" and all target distances 40 yards and greater. Butts four feet square are amply sized for both field and target archery.

It wasn't too long ago that excelsior was the most common target butt material. Today, however, there are literally hundreds of different materials available worldwide, including various fibrous natural materials, forest or agricultural by-products, bundled rags and recycled plastic, but mostly a wide variety of the more expensive castable or moldable foams and composite materials. Moreover, the trend seems to be toward the purchase of commercial, full-sized, pre-fabricated, target butts.

A medium cost compromise is the do-it-yourself fabrication using cardboard, insulation board, or any one of many sheet foam materials, stacked and compressed in a custom made screw-down frame. Foams have several advantages: (1) they're available in a variety of thicknesses and densities, (2) they can be cut to any size or shape, and (3) they're both weather-proof and varmint-proof. Unfortunately, some foams have great "grabbing power," making it difficult to extract the arrows; plus, some foams tend to 'goop up' arrow shafts, especially

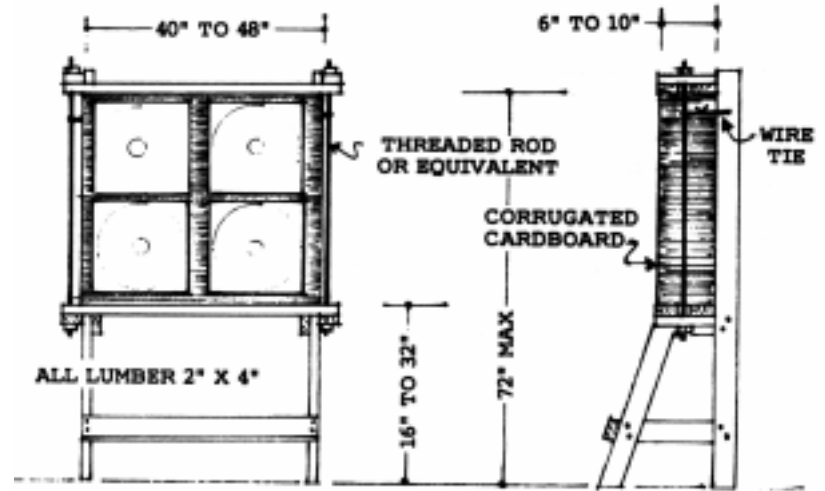
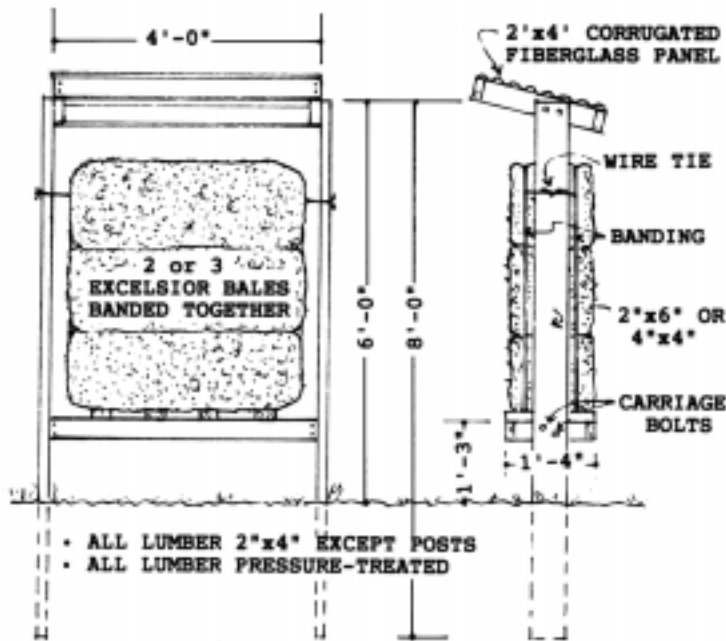
those made of composite materials.

Although the target butt may be waterproof, ordinary paper target faces need protection from the rain, especially if they're to be shot more than one day. A simple roof over the butt will suffice. The roof should be a little higher than six feet from the ground (to allow for head clearance), and about four feet wide.

Unlike indoor archery, there is no minimum height above the ground for field archery target faces. Since a standard wooden pallet is the most common base, about 5 inches is the practical minimum. A platform about 16 inches above the ground is much better, since the center of the target would then be about waist-high, making it easy to score and extract arrows.

The butt platform, roof and supporting posts should be made from materials that won't damage an errant arrow. Ordinary pressure-treated pine is good. If steel fence posts are used to hold the butt upright, then keep the posts at the edges, but behind the butt out of sight. It is also a good idea (and welcomed by all novice shooters) to keep the ground around the butts free of rocks and large stones, especially at targets longer than 50 yards.

With a little luck and ingenuity, a two-bale excelsior target butt, with platform and roof, can be constructed for less than \$100, excluding labor and equipment purchase or rental.

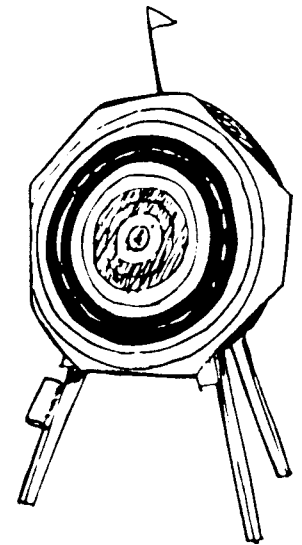


As noted above, unnatural target backstops are not desired on a field archery range unless dictated by safety concerns. Besides, fabricated backstops are eyesores, and can be quite expensive, unless natural materials, such as stacked logs, can be used.

A rule-of-thumb for backstop size is three butt-widths wide and two butt-heights high. For example, a backstop behind a 4 x 4-ft butt would be 12-ft wide by 8-ft high. That equates to three, 4 x 8-ft, 1/2-in (or thicker), exterior-grade, plywood panels mounted vertically. Of course, other materials are available. The only requirement is that the backstop must decelerate the arrow to zero, without substantial damage to the arrow, and without endangering anyone on or off the range.

### Target Archery

A few years ago, the most common butt used for outdoor target archery was the classic, circular, 50-inch diameter, grass butt. These heavy and expensive butts, however, may no longer be in production. Square butts made of the newer, lighter weight, foam or composite materials are now much more popular, and are sized to hold the standard 122-cm FITA face. Light weight and portability are also desired to accommodate those tournaments where the shooting line remains fixed while the butts and their standards (easels) are moved as the distances are changed.



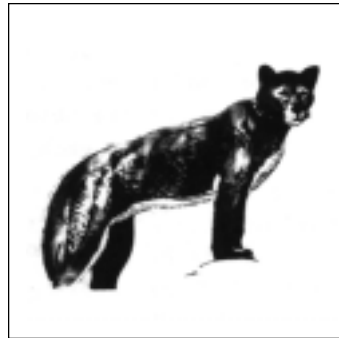
Target butts similar to those used on a field archery range may also be used, as long as portability is not required, and if the butts are sufficiently large to hold a standard 122-cm FITA face. Moreover, FITA faces are mounted such that the center is about 50 inches above ground, and tilted about 15° from vertical. For target rounds other than the 900 or American Round, common sense prevails. Obviously kids shooting target archery at summer camp need targets sufficiently low to reach their arrows.

Backstops are rarely required on a target archery range primarily because all the archers are shooting at the same time, and no one is allowed behind the targets except when all are scoring their arrows. Likewise, spectators must be clear of the safety zone behind the targets.

### 2-D Animal Targets

If required, target butts and backstops needed for a two-dimensional animal round, such as the WBHC Compulsory Round, are the same as those used on a field archery range.

Broadhead target butts and backstops are not addressed herein.



### 3-D Animal Targets

A wide variety of very durable and realistic three-dimensional animal targets are now commercially available. The more popular brands have standard scoring lines engraved, and have replaceable sections, plugs, and/or back-up blocks for do-it yourself target refurbishment.

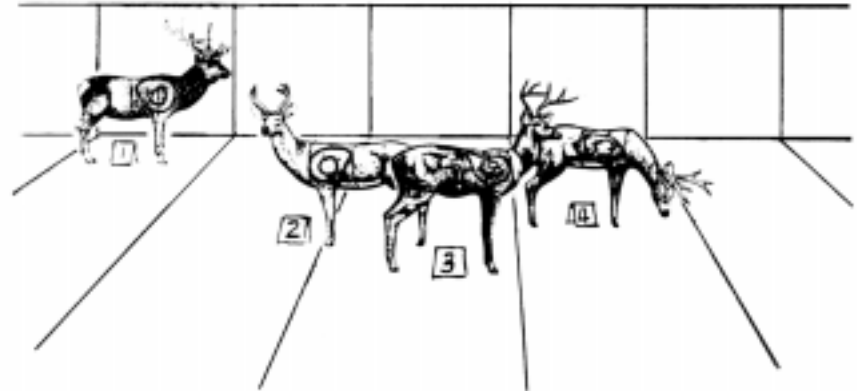
Reasonably realistic semi 3-D animal targets can also be handmade. A full-sized, color-printed, paper, animal target is glued on cardboard, and backed-up by an ethafoam (or similar) slab. The complete target is then cut out around the animal outline.

3-D animal targets are generally very portable, which means that a completely different bowhunter range can be set up overnight. Some targets even have integral support stakes, while others are merely tied to any convenient tree or sapling.

The price of these 3-D animal targets is heavily dependent on size, realism and durability; and whether you buy or make them.



A typical 3-D target is made from molded high-density foam, and has scoring circles molded into its "vitals" area. A wide range of animal species are available from several manufacturers.



3-D courses can be arranged outdoors in a natural setting, or even indoors in a simpler format. Just vary the shooting distances to make the range more interesting.

## PART IV

# Designing an Outdoor Range for Safety

### Your First Priority

#### General Range Safety

Safety on any archery range is comprised of three elements:

- Archery tackle.
- “Stupid Human Tricks.”
- Range layout, targets and backstops.

Since target archery range layouts and shooting rules are specifically structured to avoid unsafe conditions, safety issues are fairly rare. Likewise, proper archery training and/or bowhunter education should handle the tackle and human elements.

It should be remembered that range design criteria can't be separated from range safety criteria. The first priority is always every archery and bowhunter range must be designed for safety. The following material, therefore, emphasizes the most important safety issues related to the range and equipment design criteria.

#### Field Archery Range Safety

Field archery range safety may be divided into two categories: (1) factors related to range layout and terrain, and (2) factors related to maintainable items, such as target butts, target lanes and lane obstructions. The NFAA addresses both of these factors quite well in its Range Inspection Requirements. NFAA-chartered clubs with field ranges must be re-inspected every two years, and it's obvious that a club won't host many tournaments, invitationals or even club shoots, without being certified safe, and subsequently proven safe by repeated use.

With temporary ranges set up specifically for large sectional or national tournaments, problems may be the result of (1) too many ranges being built on not enough land, (2) not enough help, and (3) not enough time. Very few ranges are perfectly safe the first time, which means that unless inspection teams conduct a “shoot-through” on the new range, there's a good chance that there will

be a significant safety issue during the first day's round.

#### *Here's the kind of things often missed because of not having a “shoot-through”:*

- Waiting areas and shooting positions at the next target within the danger zone of the preceding target. This is the result of not having enough land. The NFAA's outdoor range safety guidelines, as described above, are good rules-of-thumb.
- Target butt positioned such that a road, path or another target is directly behind the butt, even if at a reasonably safe distance. Any unnatural movement in the sight window can cause an equally unnatural flinch and inadvertent arrow release.
- Lack of backstop or inadequately cleared area behind target butt. People will miss, and they will look for that missed arrow. Uncleared brush not only increases the chance of a ricochet, but it also increases the exposure of the search party to danger zones behind other targets.
- “Leaky” butts. Even if you never miss, pass-throughs put you in the same position as the guy who does miss the target.
- Non-backstopped target positioned on a brow of a hill, such that a missed shot becomes a flight-shot.
- Uncleared paths to and between targets. Here, we're talking about safety afoot. The usual method of clearing field archery lanes is to brush-hog the saplings about one or two inches above the ground — just high enough to trip head-over-heels.
- Inadequate clearance above target lane. Even with a “shoot-through,” the range inspectors often miss the fact that light-bowed and traditional shooters require more vertical clearance.

- Walk-ups which are also fan shaped. The problem here is that unlike a straight walk-up, an angled walk-up often gives the option of shooting four at a time. It depends on the angle of the fan whether this is safe or not. If there's any question, don't shoot!

### 3-D Range Safety

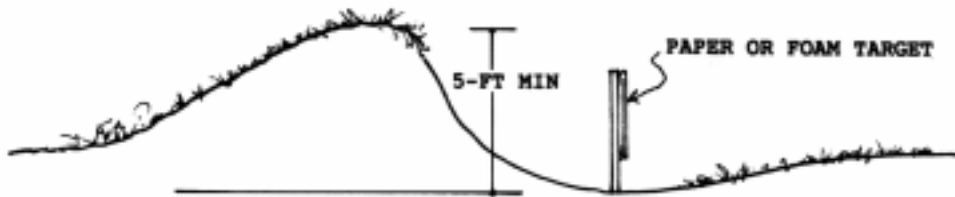
Here are some problems unique to 3-D ranges, some of which are noted elsewhere here:

Non-yielding obstructions (e.g., trees and limbs) blocking the animal kill area. When setting up a 3-D target, don't make the shot any different from that you would take in a real hunting situation. Moreover, remember the short person, the left-hander and the light-bowed bowhunter.

Overlapping "miss" areas behind the targets. Because of no backstops and because of more missed shots (at 3-D targets), special care must be taken to make sure that a missed arrow doesn't end up behind another target.

Steeplejack treestand shots. Shooting from elevated platforms is fun (although often bottlenecks), but don't make the shots ridiculously difficult — like hanging out over the railing. Also, make sure that the bow limb won't slap any part of the tree or platform upon release.

Again, the "On Deck" area and shooting stakes at the next target being in the danger zone of the preceding target. The NFAA's safety buffer rule is even more important on a bowhunter range, especially if it's heavily wooded (more ricochets)



Earth Berm Safety Backstop

## PART V

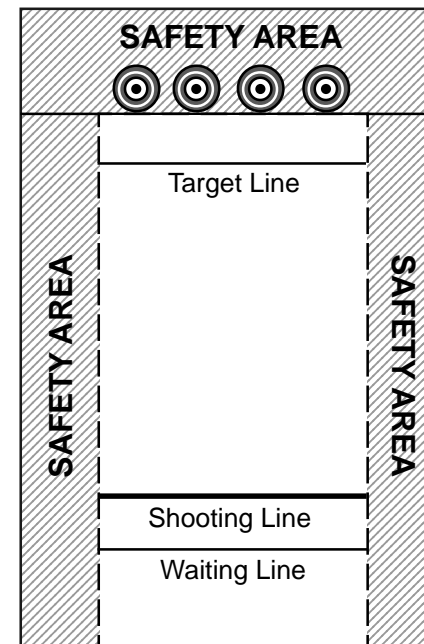
# Indoor Range Layout

## And Size Requirements

### Shooting Distances

The most common indoor shooting distance is 20 yards maximum, which encompasses the 18 meters used at the World Archery Festival, as well as at most FITA and JOAD indoor tournaments.

Total depth of an indoor range is the maximum shooting distance, plus, of course, the clearance distances needed behind both the shooting line and the target butts. Normally, a minimum clearance of 5 feet is required behind the butts to allow for a backstop, as well as sufficient "elbow room" to retrieve arrows which may have passed through the target butts. Clearance behind the shooting line should not be less than about 15 feet to allow room for bow racks, benches, tables, traffic, etc. Ten yards (30 feet) is much more desirable.



Controlled Access/Spectator Area

Therefore, a “standard” 20-yard indoor archery range requires a total depth of nominally 80 feet. A depth greater than 80 feet will permit either more “roaming” room or greater shooting distances.

### **Lane Width and Side Clearance**

The absolute minimum lane width is 24 inches. For “mature” adults, however, 30 inches is much better. Of course, the target butts must be spaced accordingly. For two lanes per butt, the 30-inch lane means that the butt centerlines are 5 feet apart. The 24-inch lane means that the nominally 48-inch butts are touching side-by-side.

The NFAA requires that, “All pillars or structural parts of the building, ... shall be properly protected so as not to damage arrows and to prevent rebound to the shooting lines.”

### **Height Clearance**

For a 20-yd range, the NFAA requires a minimum vertical clearance of 8 feet, 6 inches. For kids with light bows, 10 feet is probably better. This clearance is between the floor and anything hanging from the ceiling in the line-of-fire, such as structural beams or light fixtures. Obviously, light fixtures immediately above the target butt are not in the line-of-fire, and only need to be head-height.

### **Overall Range Dimensions**

Assuming 5 feet per target butt (two lanes), a 30-foot wide range will support 12 lanes, or 24 people in two shooting lines of league play. Widths greater or less than 30 feet should be divisible by 5 feet (or slightly less) in order to accommodate whole units of target butts. Obviously there is no minimum or maximum range width requirement ... only what’s affordable.

In addition to both the 80-foot depth requirement and the recommended 30-foot minimum width, sufficient floor space should be allocated for:

- An entry area.
- Registration counter (or cashier).
- Score tallying and posting area.
- Restroom(s).
- Heating and/or air conditioning facilities.
- Utility, storage and/or office area.
- Designated smoking area.
- Pro shop or retail sales area.

## **INDOOR TARGET BUTT AND BACKSTOP CONSTRUCTION**

### **Target Butt Dimensions**

If square or rectangular, the width or height of a target butt shall not be less than 40 inches. 48 inches is preferred; and if a circular butt is used, the minimum diameter shall not be less than 48 inches. Butts of these sizes will hold four NFAA/IFAA or WAF target faces.

NFAA requires that the bottom of the target butt be at least 16 inches from the floor.

For easel-mounted butts, the backward tilt cannot be more than 15° from vertical, and the tilt-angle must be the same for all butts used in a tournament. A perfectly vertical target face is ideal, but care must be taken to avoid having the butt pitch forward during arrow removal.

The thickness of a target butt should be no greater than the length of the shortest arrow. A completely buried “pass-through” is almost impossible to extract.

### **Target Butt and Backstop Materials**

As with outdoor target butts, an indoor target butt may be constructed of any material as long as:

- It doesn’t damage or “goop up” the arrows.
- It doesn’t allow frequent pass-throughs.
- It allows the arrows to be withdrawn easily, or at least without much effort.

Excelsior, or corrugated cardboard sheets are the most common materials used for “permanent” indoor target butts. Although cardboard is relatively inexpensive, especially if scrap can be found, a frame must be constructed for each butt to hold the compressed cardboard sheets in a neat vertical stack.

As with outdoor butts, a variety of foam materials are also suitable for indoor use. Portable versions on standards (easels) are quite popular at the large, arena-sized, indoor tournaments. Unfortunately, some of these foams have great “grabbing power,” making it difficult to extract the arrows. Other foams tend to leave a messy residue on the arrow shafts.

An indoor target backstop may be made of any material as long as it doesn’t damage any pass-through, overshot or sideshot arrow. The NFAA requires the backstop to be at least 8 feet high. Standard sheets of (thick) plywood, butted side-by-side, are commonly used as backstops. For large tournaments in temporary facilities, a curtain-like, closed-mesh fabric backstop is also common.

## PART VI

# Designing a Range for Wheelchair Accessibility

### Make Your Range Fun for All

Disabled individuals can enjoy archery and successfully compete as well!!

Disabled archers participated in the 1996 Paralympics and were separated into three classes:

- *Quadriplegic*— Requires wheelchair at all times on the range, and can use specially adapted archery tackle.
- *Paraplegic*— Requires chair (not necessarily wheelchair) at the shooting line. No provision for special tackle.
- *Standing*— Has the ability to stand at the shooting line, but requires assistance (prosthesis, crutch, wheelchair, etc.) to move around the range.

“Wheelchairs” come in various classes, too. The motorized versions with small balloon tires are ideally suited for all outdoor archery games. The classic, narrow-wheeled, manual wheelchairs are best suited for indoor shooting or on “soccer field” target ranges.

#### Indoor Ranges

Assuming that the building is already wheelchair accessible, nothing special is needed for an indoor range, except to provide more maneuvering room behind the shooting line. Also, since a wheelchair requires extra lane width at the shooting line, it's customary not to have two shooters on the same butt. This custom applies to target archery, too.

#### Outdoor Target Ranges

Because of the flat terrain, outdoor target archery ranges require very little modification for the wheelchair archer. Narrow-wheeled wheelchairs, however, just don't work in sand, loose soil or gravel. Unless some assistance is provided in scoring and retrieving the shooter's arrows, lanes to the target must also be hard packed and free of obstructions (rocks, stumps, etc.).

#### Field Archery and 3-D Ranges

Designing for manual wheelchair accessibility on roving-type archery ranges is most challenging. Here are the general design criteria:

- Grade less than 10% (about 6°).
- Avoid walk-through target arrangements.
- Use hard packed soil.
- Lanes and paths clear of rocks, brush, stumps, etc.
- Extra wide shooting lanes.
- All bridges wheelchair accessible and wheelchair-safe.
- Other accessibility features in place, such as restrooms, etc.

Because of the desire to have both a varied target layout and natural habitat realism, a 3-D range with manual wheelchair accessibility is almost improbable. As noted above, if the terrain is very flat, or if the disabled archer can use an ATV (and has a buddy to help score and retrieve arrows), then the challenge to hold a wheelchair accessible 3-D Round is somewhat lessened.

Alternatively, and if cost is of little concern, an 100% accessible wheelchair bowhunter range can be (and has been) built. It's possible to have easy access to the 3-D animal targets (to retrieve arrows), and to even have elevated platforms (simulating treestands or downhill shots). With paved paths (or boardwalks), fabricated ramps, and targets fixed in-place, some realism is obviously lost.

The fun, however, is never lost!



# Facilities and Accessories

**Making Your Range the Best**

## Items Any Outdoor Archery Range Can Use

- Adequate parking area.
- Covered shelter, pavilion or clubhouse.
- Registration table or counter.
- Storage shed for spare targets, butts, stakes, target pins, tools, etc.
- Picnic tables and benches
- Scoreboard.
- Toilet facilities (primitive, portable or otherwise).
- Practice area (covering longest distances on actual range).
- Bow racks, at both practice area and registration area.
- Bulletin board for target assignments, tournament rules, and other announcements.
- Public address system, at least for large tournaments.
- Waste containers.
- Water jugs and cups, throughout the range.
- Concession area.
- WARNING! ARCHERY RANGE signs around range boundary

## Field Archery Range Items

- Bow racks at each target butt
- Direction signs.
- Target number and target distance signs.
- Benches, at least five yards behind farthest shooting stake.

## Target Archery Range Items

- Portable bow racks behind shooting line
- Target number placards.
- Wind direction indicators.
- Chairs and beach umbrellas, if not provided by the competitors
- Timing lights.
- Tournament Director's platform.

## Bowhunter Range Items

- "On Deck" area, at least ten yards behind the next target's shooting stake
- Trail markers (signs, cord or tape).
- Target number and description signs (post in "On Deck" areas).
- Novelty event set-up, such as running deer, long-distance shoot, archery poker, etc.

## INDOOR RANGE SPECIAL EQUIPMENT AND SAFETY

### Lighting

The minimum illumination recommended is 30 foot-candles, measured at the target faces. 30 foot-candles throughout the range is good; however, care must be taken to shield the shooters' eyes while standing at the shooting line. On the other hand, there must be sufficient illumination at the line for reading sight marks and doing other close work.

Fluorescent overhead light fixtures are recommended because of the uniform illumination and lack of harsh shadows. Floor-mounted fixtures in front of the butts are sometimes used to augment target illumination. Special precautions, however, are advised to avoid tripping over these fixtures on the way to and from the target butts.

### Routine Indoor Range Accessories

Items needed for both drop-in and league shooters include:

Bow racks. These must be located at least 5 feet behind the shooting line. Remember to provide enough racks to handle a full-house of shooters (two times the number of lanes). Also, remember that many bows have extra long stabilizers and/or extra short limbs.

Equipment tables. Places are needed to store tackle boxes and to assemble/repair archery tackle. Inexpensive, folding, "cafeteria" tables are quite adequate.

Chairs or benches. These, along with the tables noted above, should be located behind the bow racks, and should provide sufficient seating for the expected number of spectators, plus at least one-half the number of shooters.

Coat racks or hooks.

Water fountain, restroom(s), designated smoking area, etc.

### Specific Items Needed for Indoor Leagues and Tournaments

Some things that may or may not be provided by league or tournament sponsors include:

A 10-foot “dropped arrow” line.

Visual timer. Depending on the tournament, a stoplight-like timer is usually required. Green is for START SHOOTING, amber is for ONE MINUTE TO GO, and red is for STOP SHOOTING. The timer may be overridden by a tournament official behind the shooting line.

Raised platform behind the shooting line for the Tournament Director and Clock/Timer Operator.

Scorecards and scoreboard.

Target faces.

### Special Safety Precautions for Indoor Ranges

Some additional common sense safety rules include:

- Never let anyone draw a bow, with or without an arrow, except while standing at the shooting line and pointed toward a clear target.
- Never allow crossbows or bows with unguarded overdraws to be shot in an indoor archery range.
- Never let anyone shoot obviously damaged or defective equipment.
- Unless the range is specifically designed for it, never allow broadheads to be shot indoors.

## PART VIII

# Resources

### Where to Go for Help

A simple archery range can be designed and build very easily if you keep in mind safety and common sense. However, exciting archery ranges can also be built using the latest techniques, targeting systems and games. These designs generally require previous experience.

There are many archery/bowhunting related organizations who may have local chapters and individuals which can act as valuable resources for your archery range project. These resources may be able to help you evaluate equipment needs and provide archery instructor-training to you or your staff.

Also, be sure to include your local archery/bowhunting dealer in your planning. He/she may have excellent suggestions and resources to help. Here are a few of the national archery associations that may be able to help:

#### Archery Shooters Association

P.O. Box 399  
Kennesaw, GA 30144  
770-795-0232 phone  
770-795-0953 fax

#### National Bowhunter Education Association

101 1/2 North Front  
Townsend, MT 59644  
406-266-3237 phone  
406-266-3239 Fax

#### International Bowhunting Organization

P.O. Box 398  
3049 E Liberty Ave.  
Vermillion, OH 44089  
440-967-2137 phone  
440-967-2052 Fax

#### National Field Archery Association

31407 Outer I-10  
Redlands, CA 92373  
909-794-2133 phone  
909-794-8512 fax

#### National Archery Association

1750 E Boulder Ave.  
Boulder, CO 80909  
719-578-4576 phone  
719-632-4733 fax

#### Physically Challenged Bowhunters of America

Rd. #1, Box 470  
New Alexandria, PA 15670  
412-668-7439 phone

#### United Foundation For Disabled Archers

P.O. Box 50  
Glenwoods, MN 56334  
320-634-3660 phone