



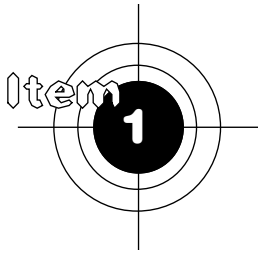
Outdoor Shooting Ranges:



Best Practices

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Properly constructed backstop berm

Definition: A backstop is a device constructed to stop or re-direct bullets fired on a range.

Purpose/Use: A backstop is the key component providing range safety and use for people in the area in and beyond a rifle or pistol range. Current NRA and NSSF safety philosophies are predicated toward range self-containment of shot rounds, i.e., “if it’s shot here, keep it here”. A properly constructed backstop at a rifle and/or pistol range are usually constructed out of a core material of compacted soil, rock or crushed cement, covered by rock-free earthen material, up to a recommended height of twenty (20) feet at a 1:1 slope (soil type dependent), with a 4 foot-wide flat top. Backstop width will be dependent upon the numbers of shooting stations the range operator wants installed at the firing line.

The toe of the backstop’s slope may be stabilized with sandbags to prevent slumping or on-going erosion. Other alternatives for backstops include either steel bullet traps (various models and styles exist), a membrane-skin covering ground, recycled rubber airplane tires, or a pressed block material of the same substance.

Key Elements to Consider/Alternatives: Earthen backstops require immediate care to re-vegetate, to prevent potential on-going erosion problems. Use of fiber mulch, filter fabric or other material is almost certainly needed for a facility constructing a new earthen backstop. Proper seed mix recommendations, matching soil conditions, moisture and sun light conditions can be obtained through your local soil and water conservation district (SWCD) office. Tree planting on an earthen berm is not recommended, since tree roots can penetrate and weaken the soil of the backstop, and encourage shooting beyond the backstop, defeating its intended purpose. Old tires are also not recommended as a core material for earthen backstops. In some cases range operators did use tires for backstop toe stabilization. In other instances, tires have been observed being used as interior and exterior berms. Old tires are considered a nuisance material, in others a hazardous substance, and should not be used on any portion of a newly constructed facility. Depending on the degree of range and backstop use, as well as soil pH, lead reclamation may or may not be an issue at any one individual facility, for some time after installation of a new backstop. Bullet deflection and splatter may begin to take place on an older, existing backstop if periodic removal is not included as a part of the maintenance plan of the range. The alternative to a full-blown, full-length backstop berm is described in Item 2.

What Do You Have at Your Range? If you don’t have a recommended height backstop, or other bullet catching device installed, either rehabilitation or new construction should be a priority, in order to prevent skipping, worming and bullets leaving your range.

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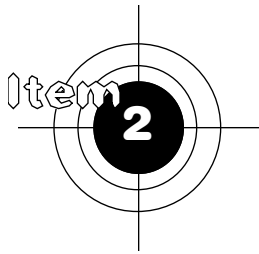


Before, and...



After

Properly constructed backstop berm



Low cost backstop alternative (Bullet Box)

Definition: A backstop is intended to stop bullets from traveling downrange, beyond the area immediately beyond a shooter's target.

Purpose: The bullet box allows for intermediate distance target placement and shooting, into a backstop, which, because of its construction will eliminate any chance for skip, worming or other opportunity for a shot bullet to leave a range. Elimination of any chance for a bullet to leave a range should help to ease local concerns regarding shooting range operations.

Key Elements to Consider/Alternatives: In certain circumstances, space limits, cost limits or lack of user demand may prevent construction of a full-blown backstop berm. A proven, low-cost home-grown alternative to a larger berm is the construction out of railroad ties of a backstop platform and three-sided box, which is lined with industrial belting lining, then filled by tree butts and sand. Chicken wire is placed in front of the butts to hang targets. These boxes have proven to be viable, low-cost alternative to constructing a larger, earthen backstop. Periodic maintenance includes replacing the face of the tree butt being shot into. In the case of a combination pistol and .22 caliber range, sand traps constructed of treated lumber may be placed at the base of a side berm, at measured distances, so that the .22 rounds are contained within the trap, which can then be periodically cleaned out.

What Do You Have at Your Range? Intermediate distance targets should have some degree of backstopping, especially if any downrange development or land use would put off-range individuals at risk.

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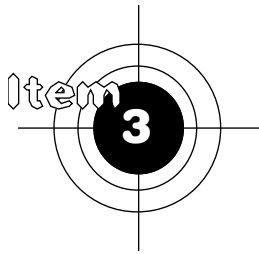




Bullet boxes - 3 perspectives



Low cost backstop alternative



Properly constructed exterior berm

Definition: A berm is an earthen or concrete embankment or wall constructed to restrict bullets to a given area.

Purpose: Self containment of shot rounds at a rifle or pistol range. Keeping with the philosophy of self-containment, an exterior berm greatly reduces any chance that discharged rounds will travel outside the bounds of an individual range area.

Key Elements to Consider/Alternatives: Recommended height of a properly constructed exterior berm is twelve (12) feet, constructed with 1:1 (soil type dependent) sidewall slopes, and a four (4) foot-wide flat top. Again, clean, rock-free earthen material is cheapest to use in construction, and must be re-vegetated immediately after final soil smoothing and shaping is completed, to prevent on-going erosion problems. As with a backstop berm, no woody vegetation should be planted on the side berm, which would tend to weaken the structure. Ditching or sloping to prevent water ponding on the outside of an exterior berm is also recommended.

What Do You Have at Your Range? Many range operators have a tendency to ignore installing an exterior berm. If full-length berms are not installed, a pair of wings should be installed to eliminate ricochets off targets or target holder at the backstop area. Again, think self-containment.

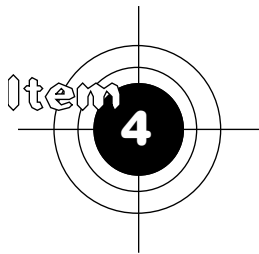
Notes:





An exterior berm

Properly constructed exterior berm



Properly constructed interior berm

Definition: A berm is an earthen or concrete embankment or wall constructed to restrict bullet travel to a given area.

Purpose: Walling off and isolating various distanced shooting bays at an outdoor range, so that concurrent use of each range can take place, with independent activity at each range and firing line.

Key Elements to Consider/Alternatives: Recommended height of an interior berm is at minimum, eight (8) feet in height, up to the exterior berm height of twelve (12) feet, with a 1:1 slope (soil type dependent) and a four foot wide flat top. If space limitations exist that would preclude an earthen berm placed between interior ranges at different distances, an alternative would be to construct concrete walls between the ranges, from the backstop all the way to the firing line.

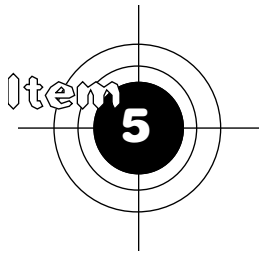
What Do You Have at Your Range? If your range has one or more interior berm, check the overall condition. Is it tall enough to allow for concurrent range use? Has it slumped, eroded, need re-building or re-vegetating? If you are using used tires as an interior berm, don't trust that these alone can stop any degree of deflection. Tires filled with soil also have a tendency to be unstable, and subsequently slump, with soil eroding on a continuing basis.

Notes:





An interior berm, placed between 50 and 100 yard shooting ranges.



Firing line bench rest

Definition: A bench rest is usually a two-seated flat, steady table or surface, used by a shooter to steady him or her self, prior to discharging their firearm. Each bench rest is also considered a “firing point”, in that not more than one person at a time is using an individual rest.

Purpose: To provide a comfortable and stable base, seat and platform, so that a steady anchor point and pattern of use is provided for a shooter. Individual accuracy and development of consistent habits are the common goal of each individual shooter.

Key Elements to Consider/Alternatives: Bench rests are usually built with both a left and right-handed seat, or may be a straight-edged bench made to accommodate either left or right-eye dominant shooters. They are usually constructed of wood or concrete, although alternatives such as picnic tables or wooden spools may also be utilized. Recommended height of the bench is thirty inches.

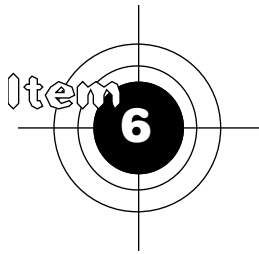
What Do You Have at Your Range? At least single benches are provided as stable rest surfaces for shooters.

Notes:





A bench rest



Firing line enclosure

Definition: A firing line is a parallel line behind which shooters are seated, and from which bullets are discharged toward [backstopped] targets. A firing line enclosure is a covering constructed over the firing line, containing one or more firing points (usually 6 to 12 per enclosure)

Purpose: Firing line enclosures can serve a number of purposes, including:

Protection from sun, wind, shadow and rain for each shooter.

Storage of gun racks, sand bags, targets, target stands and trash barrels.

Providing sound abatement, through installation of partial back and side panels and sound absorbing materials, which will re-direct the impulsive sound emitted from firearm discharges toward the range backstop.

Eliminating “blue sky” above the shooter’s vision of the bullet backstop.

Key Elements to Consider/Alternatives: Ideally, a single, common firing line should be constructed to provide a safe visual sight line for both the shooters and range safety officers. The range operator(s) will want to decide whether installing a simple post and pole, open-sided structure, or, something more elaborate is required, based on the range location, and the types of intended use. Part of this decision may be based on cost, the desire to control sound levels, or other factors. Other decisions include whether to construct an enclosure floor made of earthen materials (e.g., crushed rock), a treated wood platform or concrete. Since the enclosure will also house bench rests and other equipment, care should be taken to ensure that whichever floor is used, it is designed to be both water-free and level for shooter use.

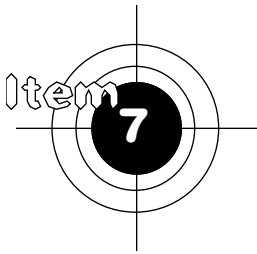
What Do You Have at Your Range? Various types of enclosures can be constructed, to provide either seasonal, or year-round use to shooters. Economics, demand for range use and the level of progress in range development generally help define what type of enclosure is built. Some ranges have no enclosures at all, while others have completely enclosed firing lines, in order to use the structure as a storage facility, and/or to keep out trespassers, or, to provide year-round shooting opportunities.

Notes:



Firing line enclosures - 3 perspectives





Blue-sky elimination techniques

Definition: Blue-sky is the area a firearm shooter sees above the range backstop (i.e., the blue sky above the backstop), when sitting or standing at the firing line.

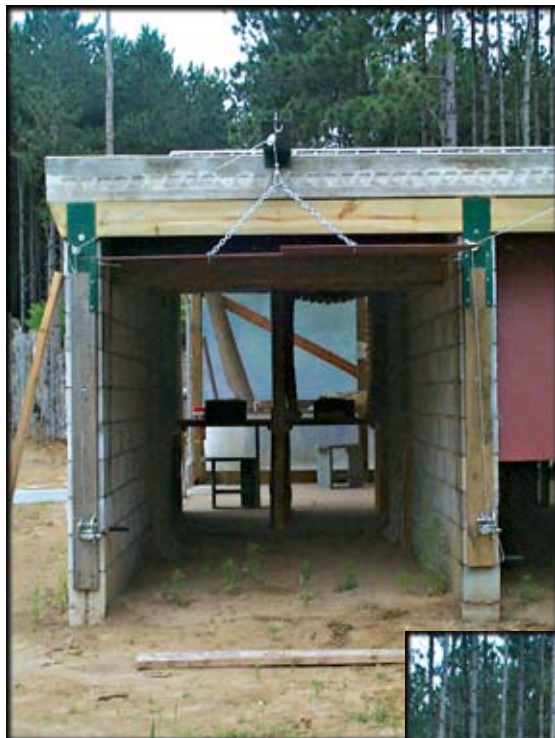
Purpose: Eliminating this portion of a shooter's view will eliminate the likelihood that any bullet will travel over the backstop area, leaving the shooting range.

Key Elements to Consider/Alternatives: Blue-sky elimination can be accomplished through installation of a single or a multiple set of baffles. Another proven technique is the installation of a sight restrictor at the firing line, preventing the shooter from seeing above a certain height. This can be in the form of a portable stand made of wood or other materials that eliminates sight above a pre-selected height on the backstop, a piece installed from the front side of the firing line enclosure, or a similar device.

What Do You Have at Your Range? If there are concerns regarding downrange land use, then one or more forms of blue-sky elimination should be built in as a safety measure at the firing line or just beyond it.

Notes:



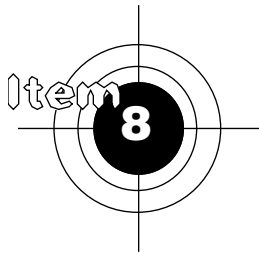


Open, and...



Closed

Blue-sky elimination techniques;



Bullet catcher installation

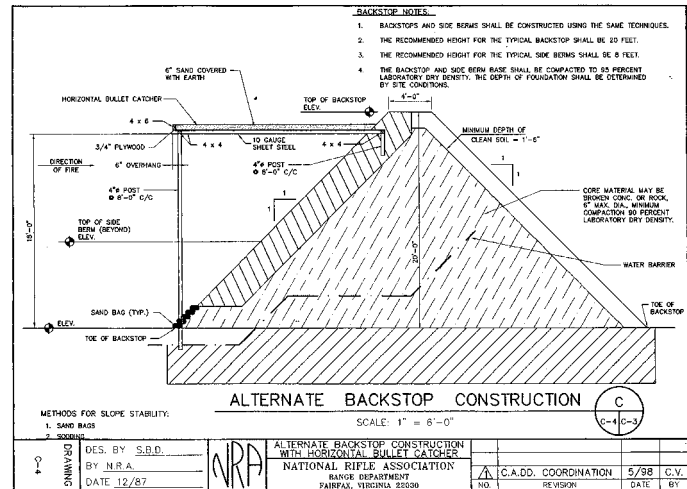
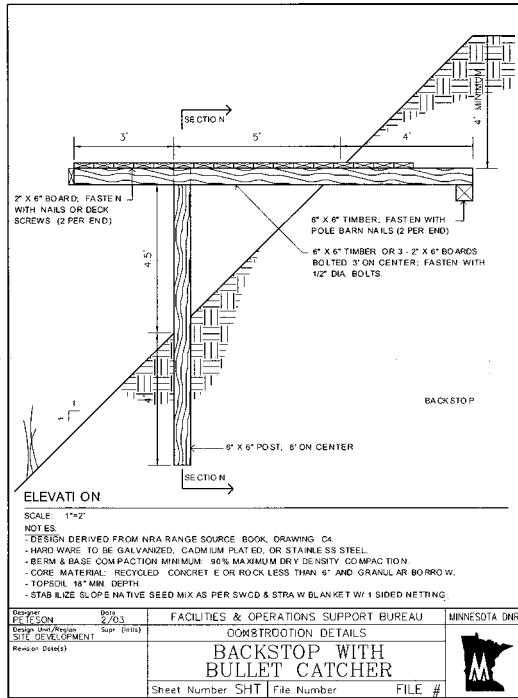
Definition: A bullet catcher is a device installed above and/or behind a target or set of targets.

Purpose: To ensure that once a bullet passes through the target it is deflected downward, thus staying on a range.

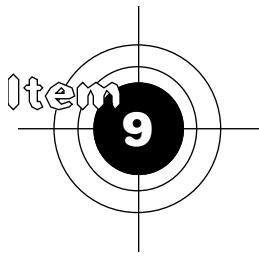
Key Elements to Consider/Alternatives: Previous NRA publications recommended installing a bullet catcher at an angle perpendicular to the slope of the backstop berm. Like the self-containment philosophy, this installation's most effective placement positioning has changed over time. The recommendation from Dr. Clark Vargas (P.E., Designer of the 1998 NRA Source Book) is to install these deflecting devices at a horizontal position angle, anchoring it into the backstop above the target.

What Do You Have at Your Range? If there are indications of bullet deflection, or the possibility of deflection based on the types of intended shooting use, then a bullet catcher may be the solution to avoid a potential problem.

Notes:



Bulletcatcher, partially constructed, using on site materials



Single and multi-baffles

Definition: Baffles are barriers to contain bullets, and when installed in multiple sets, may also re-direct or suppress sound waves produced when bullets are fired.

Purpose: Baffles are placed overhead and in front of a firing line, to restrict and interrupt the travel of errant bullets. Errant bullets are usually the result of a misfire, or when a shooter loses control of the direction of the muzzle of a firearm. The latter usually only occurs when using an automatic firearm, implying either military or law enforcement training or use on a range.

Key Elements to Consider/Alternatives: Baffles are expensive to install or otherwise maintain. Usual construction materials used include high-tensile steel and concrete for a single baffle, or combinations of treated plywood forms with pea gravel and treated timbers or steel uprights.

What Do You Have at Your Range? Or, what do you do at your range?

Notes:



Single baffle bullet deflection

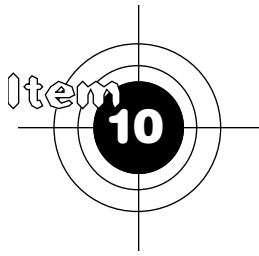


Top view, and...



Front view of another baffle style

Single & multi-baffles



Sound abatement measures

Definition: A muffled firing line is, as implied, a firing line that has one or more design features installed at it, to reduce or re-direct sound waves, thereby reducing the impulsive noise levels heard off range. Muffling can either be installed on a large scale, or, for individual firearms.

Purpose: Muffling at a firing line is installed to suppress and re-direct the sound emitted from a firearm discharge.

Key Elements to Consider/Alternatives: Range operators have to determine if this degree of sound suppression or reduction is necessary. This is usually based on the proximity of residential development [and subsequent noise complaints] to the range. Cost may also be a factor, since construction of concrete block houses or installation of large-sized concrete culverts are the large-scaled methods witnessed in Minnesota. The individual firearm mufflers recommended by the U.S. Army Corps of Engineers are not manufactured on a large-scale at the time of this writing, but have been constructed on an experimental basis. The details for these can be pulled off the website shown in the reference section of this document.

What Do You Have at Your Range? If sound reduction is an issue that needs to be addressed at your facility, then consider installing one or more form of muffling devices.

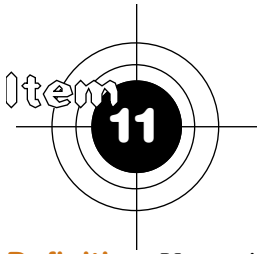
Notes:





Sound mufflers - 2 perspectives





Vegetative Buffer Plantings for Sound Absorption/Suppression & Visual Block

Definition: Vegetation that is planted to absorb, block or re-direct the muzzle blast sounds emitted from a firearm being shot at a shooting range.

Purpose: Sound emitted from a firearm is considered to be impulsive by its nature. Impulsive sounds, of any kind, from any source, may be found offensive. Most state and local noise laws, rules and ordinances focus attention on industrial noise levels, of a continuous duration. These are not similar to the sounds emitted from a shooting range, but a pro-active range operator should consider installation of vegetative plantings, in combination with other devices, in order to reduce off-property sound levels. Not only is installing the planting a demonstration of a “good neighbor” attitude, if installed properly it will provide sound abatement benefits throughout the year. Also, some ranges are in plain sight of roadways. These tend to create calls of complaint from concerned citizens, who perceive that the range either creates a threat to their safety, or they made to feel uneasy. A vegetative buffer planted as a hedge can eliminate this situation from occurring.

Key Elements to Consider/Alternatives: Distance away from a shooting range is ideal way to dissipate sound from the range, as well as eliminating a visual image of range use. However, most ranges operate in a less than ideal setting, many with residential development moving ever closer to the range. Space available for a planting inside the borders of the range that can be used for a vegetative planting becomes the most important element, when one considers what to plant.

Rather than to consider planting the proverbial “single row of pine or spruce” and calling it even, the best vegetative buffer would be a combination of native grasses and trees that are matched to the soil type found on the range perimeter. Multiple rows of different species of trees, planted similar to a windbreak or shelterbelt are recommended. With a mixture of heights, growth quickness and a combination of conifer and deciduous species, both a sight and sound buffer can be created to effectively block noise levels emitted from the range. Another alternative would be to plant two cycles of rapidly growing hybrid poplar, half of which can be harvested at a time as a bio-energy source, also providing the range with income.

What Do You Have at Your Range? If your range is within sight or sound of nearby residences, planting a properly designed buffer will help to keep the sights and sounds made at the range inside, also keeping nearby residents happy.

Notes:

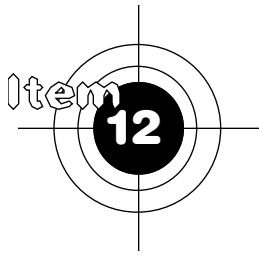
Notes continued:



Vegetative buffers - 2 perspectives



Vegetative buffer plantings;



Gating/Fencing

Definition: Fencing is the upright barrier that, once installed, serves as a barrier to range entry except through a designated point. Gating is the entrance through the fence at the designated ingress-egress point. Some ranges have terrain around their entrance that can prevent outside entry. Other range operators have to fence the entire perimeter of their property.

Purpose: Fences and gates at shooting ranges control access to the range. Virtually every shooting range is required to possess liability insurance, whether operating as a commercial business or a non-profit entity, in the event that there is an injury on a range facility. To go along with that liability protection, each range operator's responsibility is to maintain a level of security at their range, protecting their investment, keeping out vandals, also limiting operating hours and range safety. If operating hours are violated, this could result in range closure, so a limit to access ensures both the safety of the range, and neighbors of the facility..

Key Elements to Consider/Alternatives: Cyclone fencing is probably the most widely used type of fence. Some groups install barbwire strands above the cyclone fence, as an added measure of security. Local zoning requirements or restrictions, or statutory limitations may be in place that will dictate which type(s) of fencing alternatives to consider. Consultation with legal counsel should be sought, to determine what an operator can or cannot consider for installation.

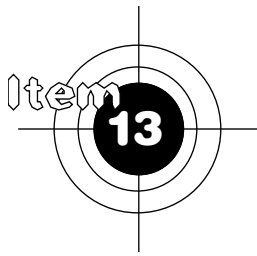
Regarding gates, there are a variety of gates and gate designs, including swing gates, and those operating on a slides or rollers. As with other measures, the decision of what type of fence to install, and how much fencing is needed is as much a function of the level of security needed, and overall cost to install and maintain the fence.

What Do You Have at Your Range? If you cannot control access and entry at your facility, then a fence and gate would be a good investment for safe operation.

Notes:



A gate



Accessibility, including parking

Definition: Accessibility describes providing the opportunity to participate in shooting sports for individuals with various degrees of disabilities.

Purpose: To provide access to all of the facilities at a shooting range. As witnessed by the levels of interest in programs such as the NRA's Disabled Shooting Sports Program, there are many disabled shooters throughout the United States participating in the shooting sports. The more improvements made to accommodate these shooters, the better.

Key Elements to Consider/Alternatives: Each range will be developed to a certain level. Some are very primitive in their construction, with little in the way of amenities available to the shooter past a bench rest, target stand and sand bags, while others are relatively lavish in the accommodations provided. Ranges with few or no access improvements made should, at the very least, be willing to make provisions for disabled shooters if disabled shooters are using the facility, or will do so in the future, so that when the disabled shooter comes to use the facility, they can do so without difficulty. Some ranges have no running water, and are using portable toilets-these should be ramped, have an entry width wide enough for wheelchair entrance, and not have an inaccessible lip or threshold at the entrance.

Complying with the Americans with Disabilities Act (ADA), all publicly funded shooting range facilities are required to be developed with a variety of features installed to provide access for all people. Likewise, other range operators participating in shooting range grant programs are also encouraged, if not required, to make improvements or new construction implementing access improvements. Retrofitting existing facilities is also a consideration, as many of the range operators constructed their facilities long before access was given due consideration. Among the items to be considered for improvement or retrofitting, are the following:

- Parking (designated disabled parking spaces, well graded or paved parking areas)
- Access paths (ample width, well graded or paved, with turn-around or resting areas, curbs)
- Building entrances (ramps, door widths, thresholds)
- Interior doors (with proper width, handle heights)
- Interior public areas (counter top heights, turn around areas, materials within reach, flooring that permits full access, drinking fountain within reach)
- Bathrooms (door openings, entry area with ample space, transfer stations with grab bar, ample width, turn around areas, sink height, lever handles).

Alternatives to the provision of unlimited range access should be considered as short-term solutions only, with an ultimate goal of retrofitting or building new facilities that are fully accessible being an ultimate goal, with a real-time timetable for improvements.

What Do You Have at Your Range? The list shown above is by no means all-inclusive. More detailed specifications and standards exist that are available and should be considered when either new construction or re-modeling is to be done on a range.

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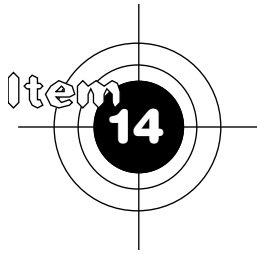


An access path



A parking lot

Accessibility, including parking



Wetland considerations

Definition: Federal and state laws are in place to protect wetland types.

Purpose: To ensure that shooting range development is done in areas that do not contain land protected by wetland conservation laws.

Key Elements to Consider/Alternatives: Wetland conservation laws protect a variety of wetland types, some of which may be in upland areas. The best and easiest way to guarantee that wetland areas are not disturbed by range development is through a site review/walk through prior to range development, with the local administrators of wetland conservation law. This is usually the county zoning office, or the local soil and water conservation district.

Another aspect of wetland consideration is that a range operator may have wetlands on the property that can either be opened up, through dredging, to provide open water and nesting habitat for waterfowl, or have a water flow controlling device installed to back water up, to achieve the same result. Conservation planning, working with either the Natural Resource Conservation Service, local SWCD or the U.S. Fish & Wildlife Service can help to determine if the potential for wetland enhancement work is possible at a range.

The last wetland consideration at a shooting range involves the deposit of lead shot into wetland areas. Various studies have determined that lead shot into open water wetland or lake areas is likely to be ingested by ducks, geese and other migratory waterfowl. Lead is toxic, and its deposition into open water lakes and wetlands should be avoided to reduce the possibility of ingestion by waterfowl and other wildlife.

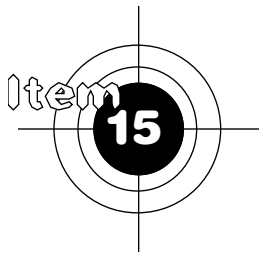
What Do You Have at Your Range? With the on-going protection of wetlands of all types being at the core of American conservation, range operators with soil, vegetation and space lending itself to wetland development or protection should do so, working through local offices.

Notes:

Notes continued:



A wetland view



Erosion and erosion control

Definition: Erosion is the displacement of soil by wind and primarily water. Erosion control or prevention is generally accomplished through installation of one or a combination of measures or practices intended to prevent soil movement and displacement.

Purpose: Erosion on a shooting range usually occurs when a backstop or side berm is left exposed following construction. Rain and wind act on exposed soil, causing sheet and rill erosion. Erosion is largely preventable, if proper steps are taken, such as installing netting, mulch, the correct seed mix and fertilizer on the exposed soil surface immediately after final shaping of the berm is completed. Once soil erosion begins, its prevention/elimination may only be accomplished through starting over on a project site. The proverbial ounce of prevention through planning to prevent erosion is worth the effort.

Key Elements to Consider/Alternatives: Minnesota has made it mandatory for any group or operator choosing to participate in the Shooting Range Grant Program to contact their local soil and water conservation district, in order to have an erosion control plan done and ready to implement prior to construction, so that the potential for erosion is minimized.

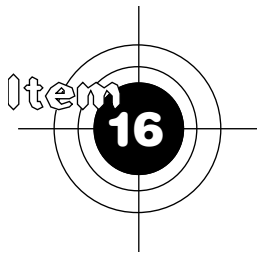
What Do You Have at Your Range? Once started, erosion is an on-going problem. Most range operators have a positive attitude toward, and participate in natural resource conservation. If you do have an erosion problem, there is likely an engineering practice that can be used to address erosion, which will provide the added benefit of improving or maintaining local water quality.

Notes:



Three views of erosion, out of control





Ecologically sound planting/vegetation at ranges

Definition: Ecologically sound plantings means to use as many native species, such as prairie grasses, shrubs and trees when re-vegetating areas that are disturbed, and then graded, shaped and sloped due to construction of berms, backstops and other areas that are disturbed through construction. “Ecologically sound” also refers to trying to avoid planting only species such as spruce and pine species in a monoculture whenever possible. Fit your planting to the local conditions, both in terms of using native plant materials, and keep in mind what the final, mature plant, tree or shrub will look like.

Purpose: Native species of all types of vegetation that are matched to a given location will provide the best form of erosion control on a shooting range. A new planting should be done using a seed species or a mixture that takes into account the soil type, sunlight and moisture levels (i.e. both depth to groundwater and amount of annual precipitation). In addition, use of native species plantings will help to attract wildlife to the range. In more rural areas, shooting ranges are able to provide habitat to a wide variety of species, including those on the threatened and endangered species list. In urban and suburban settings, ranges provide an oasis of sanctuary and habitat for species capable of living in close proximity to residences.

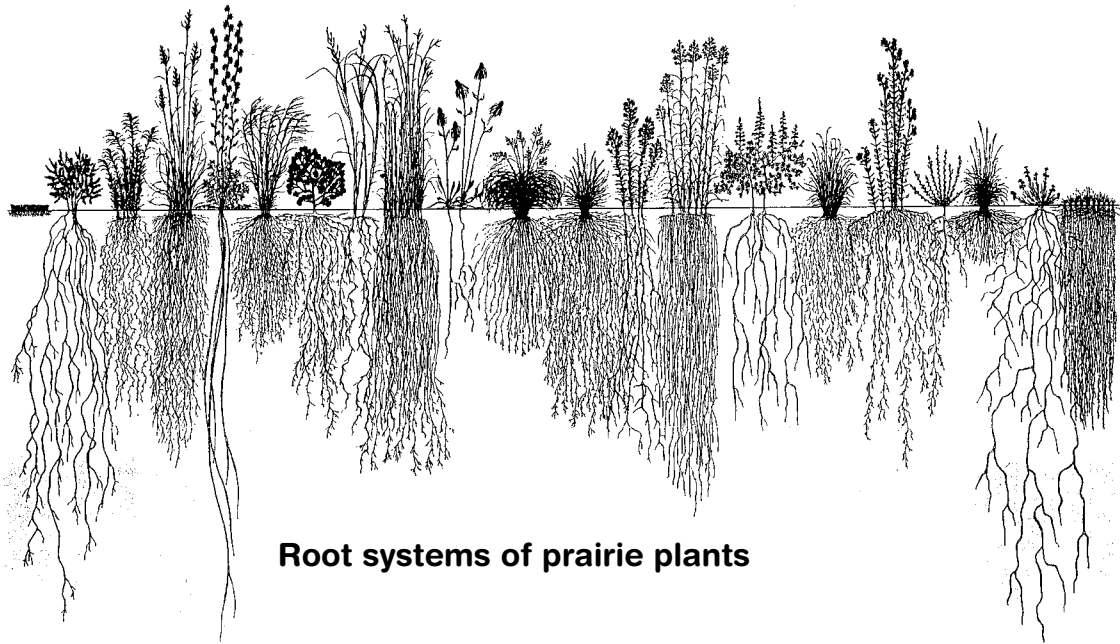
Tree and shrub species planted at a range should also be native species, taking into consideration what their function might be (aesthetic versus a hedge to provide a sound and sight buffer), and what the final form of the species will be as it matures.

Key Elements to Consider/Alternatives: In Minnesota, the Legislative Commission on Minnesota Resources (LCMR) has provided matching funds for shooting range improvements. LCMR required that native species be used, when and where possible, on sites where re-vegetation is necessary. This requirement is applicable in most cases, but not all (e.g., when a cool season exotic grass species such as crown vetch is the better thing to use versus a native warm season grass that will not grow in the northern MN latitude). The Natural Resource Conservation Service Tech Guide IV standard on re-vegetation provides a good set of alternative seeding mixes that include both native and non-native species. An NRCS staff member should be available at each SWCD office.

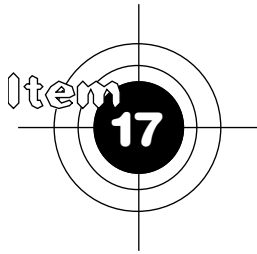
Minnesota DNR can provide landowners with some species of tree and shrub seedlings that are grown in state nurseries. Orders for these plant materials are taken starting in the fall of each year, with orders filled in late March to early April the following spring. A variety of commercial sources of native plant providers, as well as landscaping firms, and arborists can also be contacted to provide native trees and shrubs. Care should be taken when purchasing trees and shrubs, to make sure they originate from the same hardiness zone the range is located in, so that they can survive the local climate.

What Do You Have at Your Range? Native plantings, as well as introduced perennial grasses need periodic maintenance, which may include re-seeding, fertilizing and prescribed burning. If you have a newly built or existing range, a planned timetable of maintenance is recommended to ensure that the planting’s vigor is maintained, and erosion is prevented.

Notes:



The vegetation pictured shows a warm-season prairie planting mixture, tailored to this site. Information for it is described in the Natural Resource Conservation Service's *Conservation Practice 643, Restoration and Management of Declining Habitat*.



Educational Shooting Ranges: Five-stand and .22 caliber range set-ups for women & youth use/training

Definition: Educational shooting ranges are those that are built with an intent being to provide training to shooters. Two of the common types of ranges constructed for educational purposes are .22 ranges, and a five-stand trap shooting range.

Purpose: Educational shooting ranges are those that are built with their main intent being to provide training to shooters, enabling them to develop proper safety habits and shooting skills. The .22 caliber range is generally from 25 to 50 yards in length, and is the preferred range to use by Firearm Safety instructors to instruct, test and train youth shooters attending certification training classes. The five-stand is basically that: five shooting stations, each with their own platform to stand on, and an area between two uprights to swing a shotgun barrel through, as the shooter leads, shoots, and follows through, while shooting at a clay target. Five-stand ranges have a series of trap throwers in either fixed or portable trap houses, that are positioned around the five-stand's perimeter. The different throwers are used to simulate travel patterns of various species of waterfowl, upland game and small game. Experiencing these flying and running targets in a training setting will give the person shooting the ability to carry over that experience to a field setting. Cleaner kills, less lost and crippled wildlife, and more confident shooters of all ages can result by going through a five-stand session.

Key Elements to Consider/Alternatives: Although longer distance ranges can also be used for this same purpose, .22 caliber ranges that can be used for other purposes, such as year-round biathlon training are easy to site and put into place, based on the lesser sound emitted by a .22 firearm, the lesser range layout distance needed, and the lesser maximum distance a .22 caliber round is likely to travel downrange.

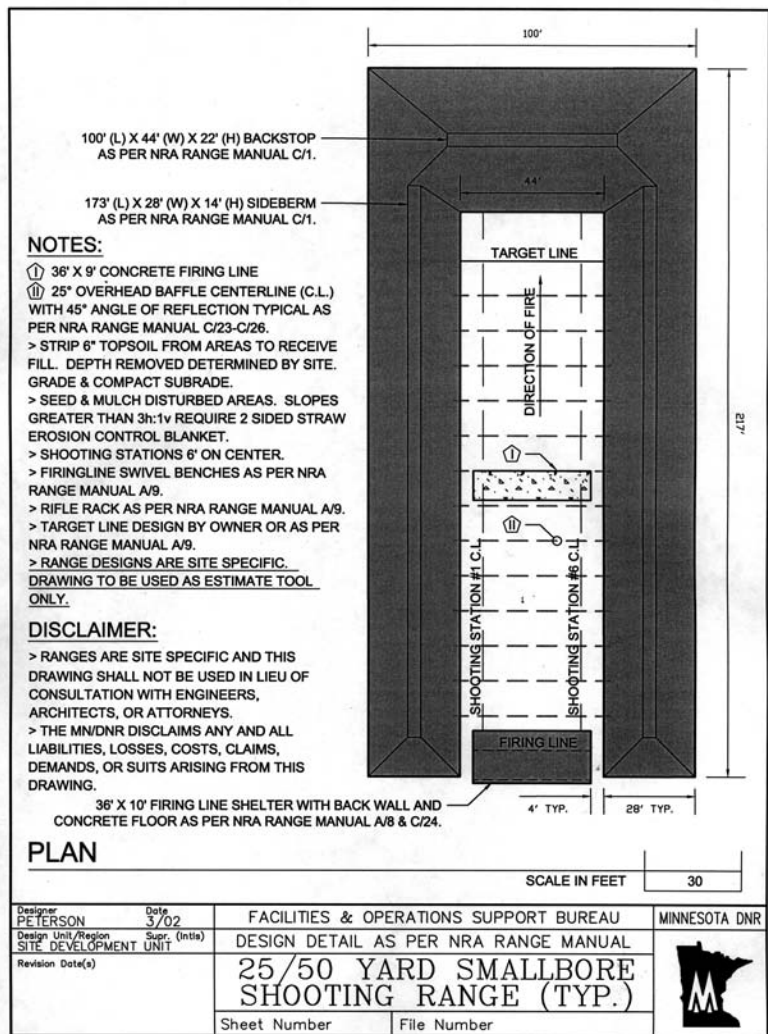
For a five-stand facility, placing the stand on the top of a small ravine or hillside is ideal, in that the variety of throwers used will require being placed at various elevations above and below the five-stand platform. However, construction in a level surface area can also be done.

What Do You Have at Your Range? If you have youth groups that offer firearm safety or competitive shooting, that are affiliated with organizations such as 4-H, FFA, Boy Scouts or, have a large number of firearm safety instructor users and/or members of your range group, consideration should be given to building a range dedicated to .22 caliber use, and/or a five-stand shooting platform. Organizations such as Becoming an Outdoors Woman (BOW) and Women in the Outdoors are organizations that can benefit from building either facility.

Notes:



A five-stand set-up



Where To Go for Further Assistance:

Best Management Practices for Lead at Outdoor Shooting Ranges, January 2, 2001. U.S. Environmental Protection Agency, Region 2 Office, New York, NY. Also available on-line at: <http://www.epa.gov/region2/waste/leadshot>

Tech Guide IV, Conservation Practices. Natural Resource Conservation Service. Available on-line at: <http://www.mn.nrcs.usda.gov>. Each state has its own individual practice listings.

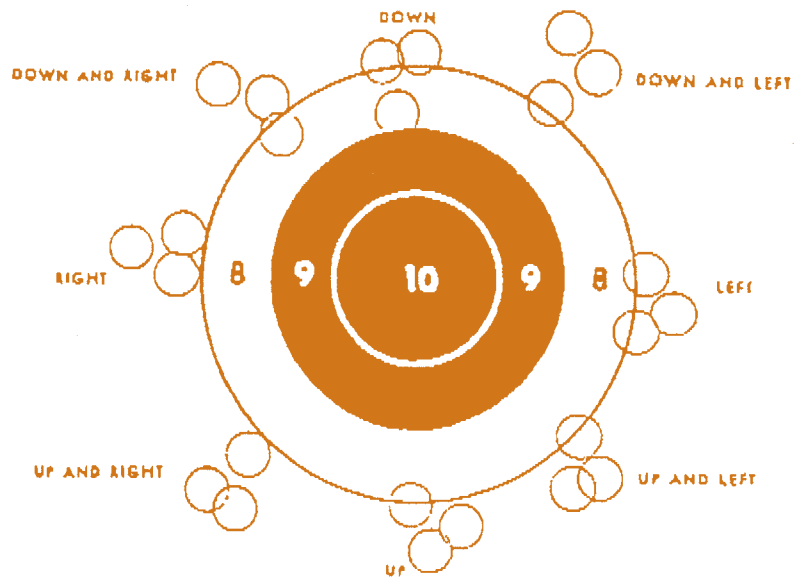
National Rifle Association Source Book: A guide to Planning & Construction, available through the National Rifle Association's Range Technical Team, and on-line at: <http://www.nra.org>

Facility Development Series Set, volumes 1-11. National Shooting Sports Foundation, Facility Development Division, 11 Mile Hill Road, Newtown, CT 06470-2359

Local Zoning Regulations and/or Ordinances: Check with local units of government, from county, city and township levels, dependent on the jurisdiction where the range site is located.

Soil erosion and local wetland protection information: contact the local soil & water conservation district (SWCD) office operating in the county where the range is located.

Notes



**For more information, contact:
Shooting Range Coordinator
DNR Division of Enforcement
(651) 297-2449**

Department of Natural Resources
500 Lafayette Road
St. Paul, MN 55155-4040
(651) 296-6157 (Metro Area)
1-888-MINNDNR (646-6367) (MN Toll Free)
www.dnr.state.mn.us

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