TODAY'S HUNTER & TRAPPER *in Pennsylvania*

PENNSYLVANIA GAME COMMISSION 1895

a guide to safe and responsible hunting and trapping

Welcome to Hunter-Trapper Education!

in Pennsylvania

This official training program will provide you with the knowledge and skills you need to be a safe and responsible hunter or trapper. The course is designed to meet the standards for hunter training established by the International Hunter Education Association (IHEA). Additional subjects are included to meet the needs of first-time hunters and trappers in Pennsylvania.

Be Smart! Be Safe! Be Responsible!

How to use this guide:

- ***Read each chapter!*** The chapters are organized to form building blocks of information. Each chapter will help you understand the information in the next chapters.
- ***Do the are YOU ON TARGET? exercises!*** In several of the chapters, you will find "On Target" exercises designed to help you learn important ideas and information.
- ***Answer the review questions!*** After studying a chapter, answer the review questions for that chapter. The review questions are located at the end of each chapter. To see how well you remembered the chapter's information, compare your answers to the correct answers found at the bottom of the chapter review page.
- ***Internet Available!*** This manual is also available online at **www.pgc.state.pa.us.**

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is online at

www.pgc.state.pa.us !

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Introduction to Hunter and Trapper Education

Objectives
Students will be able to...

- State the purpose and importance of hunter-trapper education programs.
- State how hunter education efforts are funded and supported.
- State three hunting-related projects that are funded through the Federal Aid in Wildlife Restoration Act.

INTERNATIONAL HUNTER EDUCATION ASSOCIATION
IHEA-USA
Responsible Hunting

International Hunter Education Association (IHEA-USA)

The organization's mission is to continue the heritage of hunting worldwide by developing safe, responsible, and knowledgeable hunters. Since its inception, IHEA-USA has made an effort to:

- *Serve as the primary resource for information on hunter education.*
- *Promote hunter education by providing opportunities for the exchange of ideas, knowledge, and experiences.*
- *Promote hunter education by supporting efforts among government agencies, organized groups, and industry.*
- *Uphold the image of hunting as a legitimate tool of wildlife management and as a recreational activity throughout North America.*
- *Promote programs which prevent hunting incidents.*
- *Support honesty, self-discipline, independence, responsible behavior, and good citizenship among hunters.*
- *Support constant improvement in hunter education programs.*
- *Fully involve volunteers and other associate members in all affairs of the International Hunter Education Association.*

WHY HUNTER/TRAPPER EDUCATION?

Hunting and trapping have been a part of Pennsylvania's rich history since the beginning of the Commonwealth. When Europeans arrived in 1610, they discovered an abundance of wildlife. Elk, deer, black bear, waterfowl, and even moose, along with predators such as wolves and mountain lions, roamed the mountains, swamps, and forests of the state. Settlers hunted and trapped for food and furs to survive in the "wilderness" that was Pennsylvania. This way of life was not taught in a classroom but was passed on by family members from one generation to the next.

It wasn't until 1959 that Pennsylvania provided any type of official training. The first courses were known as "safety courses" and were taken on a voluntary basis. By 2009, with hunter and trapper education mandatory, nearly 2,000,000 students have been certified.

How has this helped hunting and trapping in Pennsylvania? Since the beginning of hunter and trapper education programs, hunting fatalities and injuries from firearms have declined nearly 80 percent. It is the goal of this hunter and trapper education program to continue to produce safe, responsible, knowledgeable, and involved hunters and trappers in Pennsylvania.

HUNTER AND TRAPPER EDUCATION GOALS

The goal of hunter education is to help hunters and trappers become safe, responsible, knowledgeable, and involved because all of these qualities are necessary for the survival of hunting and trapping.

- **Safe**
  - Acting in a way that *does not cause* harm to self or others.
  - Hunting-related safety skills are gained through hands-on training and practice. It is most valuable to learn these skills from an experienced hunter.
- **Responsible**
  - Being *accountable* for one's actions.
  - A knowledgeable and skillful student of hunting will never be a true hunter unless he or she also behaves responsibly. Responsible behavior includes courtesy, respect of others and of wildlife, and being involved. Responsible hunters do not poach or act carelessly. Responsible hunters obey hunting laws, hunt fairly, practice safety rules, and wait for a clean kill before shooting. How you behave and how other people see you will determine hunting's future.
- **Knowledgeable**
  - Having knowledge or understanding of information gained through *experience.*
  - Knowledge is learning and understanding the basics of safe gun handling and hunting. Before being trained in the skill of firearm shooting, you should know how the firearm works and how to handle it safely.
- **Involved**
  - Being active as a *participant.*
  - Part of the process of becoming a true, responsible sportsman is becoming involved in efforts to make hunting a respected sport. That includes teaching others, working with landowners, and cooperating with wildlife conservation officers. It also includes joining conservation organizations, which will help preserve habitats and promote wildlife management.

HUNTER EDUCATION FUNDING AND SUPPORT

- **Federal Government**
  - U.S. Fish & Wildlife Service (**www.fws.gov**)
    - Manages Federal **Excise Tax** on sporting arms and ammunition
- **State Government**
  - Pennsylvania Game Commission (**www.pgc.state.pa.us**)
    - Sponsors and manages Hunter and Trapper Education programs
    - Managed by agency staff
    - Taught by volunteer instructors
- **National Hunter Education Organizations**
  - International Hunter Education Association (IHEA-USA) (**www.ihea.com**) and National Bowhunter Education Foundation (NBEF) (**www.nbef.org**)
    - Develop national hunter/bowhunter education standards
    - Support programs and provide instructor training
- **Conservation & Non-Government Organizations**
  - Provide some financial support
- **Industry**
  - Provides some financial and material support

Pittman-Robertson Act

- *The Federal Aid in Wildlife Restoration Act, popularly known as the Pittman-Robertson Act, was approved by Congress in 1937. The Act provides funding for the selection, restoration, and improvement of wildlife habitat, and for wildlife management research. The Act was changed in 1970 to include funding for hunter education programs and for the development and operation of public target ranges.*
- *Funds for the Act come from an 11% federal excise tax on sporting arms, ammunition, and archery equipment, and a 10% tax on handguns. One-half of the excise tax on handguns and archery equipment is used for hunter education and target ranges. These funds are collected from the manufacturers and distributed each year to the states and territorial areas by the Department of the Interior.*
- *Each state's amount of the federal funds is based on the area of the state and the number of licensed hunters in the state. The state covers the full amount of an approved project and then applies for reimbursement through federal aid for up to 75% of the project's expenses; the state is responsible for the other 25% of the project's cost.*

KEYWords

excise tax:
A federal tax paid by manufacturers of certain products before they are sold to the public

Taxable Items

Arms and Ammunition

10% Excise Tax

- *Pistols*
- *Revolvers*

11% Excise Tax

- *Firearms (other than pistols and revolvers)*
- *Rifles (all types)*
- *Shotguns and combination guns (all types)*
- *Shells*
- *Cartridges*
- *Parts/accessories*
- *Component parts for shells/cartridges sold as a kit*
- *Bows*
- *Crossbows*

Archery Equipment

- *Arrows and bolts (shafts, nocks, vanes, and points)*
- *Quivers*
- *Parts and accessories*
  - *Handles, handle sections, grips, limbs, levels, stabilizers, sights and sight extensions, slings, silencers, covers, kisser buttons, nocking points, releases, string holders, and keepers*

- Local Clubs and Organizations
  - Host classes
  - Provide some financial and material support
  - Many volunteer instructors are members of these clubs and organizations

In the space next to each word, explain why it is important to be a safe, knowledgeable, responsible, and involved hunter or trapper.

Safe:

Knowledgeable:

Responsible:

Involved:

On Target Exercise Answers

Safe: *Acting in a way that does not cause harm to self or others. • Hunting-related safety skills are gained through hands-on training and practice. It is most valuable to learn these skills from an experienced hunter.*

Responsible: *Being accountable for one's actions. • A knowledgeable and skillful student of hunting will never be a true hunter unless he or she also behaves responsibly. Responsible behavior includes courtesy, respect of others and of wildlife, and being involved. Responsible hunters do not poach or act carelessly. Responsible hunters obey hunting laws, hunt fairly, practice safety rules, and wait for a clean kill before shooting. How you behave and how other people see you will determine hunting's future.*

Knowledgeable: *Having knowledge or understanding of information gained through experience. • Knowledge is learning and understanding the basics of safe gun handling and hunting. Before being trained in the skill of firearm shooting, you should know how the firearm works and how to handle it safely.*

Involved: *Being active as a participant. • Part of the process of becoming a true, responsible sportsman is becoming involved in efforts to make hunting a respected sport. That includes teaching others, working with landowners, and cooperating with wildlife conservation officers. It also includes joining conservation organizations, which will help preserve habitats and promote wildlife management.*

Chapter Review Exercise

1. A primary goal of hunter and trapper education programs is to ____.
   a. give every hunter the same amount of skill and knowledge.
   b. make sure that everyone enjoys hunting and has an opportunity to hunt.
   c. produce safe, responsible, knowledgeable, and involved hunters and trappers.
   d. none of the above.
2. Which of these is *not* a source of hunter education support?
   a. State highway departments
   b. State wildlife agencies
   c. International Hunter Education Association
   d. U.S. Fish & Wildlife Service
3. Name three hunting-related projects for which the Federal Aid in Wildlife Restoration Act (Pittman-Robertson Act) provides funding.
   i. _____
   ii. _____
   iii. _____
4. How does state government support the Hunter/Trapper Education program in Pennsylvania?
   i. _____
   ii. _____
   iii. _____

Chapter Review Answers

1. c 2. a 3. Any three of the following: i. Habitat selection, restoration, and improvement. ii. Wildlife management research. iii. Hunter education. iv. Development and operation of public target ranges. 4. i. Sponsored and administered by Pennsylvania Game Commission. ii. Managed by agency staff. iii. Taught by volunteer instructors.

Be a Responsible and Ethical Hunter

Objectives
Students will be able to...

- Give three reasons for the existence of hunting and trapping laws.
- Define the words responsible, respect, and ethics.
- Recognize there are more non-hunters than hunters and explain how non-hunters can influence public attitude and policy about hunting.
- List and define five words that describe a responsible hunter.
- List three actions hunters can demonstrate to present a positive public image.
- Give three examples of how to get involved in making hunting a respected sport.
- Recognize the difference between responsible and irresponsible decisions when faced by dilemmas. *(To be completed at skills training.)*
- Demonstrate knowledge of hunting and trapping laws and regulations. *(To be completed at skills training.)*
- Locate hunting and trapping laws in the *Pennsylvania Digest of Hunting and Trapping Regulations. (To be completed at skills training.)*

Know the Law

Not knowing hunting laws is not a valid excuse for violating them. It is the hunter's responsibility to review state game laws before the hunting season.

Remember...

A large amount of funding for wildlife management comes from the purchase of licenses, which annually raises millions of dollars.

How Hunting Laws Are Passed

In most states, a wildlife management agency sets hunting regulations. These agencies will have regular meetings where the public can voice their concerns and make suggestions. Hunters wishing to propose changes to the regulations should participate in these meetings or join a hunting organization that meets with the agency.

WHY DO WE HAVE HUNTING LAWS?

During the 19th century, many game animals were nearly hunted into extinction. The thundering herds of buffalo that once roamed the plains were reduced to about 800 animals. The beaver was almost wiped out. Once plentiful elk, deer, and pronghorn had been reduced to a fraction of their original numbers.

Resource Conservation

To conserve wildlife for future generations to enjoy, wildlife management laws were passed. These laws allow game to flourish by:

- Setting hunting seasons that limit harvesting and avoid nesting and mating seasons.
- Limiting hunting methods and equipment.
- Setting "bag" limits on the number of animals that can be taken.
- Setting up check stations and game tag requirements to enforce laws.
- Creating enough funding for wildlife programs by collecting license fees.

Public Safety

- In addition to making sure game is available for future generations, hunting laws create safety guidelines for hunting that protect both hunters and non-hunters.

Equal Opportunity

- Hunting laws offer equal opportunity for all hunters, whether they use modern firearms, muzzleloaders, or bows.

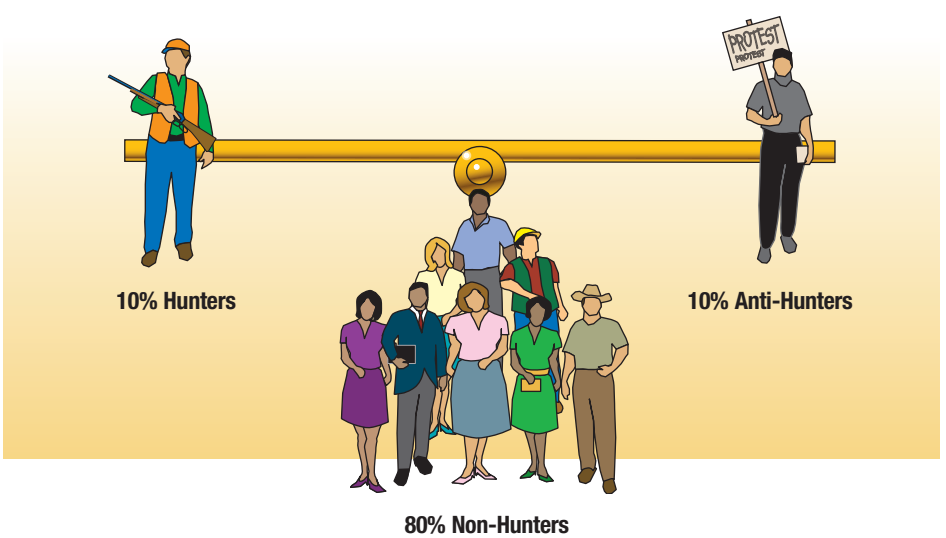
Fair Chase

- Hunting laws also define the rules of fair chase. The idea began in the Middle Ages when hunters increased the challenge of sport hunting by setting rules that limited how they took game.
- More recently, fair chase rules were developed to lessen public criticism of hunters. One of the earliest models was the "Fair Chase Principle" established in the late 1800s by the Boone and Crockett Club, which was founded by Theodore Roosevelt. Those who broke club rules were removed.
- The rules were later expanded, banning the use of vehicles, airplanes, radios, electronic calling, or shooting in a fenced-in area. Many states have made those rules into law.

HUNTING IN THE PUBLIC EYE

Responsible hunters welcome laws that enforce sportsmanlike hunting practices because the behavior of irresponsible hunters has caused some people to oppose hunting. Did you know:

- Nationally, about five percent of the population hunts, and roughly the same percentage actively opposes hunting. The rest of the population is mostly neutral. However, bad behavior by hunters could change some of the neutral crowd into the anti-hunting camp.
- There is a growing concern among hunters that the future of the sport may be in trouble because of the attitudes and conduct of irresponsible hunters. The main reason for anti-hunting beliefs is that some hunters fail to behave responsibly in the presence of those who don't hunt. The image hunters project can greatly influence public opinion.
- Pennsylvania has a population of over 12 million people, according to the most recent census information. The Pennsylvania Game Commission sells slightly more than one million hunting licenses annually, which is an indicator of the number of active hunters in the state. An equal number of Pennsylvanians are estimated to be anti-hunting. From this simplified data, we can make a model of the Keystone State's population that looks like this:



The seesaw represents the total population of Pennsylvania. On one side are hunters, and on the other are anti-hunters. The center or balance point is the non-hunting public. The position of the non-hunting public determines if there is balance or not.

KEYWords

responsible:
To be accountable for your actions

How To Behave If Confronted by Anti-Hunter Protesters

- *Remain calm and polite, and do not engage in arguments—never lose your temper.*
- *Never touch an anti-hunter or use any physical force, and especially* ***never threaten an anti-hunter with your firearm****.*
- *Report hunter harassment to law enforcement authorities. If possible, record the vehicle license number of the harassers.*

Landowner Complaints About Hunters

- *Don't get permission to hunt.*
- *Don't tell the landowners when they arrive at or leave the property.*
- *Make too much noise.*
- *Leave litter behind.*
- *Carry loaded firearms in vehicles.*
- *Drive off the farm roads.*
- *Don't leave gates as they were (open or shut) when the hunter arrived.*
- *Shoot too close to neighbors or livestock.*
- *Leave fires unattended.*
- *Violate game laws.*
- *Drink too much alcohol.*

KEYWords

ethics:
Moral principles or values that distinguish between right and wrong; they are unwritten rules that society expects to be followed

respect:
To give high or special regard to something

Remember...

Hunting is a privilege and can be taken away if hunters fail to act responsibly.

HUNTER ETHICS

- While hunting laws preserve wildlife, **ethics** preserve the hunter's opportunity to hunt. Because ethics generally guide behavior that affects public opinion of hunters, ethical behavior makes sure that hunters are welcome and hunting areas stay open.
- Ethics generally cover behavior that has to do with issues of fairness, **respect**, and responsibility not covered by laws. For instance, it's not illegal to be rude to a landowner when hunting on his or her property or to be careless and fail to close a pasture gate after opening it, but most hunters agree that rude and irresponsible behavior is unethical.
- Then there are ethical issues that are just between the hunter and nature. For example, an animal appears beyond a hunter's effective range for a clean kill. Should the hunter take the shot anyway and hope to get lucky? Ethical hunters would say no.

Present a Positive Image

As Aldo Leopold, the "father of wildlife management," once said, "Ethical behavior is doing the right thing when no one else is watching—even when doing the wrong thing is legal."

The ethical code hunters use today has been developed by sportsmen over time. Most hunting organizations agree that responsible hunters do the following.

- **Respect Natural Resources**
  - Leave the land better than you found it.
  - Follow fair chase rules.
  - Know your capabilities and limitations as a marksman, and stay within your effective range.
  - Try for a quick, clean kill.
  - Make sure that meat and usable parts are not wasted.
  - Treat both game and non-game animals ethically.
  - Follow game laws and regulations.
  - Cooperate with conservation officers.
  - Report game violations.

Respect Other Hunters

- Follow safe firearm handling practices, and insist your companions do the same.
- Do not interfere with another's hunt.
- Avoid consuming alcohol, which can slow your reactions to the point of endangering others.
- Share your knowledge and skills with others.

Respect Landowners

- Ask landowners for permission to hunt.
- Follow their rules about when and where you may hunt.
- Treat livestock and crops as your own.
- Offer to share a part of your harvest with the owner.
- Leave *all* gates the way you found them.
- If you notice something wrong or out of place, notify the landowner immediately.
- Never enter private land that is cultivated or posted, unless you have obtained permission first.

Respect Non-Hunters

- Transport animals with respect—don't display them.
- Keep firearms out of sight.
- Refrain from taking graphic photographs of the kill and from describing the kill in detail while within earshot of non-hunters.
- Maintain a presentable appearance while on the street—no bloody or dirty clothing.
- Be a respected and active citizen in your community.

Getting Involved

- Part of the process of becoming a true, responsible sportsman is becoming involved in efforts to make hunting a respected sport. That includes teaching proper knowledge and skills to others, working with landowners, and cooperating with wildlife officials.
- It also includes joining conservation organizations dedicated to improving habitat and management efforts. Young hunters can be involved by joining organizations such as 4-H, Boy Scouts, and Girl Scouts, as well as participating in wildlife projects in their local communities.
- Responsible, ethical behavior and personal involvement are both important to the survival of hunting. How you behave and how other people see you will determine whether hunting will continue as a sport.

The Five Stages of Hunter Development

It should be the goal of every responsible hunter to become a true sportsman.

As a hunter gains experience and skill, studies have shown that he or she will typically pass through five distinct stages of development. Keep in mind, however, that not everyone passes through all of these stages, nor do they necessarily do it in the same order.

1. Shooting Stage

The priority is getting off a shot, rather than patiently waiting for a good shot.

2. Limiting-Out Stage

Success is determined by bagging the limit. In extreme cases, this need to limit out also can cause hunters to take unsafe shots.

3. Trophy Stage

The hunter is selective and judges success by quality rather than quantity. Typically, the focus is on big game.

4. Method Stage

In this stage, the process of hunting becomes the focus. A hunter may still want to limit out but places a higher priority on how it's accomplished.

5. Sportsman Stage

Success is measured by the total experience—the appreciation of the out-of-doors and the animal being hunted, the process of the hunt, and the companionship of other hunters.

Hunter's Dilemma

A dilemma is a difficult situation th often has several diffe ent solutions, some better than others. Below are two examples of possible situations that hunters could encounter while in the field. Try to come up with three solutions for each, and write them on the lines beside each dilemma. Then ci cle the one that you think is the better solution. Use the following questions to guide you to a solution.

- What responsibility do you have to other hunters?
- What responsibility do you have to the wildlife resource?
- What responsibility do you have to the landowner?
- What impact do you think your decision could have on public opinion about hunting?
- Is there more than one solution? What could they be?

Dilemma #1

You're bowhunting when a nice buck walks by your tree stand, stops at about 15 yards, and quarters away. You make a great shot in the vital area of the rib cage. The deer takes only six mo e quick steps before dropping dead! You wait long enough to be sure he's finished. You climb down from your stand, approach the animal, and begin to admire the first deer you have ever taken with a bow. At that instant, another bowhunter runs toward you with a bloody arrow in his hand yelling, "Tha 's my deer!"
What would you do?

Dilemma #2

This is our first time duck hunting, and you are with a friend that never comes home "empty-handed." As you walk toward a pond that your friend says is a hot spot, you notice several ducks swimming. You and your friend sneak up to the water's edge, but the birds don't fl . Your friend says "Let's get 'em," stands, and begins firing at the ducks still swimming on the pond.
You would …

Chapter Review Exercise

1. Which of these was *not* a reason for making hunting laws?
   a. to limit hunting methods and equipment
   b. to limit the profits of sporting goods manufacturers
   c. to set rules on how hunters take game
   d. to limit harvesting and avoid hunting during nesting and mating seasons
2. A responsible and ethical hunter would *not* ____.
   a. waste meat and usable parts of the game harvested.
   b. try for a quick, clean kill.
   c. leave the land better than he or she found it.
   d. follow game laws and regulations.
3. Responsible hunters ____.
   a. use land without asking permission from the landowner.
   b. keep firearms out of sight when not hunting.
   c. draw attention to themselves by wearing bloody or dirty hunting clothes when it's not necessary.
   d. unnecessarily harass or frighten livestock.
4. Non-hunters make up ____% of Pennsylvania's population.
5. _____ are moral principles or values that distinguish between right and wrong.
6. List three things you can do to become more involved in making hunting a responsible sport.

   i. _____

   ii. _____

   iii. _____

Dilemma #1

_____

_____

_____

_____

_____

_____

Dilemma #2

_____

_____

_____

_____

_____

_____

Chapter Review Answers

1. b 2. a 3. b 4. 90% 5. Ethics 6. i. Teach skills to others ii. Join a conservation organization iii. Join 4-H or Scouts iv. Participate in wildlife projects

Know Your Firearm Equipment

Objectives *Students will be able to...*

- Explain and demonstrate the five primary rules of firearm safety.
- Identify the basic parts of a firearm and explain their purpose.
- Identify six types of firearm actions.
- Explain the differences between rifles, shotguns, and handguns.
- Identify the basic parts of ammunition.
- Explain how to transport firearms safely.
- Explain how to store a firearm properly.

PRIMARY FIREARM SAFETY RULES

When using a firearm, be sure to follow the five primary safety rules. You can remember these rules by thinking **S.M.A.R.T.:**

- **S*afe Direction:*** Keep your firearm pointed in a safe direction at all times.
- **M*ake Sure:*** Positively identify your target.
- **A*lways Check:*** Know what's beyond your target before shooting.
- **R*espect Firearms:*** Treat all firearms as if they are loaded.
- **T*rigger Caution:*** Don't touch the trigger until you're ready to shoot.

WHAT IS A FIREARM?

Since firearms were invented around 500 years ago, there have been many changes and modifications that have increased their performance and durability. Although modern firearms only slightly resemble their earlier firearms, they basically function the same: a projectile is pushed down the barrel by pressure created from burning powder.

You must know the main parts of modern firearms and ammunition in order to participate safely in hunting and trapping activities. Hunters or trappers who do not understand how firearms work may injure or kill themselves or others.

A firearm is a mechanical device that uses pressure from a burning powder to force a projectile through and out of a metal tube. To understand fully the importance of firearm safety, you must first know how firearms work. This includes knowing the parts of the firearm, the types of ammunition, how ammunition is fired, and the ranges of the various firearms used for hunting.

Basic Parts of a Firearm

Although firearms have changed a great deal since they were first invented, the terms used for their parts have changed very little. All modern firearms have three basic groups of parts.

- **Action:** The action is the heart of the firearm—the moving parts that load, unload, fire, and eject the shells or cartridges. Several types of actions are used in modern firearms. Muzzleloaders have locks instead of actions.
- **Stock:** The stock serves as the handle of the firearm. It can be made of one or two pieces and is usually made of wood or a synthetic material.
- **Barrel:** The barrel is the metal tube that the projectile travels through (bullets travel through the barrel of rifles and handguns; shot travels through the barrel of shotguns).

The first step to becoming a responsible hunter is knowing your equipment and how to use it safely.

be **SMART** *with firearms!*

Safe Direction:
Keep your firearm pointed in a safe direction at all times.

Make Sure:
Positively identify your target.

Always Check:
Know what's beyond your target before shooting.

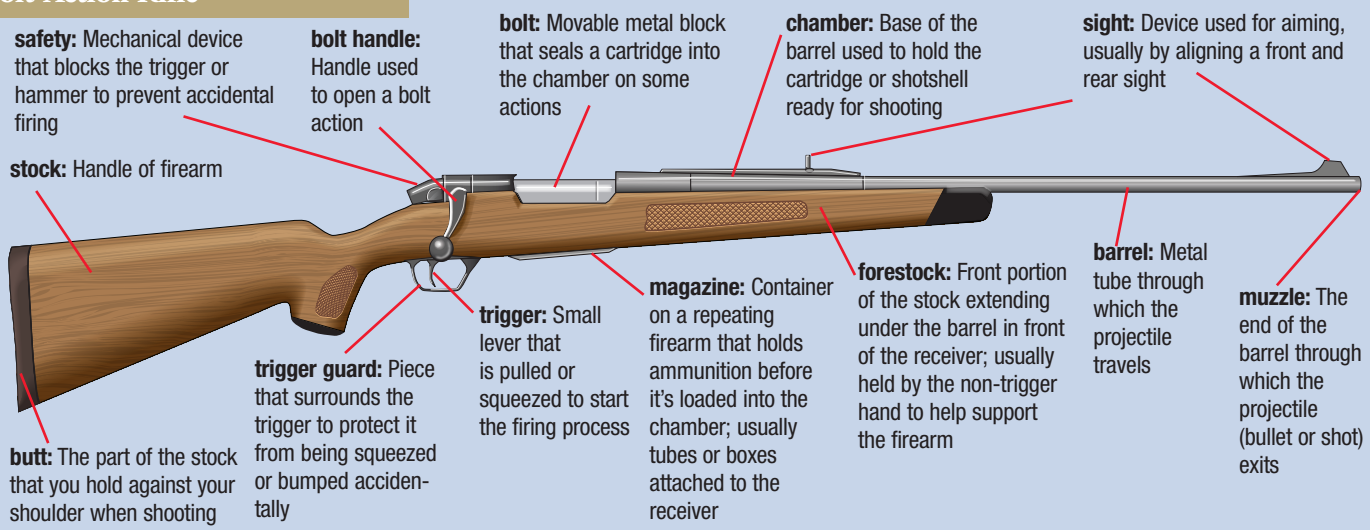
Respect Firearms:
Treat all firearms as if they are loaded.

Trigger Caution:
Don't touch the trigger until you're ready to shoot.

Parts of a Bolt-Action Rifle

Rifles, shotguns, and handguns have many similar parts. Shown here are the parts of a commonly used rifle—the bolt-action rifle.

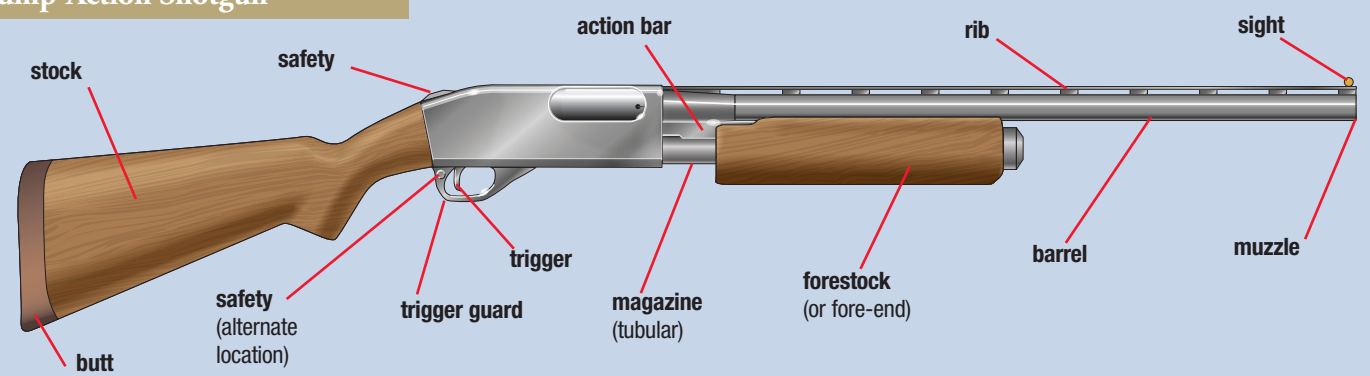
Bolt-Action Rifle



Parts of a Pump-Action Shotgun

Shotguns are another long-barreled firearm used by hunters. Below are the parts of a commonly used shotgun—the pump-action shotgun.

Pump-Action Shotgun



KEYWords

bore:
Inside of the firearm barrel through which the projectile travels when fired

breech:
Rear end of the barrel

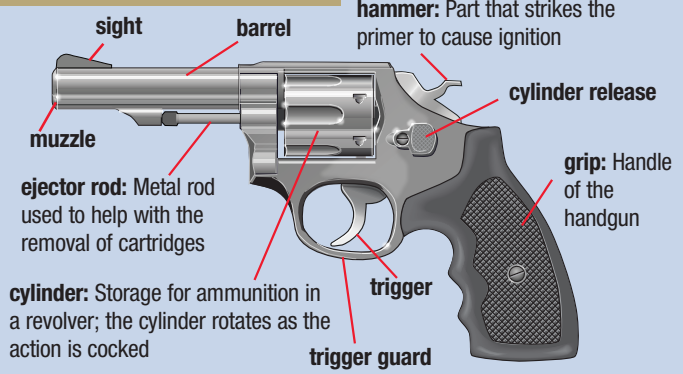
firing pin:
A pin that strikes the primer of the cartridge, causing ignition

receiver:
Metal housing for the working parts of the action

Parts of a Handgun

Handguns (revolvers and pistols) are short-barreled firearms sometimes used for hunting. To the right are the parts of a double-action revolver.

Double-Action Revolver



COMMON FEATURES OF FIREARMS

All types of firearms have actions and sights, and they may have safeties or magazines. Features unique to rifles or shotguns are discussed in the following sections.

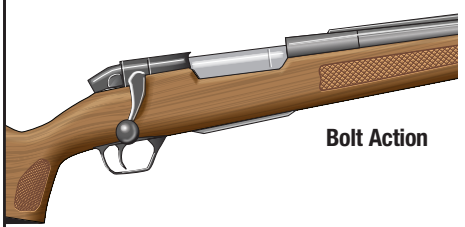
Firearm Actions

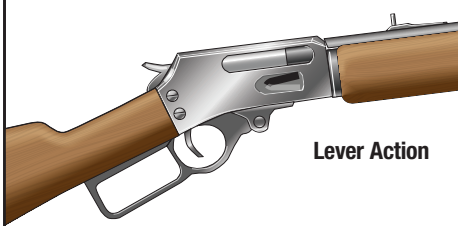
Firearms can be classified by their action type. The action of a firearm is made up of the parts that load, unload, fire, and eject the shotshell or cartridge. Actions are either single-shot or repeating styles. Single-shot firearms must be reloaded each time the firearm is fired. Repeating firearms have extra cartridges or shotshells ready in a magazine, cylinder, or extra barrel.

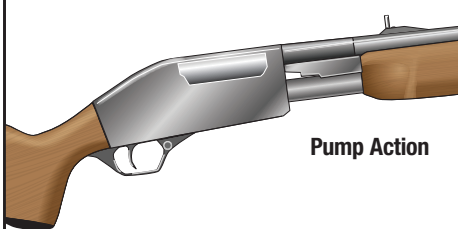
- **Bolt Action:** A bolt-action firearm operates like opening and closing a door bolt. The bolt solidly locks into the breech, making it accurate and dependable.
  - To open the action, lift the handle up and pull it to the rear.
  - If the firearm is loaded, the cartridge or shotshell will be ejected as you pull the bolt to the rear. To make sure it's unloaded, visually check *both* the open action *and* the magazine for extra cartridges or shotshells.
  - You can store a bolt-action firearm safely by storing the bolt separately from the firearm.
- **Lever Action:** The lever-action firearm has a large metal lever located behind the trigger. This handle usually forms the trigger guard as well.
  - To open the action, push the lever down and forward, which removes the cartridge case from the chamber and ejects it. If a magazine holds extra cartridges, another is immediately ready to be loaded into the chamber.
  - It's often difficult to tell if a lever-action firearm is loaded. To unload, push the lever down and forward several times until no more cartridges are ejected. To make sure it's unloaded, visually check *both* the chamber *and* the magazine for additional cartridges.
  - Most models also have an exposed hammer, which can be dangerous.
  - ***Always use extra caution to keep your hands away from the trigger while working the lever action.***
- **Pump Action:** The pump-action firearm is fast and smooth. It allows the shooter to cock the firearm without taking his or her eye off the target. The pump action is also referred to as "slide action" or "trombone action."
  - To open the action, slide the forestock to the rear, which removes the cartridge from the chamber and ejects it. Sliding the forestock toward the muzzle closes the action and readies another cartridge for loading. A pump-action firearm will open only after it's fired or if a release lever is pressed and the forestock is pulled to the rear.
  - To make sure it's unloaded, you must visually check *both* the chamber *and* the magazine for cartridges.

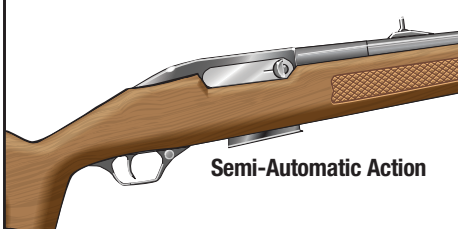
Common Actions on Rifles

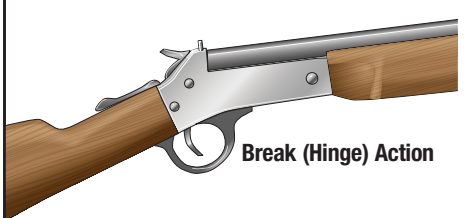
Single-shot rifles are usually break or bolt actions. Repeating rifles include the bolt-action, lever-action, pump-action, and semi-automatic types. Operating the lever, bolt, or forestock ejects the empty cartridge case, chambers a new round of ammunition, and cocks the gun.


Bolt Action


Lever Action

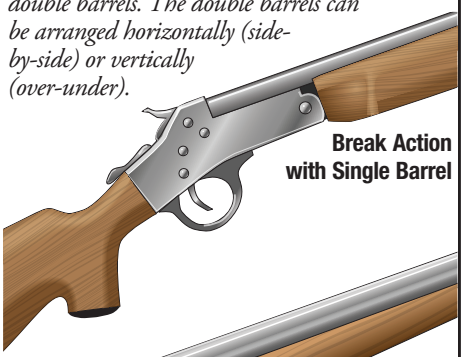

Pump Action


Semi-Automatic Action

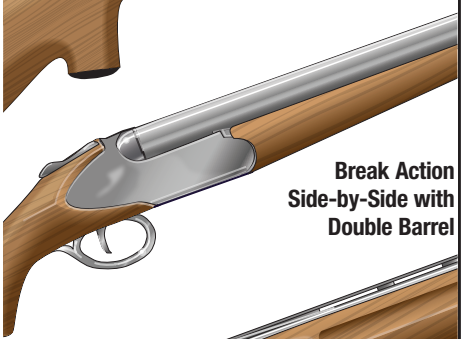

Break (Hinge) Action

Common Actions on Shotguns

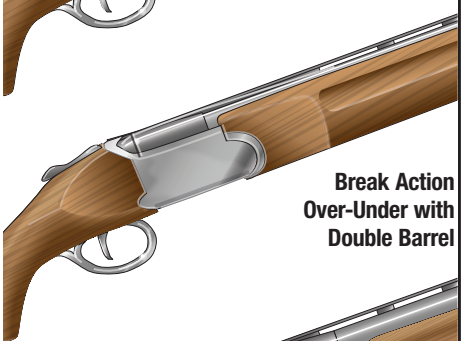
Shotguns use many of the same actions as rifles—the pump action, semi-automatic action, and bolt action. They also use a break action as either a single barrel or double barrels. The double barrels can be arranged horizontally (side-by-side) or vertically (over-under).



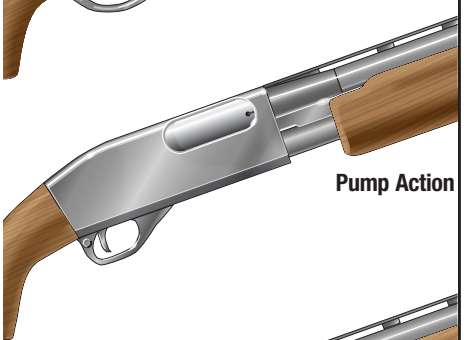
Break Action with Single Barrel



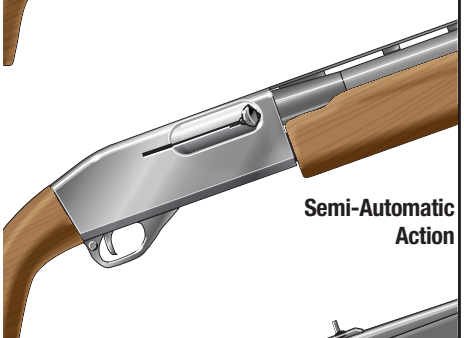
Break Action Side-by-Side with Double Barrel



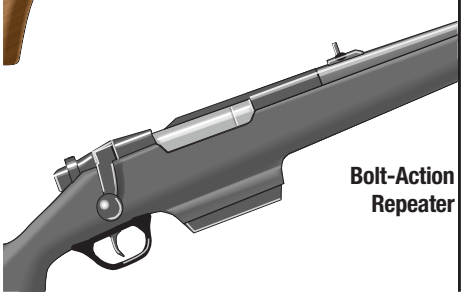
Break Action Over-Under with Double Barrel



Pump Action



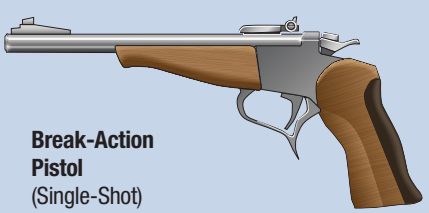
Semi-Automatic Action



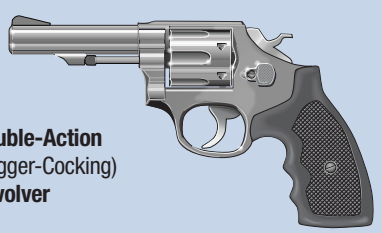
Bolt-Action Repeater

- **Semi-Automatic (or Autoloading) Action:** As each shot is fired manually, the case of the cartridge or shotshell is ejected automatically and the chamber is reloaded automatically. Semi-automatic shotguns are allowed for hunting in Pennsylvania, but only for small game and waterfowl hunting. You cannot use any other type of semi-automatic firearm to hunt or trap in Pennsylvania.
  - To open the action, you must pull back the bolt's operating handle (on a rifle or shotgun) or the slide (on a pistol). Most semi-automatics, when the bolt or slide is pulled back, will lock in the open position if the magazine is empty. If it does not lock open, it means that a cartridge from the magazine has gone into the chamber, making the firearm ready to fire. A few semi-automatics do not lock open and must be held open to check the chamber.
  - To unload, *first remove the magazine* and lock the action open. Then make sure it's unloaded—visually check the chamber for an additional cartridge or shell.
  - When closing the action for loading, pull back to unlock the bolt or slide and then let go, allowing it to travel forward on its own. Do not guide it forward with your hand because it may not seat properly.
  - On a semi-automatic, the trigger must be squeezed each time a shot is fired. This makes the semi-automatic different from the fully-automatic firearm, which continues to fire as long as the trigger is held down. ***The fully-automatic firearm may not be used for hunting or sport shooting.***
- **Break (or Hinge) Action:** The break-action firearm operates in the same way as a door hinge. Simple to load and unload, a break action is often chosen as a hunter's first firearm.
  - To open the action, point the barrel(s) at the ground. A release is pressed, and the stock drops downward. This allows the cartridges or shotshells to eject or to be removed manually if the firearm is loaded.
  - Break-action firearms have a separate barrel for each shot rather than a magazine. Most models have one or two barrels, but some have up to four.
  - Some models also have an exposed hammer(s), which can be dangerous.

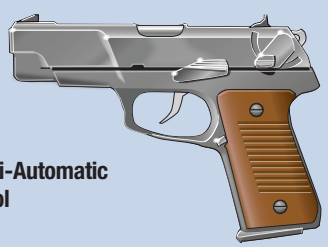
Typical Handgun Actions



Break-Action Pistol (Single-Shot)



Double-Action (Trigger-Cocking) **Revolver**



Semi-Automatic Pistol

Single-Action (Hammer-Cocking) **Revolver**

- **Revolving Action:** The revolving action takes its name from a revolving cylinder containing a number of cartridge chambers. One chamber at a time lines up with the barrel as the firearm is fired. Revolving cylinders may rotate either clockwise or counterclockwise, depending on the manufacturer. This type of action usually is found on handguns but may be found on some older rifles. Revolving actions are known as either "single action" or "double action."
  - **Single action:** Will fire only after the hammer has been cocked manually.
  - **Double action:** Squeezing the trigger both cocks and releases the hammer. A double-action revolver typically also can be hammer-cocked like a single-action revolver.

Safety Mechanisms

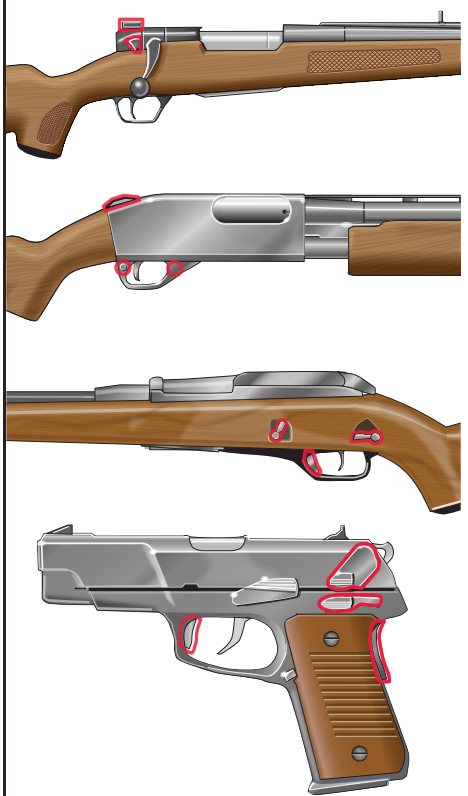
A safety is a device that blocks the action to prevent the firearm from shooting until the safety is released or pushed to the "off" position. The safety is intended to prevent the firearm from being fired accidentally. However, safeties should never be relied on totally to protect against accidental shooting. Safeties are mechanical devices and can fail from damage, lack of cleaning, or normal wear. For that reason, don't trust a firearm with a "half-cock" safety. If a "half-cock" safety fails, the hammer may go forward and cause the gun to fire. This could severely injure or kill you or others. Also, safeties can be bumped from the safe position unknowingly as your firearm is being handled or as it catches on clothing or tree branches.

All safeties are located around the receiver of the firearm and are usually easy to spot. Common types of safeties are:

- **Cross-Bolt Safety**
  - Common on pump and semi-automatic firearms
  - A simple, push-button action that blocks the trigger or hammer
  - Usually located at the trigger guard or ahead of the hammer
- **Pivot Safety**
  - Common on handguns and bolt-action rifles
  - A moving lever or tab that blocks the trigger or firing pin
  - Located on the frame (blocks trigger) or on the bolt or slide (blocks firing pin)
- **Slide or Tang Safety**
  - Common on some rifles and break-action shotguns
  - A sliding bar or button that blocks the firing action
  - Located on the tang (a metal strip behind the receiver) of break-action firearms or on the side of the receiver on some rifles
- **Half-Cock or Hammer Safety**
  - Common on firearms with exposed hammers
  - Positions the trigger at half-cock, away from the firing pin
  - Used by placing the trigger at half-cock; some firearms automatically return to the half-cock position after the trigger is released
  - While not a true safety, it sometimes is described as a mechanical safety device by firearm manufacturers

Typical Locations of Safeties

The red outlines indicate where safeties typically are located on rifles, shotguns, and handguns.

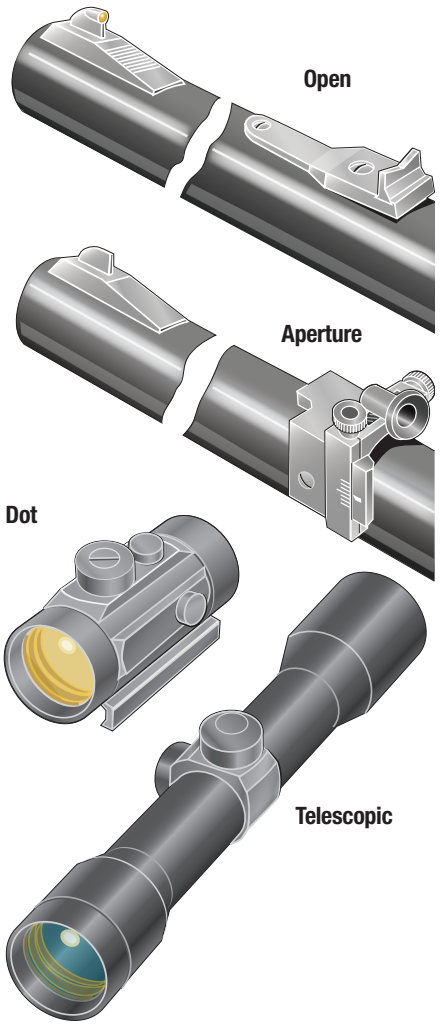


Safety TIP

You should never replace safe firearm handling by trusting the safety on a firearm. A safety is a mechanical device that could fail. Don't release the safety until just before you shoot.

Knowing where the safety is and how it works is not always as simple as it might seem. There are many types of safeties. Sometimes persons alter or modify their guns to disable the safety. This is very dangerous, especially if the gun gets into the hands of an inexperienced shooter. Be sure you know how the safety works on your own gun or any others you handle. Never alter or modify your firearm yourself. Have an experienced gunsmith look at your gun if the safety does not work or if anything else is wrong with it.

Types of Rifle Sights



Remember ...

Never use the scope on your telescopic sight as a set of binoculars!

Magazines

In repeating firearms, the magazine is the place that stores the ammunition that has not been fired. When you work the action, a cartridge is picked up from the magazine and placed in the chamber ready to be fired.

- Magazines are designed with a spring and a follower that push against the cartridges to move them into the action. When checking a magazine to make sure it's empty, you must be able to either see or feel the follower; if you cannot see or feel the follower, there may be a cartridge jammed in the magazine, which can be dangerous. Tubular magazines require close attention to make sure a cartridge is not jammed in the magazine.
- Magazines may be removable or fixed.
  - Removable magazines allow you to remove extra ammunition from the firearm simply by removing the magazine.
  - Fixed magazines require the ammunition to be removed manually from the gun itself. These include tubular, hinged-floorplate, and revolving magazines.

Sights

A sight is a device used to line up the muzzle with the shooter's eye so that he or she can hit the target. Sights are more important on a firearm that fires a single projectile (rifle and handgun) than on a firearm that shoots a pattern of shot (shotgun). Shotguns usually have a simple pointing bead. Rifles typically have an open, aperture (peep), or telescopic sight. Most handguns have an open sight, although some specialized handguns have a dot or a telescopic sight. Read more about using sights in Chapter Nine.

- **Bead Sight:** Simple round bead set into the top of the barrel near the muzzle of a shotgun. Some shotguns have a second, smaller bead about halfway back on the barrel. The shooter uses the shotgun to "point" at and follow a moving object, just like pointing with your finger. The bead is used only for a reference as the shotgun is pointed and moved to follow flying or running targets.
- **Open Sight:** Combination of a bead or post front sight and a notched rear sight. These sights are simple and inexpensive. Open sights allow quick sighting. To aim, you center the top of the bead or post within the notch of the rear sight and line up on the target. Open sights can be fixed or adjustable.
- **Aperture (Peep) Sight:** Combination of a bead or post front sight and a round hole set on the rifle's receiver close to the shooter's eye. To aim, you center the target in the rear peep or aperture sight and then bring the front sight into the center of the hole. An aperture sight is more accurate and adjusted more easily than an open sight.
- **Telescopic Sight (Scope):** Small telescope mounted on your firearm. A scope gathers light, brightening the image and magnifying the target, and does away with aligning rear and front sights. The aiming device inside the scope is called the "reticle." To aim, you simply look through the scope and line up the crosshairs, post, or dot with your target. Telescopic sights are the most accurate, which makes them popular for hunting.
- **Dot Sight:** Small device mounted on your firearm. A dot sight uses electronics or optical fibers to project a glowing dot or other mark on a lens in front of the shooter's eye. Some dot sights also magnify like telescopic sights.

DIFFERENCES BETWEEN RIFLES, SHOTGUNS, AND HANDGUNS

The main differences between rifles, shotguns, and handguns are their barrels and the type of ammunition used.

- The rifle barrel is long and has thick walls with spiraling grooves cut into the bore. The grooved pattern is called rifling.
- The shotgun barrel is long and made of thin steel that is very smooth on the inside to allow the shot and wad to glide down the barrel without friction. It's thinner than a rifle barrel since it does not have to withstand as much pressure.
- The handgun barrel is much shorter than a rifle or shotgun barrel because the gun is designed to be shot while being held with one or two hands, rather than being placed against the shooter's shoulder. The bores of most handgun barrels also have a grooved pattern similar to rifles.

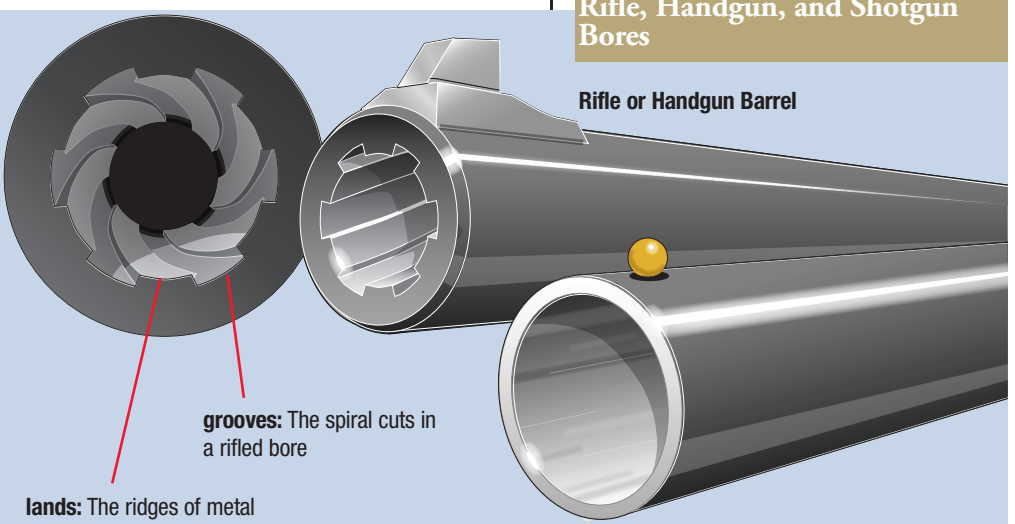
The Damascus Barrel

Damascus or "Damascus twist" barrels are older shotgun barrels that typically were made before 1900. Iron and steel ribbons were twisted and welded together. Damascus barrels are weaker than modern barrels and are not designed for the high gas pressures created by modern ammunition. Damascus barrels have a distinctive, irregular pattern of short, streak-like marks around the barrel.

If you have a Damascus barrel gun, ***don't shoot it****. The barrel may burst slightly ahead of the chamber, crippling the shooter's hand or forearm. If you have an older firearm and are not sure if it has a Damascus barrel, go to a qualified gunsmith to identify its make before shooting it.*

Rifle, Handgun, and Shotgun Bores

The bore of a rifle or handgun is grooved, which puts a spiral spin on the bullet for greater accuracy. The bore of the shotgun barrel is smooth because rifling would spread the shot pattern too soon.



Rifling in the Rifle or Handgun Bore

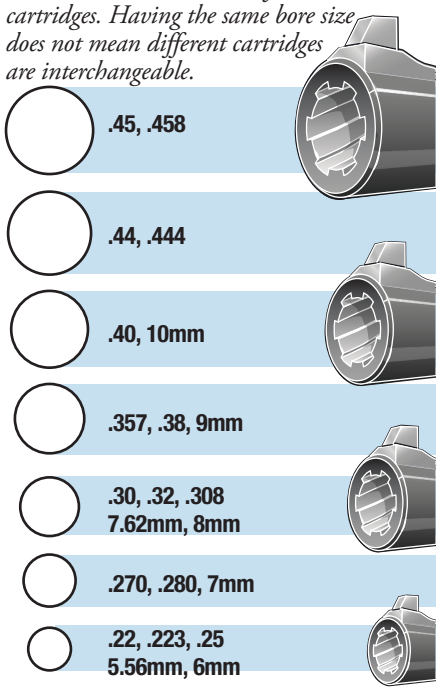
A bullet fired from a rifle or handgun has a spiral spin that keeps it point-first in flight, increasing accuracy and distance. This is made to happen by the rifling inside the barrel, from which the rifle got its name. The barrel is thick and has spiraling **grooves** cut or pressed into the bore. The ridges of metal between the grooves are called **lands.** Together, the grooves and lands make up the "rifling."

Remember...

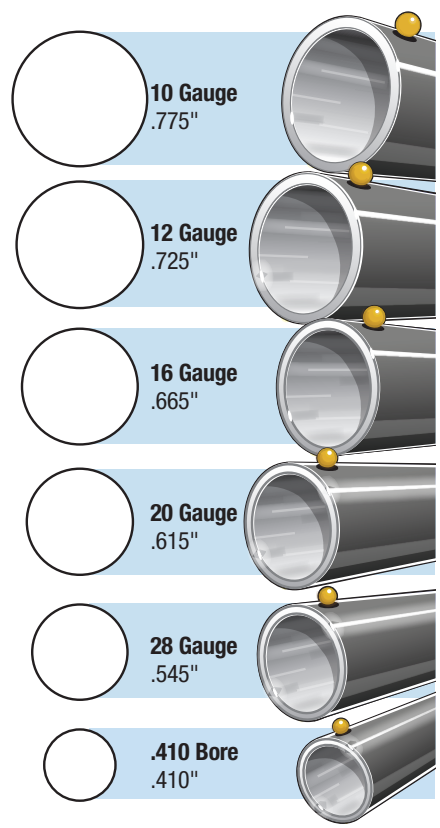
Reloaded shells may have wrong information or have been improperly reloaded. It's important to mark reloaded shells clearly. Use only shells or cartridges that you have reloaded yourself or that have been reloaded by a person whom you know is competent.

Rifle and Handgun Calibers

The circles show bore sizes of common cartridges. Having the same bore size does not mean different cartridges are interchangeable.



Shotgun Gauge Sizes



Sizes shown are the minimum inside bore diameter with a tolerance of +0.020". Data is presented courtesy of SAAMI.

A Rifle's or Handgun's Caliber

Caliber is used to describe the size of a rifle or handgun bore and the size of cartridges designed for different bores.

- Caliber usually is measured as the diameter of the bore from land to opposite land and expressed in hundredths of an inch, thousandths of an inch, or millimeters. However, there is no standard set for designating caliber. In some cases, the caliber is given as the diameter of the bullet, which is the distance between the grooves. For example, a .270-caliber rifle bore measures 270/1000ths of an inch in diameter between the lands and has a larger bore diameter than a .223-caliber rifle.
- Caliber markings sometimes have a second number that has nothing to do with the diameter. For example, the popular .30-30 is a .30-caliber cartridge, but the second number is a term used from the days when the cartridge took 30 grains of powder. The "06" in .30-06 refers to the year (1906) it became the official ammunition of the U.S. military.
- Every rifle or handgun is designed for a specific cartridge. The ammunition must match the data stamp on the firearm. For example, there are several .30-caliber firearms that use the same bullet size but are designed for different cartridges (the .30-30, .30-06, .308, and the .300 Savage). If you cannot find the caliber stamped on the firearm, take it to a qualified gunsmith.

A Shotgun's Gauge

Shotguns are classified by gauge, which is a measure related to the diameter of the smooth shotgun bore and the size of the shotshell designed for that bore.

- Common shotgun gauges are 10 gauge, 12 gauge, 16 gauge, 20 gauge, and 28 gauge. The smaller the gauge number, the larger the shotgun bore. Gauge is determined by the number of lead balls of size equal to the approximate diameter of the bore that it takes to weigh one pound. For example, it would take 12 lead balls with the same diameter as a 12-gauge shotgun bore to weigh one pound. Today, however, gauge can be measured much the same way as caliber by measuring the inside bore diameter.
- The .410-bore shotgun is the only exception to the gauge marking for shotguns. It has an actual bore diameter of 410/1000ths of an inch, which is approximately equivalent to a 67½ gauge.
- Each gauge of shotgun shoots only shells of the same gauge. For example, 12-gauge shells are used only in 12-gauge guns.
- The gauge of a shotgun is usually marked on the rear of the barrel, and the gauge of a shell is marked on the shell as well as on the factory box.

WHAT IS AMMUNITION?

Modern ammunition varies depending on the type of firearm. Rifles and handguns use a **cartridge** containing a single projectile (bullet). Shotguns use a **shotshell** containing either a single slug or a large number of small projectiles (shot or pellets). However, the basic parts of cartridges and shotshells are very similar.

Basic Parts of Ammunition

The basic parts are the case, primer, powder, and projectile(s). Shotshells have an additional part called a wad.

- **Case:** The container that holds all the other ammunition parts together. It's usually made of brass, steel, copper, paper, or plastic.
- **Primer:** An explosive chemical compound that ignites the gunpowder when struck by a firing pin. Primer may be placed either in the rim of the case (rimfire) or in the center of the base of the case (centerfire).
- **Gunpowder:** A chemical mixture that burns rapidly and changes to an expanding gas when ignited. Modern smokeless powder will burn slowly when ignited in the open (outside of the case). Black powder is less stable and can be explosive when impacted or ignited in the open.
- **Projectile:** The object(s) expelled from the barrel. A bullet is a projectile, usually containing lead, fired through a rifle or handgun barrel. A slug is a solid projectile, usually of lead, fired through a shotgun barrel. Shot is a group of lead, steel, tungsten alloy, or bismuth pellets fired through a shotgun barrel.
- **Wad:** A seal and/or shot container made of paper or plastic separating the powder from the slug or shot in a shotshell. The wad prevents gas from escaping through the shot and holds the shot together as it passes through the barrel.

Rifle and Handgun Cartridges

- It's important to select the correct cartridge for your rifle or handgun (see Chapter Ten). Carefully compare the data stamp on the barrel of the firearm against the information on the ammunition box and the stamp on each cartridge.
- Bullets used in rifle and handgun cartridges come in various designs, sizes, and weights. The bullet is made of lead but sometimes has a copper jacket. Bullets used for hunting game may have soft or hollow points designed to expand (mushroom) upon impact. Bullets used for target shooting usually have solid points that make smaller holes.
  - **Common Types of Rifle Bullets**
    - Pointed Soft Point: High velocity, accurate bullets with a flat travel path (trajectory); excellent mushrooming
    - Rounded Soft Point: Popular for low-velocity calibers; recommended for tubular magazines
    - Protected Tip: Highly accurate with excellent expansion
    - Full Metal Jacket: Maximum penetration without mushrooming; these bullets are ***illegal for big game hunting in most states***
  - **Common Types of Handgun Bullets**
    - Roundnose Lead: Good penetration, little expansion
    - Full Metal Jacket: High penetration, no expansion
    - Semi-Wad Cutter: Balances penetration and expansion
    - Hollowpoint: Designed for high expansion on impact
    - Wad Cutter: Flat-ended, used for target shooting; creates clean hole in paper

KEYWords

cartridge:
Ammunition used in modern rifles and handguns; a case containing primer, gunpowder, and a bullet

shotshell:
Ammunition used in modern shotguns; a case containing primer, gunpowder, wad, and a slug or shot

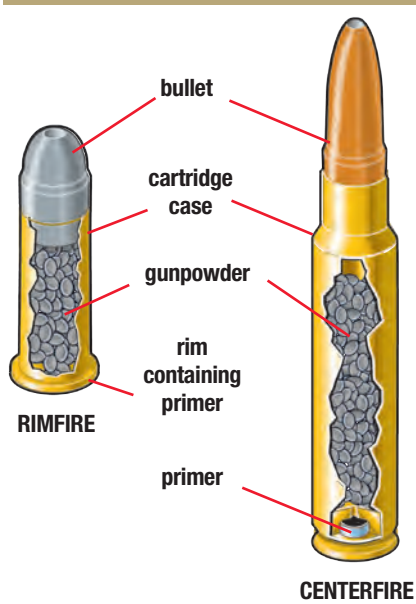
Centerfire and Rimfire Ammunition

- *Centerfire ammunition is used for rifles, shotguns, and handguns. In this type of ammunition, the primer is located in the center of the casing base. Most centerfire ammunition is reloadable.*
- *Rimfire ammunition has the primer contained in the rim of the ammunition casing. Rimfire ammunition is limited to low-pressure loads. Rimfire cartridges are not reloadable.*

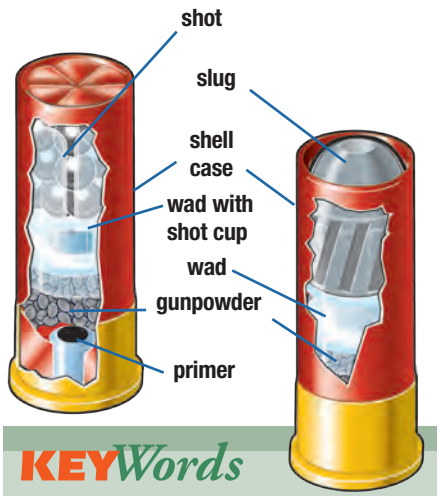
Safety TIP

In tubular magazines, the bullet tip of one cartridge rests directly on the primer of the cartridge immediately ahead. For this reason, use only rounded or blunt tips in tubular magazines.

Rifle and Handgun Ammunition



Shotgun Ammunition



KEYWords

gauge:
Term used to label bore diameter of a shotgun; gauge is the number of lead balls with diameters equal to the diameter of the bore that, when combined, weigh one pound

Non-Toxic Shot

Non-toxic shot is required throughout the U.S. for waterfowl hunting. Studies showed that many waterfowl died each year because of lead poisoning. Lead pellets from traditional shotshells were picked up and digested by waterfowl. The toxic effect spread to other birds, such as the bald eagle, who consumed the poisoned waterfowl. To reduce this problem, conservationists worked with shotshell manufacturers to produce other kinds of shot—steel, tungsten alloy, or bismuth shot.

Shotshells

- Shotgun shells (shotshells) use either a slug or shot as the projectile(s).
  - A slug is a solid projectile, usually of lead, used for hunting big game with a shotgun.
  - Shot are multiple pellets fired through a shotgun barrel. Shot size is matched to the game being hunted. This type of projectile is used typically to hunt game birds and small game animals.
- The shotshells must match the **gauge** and shell length specified by the manufacturer exactly. This information usually is found on the barrel of the shotgun. Shotguns may be chambered for 2½-inch, 23/4-inch, 3-inch, or ½-inch shells. This refers to the length of the shell *after* it has been fired. Read more about correctly matching ammunition to your firearm in Chapter Ten.
- You also must choose the correct type and size of shot for the shotshell. In general, as the size of your target decreases, you should also decrease the diameter of the shot you use.
  - As pellet diameter decreases, more shot can be placed in a standard shotshell.
  - The smaller the shot "number," the larger the pellet diameter.
- Shotshell marked as "magnum" means the shell has more shot or more gunpowder than a regular shell. You should avoid using magnum shotshells in older shotguns or in guns that are *not* designed for magnum shells. In these firearms, the chamber may be too weak to handle the extra pressure from the magnum load, leading to an accident or injury.
- Steel shot pellets react differently than lead when shot. Steel weighs about ⅔ as much as lead but is much harder. Steel does not deform and is not as unstable in flight. It will produce a tighter pattern than lead shot.

If using steel shot for hunting, choose a steel shot size one to two sizes larger than the lead shot you would select. See Chapter Nine for more information about shot strings for lead and steel shot.

Shot Sizes

Shot size is matched to the game being hunted. As pellet diameter decreases, more shot can be placed in a standard shotshell load. The smaller the shot number, the larger the shot size.

BUCK SHOT

Number	Diam. in Inches
4	.24
3	.25
1	.30
0	.32
00	.33
000	.36

STEEL SHOT

Number	Diam. in Inches	Approx. Pellets in 1 oz.
6	.11	317
4	.13	192
3	.14	154
2	.15	125
1	.16	103
BB	.18	72
BBB	.19	61
T	.20	53

LEAD SHOT

Number	Diam. in Inches	Approx. Pellets in 1 oz.
12	.05	2385
9	.08	585
8	.09	410
7½	.09½	350
6	.11	225
5	.12	170
4	.13	135
2	.15	90
BB	.18	50

Shotgun Choke and Shot Pattern

When a shotshell is fired from a shotgun, the pellets leave the barrel and begin to spread or scatter. The farther the pellets travel, the greater the spread of shot. Shotgun barrels have a **choke** to control the spread or **shot pattern.** Read more about how to pattern a shotgun on page 113.

- The choke of a shotgun acts like the nozzle of a garden hose. As the nozzle is tightened, water shoots out in a long, narrow stream, similar to the full choke on a shotgun. As the nozzle is opened, similar to the cylinder choke on a shotgun, water shoots out in a wide spray.
- Your distance from the target determines the choke you need. The choke does not alter the shotgun's power—it just controls how tight or spread out the shot pattern will be at a specific distance.
- The spread effect of the most common chokes is illustrated below. The choke controls how much shot will hit in a certain area at different ranges.
  - **Cylinder** choke is an unconstricted barrel. The shot pattern spreads quickly.
  - **Improved Cylinder** choke has a slight narrowing. It allows the shot pattern to spread fairly quickly. This is a good choice for quail, rabbits, and other upland game.
  - **Modified** choke has moderate narrowing. The shot stays together longer, making the pattern denser and more useful at longer ranges. This choke is used often for dove hunting and is the preferred choke when using steel shot to hunt for ducks or geese. There is also an Improved Modified choke that is slightly tighter than Modified.
  - **Full** choke has tight narrowing. The shot holds together even longer, so it's good for squirrels, turkey, and other game shot at 35- to 40-yard ranges. Turkey hunters sometimes use Extra Full or Turkey choke for even denser patterns at long range.

KEYWords

choke:
The degree of narrowing at the muzzle end of the shotgun barrel

shot pattern:
The spread of shot pellets after they hit a non-moving target

shot string:
The three-dimensional spread of shot pellets after they leave the barrel

Steel Shot

Steel shot is slightly lighter than lead shot of the same size—reducing its velocity and distance (range). Also, steel shot is harder than lead, so the individual pellets stay round, keeping the pattern tighter.

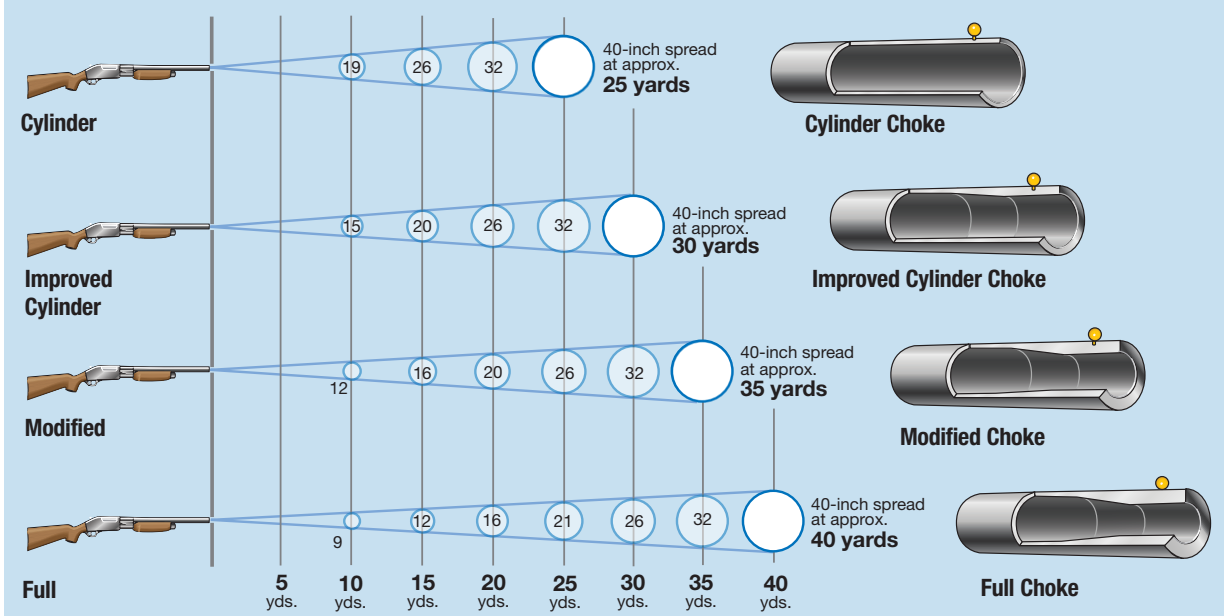
Some hunters use steel shot one or two sizes larger to make up for the difference in weight from lead shot. Others use the same size steel shot or even smaller steel shot to get more shot into their patterns. You should pattern your shotgun with various loads of steel shot before hunting waterfowl with it.

Effective pattern density is the key. Maximum pellet counts spread evenly across a 30-inch circle are best. Full chokes generally produce poor patterns with steel shot.

Effect of Choke on Shot String at Various Distances

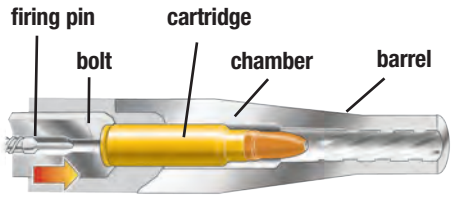
Circles represent the diameter of a lead shot string (in inches) as distance (in yards) increases.

Bore narrowing is exaggerated for clarity.



How Ammunition Is Fired

The firing steps for handguns and shotguns is very similar to this sequence shown for a bolt-action rifle.



- *The bolt moves forward, compressing the firing pin spring and inserting a cartridge into the chamber.*

- *The firing pin is held back under spring tension.*

- *When the trigger is pulled, the firing pin moves forward, crushing and igniting the primer in the cartridge base.*

- *The primer ignites the gunpowder, generating gas pressure, which forces the bullet forward and out of the barrel.*

HOW A FIREARM WORKS

The same physical process is used to fire shotshells from shotguns or cartridges from rifles or handguns. Pulling the trigger causes the firing pin to strike the primer in the base of the cartridge or shotshell. The spark from the primer ignites the gunpowder, which burns rapidly and changes to a gas. The gas rapidly expands and drives the projectile(s) through the barrel with great force.

How the rifle and handgun fire:

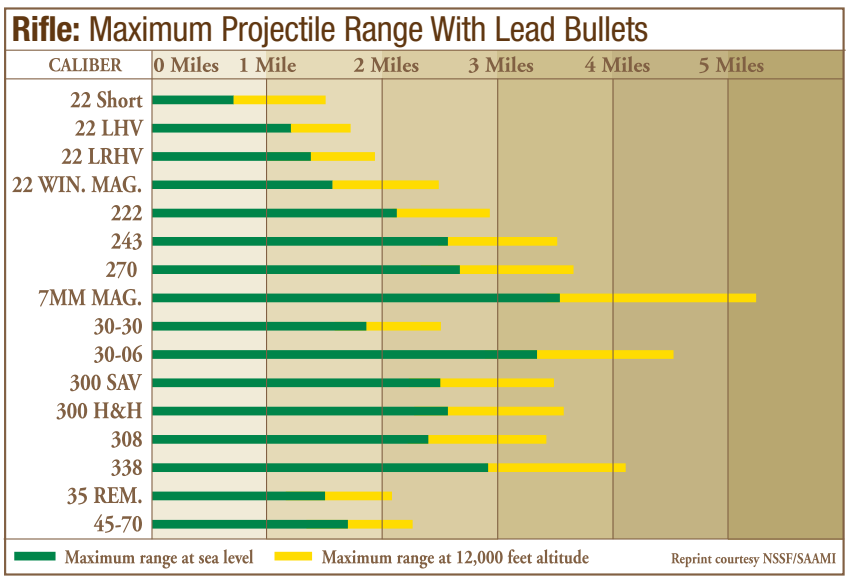
1. A cartridge is inserted into the chamber.
2. The action is closed, and the firing pin is pushed back and held back under spring tension.
3. The trigger is squeezed, releasing the firing pin, which moves forward with great force. The firing pin strikes the primer, causing a spark.
4. The spark from the primer ignites the gunpowder. Gas created from the burning powder rapidly expands in the cartridge.
5. The expanding gas forces the bullet out of the cartridge and down the barrel with great speed.
6. The rifling in the barrel (see page 19) causes the bullet to spin as it travels out of the barrel. The bullet's speed and escaping gases produce a "bang."

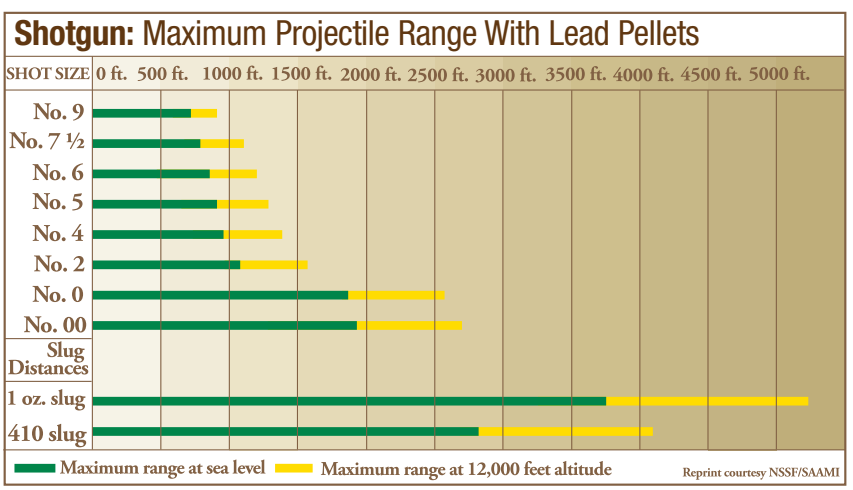
How the shotgun fires:

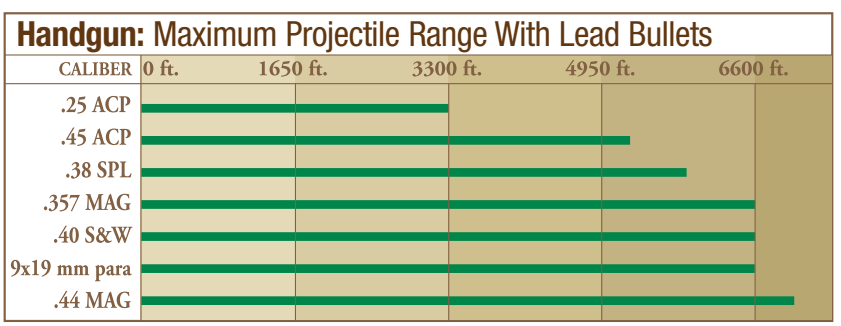
1. A shotshell is inserted into the chamber.
2. Closing the action pushes the firing pin back and holds it under spring tension.
3. Pulling the trigger releases the firing pin. The firing pin strikes the primer producing sparks.
4. Heat and sparks from the primer ignite the gunpowder. Gas created from the burning powder expands in the shell.
5. The expanding gas creates pressure and forces the wad and shot out of the plastic body of the shell.
6. The escaping gases produce a "bang" as the wad and shot leave the barrel.
7. The wad quickly opens and falls away. The shot cluster spreads. This spread is called the shot string.

KNOW YOUR FIREARM'S RANGE

Knowing your firearm's "maximum projectile range" is important to being a safe and responsible hunter. The maximum projectile range tells you at what distances your firearm's projectile could cause injury or damage to persons, animals, or objects. When hunting, knowing the "effective killing range" also lets you immediately know when a shot will give a clean kill. The effective killing range will always be less than the maximum projectile range. Learning to estimate distances and knowing your firearm's projectile range and your effective killing range are important parts of hunting.







History of Firearms

The Chinese are believed to be the first to use gunpowder, now called "black powder." The first firearms were tubes closed at one end, usually made of brass or cast iron. Early firearms were loaded by pouring black powder and shoving a projectile into the tube from the muzzle end, and then igniting the powder using a lighted wick or match. The powder burned, creating pressure that launched metal objects or arrows. These firearms are called "muzzleloaders" due to their loading process.

Advances in ignition systems were the major changes that brought about modern firearms.

- ***Matchlock ignition** was developed in the early 1400s. When the trigger is pulled, a lighted wick is lowered into a priming pan located next to a vent hole drilled into the closed end of the barrel. When the priming powder ignites, it lights the main charge.*
- ***Wheel lock ignition** replaced the wick of the matchlock in the 1500s. When the trigger is pulled, a coiled spring forces the rough-edged steel wheel to spin against a piece of iron pyrite, creating sparks to ignite the powder in the priming pan.*
- ***Flintlock ignition** appeared in the late 1600s. When the trigger is pulled, the hammer holding a piece of flint falls against a steel cover (the frizzen) sitting over the priming pan. The hammer knocks the cover out of the way, and the flint striking the steel causes sparks that ignite the powder in the priming pan.*
- *The **percussion lock** (also called "caplock") replaced the flintlock in the early 1800s. Early percussion locks used priming compounds inside a metallic foil cap placed over the vent hole. When the hammer strikes the cap, the resulting spark ignites the main charge.*
- *The next advance, in 1835, was to arrange a series of percussion locks and barrels on a rotating wheel (cylinder) to allow a rapid succession of shots (Paterson revolver). With a single hammer and trigger, multiple shots can be fired without reloading—a **repeating firearm**. The percussion cap revolvers are the forerunners of modern revolvers.*
- *The **percussion cap** also paved the way to the self-contained ammunition we have today—cartridges and shotshells. In the mid-1800s, gunpowder, the projectile, and the primer were put together into a single housing that could be loaded quickly.*
- ***Actions** were developed to allow shooters to load cartridges and shotshells at the rear, rather than the muzzle, end of the barrel.*

Typical Gun Cases

Padded, soft-sided case

Materials: Canvas, nylon, neoprene, polyester, and leather

Advantages:

- *Light, easy to handle and store*
- *Many designs made for scoped rifles*
- *Made in camouflage*
- *Waterproof and floating cases available for duck hunters*
- *Less costly than hard cases*

Disadvantage:

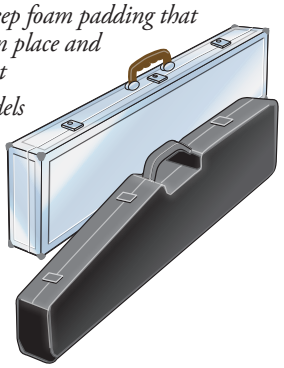
- *Less protection than hard-sided cases*

Lockable, hard-sided case

Materials: Aluminum, composite (widely used by the U.S. military)

Advantages:

- *Lightweight but sturdy*
- *Meets airline standards*
- *Can include deep foam padding that holds firearm in place and cushions impact*
- *Composite models can be molded to fit firearm*
- *Available in waterproof models*



Disadvantage:

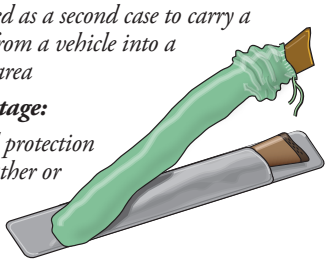
- *Bulkier and costlier than soft-sided cases*

Gun sock

Materials: Durable stretch fabric (polyester/acrylic) and soft pile materials

Advantages:

- *Lightweight protection from dust, dirt, and moisture*
- *Made in camouflage*
- *Often used as a second case to carry a firearm from a vehicle into a hunting area*



Disadvantage:

- *Minimal protection from weather or impact*

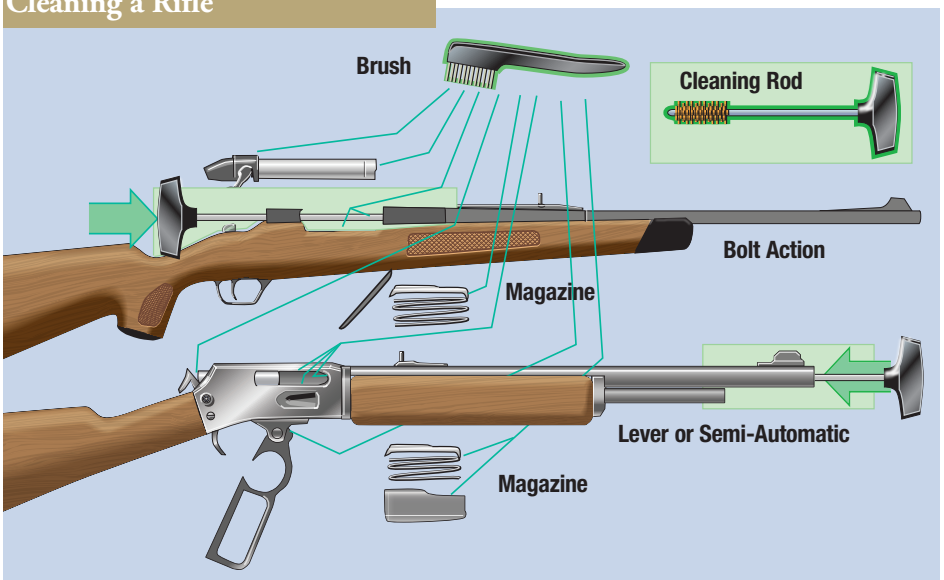
SAFELY TRANSPORTING FIREARMS

Transporting firearms involves both legal and safe practices. In addition to federal laws, there are regulations that vary from state to state.

General Rules

- Always unload and case firearms before transporting them. In many states, this may be the law. The action should be open or the gun broken down, whichever makes the firearm safest if it's mishandled.
- Firearms should not be displayed in window gun racks because the display may cause anti-hunter attitude. It's also an invitation to thieves.
- Lean a firearm against a secure rest only. A vehicle does not provide a secure resting place. A gun that falls over might accidentally discharge or be damaged.

Cleaning a Rifle



CLEANING YOUR FIREARM

- Firearms must be cleaned after every use to keep them in top condition. Every hunter should have a kit with all the parts for a thorough cleaning.
- Always take care when cleaning your firearm. Never clean a firearm while doing something else. Work on a cleared table or bench.
- Follow these basic steps to clean your firearm.
  - Point the muzzle in a safe direction, and make sure the gun is unloaded.
  - Remove all ammunition from the cleaning bench.
  - For the most thorough cleaning, take the firearm apart following the owner's manual and clean each part separately.
  - If possible, clean the barrel from the breech end, using a bore guide and a cleaning rod holding a bore-brush or patch, wetted with solvent. Pass the brush/patch all the way through the barrel. Because the chamber's diameter is greater than the bore, you may need a chamber brush and a larger patch. Follow the instructions included with the cleaning kit.
  - Use cleaning solvents in a well-ventilated area and only as directed.

STORING YOUR FIREARM

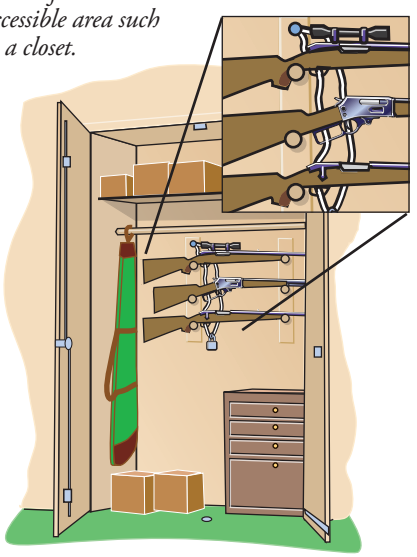
- Firearms must be stored *unloaded* and in a *locked* location, *separate from ammunition.* The storage area should be cool, clean, and dry. Storing firearms in closed hard- or soft-sided gun cases isn't recommended because moisture can accumulate.
- Store guns horizontally, or with the muzzle pointing down. When guns are stored upright, gravity pulls gun oil downward into the action, which forms a sticky film. Oil also can drain onto the stock, softening the wood.
- Displaying guns in glass cabinets or wall racks is an invitation to thieves and curious children. Ideally, guns should be hidden from view and locked. Storage devices with hidden spaces are available. For the best protection against theft and fire damage, purchase a safe.

Cleaning Kit

- *Assorted rod tips—brushes, mop tips, slotted tips, jag tips*
- *Bore light*
- *Clean cloths*
- *Cleaning rods*
- *Cotton swabs*
- *Dental mirror*
- *Gun grease*
- *Gun oil*
- *Gunsmith screwdrivers*
- *Patches appropriate for the caliber or gauge of the firearm*
- *Pipe cleaners*
- *Solvent*
- *Stand to hold the firearm securely in a horizontal position*
- *Toothbrush*

Storing Firearms

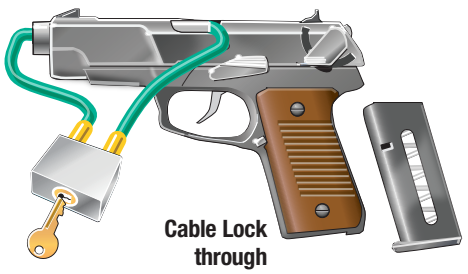
Store firearms with a locking device if stored in an accessible area such as a closet.



Storing Ammunition

- *Store ammunition, reloading supplies, and firearms in separate locked spaces.*
- *Keep all ammunition away from flammables.*
- *Store ammunition in a cool, dry place to prevent corrosion. Corroded ammunition can cause jamming, misfires, and other safety problems.*

Locking Handguns



Cable Lock through Semi-Automatic Barrel or Magazine Well

Trigger Lock on Revolver

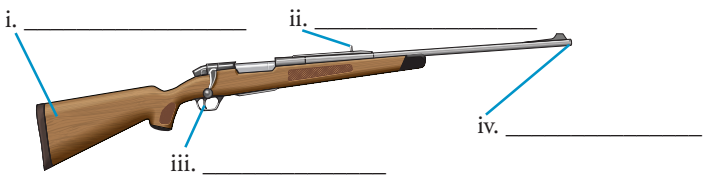
Integral Lock in Revolver Hammer

Chapter Review Exercise

1. What does S.M.A.R.T. stand for?
   S _____
   M _____
   A _____
   R _____
   T _____

2. The three basic parts of a modern firearm are ____.
   a. cartridge, stock, and barrel.
   b. action, stock, and barrel.
   c. stock, trigger, and action.
   d. barrel, chamber, and muzzle.

3. Label the selected parts of a bolt-action rifle.



4. The action of a firearm is made up of parts that ____.
   a. block the trigger or hammer to prevent accidental firing.
   b. hold ammunition before it's loaded into the chamber.
   c. load, unload, fire, and eject the cartridge or shotshell.
   d. serve as the handle of the firearm.

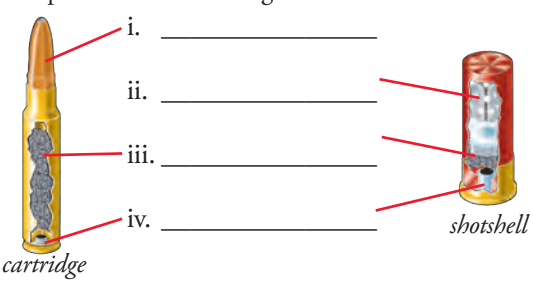
5. List six types of firearm actions.
   i. _____ iii. _____ v. _____
   ii. _____ iv. _____ vi. _____

6. A safety is located around the receiver of the firearm and ____.
   a. makes sure that the firearm can never be accidentally fired.
   b. is a device that blocks the action to prevent accidental firing.
   c. is always located either inside or on the trigger guard.
   d. all of the above.

7. True or False: The mechanical safety on your firearm will *always* work correctly.

8. The chemical compound in ammunition that ignites the gunpowder when struck by a firing pin is the _____.

9. Label the selected parts of rifle and shotgun ammunition.



10. Knowing your firearm's range is very important—it allows you to ____.
    a. determine whether or not you're able to make a clean kill.
    b. make accurate shots at any distance as long as they are within your firearm's range.
    c. know at what distances your firearm could cause injury.
    d. both a. and c.

11. ____ is not a safe way to transport a firearm.
    a. Unloaded
    b. With the action open
    c. In a gun case
    d. Loaded and in a gun rack in the rear window

12. Before cleaning any firearm, you should check to see if the firearm is _____.

13. Firearms must be stored _____, in a _____ location, and _____ _____.

Chapter Review Answers

*1. **S**afe Direction **M**ake Sure **A**lways Check **R**espect Firearms **T**rigger Caution 2. b 3. i. Stock ii. Sight iii. Trigger iv. Muzzle 4. c 5. i. Bolt ii. Lever iii. Pump iv. Semi-Automatic v. Break or Hinge vi. Revolving 6. b 7. False 8. primer 9. i. Bullet ii. Shot iii. Gunpowder iv. Primer 10. d 11. d 12. loaded 13. unloaded, locked, separate from ammunition*

Wildlife Conservation and Management

Objectives
Students will be able to...

- List the four essential elements for wildlife habitat.
- List three ways in which hunting and trapping support and benefit wildlife conservation.
- Define at least three important wildlife management terms or principles.
- Give five examples of wildlife management practices that can benefit wildlife populations.

WILDLIFE CONSERVATION

- The large number of game and non-game species in Pennsylvania is a prime example of how successful wildlife conservation efforts have been. This success would not have been possible without using hunting and trapping as management tools. Equally important is funding directed to state wildlife agencies from federal excise taxes and from the sale of hunting and trapping licenses. Without the support of hunters and trappers, wildlife and wildlife habitats in the United States would be in jeopardy. Many common species would be threatened or extinct, and much of the country's different habitats would be lost.
- The wildlife found in Pennsylvania is as diverse as the state's habitats. Birds and mammals thrive in the woods, fields, and wetlands of the state. A variety of migratory waterfowl species and birds of prey can be found here. Wildlife identification is important to hunting and trapping. Properly identifying game and non-game species prevents mistaken kills and adds to the overall enjoyment of time spent in the woods and fields of the state.
- The idea of wildlife **conservation** has been around since ancient times. Restrictions on taking game are mentioned in the Bible, and the first official hunting season may have been established in the 13th century by Kublai Khan.
- Today, wildlife conservation has evolved into a science, but its goal remains essentially the same: to make sure of the wise use and management of **renewable resources.** Given the right conditions, the living organisms that we call renewable resources can renew themselves over and over again.
- **Preservation** is another means of protecting or saving a resource, such as outlawing hunting of endangered species. Both preservation and conservation are necessary to make sure there are resources for future generations.

KEYWords

conservation:
Wise use of natural resources, without wasting them

renewable resource:
Natural resource that replaces itself unless overused

preservation:
Saving natural resources, but with no direct use of them

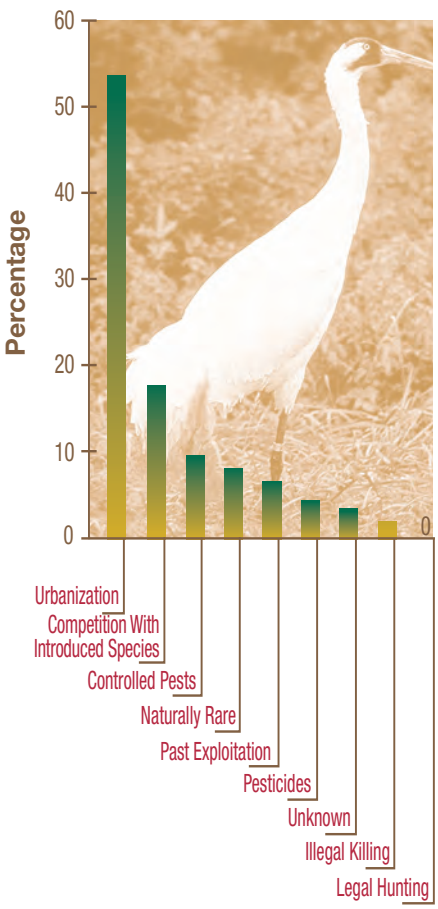
KEYWords

wildlife management:
Science and practice of maintaining wildlife populations and their habitats

habitat:
Complete environmental requirements of an animal for survival: food, water, cover, and space in a proper arrangement

surplus:
Nature overproduces game resources that can be harvested by hunters

Causes of Threatened and Endangered Species



Remember...

No North American animal has become extinct because of sport hunting.

Lessons in Wildlife Management

- Initially, **wildlife management** in the United States was focused on protection. In the early 1900s, for example, wildlife managers attempted to preserve a mule deer herd in the remote Kaibab Plateau of Arizona. Hunting was banned, and predators were destroyed. The result was severe overpopulation, **habitat** destruction, and mass starvation.
- The Kaibab Plateau was opened to hunting in 1929, which brought the population into balance with the habitat. Today, a large, healthy herd of mule deer inhabits the area.
- Around the same period, a similar event took place in Pennsylvania. Deer had been brought into the state after the native population was thought to be extinct. With most of the predators eliminated and little hunting allowed, the herd grew out of control. As the food supply dwindled, thousands of white-tailed deer starved to death.
- From these hard lessons, wildlife managers learned that there is more to conservation than just protecting wildlife. They discovered that nature overproduces its game resources and that good wildlife management yields a **surplus** that can be harvested by hunters.

Habitat Management

- The most important aspect of wildlife conservation is habitat management. Habitat loss presents the greatest threat to wildlife.
- These essential elements must be present to provide a healthy habitat: food, water, cover, and space in a proper arrangement.

Water

Cover

Food

- The need for food and water is obvious. Cover is not only needed as shelter from the elements and predators, but it's also necessary to protect animals while they are feeding, breeding, roosting, nesting, and traveling. Cover can range from thick weeds and brush to a few rocks piled together.

- Space is necessary to avoid over-competition for food. Some animals also need a certain amount of territorial space for mating and nesting. When crowded, some species may develop stress-related diseases.

Space

- For example, quail will spend much of their time where shrub and grassland areas meet. This is called **edge effect**. Most animals can be found where food and cover meet, particularly near a water source. River bottoms are ideal, offering many animals all their habitat needs in one area.

Edge Effect

- Another way to measure the health of a habitat is **biodiversity**, which is the number and variety of plant and animal species in an area. When the biodiversity of an area decreases, the habitat is not healthy.

KEYWords

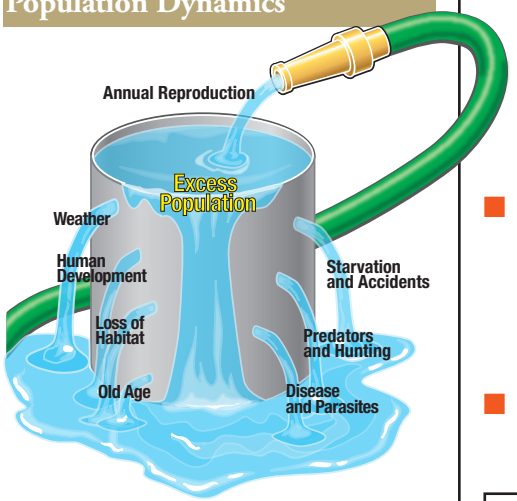
edge effect:
Habitat conditions of an area created when two types of habitat are brought together

biodiversity:
The number and variety of plant and animal species in an area

Balancing Act

Habitats must be in balance in order to support wildlife. Remove a certain population of plants or animals from a community, and the community may not survive. This typically happens when urban development pushes into wildlife areas.

Population Dynamics



KEYWords

carrying capacity:
The number of animals the habitat can support throughout the year without damage to the animals or to the habitat

limiting factors:
Reduce the potential production of wildlife

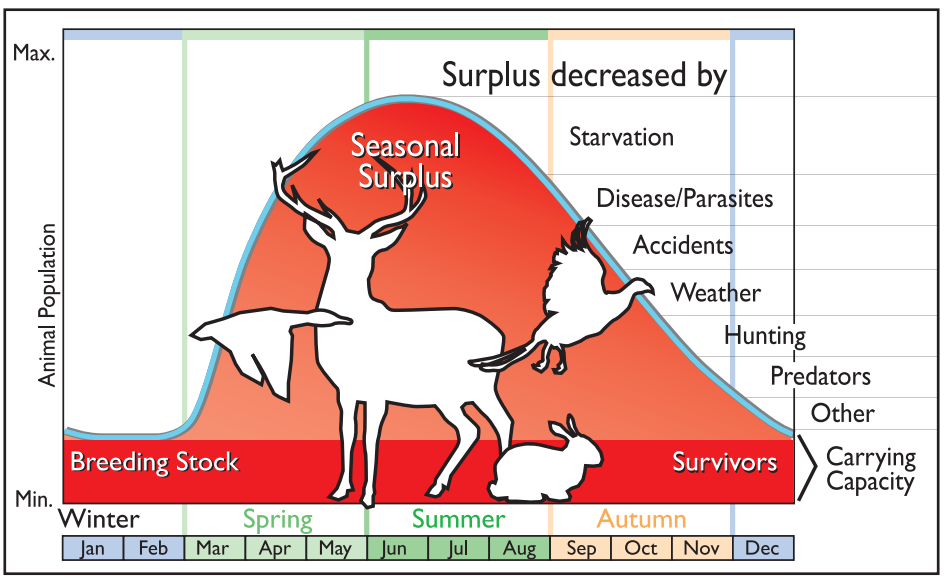
Hunters and Wildlife Conservation

Hunters spend more time, money, and effort on wildlife conservation than any other group in society. In addition to participating in the harvest of surplus animals, hunters help sustain game populations by:

- *Filling out questionnaires*
- *Participating in surveys*
- *Stopping at hunter check stations*
- *Providing samples from harvested animals*
- *Helping fund wildlife management through license fees*

Carrying Capacity

- The resources in any given habitat can support only a certain quantity of wildlife. As seasons change, food, water, or cover may be in short supply. **Carrying capacity** is the number of animals the habitat can support all year long. The carrying capacity of a certain tract of land can vary from year to year. It can be changed by nature or humans.
- **Limiting factors** that affect the potential production of wildlife include:
  - Disease/parasites
  - Starvation
  - Predators
  - Pollution
  - Accidents
  - Old age
  - Hunting
- If the conditions are balanced, game animals will produce a surplus, which can be harvested on an annual basis.



How Hunting and Trapping Support Wildlife Conservation

- Since wildlife is a renewable resource with surplus, hunters help control wildlife populations at a healthy balance for the habitat.
- Hunting is an effective wildlife management tool. Hunters play an important role by providing the information from the field that wildlife managers need.
- Funding from hunting licenses has helped many game and non-game animals recover from dwindling populations.
- Regulated hunting and trapping have never caused wildlife to become threatened or endangered.
- Hunting and trapping are effective and inexpensive management tools used to prevent overpopulation, the spread of disease, and habitat destruction.
- Funding from license sales and excise taxes on firearms and hunting/trapping equipment has helped to protect and enhance wildlife habitat for game and non-game species.

WILDLIFE MANAGEMENT AND CONSERVATION PRINCIPLES

- The wildlife manager's job is to maintain the number of animals in a habitat at or below the habitat's carrying capacity so that no damage is done to the animals or to their habitat.
- In a sense, a wildlife manager's task is similar to a rancher's. Just as a rancher limits the number of animals in a cattle herd to a level that the habitat can support, wildlife managers try to keep the number of animals in balance with their habitat. In addition to looking at the total number of each species in a habitat, wildlife managers also monitor the breeding stock—the correct mix of adult and young animals needed to have a healthy population.
- To manage a habitat, wildlife managers must consider historical trends, current habitat conditions, breeding population levels, long-term projections, and breeding success. With that knowledge, wildlife managers have a variety of practices they use to keep habitats in balance.

Wildlife Management Practices

- **Monitoring Wildlife Populations:** Wildlife managers continuously monitor the **birth rate** and **death rate** of various species and the condition of their habitat. This provides the data needed to set hunting regulations and determine if other wildlife management practices are needed to conserve wildlife species.
- **Habitat Improvement:** As **succession** occurs, the change in habitat affects the type and number of wildlife the habitat can support. Wildlife managers may cut down or burn forested areas to promote new growth and slow down the process of succession. This practice enables them to increase the production of certain wildlife species.
- **Hunting Regulations:** Hunting regulations protect habitats and preserve animal populations. Regulations include setting daily and seasonal time limits, bag limits, and legal methods for taking wildlife.
- **Hunting:** Hunting is an effective wildlife management tool. Hunting practices help managers keep animal populations in balance with their habitat.
- **Predator Control:** Sometimes **predators** must be reduced to enable some wildlife populations to establish stable populations, particularly threatened or endangered species.
- **Artificial Stocking:** Restocking of game animals has been successful in many parts of the nation. Trapping animals in areas where they are abundant and releasing them in other areas of suitable habitat is an example of restocking.
- **Controlling or Preventing Disease and Its Spread:** Disease can have a very bad effect on wildlife. Avian cholera, for example, poses a serious threat, especially to ducks and geese on crowded wintering grounds. Once avian cholera occurs, managers must work to prevent its spread by gathering and burning waterfowl carcasses daily.
- **Management Funds/Programs:** In addition to the Pittman-Robertson funds, many states have started programs that help finance conservation efforts.

Beneficial Habitat Management Practices

- *Brush pile creation*
- *Control of problem-causing plants or animals*
- *Controlled burning*
- *Diking*
- *Ditching*
- *Food plots and planting*
- *Mechanical brush or grass control*
- *Timber cutting*
- *Water holdings*

Suppose each adult pair of waterfowl produces six young each year and none of the factors that limit wildlife production are active. At the end of the fifth year, the initial pair will have grown to over 2,000 waterfowl.

KEYWords

birth rate:
The ratio of number of young born to females of a species to total population of that species over one year

death rate:
The ratio of number of deaths in a species to total population of that species over one year

succession:
Natural step-by-step growth of vegetation and wildlife populations in an area; for example, as trees grow and form a canopy, shrubs and grasses will disappear along with the wildlife that use them as cover

predator:
Animal that kills other animals for food

Cleaning Game

After harvesting any game animal, follow these safe handling tips:

- *Always wear disposable gloves when cleaning game*
- *Remove feces from meat*
- *Wash your hands with soap and water*
- *Clean knives with clean water, wet wipes, or alcohol wipes*
- *Avoid handling brain tissue or spinal cord*
- ***Never** eat meat from any animal that looks sick*

WILDLIFE DISEASES

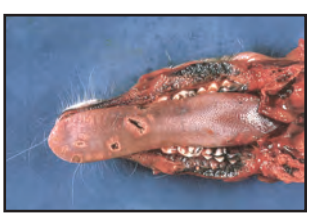
Chronic Wasting Disease (CWD)

- Chronic Wasting Disease (CWD) is a fatal disease that affects the nervous system of deer, elk, and moose. The disease is caused by a prion, which is a protein that acts like a virus. CWD was first discovered in 1967 in captive mule deer in Colorado.
- CWD is a slow-spreading disease that is passed from one animal to another through saliva, feces, and urine. Deer, elk, and moose may not show any signs of the disease for 24 to 48 months after they become infected.

- As the disease gets worse, infected animals show changes in behavior and appearance. These symptoms may include:
  - Continuous weight loss
  - Little fear of humans and predators
  - Excessive drooling, drinking, and urination
  - Stumbling, body tremors, lack of coordination
  - Loss of appetite
- Most animals die within a few months of developing these symptoms. CWD is not believed to infect humans—but to be safe, hunters should **never** shoot, handle, or eat any animal that appears sick.

Hemorrhagic Disease

- Hemorrhagic Disease (HD) is one of the most common diseases affecting white-tailed deer in the eastern United States. The viruses causing this disease are transmitted by biting flies or midges.
- White-tailed deer usually develop signs about seven days after infection; however, some animals may show no signs at all. These symptoms may include:
  - Swollen face or neck
  - Loss of appetite
  - Acting tired or weak
  - Limping (lameness)
  - Difficulty breathing
  - Drooling
  - Fever
  - Sudden death



- Deer with HD often have mouth sores and may bleed from the nose and/or mouth. Some animals may develop swollen, blue tongues as well. Often these animals have hoof overgrowth and may have dents or cracks in the walls of their hooves. Usually, infected deer will go into shock and die within 8 to 36 hours.

Lyme Disease

- Lyme disease is transmitted by ticks and affects humans and some domestic mammals. The disease was named after an outbreak that occurred in 1975 in children from Lyme, Connecticut.
- Lyme disease is common in Pennsylvania, especially in areas where deer ticks are abundant. The disease can cause mild to severe illness in humans, affecting the joints, heart, and nervous system. Humans with Lyme disease often develop a "bull's eye" rash at the bite location followed by fever, fatigue, and headaches. Humans and domestic animals can be treated successfully with antibiotics, especially when the infection is addressed early.
- When spending time outdoors in tick habitats, wear long pants tucked into socks or boots, and use insect repellant. Each day spent in tick habitat should be followed by a thorough "tick check." Ticks found on people or pets should be removed immediately and completely.
- Most common tick-borne disease in the United States
- Pennsylvania has more cases of Lyme Disease each year than any other state in the U.S.
- Delayed or inadequate treatment can lead to more serious symptoms, which can be disabling and difficult to treat
- Embedded ticks should be entirely removed as soon as possible by using fine tipped tweezers, gripping the tick as close to the skin as possible, pulling straight out without twisting, and storing the tick in a dry jar or ziplock bag for further identification if needed.

Rabies

- Rabies is caused by a virus that affects the central nervous system of mammals. The virus is usually passed on through the saliva of the infected animal. Rabies is a public health concern because humans can become infected and it is nearly 100% fatal without treatment.
- It takes about 1 to 3 months for the virus to move from the bite area to the brain, where it then spreads to the salivary glands and then other tissues. Infected animals may show strange behaviors such as jumpiness, lack of fear, or aggression. Other symptoms include loss of coordination and paralysis, which will eventually lead to coma and death within 1 to 10 days.
- Sometimes infected animals will appear normal. Symptoms can vary widely and resemble many other neurological conditions, so a diagnosis cannot be made just from these signs alone. However, abnormal behavior is the most common sign.
- If bitten by an animal you think may be rabid, wash the bite area thoroughly with soap and water, then see a doctor immediately! If treatment is given before symptoms appear, development of rabies is usually prevented.
- For more information on these and other animal diseases, go to the Pennsylvania Game Commission's website at **www.pgc.state.pa.us** and select Wildlife Diseases under the Wildlife section on the menu bar.

Tick

Mange

*Mange is a highly contagious skin disease that affects mammals and is caused by small insects called **mites**.*

***Sarcoptic mange** is the most common type of this disease affecting wildlife. In North America, sarcoptic mange has been found in red foxes, coyotes, gray wolves, red wolves, black bears, porcupines, rabbits, squirrels, and raccoons.*

Animals with sarcoptic mange will often have hair thinning and loss. Severely infected animals may lose weight, act sluggish, and may lose their fear of humans.

White-Tailed Deer

Black Bear

Rocky Mountain Elk

WILDLIFE IDENTIFICATION

- Developing wildlife identification skills is a basic requirement for hunters. Mistakes can lead to illegal harvest of game or non-game animals. To identify game properly, you must learn to recognize key features of the animal you're hunting.
- Identifying animals accurately can be a challenge. Sometimes the difference between animals in the same species is subtle, such as the size of their ears or distinctive coloring. Recognizing tracks, scat, food sources, and habitat types also can help you identify animals.
- A variety of print and visual resources are available to help you increase your knowledge about wildlife. Television shows that feature hunting and nature topics also can be a good source of information.
- Wild animals are generally divided into five groups:
  - Large mammals
  - Small mammals
  - Upland birds
  - Waterfowl
  - Rare, threatened, or endangered species
- Important differences between males, females, and juveniles include
  - Males
    - Larger body size
    - More colorful
    - Additional features (antlers or beards)
  - Females
    - Smaller body size
    - Duller coloration
  - Juveniles
    - Smaller body
    - No antlers/beards possible
    - Coloration may differ from adults
    - Smaller features (snout, head, legs, etc.)

Large Mammals

Large mammals can be sorted into family groups. Each family has unique features.

- For example, the deer family, which includes deer, elk, and moose, has cloven hooves—a hoof in two parts. They are also cud chewers. They do not have upper teeth, so they use their broad, flat lower teeth to roll and crush cud against the hard roof of their mouths. Deer also have antlers, which are solid bone and are shed annually. They rub their antlers on trees. Spotting a deer's "rub" on a tree is an indication that deer have been in the area.
- Horns are found on sheep and goats. Horns are hollow and are not shed. Females have horns with half-moon curves, while males have larger horns that curve around each side of the head.
- Large mammals also can be grouped by diet. Wolves and mountain lions eat only meat, and bears eat plants and meat.

Small Mammals

- Two of the most common small game animals are cottontail rabbits and squirrels. These mammals have a high birth rate, a high death rate, and a short life span. By studying these animals, you can learn to recognize their tracks.
- Some small mammals that are sought after primarily for their pelts are called furbearers. Two popular breeds are mink and muskrats.

Rabbit

Red Fox

Fox Squirrel

Striped Skunk

Upland Birds

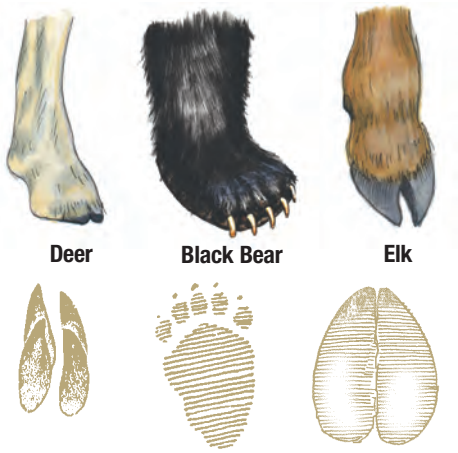
- Popular upland birds that are found across the country include turkeys, pheasants, grouse, and quail.
- Most male upland birds have brighter feathers or features than females. The female's plain feathers help her provide camouflage cover for her nest.
- The basic shape of upland birds is similar to chickens—short rounded wings, short bills, and heavy bodies. Upland birds seek cover in brush or woodlands and prefer to live on dry land close to water.

Wild Turkey

Mourning Dove

Ring-Necked Pheasant

Some Large Mammal Hooves/Paws and Tracks



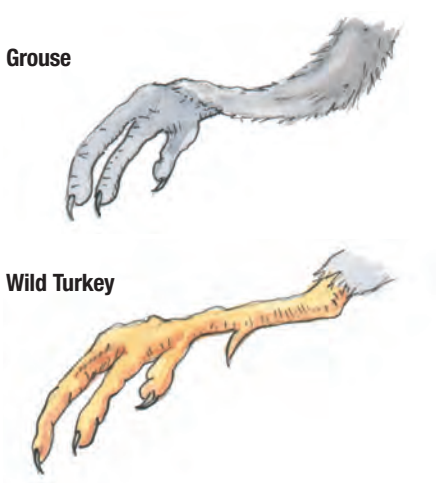
Deer | Black Bear | Elk

Some Small Mammal Tracks

Rabbit | Fox Squirrel

Red Fox | Striped Skunk

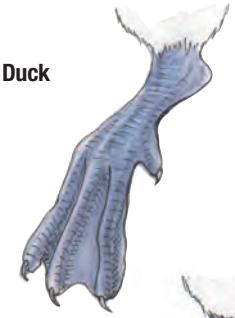
Upland Bird Feet



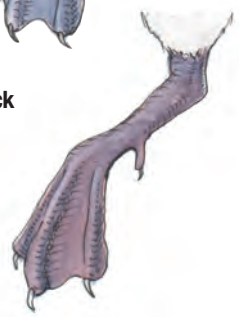
Grouse

Wild Turkey

Waterfowl Feet



Diving Duck



Puddle Duck

Pennsylvania Threatened and Endangered Species

Birds

Endangered

- *American Bittern*
- *Black-Crowned Night Heron*
- *Black Tern*
- *Common Tern*
- *Great Egret*
- *King Rail*
- *Least Bittern*
- *Loggerhead Shrike*
- *Peregrine Falcon*
- *Short-Eared Owl*
- *Yellow-Crowned Night Heron*

Threatened

- *Bald Eagle*
- *Dickcissel*
- *Osprey*
- *Sedge Wren*
- *Upland Sandpiper*
- *Yellow-Bellied Flycatcher*

Mammals

Endangered

- *Delmarva Fox Squirrel*
- *Indiana Bat*
- *Least Shrew*

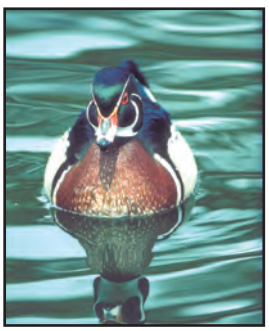
Threatened

- *Eastern Wood Rat*
- *Small-Footed Myotis*
- *West Virginia Shrew*

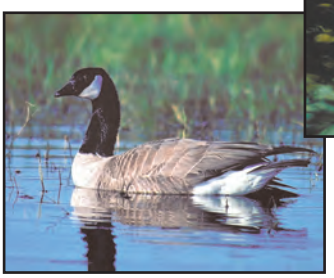
Waterfowl

Waterfowl are warm-blooded animals that live on or near water and include diving ducks and puddle ducks.

- Diving ducks live on lakes and deep ponds and dive for fish, crustaceans, and water plants. They run on top of the water to take off.
- Puddle ducks live on shallow ponds and marshes, where they eat seeds and grasses. They spring into the air to fly.



Wood Duck



Canada Goose

Lesser Scaup

Rare, Threatened, or Endangered Species

- Some species are protected from hunting because their numbers are small and they produce no surplus to harvest.
- Animals that are labeled "rare," "threatened," or "endangered" are all fully protected by law.

Bald Eagle

Indiana Bat

Great Egret

Osprey

Wood Rat

As a responsible hunter, you should educate yourself about wildlife prior to your hunt. The ability to identify species accurately will make you a better hunter and will increase the enjoyment of your hunting experience.

TODAY'S WILDLIFE: FIELD IDENTIFICATION GUIDE

- Consult with the Pennsylvania Game Commission for legal game species and their hunting seasons.
- Develop wildlife identification skills. Learn to recognize key characteristics of the animal you're hunting. This can include slight differences such as the size of their ears or distinctive coloring. Also learn to recognize tracks, scat, food sources, and habitat types.
- Use the variety of print and visual resources that are available to help you learn about wildlife. Television shows that feature hunting and nature topics also can be a good source of information.
- Wild animals are generally divided into five groups:
  - Large mammals
  - Small mammals
  - Upland birds
  - Waterfowl
  - Rare, threatened, or endangered species
- Other wildlife groups are wetland birds and birds of prey.

SUMMER RANGE
WINTER RANGE
ALL-YEAR RANGE

Large Mammals

Large mammals are large-sized, warm-blooded animals with hair. Young are nourished with milk from the mother. Examples are deer and bear. Large mammals are found throughout North America.

White-Tailed Deer

Reddish-brown to blue-gray or tan coloring; underside of tail is white, producing a "flag" when raised off the rump. Antlers on males consist mainly of main beam with tines growing from it.

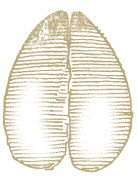
Habitat and Habits: Lives in forests, swamps, open brushy areas, foothills, plains, and river bottoms. Herbivorous. Lives up to 16 years. Male is polygamous; rut runs Oct.–Dec. One to two spotted fawns typical.

Black Bear

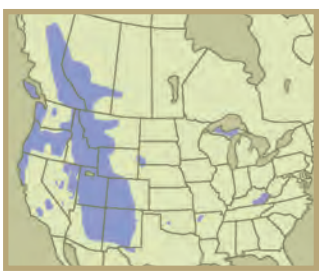
Color varies from black or cinnamon to blond in West and black in East; muzzle usually brown; may have a small white patch on chest. Male much larger than female.

Habitat and Habits: Lives primarily in forest and swamps in East, in forest and wooded mountains in West. Omnivorous. Lives up to 30 years. Nocturnal, usually solitary, except mother with cubs. Mates Jun.–Jul. Typically two to three cubs, born in winter.

Elk (Wapiti)



Dark brown to tan coloring; yellowish rump patch and tail. Large, spreading antlers on male.



Habitat and Habits: Lives in mountain terrain in summer and may move to lower elevations, wooded slopes in winter. Herbivorous. Lives up to 15 years. Male is polygamous; rut runs Sept.–Nov. Usually one calf; spotted until 3 months of age.

Small Mammals

Small mammals are smaller-sized, warm-blooded animals with hair. Young are nourished with milk from the mother. Examples are foxes, rabbits, and squirrels. Small mammals are found throughout North America.

American Beaver

Large-sized, brown rodent; naked tail, scaly and paddle-shaped. Large chestnut-colored front teeth and webbed short feet for swimming.

Habitat and Habitats: Lives in streams, rivers, ponds, or lakes. Constructs houses of sticks, logs, and mud or burrows in banks; builds dams serving as habitat. Herbivorous. Lives up to 11 years. Two to four kits born Apr.–Jul.

Porcupine

Large rodent, size of small dog; chunky body with short legs. Color varies from black to brownish-yellow. Sharp spines on rump and tail.

Habitat and Habitats: Lives in forests or in brushy areas. Herbivorous; likes salt. Lives up to 8 years. Primarily nocturnal. Mates in fall; one young born May–Jun.

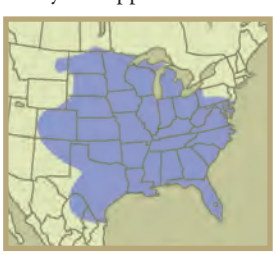
Eastern Gray Squirrel

Medium-sized with inner yellowish-rusty and gray or white-tipped hairs; lighter underside and bushy tail with varying dark hairs with white or yellow tips.

Habitat and Habitats: Lives in forests, river bottoms, pine forests interspersed with hardwoods, and clearings. Herbivorous. Lives up to 15 years. Two to five young per litter.

Eastern Fox Squirrel

Larger rusty-yellowish with orange-red underside and bushy tail tipped with darker hairs.



Habitat and Habitats: Lives in open woodlands, river bottoms, and pine forests with interspersed clearings. Herbivorous. Lives up to 10 years. Two to five young born in Jan. and May.

Red Squirrel

Smallest of tree squirrels in its range. Yellowish or reddish back and whitish belly; bushy tail.

Habitat and Habitats: Lives in coniferous or mixed hardwood forests. Nests in tree cavities or branches. Herbivorous. Lives up to 10 years. Three to seven young born Mar.–Apr.

Bobcat

Medium-sized with reddish-spotted fur (grayer in winter) and black on top and at tip of very short tail. Light-spotted underside including face.

Habitat and Habitats: Lives in thickets of shrubs or trees, swamplands, woodlands, rimrock, and rocky prairies. Carnivorous. Mainly nocturnal and solitary. Two to four kittens in one litter can be born throughout year.

Coyote

Medium-sized with gray to reddish-gray fur, more tan on legs, feet, and ears; dark-tipped tail; whitish belly and throat.

Habitat and Habits: Lives in prairies, open woodlands, shrublands, and a variety of habitats. Carnivorous. Mainly nocturnal but can be active anytime. Five to ten pups born Apr.–May.

Common Gray Fox

Medium-sized with salt-and-pepper fur; face is white under gray and rust; rust color on neck, flanks, and legs; bushy tail topped with black stripe and tip.

Habitat and Habits: Lives in thickets of shrubs or trees, open woodlands, and rocky areas. Omnivorous. Mostly nocturnal. Three to seven young born Apr.–May.

Red Fox

Medium-sized, usually reddish-yellow but sometimes gray; can range from darker to lighter; bushy tail with white tip; usually dark legs and paws.

Habitat and Habits: Lives in mixed woodlands, farming areas, and open country Carnivorous. Three to seven young born Apr.–May.

Mink

Medium-sized with dark brown fur and white chin patch; tail slightly bushy.

Habitat and Habits: Lives along rivers, streams, marshes, ponds, and lakes. Carnivorous. Polygamous. Four to ten young born Jan.–Mar.

Long-Tailed Weasel

Long-bodied and short-legged; brown back and white or yellow underside; long tail with black tip.

Habitat and Habits: Lives on all types of land, preferably near water. Carnivorous. Mostly nocturnal. Four to eight young born Apr.–May.

Virginia Opossum

Small- to medium-sized with gray to dark gray fur; whitish face, and small ears; rat-like tail.

Habitat and Habits: Lives in woodland and farming areas. Omnivorous. Nocturnal. Up to 14 young per litter several times a year. Young remain in mother's pouch for several months.

Common Muskrat

Small-sized with brown to grayish-brown fur and grayish underside; black, scaly tail; partially-webbed hind feet.

Habitat and Habits: Lives in marshes, ponds, and streams. Omnivorous; feeds primarily on aquatic vegetation, but also on frogs, and small fish on occasion. Two to six young per litter; two to three litters per year.

River Otter

Large-sized and weasel-like with brown fur and silvery face, chin, and underside; feet webbed; tail thick at base.

Habitat and Habits: Lives in aquatic habitats around marshes, ponds, and streams. Carnivorous; feeds on fish, frogs, crayfish, and crustacea. Lives more than 14 years. One to five young.

Snowshoe Hare

A large-footed hare with black-tipped, relatively small ears. In summer, dark brown with small tail dark above and dusky to white below. In winter, white on tips of hairs that remain dark at base.

Habitat and Habits: Lives in swamps, forests, and thickets. One of the shyest of the hares, tries to hide in brush. Nocturnal. Mostly herbivorous, but fond of frozen meat. One to six young per litter; two to three litters per year.

Eastern Cottontail Rabbit

Small-sized with brownish-gray fur with cottontail; large ears but not as large as jackrabbit.

Habitat and Habits: Lives in heavy brush in forests, farmlands, thickets of shrubs or trees, swamplands, and weed patches. Herbivorous. Four to seven young per litter; three to four litters per year.

Striped Skunk

Medium-sized with black fur and white stripes from top of head to nose.

Habitat and Habits: Lives in semi-open prairies, thickets of shrubs or trees, farming areas, and mixed woods near water. Omnivorous. Mostly nocturnal. Emits a strong scent in defense. Five to six young born in May.

Common Raccoon

Medium-sized with dark and light mixed fur; distinctive black mask across white face; small- to medium-sized ears and ringed tail.

Habitat and Habits: Lives in woods, often near water. Omnivorous. Nocturnal. Two to seven young born Apr.–May.

Upland Birds

Upland birds live in forests, brushlands, and prairies where there is cover. Examples are grouse, quail, and pheasants. Upland birds are found throughout North America.

Northern Bobwhite

Brown; male with white eyebrow and throat, dark streak across eyes; female with buff-colored eyebrow and throat.

Habitat and Habits: Lives in fields, farmlands, and open woodlands. Makes a wide variety of calls, including "bob-white." Nests in ground; 12–14 white eggs.

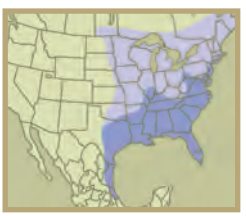
Mourning Dove

Light grayish-brown; lighter below; wings are darker; tail has tipped outer feathers.

Habitat and Habits: Lives in dry uplands, grain fields, thickets of shrubs/trees, shrublands, and deserts. Unmated male makes a "ooahoo-oo-oo-oo" sound. Breeding male and female make a short "ooahoo" call. Nests in trees; two white eggs.

American Woodcock

Brownish with lighter buff breast; large, lighter-colored head; short neck; large dark eyes. Very long, straight bill.

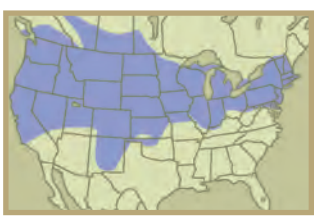


Habitat and Habits: Lives in woods and thickets near open areas. Makes a "peeent" sound. Nests in depressions in ground; four buff-colored eggs with brown markings.

Ring-Necked Pheasant

Hen

Large, chicken-like bird. Male is gold-colored with white neck band, green and purple iridescent head, and red wattle around eyes. Hen is dull brown with dark flecks on wings and back. Both have long tail feathers.



Habitat and Habits: Lives in farmlands near woods. Male makes "skwagock" cackle; female "kia-kia" sound. Flies for short distances. Nests in grasses and shrubs; 10–12 brownish-green eggs.

Ruffed Grouse

Brown to grayish-brown, with black ruffs (sides of neck). Chicken-like in form with slight crest.

Habitat and Habits: Lives in forests with dense undergrowth and brushy areas. Alarm call is a sharp "quit-quit"; female makes soft clucking sound. Nests under brush; 9–12 buff-colored eggs.

Wild Turkey

Hen

Large, long-legged bird with dark, iridescent body; featherless, reddish head. Male is larger and more iridescent than female.

Habitat and Habits: Lives in open woodlands, brush country, thickets of shrubs or trees, river bottoms, and hardwoods. Lives up to 12 years. Polygamous males. Mating call is a gobble; normal calls are clucks, putts, and purrs. Nests in depressions; 6–20 whitish eggs.

American Crow

Stocky, all-black bird with fan-shaped tail.

Habitat and Habits: Lives almost anywhere except deserts and pine forests. Makes a "caw-caw" call. Nests in trees; 4–6 green-colored eggs with brown spots.

North American Flyways

There are four major North American flyways—the Pacific, the Central, the Mississippi, and the Atlantic Flyways. The migration route is from the northern breeding grounds to the southern wintering grounds. The lanes of heaviest concentration conform very closely to major topographical features, following the coasts, mountain ranges, and principal river valleys. Except along the coasts, the flyway boundaries are not always sharply defined.

- PACIFIC FLYWAY
- CENTRAL FLYWAY
- MISSISSIPPI FLYWAY
- ATLANTIC FLYWAY

Waterfowl

Waterfowl are birds that live near or on water. Examples are ducks and geese, which are found throughout North America.

Puddle Duck

surface-feeds on fresh, shallow marshes and rivers

Diving Duck

dives for food in deeper lakes and rivers, coastal bays, and inlets

Goose

large, long-necked waterfowl

Eclipse Plumage

Most ducks shed their feathers twice each year. Nearly all drakes lose their bright plumage after breeding and for a few weeks resemble females. This hen-like appearance is called the eclipse plumage.

Northern Pintail


Drake


Hen


Eclipse Drake

Long-necked, slender duck with pointed tail. Male has dark brown head; white breast and neck; gray flanks and wings. Female has light brown-speckled body; light brown head and neck; gray bill.

Habitat and Habits: Summers on marshes and ponds; winters on coastal bays, lakes, and grain fields. Female quacks coarsely; male whistles. Nests near water; 6–12 light green eggs.


Drake


Hen

Mallard

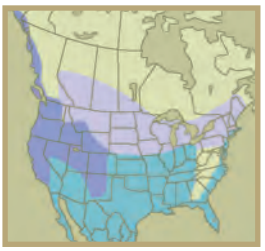
Most common duck. Male often called "greenhead."

Habitat and Habits: Found in deep lakes, slow rivers, ponds, and sometimes bays. Main wintering area is the lower Mississippi basin and along the Gulf Coast; many as far north as open waters permit. Female quacks loudly; male makes quiet "yeeb" or low "kwek." Nests near water; 8–10 greenish-white eggs.


Drake


Hen

Gadwall



Male is gray with light brown head; white patch on back of wing; black rump. Female is mottled brown with white patch on back of wing.

Habitat and Habits: Found on open lakes and marshes. Male makes a whistle and "kack-kack." Nests on islands in colonies; 7–13 white eggs.


Drake


Hen

American Wigeon

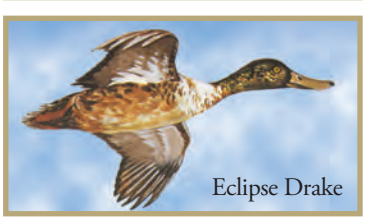
Male is brown with white crown, green eye patch; green and white on wings visible in flight. Female is mottled brown with gray head. Both have pale blue bill.

Habitat and Habits: Found on lakes, marshes, and ponds. Makes quacking and whistling sounds. Nests in grasses near water; 9–11 cream eggs.


Drake


Hen

Northern Shoveler



Male has dark green head; white breast; rust-colored wings. Female is brown-flecked with pale blue on shoulders.

Habitat and Habits: Found on shallow lakes and ponds, and sometimes on brackish marshes. Male croaks; female quacks. Nests in grasses, not always near water; 6–14 pale green eggs.


Drake


Hen

Blue-Winged Teal

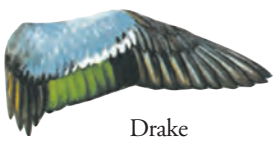

Drake


Hen


Eclipse Drake

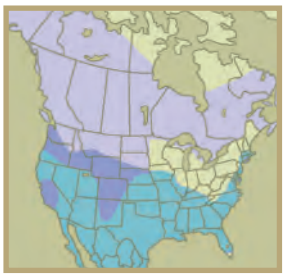
Male is brown and buff speckled; gray head with white crescent in front of eye; pale blue patch on wings. Female is brown speckled; smaller pale blue patch on wings.

Habitat and Habits: In summer found on small lakes in open grasslands; in winter on marshes and coastal areas. Male peeps; female quacks. Nests in grasses near water; 6–15 white eggs.


Drake


Hen

Green-Winged Teal




Drake


Hen


Eclipse Drake

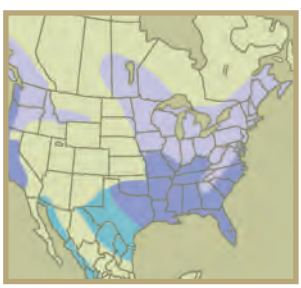
Male is gray with white vertical bar on shoulder; rust head with green band. Female is speckled dark brown and white with dark band across eye.

Habitat and Habits: In summer found on ponds and lakes; in winter on rivers and coastal marshes. Male whistles; female quacks. Nests in grasses, not always near water; 7–15 pale green eggs.


Drake

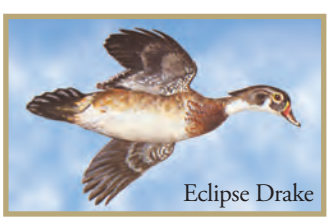

Hen

Wood Duck




Drake


Hen


Eclipse Drake

Male has colorful crested head and red eyes; iridescent greens, purples, and blues over entire body with white marking. Female is light brown speckled and has white-ringed eyes.

Habitat and Habits: Found on swamps, ponds, and rivers near wooded areas. Male makes a "hoo-w-ett" call; female a "oo-eek." Nests in tree cavities; 10–15 dull whitish eggs.


Drake


Hen

Black Duck


Drake


Hen


Eclipse Drake

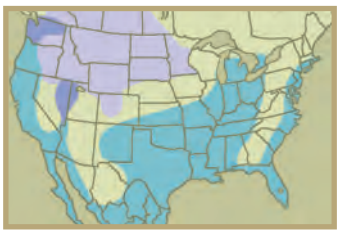
Sexes are similar. Large brown duck with paler brown head and neck; violet patch on wings.

Habitat and Habits: Summers on fresh- and saltwater marshes; winters along coast. Female quacks when separated from male; male makes soft, reedy noise. Nests in depressions in ground, close to water; 6–12 eggs, cream to greenish-buff colored.


Drake

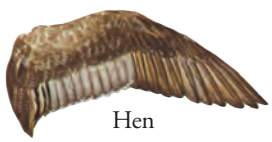

Hen

Canvasback



Male has white body; reddish head; black breast, bill, and tail. Female has gray body and brown head.

Habitat and Habitats: In summer found on lakes and marshes; in winter on lakes and coastal waters. Male coos during breeding; female quacks. Nests in reeds and grasses; 7–12 greenish eggs.



Redhead

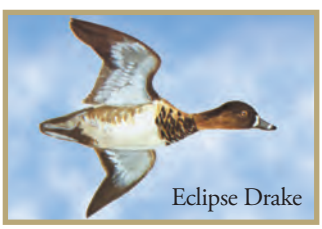
Male is gray with reddish head and black breast. Female is brown with darker brown back and crown.

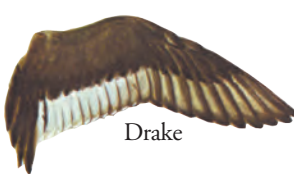
Habitat and Habitats: Found on lakes and bays. Male makes "meow" sound or quacks; female makes a soft low call. Nests in rushes and grasses; 9–13 pale eggs.

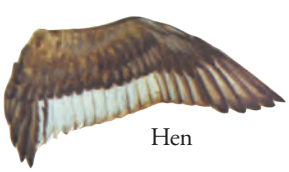
Ring-Necked Duck

Male is black with pale gray sides. Female is brown with darker back and has white-ringed eyes.

Habitat and Habitats: In summer found on lakes and marshes; in winter found on large lakes and coastal areas. Nests in grasses near water; 6–14 pale green eggs.



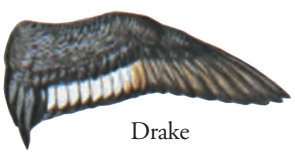


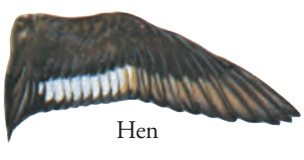


Lesser Scaup

Male has white flanks with dark head, breast, and tail; speckled gray back. Female is dark brown with white spots on either side of bill base.

Habitat and Habitats: In summer found on lakes and marshes; in winter on lakes and coastal areas. Male makes a purring call; females are mostly silent. Nests in grasses near water; 8–14 pale green eggs.

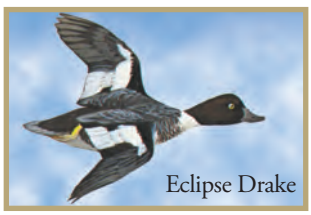




Common Goldeneye

Male has white flanks; black head and back with round white spot below eye. Female is gray with dark head and white collar.

Habitat and Habits: In summer found on lakes and marshes; in winter found on lakes and coastal areas. Male makes a shrill whistle and female a low quack during breeding. Otherwise, usually quiet. Nests in tree cavities; 5–15 light green eggs.

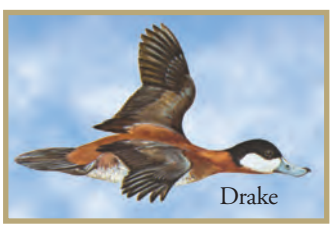


Bufflehead

Male is mostly white with black back and white patch at back of head. Female is grayish with white patch below eye.

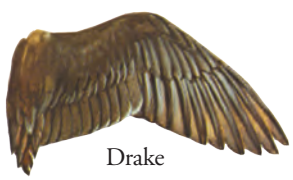
Habitat and Habits: In summer found on lakes and rivers near woods; in winter on lakes and coastal areas. Male is usually silent; female quacks. Nests in tree cavities; 8–10 buff eggs.

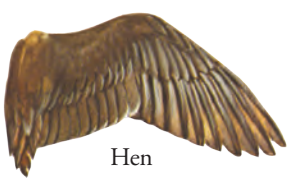
Ruddy Duck



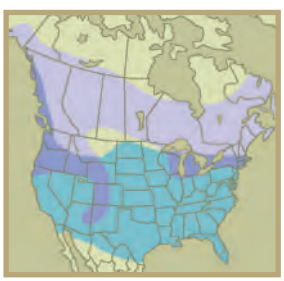
Male is reddish-brown with black head and white cheek; in winter male looks similar to female. Female is brown; darker on head and back.

Habitat and Habits: In summer found on lakes; in winter on coastal areas. Both sexes are mostly silent. Nests in grasses near water; 6–10 white eggs.





Common Merganser



Male has dark green head; dark back; white neck and underside. Female is grayish-brown with reddish-brown head and white breast.

Habitat and Habits: In summer found on lakes and rivers near woods; in winter on freshwater lakes and ponds. Nests in tree cavities and rock crevices; 8–11 cream eggs.

Hooded Merganser

Male has dark crested head with white patches, brownish sides, and white breast. Female is gray with reddish-brown crest and lighter gray breast.

Habitat and Habits: In summer found on rivers and lakes in wooded areas; in winter found on coastal areas. Male makes a croak-like sound; female a "gak." Nests in tree cavities; 6–18 white eggs.

North American Flyways

- PACIFIC FLYWAY
- CENTRAL FLYWAY
- MISSISSIPPI FLYWAY
- ATLANTIC FLYWAY

There are four major North American flyways—the Pacific, the Central, the Mississippi, and the Atlantic Flyways. The migration route is from the northern breeding grounds to the southern wintering grounds. The lanes of heaviest concentration conform very closely to major topographical features, following the coasts, mountain ranges, and principal river valleys. Except along the coasts, the flyway boundaries are not always sharply defined.

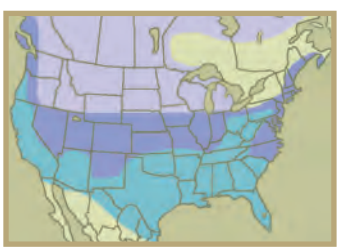
Snow Goose

Male and female are white with dark gray on underside of wings; short neck; large head.

Habitat and Habits: In summer found on tundra; in winter on fields and wetlands. Male and female both honk. Nests in grasses near water in colonies; 3–5 white eggs.

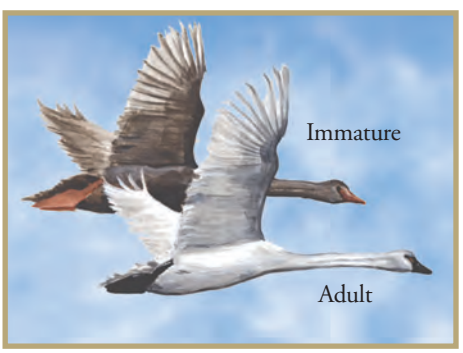
Canada Goose

Both male and female are brownish-gray; black head and tail; white patch on cheek, breast, and underside.



Habitat and Habits: Found on lakes, marshes, fields, and parks. Male and female make honking call. Nests on water edges; 4–7 white eggs.

Tundra Swan



Male and female both are long-necked and white with black legs and feet. Black bill with variably-sized yellow spot at base. Holds neck straight up. Formerly named "whistling swans." Immature: brownish-gray body.

Habitat and Habits: In spring found in upland tundra for nesting; winters on marshy lakes and bays. Male and female both have a mellow call; 2–7 creamy-white eggs in large nests.

Wetland Birds

Wetland birds live close to water in marshy and coastal areas. Examples are cranes and pelicans. Most of these birds are protected.

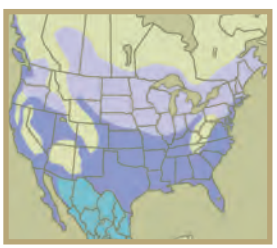
Wilson's (Common) Snipe

Long-billed, dark brown and black shorebird with white stripes on head and back. Outer tail feathers are white with black bars. Flies in zigzag pattern.

Habitat and Habits: Found in wet meadows, fresh-water marshes, and fields. Makes a "scaip" call when flushed. Nests in depressions in marshy areas; 4 yellowish-olive-colored eggs with brown spots and brown circle at large end.

Great Blue Heron

Grayish-blue with a yellow bill. White crown and face with a black stripe above each eye extending to the back of the neck as a plume. Shaggy neck. Long gray legs with reddish thighs.



Habitat and Habits: Found on lakes, rivers, ponds, marshes, and swamps. Makes a hoarse, deep guttural squawk. Nests in trees near water; 3–7 large blue eggs.

Great Egret

Large, white heron with yellow bill and black legs and feet.

Habitat and Habits: Lives on marshes, swamps, seashores, and lake margins. Makes very deep, low "kroow" and "karrr." Nests often high up in trees and shrubs; 1–6 pale bluish-green eggs.

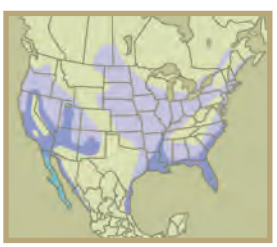
Coot

Duck-like waterbird with a slate-colored body and black head and neck. Partial ring around tip of white bill. Immature: grayish with whitish chin and throat and no ring around bill.

Habitat and Habits: Lives in the summer on marshy lakes; winters along the coast. Sounds like a tiny trumpet. Nests on a platform of floating vegetation attached to reeds; 8–12 pink-buff eggs with dark marks.

Black-Crowned Night Heron

Gray-and-white stocky heron with black cap and back. Immature: brown with white streaks below and white spots on back and wings.



Habitat and Habits: Lives in fresh-water streams, lakes, rice fields, dry grasslands, and salt marshes. Makes a low, hoarse "quok" at dusk. Nests in reeds, shrubs, or trees; 3–5 pale blue-green eggs.

American Bittern

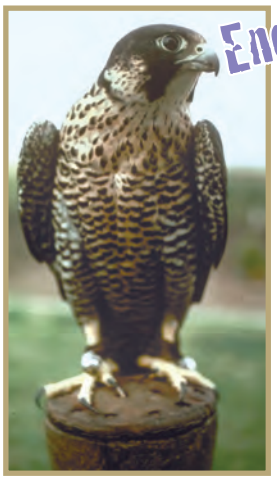
A secretive, medium-sized heron with brown streaking underneath and sometimes a black streak extending down neck from the base of the bill. Immature: no black streak.

Habitat and Habits: Lives in fresh-water or brackish marshes with tall vegetation. Makes a loud pumping sound when breeding. Platform nests are composed of reeds placed a few inches above water; 2–6 buff olive-brown eggs.

Birds of Prey

Birds of prey feed on other birds or mammals. Examples are eagles, falcons, and owls. Birds of prey are found throughout North America. All of these birds are protected.

Peregrine Falcon



Large, speckled brown falcon with bluish-gray back, darker head, and lighter neck and chest. Immature: streaked belly and breast.

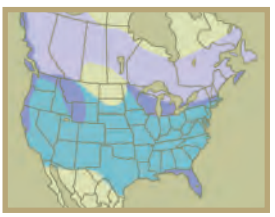
Habitat and Habits: Found near cliffs, urban, and coastal areas. Makes a high-pitched "ki-ki-ki-ki" call. Nests in cliffs; 3–4 white eggs.

Northern Harrier (Marsh Hawk)

Male is grayish-brown with lighter underside. Female is larger and brown with streaked underside. Both have white patch on rump.

Habitat and Habits: Found in fields, grasslands, and marshes. Generally quiet unless alarmed. Nests on ground; 3–9 pale blue eggs.

Bald Eagle



Large, dark bird with white head and tail; yellow bill. Immature: brownish speckled with more white under wings and belly.

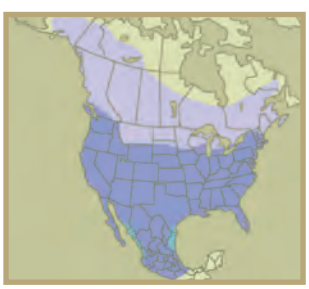
Habitat and Habits: Found on lakes, rivers, and coastal areas. Makes a loud screech. Nests on cliffs or in trees; 1–3 pale blue eggs.

Golden Eagle

Large, dark bird. Immature: dark with white patches under wings and on tail.

Habitat and Habits: Found in mountains, hills, and grasslands. Mostly quiet. Nests on cliffs, on ground, or in trees; 1–4 speckled eggs.

Red-Tailed Hawk



A large hawk with a red tail, white chest, white mottling on back, and usually a belly band. Wide color variation in species.

Habitat and Habits: Found in a variety of open habitats. Makes a high-pitched descending scream. Nests on a platform of sticks in trees or on a rock ledge; 1–5 bluish-white eggs with dark marks.

Common Barn Owl

Light brown with white heart-shaped face, dark eyes, and white breast.

Habitat and Habits: Found in fields, grasslands, deserts, and suburban areas. Makes a screeching call. Nests in abandoned buildings, tree hollows, and holes in ground; 4–7 white eggs.

Great Horned Owl

Large, grayish with brown specks; yellow eyes and ear tufts.

Habitat and Habits: Found almost everywhere. Makes a rhythmic hooting call. Lives in nests abandoned by other birds and small mammals; 1–4 white eggs.

Eastern Screech Owl

Small, light reddish-brown or grayish owl with ear tufts and yellow eyes.

Habitat and Habits: Found in woods, swamps, and suburban areas. Makes whining call. Nests in tree cavities; 3–5 white eggs.

Barred Owl

Large, grayish-brown with cross-barring on neck and chest, striping on belly; dark eyes; no ear tufts.

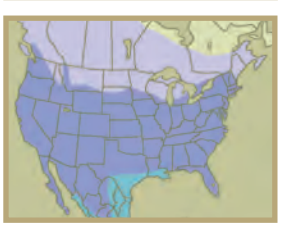
Habitat and Habits: Found in densely forested areas and wooded swamps. Makes "hoo-hoo-hoohoo" call and also screams. Nests in tree cavities; 2–4 white eggs.

Turkey Vulture

Large, all-dark bird with long tail and small, bare, reddish head.

Habitat and Habits: Found mainly in deciduous forests, open country, and dumps. Usually silent. Nests on bare ground, in tree hollows, on cliff ledges, or in old buildings; 1–3 dull white eggs with dark marks.

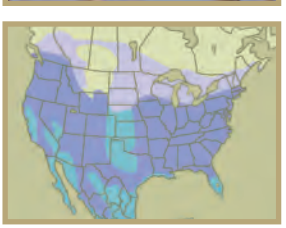
American Kestrel



Small, colorful falcon with two black sideburns. Male has blue-gray wings; female has reddish-brown.

Habitat and Habits: Found in a wide variety of open habitats. Makes a series of sharp shrill notes. No nesting material in natural or man-made cavity; 3–7 pinkish eggs with dark marks.

Cooper's Hawk



Small, "crow-sized" hawk with short, rounded wings and long, narrow tail.

Habitat and Habits: Found in broken forests and open woodlands. Makes a series of nasal, barking notes. Nests high in trees; 3–8 pale blue-green eggs with dark marks.

Osprey

This "fish hawk" is dark above, white below with white head and black streak through eye.

Habitat and Habits: Found around large lakes, rivers, and seacoasts. Makes a short, shrill whistle. Nests in trees, cliffs, or human structures; 2–4 white, pink, or buff eggs blotched with brown.

North American Flyways

There are four major North American flyways—the Pacific, the Central, the Mississippi, and the Atlantic Flyways. The migration route is from the northern breeding grounds to the southern wintering grounds. The lanes of heaviest concentration conform very closely to major topographical features, following the coasts, mountain ranges, and principal river valleys. Except along the coasts, the flyway boundaries are not always sharply defined.

- PACIFIC FLYWAY
- CENTRAL FLYWAY
- MISSISSIPPI FLYWAY
- ATLANTIC FLYWAY

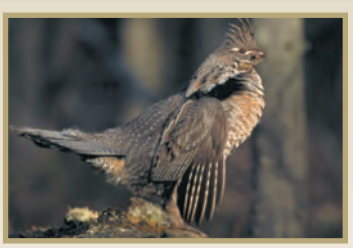
are YOU ON TARGET?

Using the identification guide in this chapter, identify the following birds and animals.

1. _____

2. _____

3. _____



4. _____

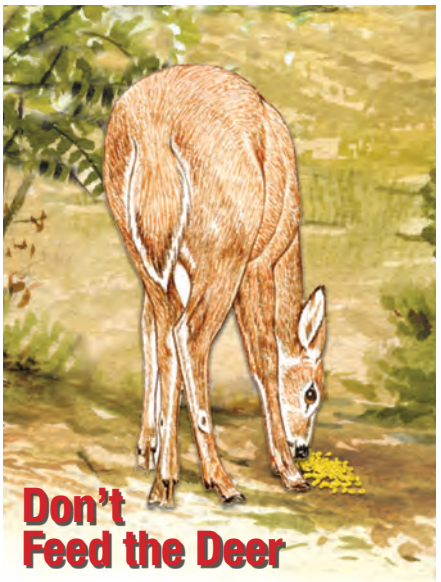
5. _____

6. _____

7. _____

8. _____

On Target Exercise Answers 1. Wood Duck 2. Mallard Hen 3. Woodcock 4. Ruffed Grouse 5. Gray Fox 6. Common Muskrat 7. Osprey 8. Great Egret



How You Can Help With Wildlife and Habitat Management

*One rule you should follow if you want to help is **don't feed the deer**. Although many people think that feeding deer will help them survive the winter, this is not the case. Supplemental feeding can:*

- *Help spread diseases like Chronic Wasting Disease (CWD) and tuberculosis (TB).*
- *Cause disease in deer because they are not meant to eat corn or apples during the winter.*
- *Increase the deer's energy loss by luring them long distances away from cover and their normal feeding areas.*
- *Cause long-term habitat destruction.*
- *Increase the number of deer/vehicle collisions.*
- *Cause deer to rely on feeding locations, making them a private, not a public, resource.*

Instead of feeding deer, you can help them survive by:

- *Creating and maintaining a good quality deer habitat*
- *Improving natural food resources that will benefit all wildlife*

For more ideas and information on helpful programs, visit the Pennsylvania Game Commission website at **www.pgc.state.pa.us** *and click on the "Wildlife" section.*

Chapter Review Exercise

1. Wildlife conservation makes sure that ____.
   a. hunting seasons established by Kublai Khan will continue.
   b. no animals are ever harvested.
   c. natural resources can be drawn on despite unwise use.
   d. renewable resources can replenish themselves over and over again.
2. Wildlife preservation ____.
   a. allows for the consumptive use of natural resources.
   b. is a Biblical rule for saving natural resources.
   c. saves natural resources but with no direct use of them.
   d. allows hunting of endangered species.
3. A habitat healthy for wildlife must include ____.
   a. space, arrangement, food, cover, and water.
   b. brush and rocks, predators, water, and space.
   c. space, vegetation, food, and resting and breeding places.
   d. cover, predators, large area, arrangement, and food.
4. The "carrying capacity" of a wildlife area is the _____ _____.
5. List four factors that can limit wildlife populations.
   i. _____
   ii. _____
   iii. _____
   iv. _____
6. Hunting and trapping is an effective wildlife management tool because ____.
   a. funding from hunting licenses helps many game and non-game animals recover from dwindling populations.
   b. hunters and trappers play an important role by supplying wildlife managers with needed information from the field.
   c. hunting and trapping contribute to threatened or endangered wildlife.
   d. both a. and b.
7. Trapping and relocating animals is an example of the ____ wildlife management practice.
   a. hunting
   b. artificial stocking
   c. setting bag limits and legal methods for taking wildlife
   d. habitat improvement
8. It is important that hunters are able to identify wildlife correctly, so that they don't mistakenly ____.
   a. harvest illegal game animals or non-game animals
   b. confuse horns with antlers
   c. confuse cloven hooves with cud chewers
   d. confuse meat-eating animals with those that eat meat as well as plants
9. List five major resident species found in Pennsylvania.
   i. _____
   ii. _____
   iii. _____
   iv. _____
   v. _____
10. List three migratory species found in Pennsylvania.
    i. _____
    ii. _____
    iii. _____

Chapter Review Answers

1. d 2. c 3. a 4. number of animals the habitat can support year round 5. i. Disease ii. Starvation iii. Predators iv. Pollution v. Accidents vi. Old Age vii. Hunting viii. parasites 6. d 7. b 8. a 9. Answers may vary; 10. Answers will include most waterfowl, wetland birds, and some birds of prey.

Outdoor Safety

Objectives *Students will be able to...*

- State three primary reasons why a hunter or trapper needs to develop an outdoor activity plan.
- List five conditions that affect a hunter or trapper's physical ability to perform safely and responsibly.
- List at least three primary items that should be included in a survival kit.
- List three methods for signaling for help when lost in the outdoors.
- List three health emergencies or accidents that make it important for hunters and trappers to complete a first-aid and/or CPR training course.
- State the causes, symptoms, prevention, and treatment of hypothermia and heat exhaustion.
- State the two major dangers when hunting near water, and name the important safety device that must be used when hunting or trapping from a boat.
- State how alcohol and drugs can impair the senses and abilities of hunters and trappers.

IMPORTANCE OF PLANNING AND PREPARATION

Hunting is a safe sport, but it does involve a certain amount of risk. Aside from firearm safety issues, a variety of incidents can occur on a trip outdoors. The rougher the terrain—particularly when it's unfamiliar terrain—the greater the chance of accidents. Climate extremes also increase the risk factor. In remote areas, there's always the possibility of getting lost.

The purpose of this chapter is not to train you in first-aid and rescue procedures but to make you aware of situations that require medical attention. Knowing what to expect, how to prepare, and where to receive the necessary training will help reduce the number and severity of injuries experienced while participating in hunting and trapping activities.

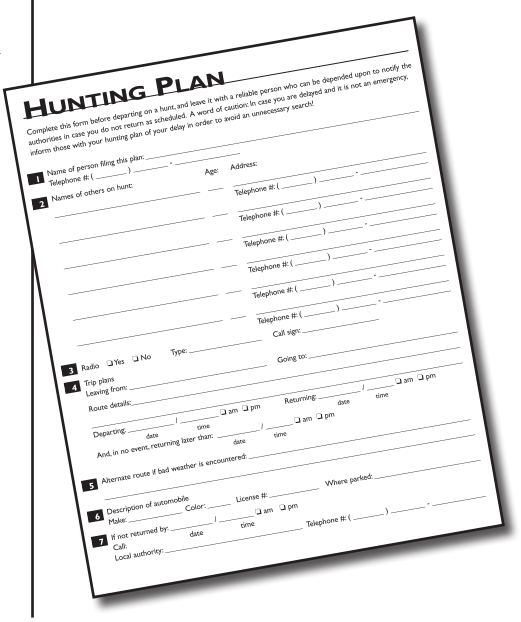
To plan properly:

- **Be Ready:** To help you avoid or minimize problems, it's essential that you plan carefully for the hunt. Responsible hunters think about possible problems and make plans to deal with them. Some things to consider include terrain, location, weather, dangerous game, and the potential for forest fires.
- **Know Your Location:** Learn as much as you can about your chosen hunting area before you arrive. Purchase a topographic map, and familiarize yourself with the terrain. If the location is close to home, it's a good idea to visit the area in the off-season.
- **Prepare for Safety:** You also need to consider your physical condition and equipment. Refresh your memory of hunting and firearm safety rules, and review the rules with your hunting partners.
- **Tell Others:** Prepare a hunting plan, which is a document that can be used to locate you if you fail to return at the appointed time. It can be a lifesaver, so be sure that it answers the following questions:
  - Who is going?
  - Where are you going?
  - What area will you be hunting in?
  - What route are you taking to and from the area?
  - When are you leaving?
  - What kind of vehicle are you using?
  - When do you plan to return?

Remember ...

If you're an experienced map reader, you can:

- *Read terrain.*
- *Determine direction.*
- *Follow rivers, valleys, and ridges.*
- *Find your location in relationship to your camp.*
- *Identify areas preferred by game animals.*


HUNTING PLAN

Complete this form before departing on a hunt, and leave it with a reliable person who can be depended upon to notify the authorities in case you do not return as scheduled. A word of caution: In case you are delayed and it is not an emergency, inform those with your hunting plan of your delay in order to avoid an unnecessary search!

1 Name of person filing this plan: _____ Age: _____ Address: _____
Telephone #: ( ) - _____

2 Names of others on hunt: _____ Telephone #: ( ) - _____
Telephone #: ( ) - _____
Telephone #: ( ) - _____
Telephone #: ( ) - _____
Telephone #: ( ) - _____
Telephone #: ( ) - _____
Call sign: _____

3 Radio ❑ Yes ❑ No Type: _____ Going to: _____

4 Trip plans
Leaving from: _____
Route details: _____
Departing: ____/____/____ time ❑ am ❑ pm Returning: ____/____/____ time ❑ am ❑ pm
And, in no event, returning later than: ____/____/____ time ❑ am ❑ pm

5 Alternate route if bad weather is encountered: _____

6 Description of automobile
Make: _____ Color: _____ License #: _____ Where parked: _____

7 If not returned by: ____/____/____ time ❑ am ❑ pm
Call: _____ Telephone #: ( ) - _____
Local authority: _____

Remember...

Shooting from vehicles is unsafe, unethical, and in many instances illegal.

Hunting With All-Terrain Vehicles

All-Terrain Vehicles or ATVs are special-purpose vehicles that require careful, responsible handling and good judgment.

- *They're useful for traveling into back country, but they can damage the environment if used recklessly. They also require training and practice to handle them safely in rough terrain.*
- *Studies show that the majority of ATV accidents occur when the rider unexpectedly encounters an obstacle, such as a rock or a ditch. Maintaining a safe speed is critical.*
- *If you use ATVs to hunt, prepare yourself and your family by attending an approved ATV course.*
- *Before hunting with ATVs on private land, be sure to get the landowner's permission.*
- *Always follow the rules for safe and ethical operation:*
  - *Wear a helmet.*
  - *Carry firearms unloaded and cased, or on a proper gun rack.*
  - *Stay on the main roads and trails.*
  - *Pick your route carefully to minimize terrain damage.*
  - *Don't drive over crops or planted fields.*
  - *Don't shoot from an ATV.*
  - *Use ATVs only to get to the hunting area or to haul an animal from the woods.*
- *Many states prohibit hunting from any motorized vehicle, including ATVs; this includes disturbing, stirring up, or driving any game animals or game birds with a motorized vehicle.*
- *It is illegal in some states to operate an ATV off trail; in other places, there may be trails specifically closed to ATV use.*
- *In many states, it is prohibited to operate an ATV off roads or trails in a manner that damages or disturbs the land, wildlife, or vegetation.*
- *Some states require that ATVs be equipped with approved and operating spark-arresting mufflers and comply with sound regulations.*

Give specific directions on your route to your destination and any alternate destinations. (When hunting with companions who will travel separately, each person should write a hunt plan.) Leave the plan with a family member or friend. Do not deviate from your hunting plan without notifying someone about your change. Remember, for your safety, "plan the hunt and hunt the plan."

CONDITIONS AFFECTING PHYSICAL ABILITY

- Hunting often demands more physical activity than you're use to. Conditions that may hamper your physical ability to perform safely and responsibly while hunting include:
  - **Known Allergies**
    - Take medication or have medication with you at all times.
    - Be wary of side effects.
  - **Physical Fitness**
    - Hunting and trapping are physically demanding activities; you need a fitness program (strength, endurance, cardiovascular).
    - Being physically fit also reduces the possibility of becoming ill.
  - **Overweight**
    - Affects your heart and endurance.
    - May restrict your ability to move from place to place.
    - Requires a sensible rate of activity.
  - **Mind Set**
    - A clear head is essential to make critical decisions.
    - May influence reaction time in critical situations.
  - **Physical Disability**
    - Doesn't prevent you from participating in hunting or trapping activities.
    - May require special equipment.
    - May need to locate accessible areas to hunt or trap.
    - Requires that you hunt or trap with a partner.
  - **Fatigue or Illness**
    - Reduces energy.
    - Lessens your ability to think clearly.
    - Reduces motor response.
- If you're planning a hunt that involves a lot of physical activity, start getting in shape at least two months ahead of time.

Clothing

- Clothing also can affect your ability to perform safely and responsibly. Select clothing based on the weather you expect, while being prepared for the worst.
- In warm weather, wear a hat and light clothing that covers as much of your skin as possible to prevent heat exhaustion or sunburn.

- Cold weather conditions call for clothing that is worn in layers. Layers offer superior insulation. Also, as weather warms up, you can shed a layer at a time to stay comfortable. Layers should include:
  - A breathable outer layer (material such as polypropylene)—worn next to the body; it should release moisture from the skin while keeping you warm.
  - An insulating layer—weightier or bulkier; it should hold warm air around you.
  - A protective outer layer—available in various weights and materials according to conditions; it should protect the inner layers from water and wind.

- The most important clothing choices are a fluorescent orange hat *and* fluorescent orange outerwear—a shirt, vest, or jacket. Fluorescent orange clothing makes it easier for one hunter to spot and recognize another hunter because nothing in nature matches this color. The orange color of the clothing should be plainly visible from all directions. This is required by law in many states.

Other Clothing Essentials

- *A hat or cap with earflaps and gloves to retain body heat—most body heat is lost through the head and hands; gloves also protect your hands from scrapes and rope burns*
- *Footwear that is sturdy, suitable for the conditions you'll encounter, and broken in before the hunt*
- *Two layers of socks—polypropylene against the skin and a wool outer layer*

Remember...

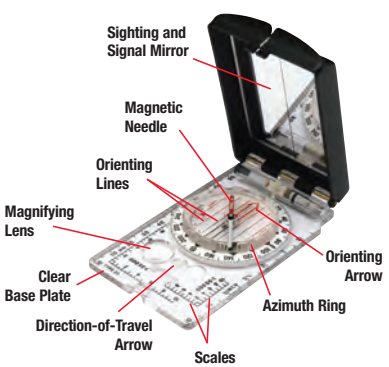
Wool is the best all-around choice for insulation because it can provide warmth even when wet. The best clothing combination in bad weather is polyester or polypropylene underwear and shirt, woolen pants, heavy jacket, and water repellent rain pants and parka. Clothing that is soaking wet can lose heat several hundred times faster than dry clothing. Any type of cotton clothing (underwear, T-shirts, jeans, flannel shirts) is a poor choice for cold, wet weather. When wet, cotton loses its already limited insulating ability and can cause rapid transfer of heat away from the body, increasing the risk of hypothermia.

Topographic Maps and Compasses

- *Whenever you're in a remote or unfamiliar area, a topographic map and compass are a must.*
- *Topographic maps are created from aerial photographs and reveal the contours of the land, including hills, ridges, and valleys, as well as lakes, rivers, creeks, trails, and roads:*
  - *Contour lines show the elevation of the ground.*
  - *Contour intervals reveal how much vertical distance there is between each contour line—closely spaced contour lines indicate very steep slopes.*
  - *Contour lines that are sharply tapered indicate an uphill direction.*
  - *Rounded contour lines typically indicate a downhill direction.*

The Compass

- *The orienteering compass is an important piece of equipment for outdoor travel.*
- *A good orienteering compass has these features:*
  - *Clear base plate that allows you to see the map underneath*
  - *Straight sides for lining up two points or for drawing lines*
  - *Liquid-filled needle housing that keeps the magnetic needle relatively steady when taking readings*
  - *Two arrows: a direction arrow painted on the base plate is used to point the compass at your destination; an orienting arrow, located in the needle housing, is used to orient your compass to your map*



Remember...

Metal objects, such as knives, gun barrels, belt buckles, etc., will affect a magnetic needle.

SURVIVAL KIT ITEMS

Although Pennsylvania does not have the types of remote terrain found in the western United States or Canada, hunters and trappers should be prepared to spend the night in the field. There have been occasions, either due to weather conditions or becoming lost, when hunters and trappers have had to survive the night in the forests of the state. Several items should be taken when hunting or trapping in the more remote areas of Pennsylvania.

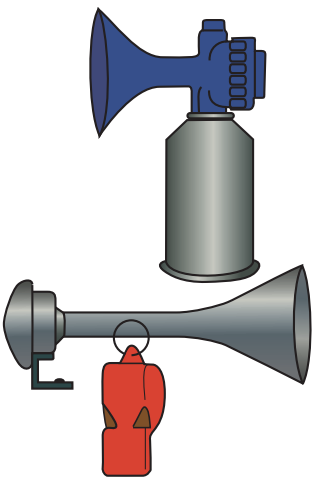
Primary Items

- **Shelter Material**
  - Can be as simple as a large trash bag.
- **Fire Building Materials**
  - Tinderbox, waterproof matches, fuel (quick start).
- **First-Aid Kit**
  - Include any medications needed.
- **Flashlights**
  - Always have a backup.
- **Compass and Map, or GPS**
- **Water and Food**
  - Include purification tablets.
- **Sharp Knives**

Signaling Devices

Should you find yourself in a situation where you are lost or unable to move, you will need to signal for help. Your options include three of any signal:

- Whistle
- Small Air Horn
- Signal Mirrors (a sequence of three flashes)
- Fires (a grouping of three)
  - Care must be taken to control the fires.
  - Create a thick smoke column during the day by using wet leaves.
  - Build large fires to create visible flames at night.
- Firearm
  - Not recommended.
  - If it is your only option, remember the five primary rules of firearm safety.
- Cell phone or hand-held radios
  - Cell phones may not work in some areas.
  - Hand-held radios might be affected by the terrain and distance.
- Voice
  - Will not last long.



Topographic Maps and Compasses (cont.)

Declination

- *Topographic maps are drawn to true north (North Pole), which is indicated by the grid lines on the map. However, a compass will always point to magnetic north, which is in the Hudson Bay area. The difference between true north and magnetic north is called "declination."*
- *When true north and magnetic north are aligned, you're at 0˚ declination. Your compass needle will point to true north. However, if you're east or west of 0˚ declination, your compass will not be in line with true north.*
- *To compensate for declination:*
  - *Center the north arrow (the "N") of the compass dial along a north/south line of the map.*
  - *Check the diagram at the bottom of the map that shows whether magnetic north is to the left or right of true north.*
  - *Turn the compass dial the correct number of degrees left or right as indicated on the map. The "N" is now pointing at magnetic north.*
  - *Hold the compass level in front of you and rotate your body until the tip of the compass needle aligns with the "N" on the compass dial. The direction arrow on the base plate now points in the direction you want to go.*

Plot Your Progress

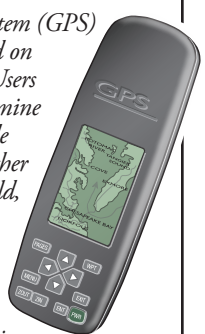
- *As you hike into unfamiliar terrain, you can keep your bearings by taking frequent compass readings and plotting your progress on a map.*
  - *Note key points, such as stream crossings, to help you find your way back.*
  - *Pay particular attention when you reach a high point at the top of a ridge.*
  - *Use the elevation to locate landmarks visible from there.*
- *Learning to set a course and take bearings takes study and practice. The best way to become proficient with a compass is under the guidance of an experienced individual.*

Map Resources

Topographic maps are available at many outdoor stores or may be obtained from the U.S. Geological Survey at **www.usgs.gov**. *Or contact the USGS by calling toll-free 1-888-ASK-USGS (1-888-275-8747).*

National Forest Service Motor Vehicle Use Maps (MVUMs) show forest road networks and restrictions. They are available from the U.S. Forest Service at **www.fs.fed.us**.

Global Positioning System (GPS)



- *The Global Positioning System (GPS) is a navigation system based on a network of 24 satellites. Users with a GPS unit can determine their exact location (latitude and longitude) in any weather conditions, all over the world, 24 hours a day.*
- *GPS satellites circle the earth twice a day and transmit information to Earth. GPS receivers use this information to calculate the user's location by comparing the time a signal was transmitted by a satellite with the time it was received. The time difference tells the GPS receiver the distance from the satellite. By calculating the distances from several satellites, the receiver can determine and display the user's location on the GPS unit.*
- *Once the user's position is determined, a GPS unit can calculate other information—bearing, trip distance, distance to destination, sunrise and sunset times, and more.*
- *GPS receivers are accurate to within 15 meters (49 feet) on average. Certain atmospheric factors and other sources of error can affect the accuracy. Accuracy can be improved with a Differential GPS (DGPS) or WAAS (Wide Area Augmentation System).*

SURVIVAL SKILLS

Planning and preparation should keep you from having an outdoor misadventure. If something does go wrong, switch into survival mode.

Most everyone who treks into the wilderness gets turned around occasionally. How you respond in the early stages often determines if your disorientation becomes a temporary hassle or a dangerous situation. If you keep a cool head, you'll usually get your bearings fairly quickly.

Think through recent events to see if you can retrace your path. If you decide you can't return to your camp or car, commit yourself to spending the night where you are. If you remain in one spot, it's very likely that you will be found in a few days.

You now have three priorities: shelter, fire, and signal.

Shelter

- Start preparing your camp well before dark. Look for a natural shelter, such as a rock overhang or a thick stand of evergreens. The site should be dry and well drained, and protect you from the wind. Ideally, it also should be near water and plenty of firewood.
- If no natural shelter is available, pick an area with materials nearby to build a lean-to or debris hut.
- A lean-to is constructed by leaning branches against a horizontal support to form a frame for a roof. Be sure to orient the opening away from the wind. Cover the frame with evergreen branches to block out wind or precipitation. Leaves and twigs are another option. If you need additional protection, you can add side walls.
- Build your fire where its heat will radiate into the shelter. Your sleeping area should be located between the shelter wall and the fire.

Starting a Fire

- If there is snow on the ground, build the fire on a platform of green logs or rocks. If the terrain is dry, clear a patch of bare dirt to avoid starting a grass or forest fire.
- Gather everything you need before starting the fire. Pile fuel ranging from small twigs to fuel logs next to the fire site. Collect more fuel than you think you can use; you may need more than you think you will need.
- Pile fine twigs, grass, or bark shavings loosely as a base. If you can't find kindling (small pieces of dry wood), remove bark from trees. Use your knife to shave dry wood from the inside of the bark.
- Place slightly larger sticks on the starter material until you have a pile about 10 inches high.
- If there's no breeze, light the kindling in the middle of the base. If there is a breeze, light one end of the kindling so that the flame will be blown toward the rest of the fuel. As the kindling lights and the flames spread to the larger twigs, slowly add more wood to the blaze. Add larger pieces as the fire grows. A large fire will throw more heat and be easier to maintain.

Signaling for Help

- When you decide to stay put and wait for rescue, prepare help signals as soon as possible.
- The international emergency sign for distress is three of any signal: three shots, three blasts on a whistle, three flashes with a mirror, or three fires evenly spaced. If you're near an open space, walk an "X" in the snow, grass, or sand. Make it as large as possible so that it can be seen easily from the air. Placing branches, logs, or rocks along the "X" will make it more visible. Do not light signal fires until you hear an aircraft. Adding green boughs, preferably pine if available, to the fire will help create smoke.
- Once you have a shelter, fire, and your signal prepared, you can focus on water and food.

Water

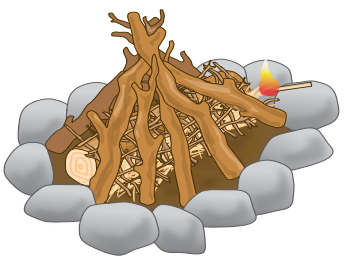
- Even in cool weather, you need two to four quarts of water a day. Under most conditions, humans can last only about three days without water.
- Pure drinking water is rare, even in the most remote regions. Clear mountain streams often are contaminated by *Giardia lamblia*, a parasite that causes serious intestinal sickness in humans.
- The best way to purify water is by boiling. Chemical purifiers such as iodide or chlorine and filter systems can be used, but some may not be satisfactory. Never make survival problems worse by drinking unsafe water.

Food

- Humans can go for two weeks or more without food. Although the need for food is not that urgent, you'll be more comfortable and clear-headed if you eat. Anywhere there is game, there is food, but probably not what you're accustomed to eating.
- Before you head into a remote area, it's a good idea to read up on what's edible in that particular region. Hopefully, you'll be able to use your hunting equipment to harvest the bulk of your food.

Rules of Survival

- *Tell someone where you're going and when you plan to return.*
- *Don't hunt alone.*
- *Take enough food and water to last for at least two days in an emergency.*
- *Bring a map and compass, and always orient yourself before leaving camp.*
- *Wear layered clothing and take extra clothing, preferably wool and polyester, with you.*
- *Plan your outings so that you can return to camp before dark.*
- *Never leave camp without taking fire-starting equipment and a foil blanket.*
- *Don't panic if you become lost.*



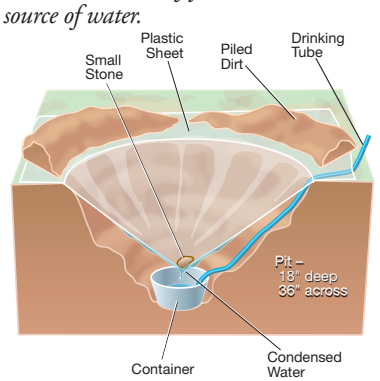
A tepee of larger sticks enclosing the kindling is a good way to start a fire.

Solar Still

Solar stills can provide emergency drinking water. Ground water condenses on a plastic cone set in the ground and drips into a collecting pan.

To make a solar still:

- *Dig a pit 3 feet wide by 18 inches deep.*
- *Place a shallow container in the center.*
- *Run a tube from the container to the edge of the pit.*
- *Lay clear plastic over the pit and place a rock or a little soil in the center to form a cone.*
- *Draw water through the tube to avoid disturbing the still.*
- *Make several stills if you have no other source of water.*



Remember...

Every hunter should take a first-aid course and a course in cardiopulmonary resuscitation (CPR) to be prepared to handle outdoor emergencies. A prepared hunter also will carry a complete first-aid kit.

Moving an Injured Person

Moving the victim with a back or neck injury should be left to paramedics or other professionals since permanent damage could result from improper handling.

If a victim must be pulled to safety, move him or her lengthwise and headfirst, supporting the head and neck. Keep the spine in alignment.

American Red Cross

Together, we can save a life

The Mission of the American Red Cross

The American Red Cross is a public service organization, led by volunteers, that provides relief to victims of disasters and helps people prevent, prepare for, and respond to emergencies.

Visit their website at **www.redcross.org**.

Nonmedical Good Samaritan Civil Immunity

"Good Samaritans" who render first aid to an injured person may be protected against civil damage claims under Pennsylvania's "Nonmedical Good Samaritan Civil Immunity" statute provided they meet certain conditions (such as holding a certificate from an approved training course). For more specific information on approved courses and when civil immunity does and does not apply, go to Title 42, Section 8332 on the Pennsylvania General Assembly Consolidated Statutes website at **http://www.legis.state.pa.us/cfdocs/legis/li/public/cons_index.cfm**.

HEALTH EMERGENCIES

Every hunter should take a first-aid course to learn what to do in case of injuries. Below are some common injuries that could occur while hunting.

Allergies

- Can be caused by plants, food, or clothing.
- Severe reactions can be life-threatening.
- Always use medication.
- Always bring medication with you.

Bleeding

- Severe bleeding is a life-threatening medical emergency. The rapid loss of just two pints of blood can result in shock and loss of consciousness. A victim can bleed to death in a short time.

Broken Bones

- You can assume someone has a broken bone if pain lasts more than a few minutes, moving the injured area is difficult, or there is swelling in the injured area.

Burns

- First- and second-degree burns with closed blisters are best treated with cold water.
- Second- and third-degree burns with open blisters should be wrapped with a loose, dry dressing.

Carbon Monoxide Poisoning

- Improperly working camp stoves and lanterns, as well as wood and charcoal fires, can produce lethal carbon monoxide.
- Symptoms of carbon monoxide poisoning include headache, dizziness, weakness, and difficulty in breathing. The victim's skin can turn red, and he or she can lose consciousness.
- Get victims into the fresh air immediately, and keep them lying quietly. Quick medical care is very important.

Chest Wounds

- A bullet striking the chest can cause a sucking chest wound—a deep, open wound of the chest wall that allows air into the chest cavity.
- All chest injuries are very serious and need immediate medical attention.

Heart Attack

- Symptoms include pain or discomfort in the chest for a few minutes, shortness of breath, cold sweat, nausea, and lightheadedness.
- May be triggered by physically demanding activity.
- Seek medical attention immediately.

Shock

- Shock can result from any serious injury. Symptoms include pale, cold, clammy skin; rapid pulse; shallow breathing; and fear in the victim.
- To treat shock:
  - Keep the victim lying on their back. In some cases, shock victims improve by raising their feet 8-10 inches.
  - If the victim is having trouble breathing, raise the victim's head and shoulders about 10 inches rather than raising the feet.
  - Maintain normal body temperature and loosen any tight clothing.
  - Try to keep the victim calm and comfortable, and get medical help as quickly as possible.

Snakebite and Insect Stings

- Most doctors agree that the best response is to rush the victim to a hospital emergency room.
- Do not try to remove poison from snakebites. Cutting and suctioning the bite can do more harm than good.
- Fear and panic may worsen snakebite reactions. Calm the victim as much as possible. Keep the victim in a reclining position to slow the spread of venom. If the bite is on a limb, keep the wound at or below the level of the heart.
- Remain calm and quickly get to a hospital for medical treatment for bites that show signs of reaction.
- Remember what the snake or insect looks like; a description helps doctors determine the method of treatment.
- Snakes and insects will attack or bite if threatened or surprised.

First-Aid Kit

- *2-inch-square sterile gauze pads*
- *2-inch-wide gauze bandage roll*
- *4-inch-square sterile gauze pads*
- *42-inch-square cloth for triangular bandage or sling*
- *Antacid*
- *Antibiotic salve*
- *Aspirin*
- *Assorted adhesive dressings*
- *Assorted butterfly dressings*
- *Cell phone*
- *Cotton swabs*
- *Decongestant*
- *Eye dropper*
- *Instant chemical cold packs*
- *Moleskin*
- *Needles*
- *One-half percent hydrocortisone cream*
- *One-sided razor blades*
- *Petroleum jelly*
- *Roll of 1-inch adhesive tape*
- *Roll of 2-inch adhesive tape*
- *Safety pins*
- *Scissors*
- *Sterile eyewash*
- *Thermometer*
- *Tweezers*

Safety TIP

Every year, dozens are injured or killed at abandoned mine sites.

In 2004, 35 people died in the U.S. in non-mining related accidents on mine property. In Pennsylvania, 26 people have lost their lives while illegally on abandoned mine and quarry property. While hunting or trapping, do not trespass on these areas.

Stay Out! Stay Alive!

- *Pennsylvania is home to approximately 250,000 acres of abandoned mine lands as a result of decades of unregulated mining.*
- *Abandoned mine openings may be unmarked or unprotected at the surface and can be hundreds of feet deep.*
- *Openings covered by decaying material may give way under the slightest weight.*
- *Unmarked mine shafts and tunnels can be hundreds of feet deep and will swallow you without a trace.*
- *Unstable cliffs, water-filled pits, old explosives, and abandoned buildings all add to the danger.*
- *To report the location of an abandoned mine or quarry, please contact Pennsylvania's Department of Environmental Protection, Bureau of Mine Safety at:*

Commonwealth of Pennsylvania
Department of Environmental Protection
Bureau of Abandoned Mine Reclamation
Rachel Carson State Office Building
400 Market Street, P.O. Box 8476
Harrisburg, PA 17105-8476
717-783-2267

Stay Out! Stay Alive!

COPING WITH EXTREME WEATHER

Some of the most common and dangerous risks to hunters result from exposure to extreme weather.

Hypothermia

Hypothermia occurs when your body loses heat faster than it can produce it, causing your core body temperature to fall. Hypothermia is often induced by cold, wet conditions, such as rain, snow, sleet, or falling into water.

Moisture from sweating, humidity, and dew or rain on bushes and trees also can soak your clothing over time, putting you at risk in cold weather. Wet or damp clothes will draw heat out of your body more rapidly than cold air. Wind lowers your body temperature as it evaporates moisture from your body. Resting against cold surfaces also will draw heat from your body.

- **Prevention of Hypothermia**
  - Hypothermia can be prevented by dressing properly, by avoiding possibly dangerous weather conditions, and by drying out as quickly as possible when you get wet.
  - High-calorie foods, such as chocolate, peanuts, or raisins, provide quick energy that helps your body produce heat.
- **Symptoms of Hypothermia**
  - Uncontrolled shivering—usually the first obvious symptom, but ceases as hypothermia progresses
  - Slow, slurred speech
  - Memory loss
  - Odd behavior, such as removing clothing
  - Lack of body movement
  - Sleepiness
  - Unconsciousness, which could lead to death

Treatment of Hypothermia

- Find shelter for the victim.
- Remove wet clothing, and replace with dry clothing and other protective covering. If there is no dry clothing, use a fire to dry one layer at a time.
- Give warm liquids to hydrate and warm, but never give the victim alcohol to drink. Quick-energy foods also produce inner body heat.
- For mild cases, use fire, blankets, or another person's body heat to warm the victim.
- In more advanced stages, warm the victim slowly by placing one or more persons in body contact with the victim. Place canteens of hot water insulated with socks or towels on the groin, armpits, and sides of the neck of the victim.
- A victim at or near unconsciousness must be handled gently, and not placed in a warm bath or exposed to a large fire, which can lead to traumatic shock or death. Immediately contact emergency medical personnel to evacuate the victim to a hospital for treatment.

Frostbite

Frostbite occurs when skin tissue freezes. The best prevention is to avoid severe weather. If you're caught in extremely cold weather, pay attention to your head and extremities, such as fingers, toes, ears, and nose. Wear a face cover if the temperature is below 0° Fahrenheit. If you experience any symptom of frostbite, treat immediately.

Symptoms of Frostbite

- Skin turns off-white.
- Prickly or tingling feeling as ice crystals form.
- Pain may be present initially, then disappears as frostbite progresses.
- In severe cases, loss of feeling in the affected area.

Treatment of Frostbite

- Warm the affected area with body heat, but avoid rubbing the area—it can damage tissue.
- Don't use hot water or other external heat sources, which could cause burns.
- Wrap with warm, dry clothing.
- Get to a warm shelter.
- Drink hot liquids.
- Get medical attention.

Basics of Cold Survival Without Fire

- *Wear proper type of clothing (no cotton).*
- *Stay dry. Use water-repellent outer garments.*
- *Build a shelter. The best is a nylon tarp shelter as it will protect you from wind, rain, and snow. Insulate the floor of the shelter with pine boughs, if available.*
- *Avoid contact with cold surfaces (the ground, rocks, or snow).*
- *Wrap your body in a thermal foil blanket. This will maintain a temperature of 60° F inside the wrap even when the outside temperature is -10° F.*
- *Limit your physical activity to conserve energy.*

Wind Speed (mph)													
5	10	15	20	25	30	35	40	45	50	55	60		
36	34	32	30	29	28	28	27	26	26	25	25	40	
31	27	25	24	23	22	21	20	19	19	18	17	35	
25	21	19	17	16	15	14	13	12	12	11	10	30	
19	15	13	11	9	8	7	6	5	4	4	3	25	
13	9	6	4	3	1	0	-1	-2	-3	-3	-4	20	
7	3	0	-2	-4	-5	-7	-8	-9	-10	-11	-11	15	
1	-4	-7	-9	-11	-12	-14	-15	-16	-17	-18	-19	10	Air Temperature (°F)
-5	-10	-13	-15	-17	-19	-21	-22	-23	-24	-25	-26	5	
-11	-16	-19	-22	-24	-26	-27	-29	-30	-31	-32	-33	0	
-16	-22	-26	-29	-31	-33	-34	-36	-37	-38	-39	-40	-5	
-22	-28	-32	-35	-37	-39	-41	-43	-44	-45	-46	-48	-10	
-28	-35	-39	-42	-44	-46	-48	-50	-51	-52	-54	-55	-15	
-34	-41	-45	-48	-51	-53	-55	-57	-58	-60	-61	-62	-20	
-40	-47	-51	-55	-58	-60	-62	-64	-65	-67	-68	-69	-25	
-46	-53	-58	-61	-64	-67	-69	-71	-72	-74	-75	-76	-30	
-52	-59	-64	-68	-71	-73	-76	-78	-79	-81	-82	-84	-35	
-57	-66	-71	-74	-78	-80	-82	-84	-86	-88	-89	-91	-40	
-63	-72	-77	-81	-84	-87	-89	-91	-93	-95	-97	-98	-45	
Frostbite occurs in 15 minutes or less													

Wind chill is given in the body of the table. The National Weather Service issues a Wind Chill Advisory when wind chills are expected to reach -10° F. A Wind Chill Warning will be issued when wind chills are expected to be -20° F or less.

Air Temperature (°F)												
120	115	110	105	100	95	90	85	80	75	70	Relative Humidity (%)
107	103	99	95	91	87	83	78	73	69	64	0
111	107	102	97	93	88	84	79	74	69	64	5
116	111	105	100	95	90	85	80	75	70	65	10
123	115	108	102	97	91	86	81	76	71	65	15
130	120	112	105	99	93	87	82	77	72	66	20
139	127	117	109	101	94	88	83	77	72	66	25
148	135	123	113	104	96	90	84	78	73	67	30
	143	130	118	107	98	91	85	79	73	67	35
	151	137	123	110	101	93	86	79	74	68	40
		143	129	115	104	95	87	80	74	68	45
		150	135	120	107	96	88	81	75	69	50
			142	126	110	98	89	81	75	69	55
			149	132	114	100	90	82	76	70	60
				138	119	102	91	83	76	70	65
				144	124	106	93	85	77	70	70
					130	109	95	86	77	70	75
					136	113	97	86	78	71	80
						117	99	87	78	71	85
						122	102	88	79	71	90
							105	89	79	71	95
							108	91	80	72	100

Heat Index	General Effect of Heat Index
	Fatigue possible with prolonged exposure and/or physical activity
	Sunstroke, heat cramps, or heat exhaustion possible with prolonged exposure and/or physical activity
	Sunstroke, heat cramps, or heat exhaustion likely and heat stroke possible with prolonged exposure and/or physical activity
	Heat stroke highly likely with continued exposure

Heat Index uses air temperature and relative humidity to determine how hot the air actually "feels." Above 80° F your body does not have enough surface area to get rid of the heat fast enough, so your body sweats to make evaporative cooling possible. When humidity is low, the apparent temperature will be lower than the air temperature since sweat evaporates rapidly to cool the body. However, when humidity is high, the apparent temperature "feels" higher than the actual air temperature because perspiration evaporates more slowly. In high temperature/high humidity environments, your body can get into a dangerous situation where it cannot cool down or evaporate the heat away.

Heat Exhaustion

Heat exhaustion is the opposite of hypothermia—the core body temperature increases, usually as a result of hot and humid conditions, plus a lack of water.

- **Prevention of Heat Exhaustion**
  - Drink plenty of water.
  - Take frequent breaks if you're hiking to or from your hunting spot, especially when carrying a large load.
  - Dress in layers, and shed layers as physical activity increases.
- **Symptoms of Heat Exhaustion**
  - Pale and clammy skin
  - Weakness
  - Nausea
  - Headache
  - Muscle cramps
- **Treatment of Heat Exhaustion**
  - Move to a cooler place and drink water.
  - Fan to lower body temperature, but don't over-chill.

Heat Stroke

Heat stroke should be treated as a medical emergency—it can be fatal.

- **Symptoms of Heat Stroke**
  - Dry, hot, and flushed skin—dark or purple in color
  - Pupils are very large
  - Rapid, weak pulse
  - Shallow breathing
  - High temperature—may be in excess of 106° Fahrenheit
- **Treatment for Heat Stroke**
  - Wrap in a sheet and soak with cool—not cold—water.
  - Fan, but don't over-chill.
  - Get to a hospital immediately.

DRUGS AND ALCOHOL

The effects of drugs and alcohol on the body can influence your ability to perform simple tasks. In order to hunt or trap safely, do not take any of these substances. Below is a short list of how alcohol and drugs, even over-the-counter medications, can impair your ability to hunt or trap.

Impaired Functions

- **Coordination**
  - Disorientation, loss of balance, loss or slowing down of motor skills
- **Hearing**
  - Lack of sound acuity (cannot hear well)
- **Vision**
  - Difficulty in focusing, lack of peripheral vision, impaired color perception
- **Communication**
  - Slurred speech
- **Judgment and Reasoning**
  - Confusion, dizziness, slow or unable to make decisions

HUNTING WITH BOATS

Hunters often use boats in difficult conditions, such as wind, cold, and snow. If you hunt with a boat, you should take a boating education course. Visit **www.boat-ed.com** to learn more.

Special care must be exercised to make sure you have a safe trip.

Trip Preparation

- Leave a float plan with family and friends, detailing where you're going and when you plan to return.
- Be sure the boat is large enough to carry you and your gear safely.
- Load gear low in the boat, and distribute the weight evenly.
- Have a wearable personal flotation device (life jacket) on board for each passenger to wear.
- Have throwable personal flotation devices on board in case someone falls overboard.
- Stow required visual distress signals.
- Check an up-to-date weather forecast before heading out.
- Cancel your trip if wind and water conditions aren't safe.

Transporting Firearms in a Boat

- The same rules apply as when transporting firearms in a vehicle—unload and case firearms before transporting them. The action should be open or the gun broken down, whichever makes the firearm safest.
- Before boarding the boat, place the unloaded firearm into the bow of the boat with its muzzle pointing forward.
- When hunting with others, the first person settles in the bow position facing forward after the first gun is placed. Next, place the second unloaded firearm in the rear of the boat with its muzzle pointing rearward. Then second person settles in the back of the boat facing rearward. Repeat the procedure when unloading.

Zones-of-Fire in a Boat

When duck hunting, the back-to-back position is the safest, with the zone-of-fire confined to a 180-degree area in front of each hunter.

Remember...

Don't press your luck in cold weather. At the first sign of a storm, head for shore.

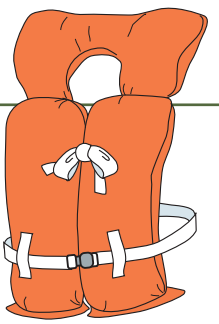
Types of Personal Flotation Devices

Type I

Wearable Off-Shore Life Jacket

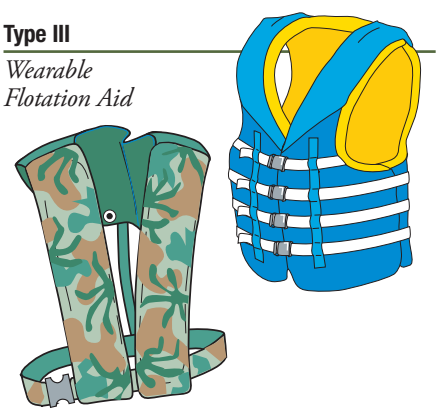
Type II

Wearable Near-Shore Buoyant Vest



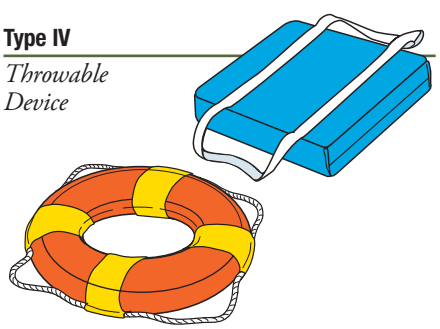
Type III

Wearable Flotation Aid



Type IV

Throwable Device



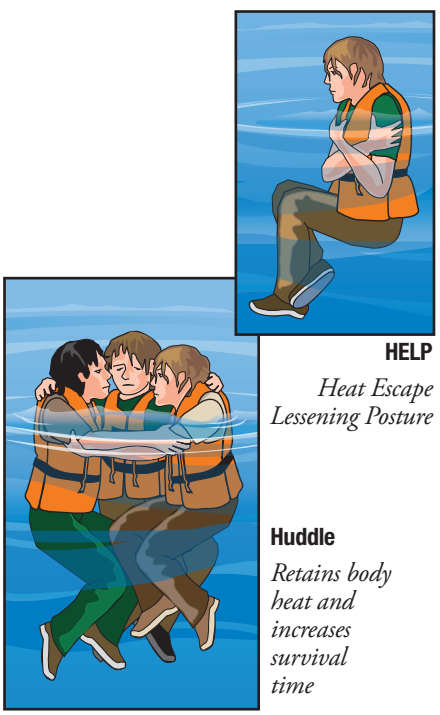
Safety TIP

If you fall into the cold water, leave your clothes on; they'll help retain body heat.

Recognizing Advanced Stages of Hypothermia

When the victim has these symptoms, dry clothing, heat, and medical attention are required immediately:

- *Bluish-white appearance*
- *Weak heartbeat*
- *Shallow breathing*
- *Rigid body muscles*
- *May be unconscious*



HELP

Heat Escape Lessening Posture

Huddle

Retains body heat and increases survival time

Surviving Water Emergencies

- Always wear a U.S. Coast Guard–approved wearable personal flotation device (life jacket) while you're in the boat. Life jackets will not only keep you afloat, they'll also help you keep warm.
- If you get caught in a storm and your boat swamps or capsizes, stay with the boat. Most small boats will float even when upside down or filled with water. Signal passing boats with a bright cloth, or raise an oar if one is available.
- Placing an oar under your back and shoulders and another under your legs can help you float. If decoys are in reach, stuff them inside your jacket.
- Chest waders and hip boots also will help you stay afloat.
  - If in chest waders, trap air in the waders by bending your knees and raising your feet. Lie on your back.
  - If in hip boots, trap air in the boots by bending your knees. Lie on your stomach.
- Equip your boat with a means for re-entry (ladder, sling, etc.) to use if you should fall into the water.

Falling Into Cold Water and Hypothermia

- Suddenly falling into cold water can cause immediate gasping for air; rapid, deep breathing; panic; and dizziness—all of which can result in water inhalation and drowning. Falling into cold water also can cause sudden changes in blood pressure, heart rate, and heart rhythm, which also can result in death.
- Prepare for boating in cold water conditions by always wearing a secured life jacket. Also wear layered clothing for insulation.
- The best prevention is to take all measures necessary to avoid capsizing your boat or falling into cold water in the first place. If you do fall into cold water:
  - Don't panic. Try to get control of your breathing. Hold onto something or stay as still as possible until your breathing settles down.
  - When your breathing is under control, *perform the most important functions first* before you lose dexterity (10–15 minutes after falling into cold water).
  - Put on a PFD immediately if you don't already have one on. Don't take your clothes off unless absolutely necessary—they help insulate you.
  - Focus on getting out of the water quickly before you lose full use of your hands, arms, and legs. Try to get back into your boat, even if it is full of water or capsized. Get as much of your body out of the water as possible—the rate of heat loss will be slower than if surrounded by water.
  - If you cannot get out of the water quickly, act to protect against rapid heat loss. In as little as 10 minutes, you may be unable to self-rescue.
    - Stay as motionless as possible, protecting the high heat loss areas of your body, and *keep your head and neck out of the water.*
    - Safety typically looks closer than it actually is, so staying with the boat is usually a better choice than swimming.
    - Adopt a position to reduce heat loss. If alone, use the HELP (Heat Escape Lessening Posture) position; or if there are others in the water with you, huddle together.
  - Be prepared at all times to signal rescuers.
- Read more about symptoms of and treating hypothermia on pages 64–65.

Chapter Review Exercise

1. There are four ways to prepare for a hunting trip: be ready, know your location, prepare for safety, and _____.
2. _____ would *not* be an important part of a hunting plan that you would leave with a family member or friend.
   a. The number of game you plan to harvest
   b. Where and with whom you intend to hunt
   c. Specific directions on the route to your destination
   d. When you expect to return
3. List five conditions that can affect a hunter or trapper's physical ability to perform safely and responsibly.
   i. _____
   ii. _____
   iii. _____
   iv. _____
   v. _____
4. If dressing for cold weather conditions, you should _____.
   a. wear several layers of clothing instead of one heavy article of clothing.
   b. wear cotton since it can provide warmth even when wet.
   c. wear wool.
   d. both a. and c.
5. List three items that should be included in a survival kit.
   i. _____
   ii. _____
   iii. _____
6. The international emergency signal for distress is _____.
   a. three fires evenly spaced
   b. three shots
   c. three blasts of a whistle
   d. any of the above
7. List three health emergencies that make it important to be Red Cross First-Aid–certified.
   i. _____
   ii. _____
   iii. _____
8. Hypothermia can be prevented by _____.
   a. staying dry.
   b. dressing properly.
   c. exposing yourself to the wind to dry out if wet.
   d. both a. and b.
9. Heat exhaustion can be prevented by _____ water.
10. When hunting from a boat, it is best to always wear a _____.
    a. personal flotation device.
    b. camouflage jacket.
    c. red jacket.
    d. safety harness.
11. If trapped alone in cold water, pull your _____ to your chest and keep your elbows _____.
12. How do drugs or alcohol affect the following functions?
    i. Coordination: _____
    ii. Vision: _____
    iii. Judgment and Reasoning: _____

Chapter Review Answers

1. tell others 2. a 3. i. Known Allergies ii. Physical Fitness iii. Overweight iv. Mind Set v. Physical Disability vi. Fatigue or Illness 4. d 5. i. Shelter Material ii. Fire Building Materials iii. First-Aid Kit iv. Flashlights v. Compass and Map, or GPS vi. Water and Food vii. Sharp Knives 6. d 7. i. Bleeding ii. Broken Bones iii. Burns iv. Carbon Monoxide Poisoning v. Chest Wounds vi. Shock vii. Bites and Stings viii. Allergies ix. Heart Attack 8. d 9. drinking plenty of water 10. a 11. knees / close to your sides 12. i. Coordination: Disorientation, loss of balance, loss or slowing down of motor skills ii. Vision: Difficulty focusing, lack of peripheral vision, impaired color perception iii. Judgment and Reasoning: Confusion, dizziness, slow or unable to make decisions

are YOU ON TARGET?

Hunting Plan

Before you depart, leave a hunting plan with a family member or friend. A hunting plan tells where and with whom you intend to hunt, and when you expect to return. It also should contain specific directions on your route to your destination and to any alternate destination you may have if bad weather changes your plans.

Using the information below, fill out the blank Hunting Plan found in the back of this manual.

Persons on the trip:

Frank Hunter Age 48
Address 401 Box Wood Lane
Hometown, PA 17778
Phone 510-777-6565

Tom Hunter Age 15
Address 401 Box Wood Lane
Hometown, PA 17778
Phone 510-777-6565

Emily Hunter Age 46
Address 401 Box Wood Lane
Hometown, PA 17778
Phone 510-777-6565

The group will not have any handheld radios on this trip. They will leave the Hunter residence on November 19 at 4:00 a.m. They will be hunting in Sproul State Forest near the town of Renovo, PA.

They will take U.S. Route 80 west from Hometown to the town of Snowshoe. Then they will travel north on Route 144 to Sproul State Forest near Renovo. They plan to park in the Cranberry Swamp area in Clinton county. They will return home along the same route.

The group has a brown Chevy pick-up truck. License plate number HNT-123.

The Hunters plan to return by 10:00 p.m. on November 19. If they are not home by 2:00 a.m. on November 20, call the State Police.

Basic Hunting Techniques

Objectives
Students will be able to...

- Identify the locations of vital organs of various game animals.
- Explain how to properly approach downed game.
- Identify three types of tree stands and explain their advantages and disadvantages.
- Identify the primary safety concerns when using tree stands, and state at least three safe tree stand practices.
- Explain how and when most tree stand falls occur.
- Explain safe entry and exit of a tree stand during a simulated hunting situation.
- Identify the primary cause of turkey hunting shooting incidents, and explain how to avoid such an incident.
- State four safe turkey-hunting practices.
- Explain how firearms kill game compared to how an arrow kills game.
- List the steps to properly care for harvested game.

It is very important that you educate yourself about your quarry when preparing to hunt. Understanding game species will add to your enjoyment and increase your chances of success as well.

PLANNING AND PREPARATION

- A successful hunt begins with careful planning and preparation. The process usually requires more time than the hunt itself.
- Here are some steps you should take to prepare for a hunt.
  - Educate yourself about the game you'll be hunting and its environment.
  - Read the most current state regulations.
  - Buy appropriate clothing and gear for the environment.
  - Get lease arrangements and permits (dogs and horses may require a veterinarian's certificate or a current vaccination record).
  - Visit the site in the off-season to prepare blinds and cabin facilities.
  - Sight-in rifles, handguns, and bows; pattern shotguns.
  - Sharpen your skills at the shooting range.
  - Pack extra firearms, scopes, bow strings, etc.

Know Your Quarry

- Of all the steps of preparation, learning about the game you're hunting is one of the most important. Understanding your quarry will increase your success and add to the enjoyment of the experience as well.
- In many cases, knowing your quarry is also necessary to ensure that you're taking legal game. For example, you may need to determine the sex of game birds on sight or quickly recognize protected species as they move into firing range. If you hunt in a region where white-tailed and mule deer occupy the same area, you'll need to know how to identify both.
- There are many ways that wild animals are classified, but hunters are concerned with four basic categories.
  - **Large mammals:** Big game, such as deer, elk, and bear
  - **Small mammals:** Small game, such as rabbits, squirrels, and raccoons
  - **Upland birds:** Turkey, grouse, quail, and dove
  - **Waterfowl:** Ducks and geese

See Chapter Four for more wildlife information.

Animal Characteristics

Whatever you're hunting, a basic understanding of an animal's features will help you develop an effective strategy for identifying and tracking it.

- Animals can be identified by these basic features.
  - **Distinctive Markings:** The black cheek patch on male pronghorns; the "flags" of the white-tailed deer; the face pattern on a gray fox; the green head on a mallard drake; the red, white, blue, and black on the head of a male turkey
  - **Sounds:** The wild call of the falcon, the familiar honk of the goose, the gobble of a strutting "tom," the grunt of the deer, the howl of the coyote
  - **Movement:** The bounce of mule deer, the fast or slow wing beats of some waterfowl, the zigzag in-flight pattern of the common snipe when flushed
  - **Group Behavior:** Flock patterns, such as the familiar "V" shape of certain migratory birds; various types of herd behavior
  - **Game Sign:** Animals leave "signs" indicating their presence in an area. These signs can include tracks, fecal droppings, scrapes or rubs, and beds.
- Further study will help you learn other ways to identify and understand your quarry, including its ability to hide and its behavior.

HUNTING METHODS

Hunting techniques are skills sharpened through education and experience. Ideally, beginners should seek the guidance of experienced hunters on their initial hunts.

Still Hunting

- As the name implies, still hunting is walking stealthily through an animal's habitat, stopping frequently—sometimes for long periods—to scan and listen for game. Typically, big-game hunters use this method in unfamiliar terrain or where stands cannot be used or are not allowed.
- As a general rule, spend at least ten times longer being still and observing than walking. Keep from being seen; a human silhouette will spook many game species. Use binoculars in open terrain to identify movement properly.
- If you are a good still hunter, game will be unaware of your presence but so will other sportsmen. To avoid being mistaken for game by other hunters, always wear fluorescent orange.

Still hunting often involves stopping for long periods to scan and listen for game.

Stalking

- The difference between still hunting and stalking is that when stalking, you follow signs leading to a particular type of game or group of animals, or close the distance to game already spotted.
- You may stalk to:
  - Follow tracks on trails or a morning "dew" trail through leaves and brush.
  - Follow sounds or scents of animals, such as elk, sheep, or collared peccaries.
  - Sneak closer to an animal for a better shot.
- Stalking requires total focus because you must remember to keep downwind, stay quiet, stay alert, and remain patient.

Stalking often involves following tracks to lead you to the type of game you are hunting.

Ground blinds, often made of branches, conceal the hunter.

A skillful hunter uses sounds to attract the quarry close enough for an effective shot.

Remember...

When hunting with a group, it is illegal in most states to use your license tag on another person's kill.

Posting

- Posting involves sitting or standing in one spot. The location may offer a clear view or a spot near the animal's trails.
- Posting is effective when you know where game is traveling each day and you're not allowed to use a blind or stand.
- The key to setting up a posting site is finding a location that allows you to freely swing your firearm or draw your bow.

Ground Blinds

- Ground blinds are temporary structures located on the ground that conceal the hunter. They're made of everything from plywood to branches.
- You should place ground blinds:
  - Downwind, based on the normal wind pattern during a given time of day, such as morning
  - Away from the sun
  - Where the foreground and background are safest

Elevated Stands

- Elevated stands (tower stands or tree stands) offer a number of advantages to both firearm and bow hunters. (Read more in the "Hunting From Elevated Stands" section, which begins on page 73.)

Game Calling and Scents

- Calling is an effective technique for most animals. There are a variety of sounds that can be imitated to draw game to you.
  - **Territorial sounds:** Deer "rattling," elk "bugle," or a turkey "gobble"
  - **Feeding sounds:** A duck's feeding "chuckle"
  - **Distress sounds:** Inviting coyotes, bobcats, or foxes to feed
- There are hundreds of sounds that can attract all types of wildlife. A skillful hunter uses these sounds to attract animals close enough to him or her for an effective shot.
- Chemicals released from an animal's glands or waste give off scents that communicate to other animals. These scents are used to:
  - Mark territory.
  - Attract others for mating purposes.
- Non-game scents can be used to mask human odor or attract game animals.
  - Pine or earth scents cover body odor and allow hunters to get close to game animals without frightening them.
  - Odors that smell like preferred foods attract animals to an area to feed.

Driving

- Driving involves a group of hunters, some acting as "drivers" and others as "posters."
  - Drivers spread out across a field or woods and push game out of cover.
  - Posters take positions at the end of the cover to intercept game pushed out by the drivers.
- The success of a drive depends on good organization and being familiar with the terrain.
- It is critical that everyone involved in the drive is aware of the position of the other drivers and posters. Wear fluorescent orange, and never shoot in the direction of another hunter.

Flushing

- Flushing involves using noise, movement, or dogs to cause game to become nervous and leave cover.
- Pause frequently when attempting to flush game. By varying your pace, your quarry may think it has been detected and be more likely to leave cover.

Dogs

- There are several breeds of dogs that can be used for hunting different game species. Some dogs can be used to hunt several types of game animals.
  - **Pointers** are used primarily for upland game birds.
  - **Retrievers** are large, hearty dogs used primarily to retrieve waterfowl; they also can be trained to hunt other game birds.
  - **Spaniels** are used mainly as flushers.
  - **Hunting Hounds** are used to hunt raccoons and rabbits in the Southeast, lions and bears in the West, and deer in some states.

Decoys

- Decoys are life-like models of game used to lure animals toward a hunter's position. They are typically used to hunt waterfowl—ducks and geese—and wild turkey.
- Decoys are most effective when used with scents and game calling.

HUNTING FROM ELEVATED STANDS

Elevated stands can be tree stands placed in or against trees, or free-standing structures. While elevated stands offer certain advantages, they also have some drawbacks, including a degree of risk.

- **Advantages**
  - Provide a wider field of vision—game is spotted sooner than at ground level
  - Allow time to plan for best shot through earlier detection of game
  - Position a hunter above the animal's normal field of vision
  - Make a hunter's scent harder to detect and movement less noticeable
  - Make a hunter more visible to others, reducing accidents
  - Provide a good backstop for arrows or bullets since shooting downward
- **Disadvantages**
  - Increase risk of injury resulting from falling
  - Can be difficult to carry, especially large, portable stands
  - Provide no protection from cold or wind
  - Give little room for movement and cannot move toward game while hunting

A trained hunting dog can be an excellent hunting partner.

Safety TIP

Safety Harnesses

Should you fall out of your stand with a full-body harness on, you need to get back into your stand immediately. Hanging from a harness for a prolonged period of time may cause a severe injury or death.

S.T.E.P.S. to Safe Tree Stand Hunting

By remembering the S.T.E.P.S. of tree stand safety, you can reduce your risk of falling and be prepared to signal for help if you do fall.

S.T.E.P.S.

S*afety harness*
- *Always wear your fall-arrest system with a full-body harness whenever your feet leave the ground.*

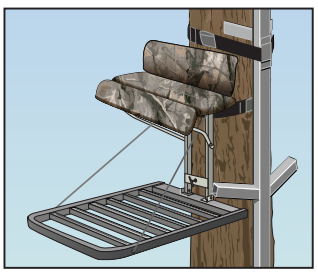
T*ree stand maintenance*
- *Check your stand for missing or broken parts before each use.*

E*valuate your stand site*
- *Select trees that are alive and will support your stand.*

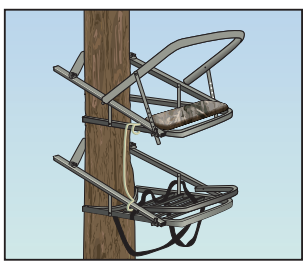
P*artners and plans*
- *Hunt with a partner, and have a plan in case of an emergency.*

S*ignals*
- *Carry a whistle or other signaling device should you need assistance.*

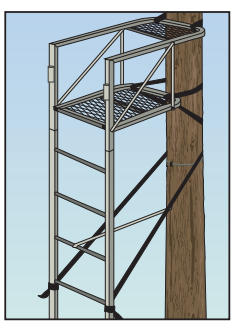
Types of Elevated Stands



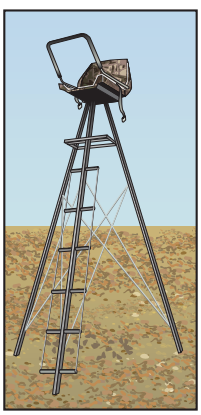
Hang-On Stand



Climbing Stand



Ladder Stand



Tripod Stand

Elevated Stand Location

- *Place stands by clearings, cut paths, or anywhere that gives hunters a clear, unobstructed view.*
- *Never place stands on fence lines or near another landowner's property.*
- *Look for a tree with the following features:*
  - *Alive*
  - *Straight*
  - *Rough bark*
  - *Large limbs*
- *Select the right species of tree.*
  - ***Safe trees** are oak, cedar, ash, hemlock, large pines, and maples.*
  - ***Unsafe trees** are birch, poplar, aspen, willow, shagbark hickory, beech, and small pines.*

Types of Elevated Stands

- **Portable Tree Stands**

  Portable tree stands can be safe and environmentally friendly. **Homemade stands should not be used.** Commercial stands that are manufactured, certified, and tested to industry standards are best. You should follow the manufacturer's instructions and also practice installing a tree stand before you go hunting. Portable tree stands come in three basic types.

  - **Hang-On Stands:** These simple stands provide about four square feet of space. They must be hauled into place and secured to the tree with belts or chains. These stands require separate climbing aids such as segmented ladders or climbing sticks. When installing a climbing aid:
    - Determine your climbing route first.
    - Attach the aid to the tree so that it extends above the stand's platform and you can step down onto the center of the platform.
  - **Climbing Stands:** These self-climbing stands are designed for trees with straight trunks and consist of two sections. A hunter "walks" the stand up a tree by moving the top section with the hands and the bottom section with the feet.
    - While still on the ground, adjust the stand to allow for the tapering of the tree that occurs as you go up.
    - When climbing, go slowly, take small steps, and keep the two sections of the stand connected with a tether.
    - Avoid using these stands on trees with shaggy bark or with branches between the ground and the desired elevation.
    - Never use these stands on trees covered with ice or snow.
  - **Ladder Stands:** These stands provide a platform 10 to 20 feet above the ground and have a built-in ladder. Due to their size and weight, hunters normally assemble and set up ladder stands before the first day of hunting. Three to five people are needed to erect or take down a ladder stand safely. When setting up the stand:
    - Clear the base area of all rocks and debris, making sure the ground is level.
    - Lean the stand against the tree and chain or strap it into place.
    - Using all parts, assemble the stand as instructed by the manufacturer.

- **Tripods, Quadpods, or Tower Stands (Free-Standing)**

  These stands are similar to a ladder tree stand but are free-standing and do not require a tree. They can be placed anywhere that has a firm base. Some resemble one or two chairs atop stilts. Others are enclosed, box-like platforms.

Fall-Arrest Systems (FAS)

You should use a fall-arrest system (FAS) that is manufactured to industry standards. ***Never use single-strap belts and chest harnesses***—they can be deadly. Before hunting, carefully read the manufacturer's instructions for proper use of your FAS and follow all safety guidelines.

- Always use a properly fitting FAS that includes a full-body harness while climbing a tree, installing a tree stand that uses climbing aids, and hunting from a tree stand.

- Make sure your FAS includes these components:
  - **Full-body harness**—the vest harness is a very effective style of full-body harness
  - **Lineman's-style belt and/or climbing belt**—used when climbing up and down the tree
  - **Tree strap**—goes around the tree
  - **Tether**—attaches the harness to the tree strap
  - **Suspension relief strap**—provides a loop to stand in if you fall
- With an adult present:
  - Practice adjusting and using your FAS, including the suspension relief strap.
  - Practice at ground level before hunting from an elevated stand.
- To protect yourself if you fall, always wear your FAS full-body harness, attaching it to the tree at ground level and keeping it attached throughout your hunt.
  - To attach your harness to the tree:
    - Attach one end of the FAS lineman's-style belt to one side of the FAS full-body harness.
    - Wrap the belt around the tree.
    - Attach the other end of the belt to the other side of the harness.
  - Use the FAS lineman's-style belt with your FAS full-body harness when you are *installing* or *uninstalling* the stand or the climbing aids for a hang-on tree stand.
  - Also use the belt with your full-body harness when you are climbing into or out of a hang-on stand.

- When you are in any tree stand, including a ladder stand, use the FAS tree strap and tether to attach your FAS full-body harness to the tree. If you fall, you do not want to drop below a level that would keep you from returning to the platform.
  - Attach the tree strap to the tree so that the strap is at, or above, head level when you are standing.
  - After attaching the tether, adjust both the tree strap and tether so that you have ***no*** slack in the tether while seated in your stand.
- If you should fall while in your stand:
  - Do not panic. Your FAS will hold you.
  - Signal for help.
  - Climb back onto the platform as quickly as possible.
  - Take actions to avoid suspension trauma if you must wait for rescue. If you do not have a suspension relief strap, keep moving your legs.
- Discard any FAS that shows signs of wear and tear or has been worn during a fall. Also adhere to the expiration date sewn into the FAS by the manufacturer.
- Due to the risks of injuries or death, hunters who choose not to wear and use their FAS properly should stay on the ground to hunt.

Suspension Trauma

Hanging motionless and suspended in your FAS after a fall can cause the leg straps to constrict blood flow. The pressure can make blood pool in the legs, limiting circulation and depriving organs of oxygen. This is called suspension trauma and can lead quickly to unconsciousness followed by death.

To avoid suspension trauma while you wait to be rescued:

- *Step into your suspension relief strap and stand up to relieve the pressure caused by the leg straps.*
- *If you do not have a suspension relief strap, move your legs continuously by pushing off from the tree or raise your knees and pump your legs frequently to keep your blood flowing until help arrives.*

Basic Elevated Stand Safety

Merely climbing into or out of a tree stand or other elevated platform to hunt puts you at risk. Long hours spent waiting in a stand, as well as poor safety techniques, can lead to accidental falls. To protect yourself, use good judgment and follow these recommendations, always putting safety first.

- *Purchase a commercial stand that is manufactured, certified, and tested to industry standards.*
- *Read the manufacturer's instructions and watch the video that accompany the stand. Review this information each season before using the stand.*
- ***Attach your FAS to the tree while at ground level, and keep it attached throughout your hunt—from the time you leave the ground until you get back down.***
- *Use a tree stand only during daylight hours.*
- *Practice first with your tree stand and FAS at ground level, using all safety devices that were included with the stand. Then continue to practice, gradually going higher.*
- *When climbing into or out of a tree stand, always use three points of contact with your hands and feet.*
- *Keep a firm hold on the climbing system as you enter or leave a platform, and don't let go until you're certain you are secure.*

Safety TIP

Before hauling a firearm into a stand, make sure it is unloaded. Also, you can avoid getting debris in the barrel by placing a cover over the muzzle. Once you are securely in the stand, check for obstructions before you load.

Elevated Stand Safety Tips

- *Get enough sleep to ensure that you are well rested before using a tree stand.*
- *Carry a signaling device, such as a whistle, radio, or cell phone, to let others know if you have a problem.*
- *Take your time and plan every move you make while installing and using an elevated stand.*
- *Check your stand carefully prior to each use. Do not leave a stand attached to a tree for more than two weeks.*
- *Never exceed the weight limit of your stand or FAS. Remember that the weight includes you plus your equipment.*
- *Do not climb with anything in your hands or on your back. Use a haul line.*
- *Raise and lower all hunting equipment on the opposite side of the tree from your climbing route.*

Female Turkey

Hauling Hunting Equipment into a Stand

- Never carry your hunting equipment up or down the tree with you as you climb. Always use a haul line.
- Before attaching the haul line to your hunting equipment:
  - If using a firearm, unload it and open the action.
  - If using a bow, put the arrows in a covered quiver secured to the bow.
- Use a haul line of heavy cord attached to your stand to bring up your hunting equipment or to lower it prior to climbing down from your stand.
  - If using a firearm, attach the haul line to the firearm's sling so that the firearm hangs with the muzzle pointed down.
  - If using a bow, attach the haul line so that the arrow fletching points down when raising your equipment and points up when lowering it.
- Slip the end of the haul line through your belt—leave it untied so that it can pull free if you fall. Put on your FAS full-body harness, secure yourself to the tree, and climb to your stand.
- After you are in the stand and secure, haul up your hunting equipment and untie the haul line.

SPECIAL CONCERN: TURKEY HUNTING

Each spring and fall, hunters take to the woods and fields in pursuit of wild turkey. Unfortunately, injuries and fatalities occur each season. Normally this occurs when a hunter fails to identify the target properly, mistaking the sound or movement of another hunter as the activity of a wild turkey. The hunter shoots at a flash of red or blue, or in the direction of the sound of a turkey call.

All hunters need to wait patiently and identify their target properly prior to pulling the trigger. Because wild turkey hunting methods include wearing full camouflage and sitting nearly motionless, turkey hunters need to be even more aware of their surroundings. All too often the activities that increase the chance of harvesting a turkey also increase the chance that a hunter will be shot by mistake.

Identification

The wild turkey has red, white, blue, and black coloring on its head. Wearing these colors while hunting is like painting a target on your back. Many turkey-hunting shooting incidents occur because hunters think they see a wild turkey. In reality, many of these incidents happen because the hunter sees movement and shoots. If someone is wearing wild turkey colors, such as a red handkerchief around the neck, a blue T-shirt, or dark-colored camouflaged clothing, that person could be mistaken for a male turkey.

It is very important to be sure of your target before you pull the trigger. In Pennsylvania, there are two wild turkey hunting seasons. One season occurs in fall, and the other is in the spring. During the spring wild turkey season, only bearded turkeys can be shot. You must be able to identify the basic physical characteristics of a male wild turkey.

- **Male Wild Turkey**
  - Head color is red, white, blue, and black
  - Larger body than a female
  - Beard in the middle of chest; can be up to 12 inches long
  - "Spur" found on the back of each leg
- **Female Wild Turkey**
  - About ⅓ shorter than males and half their weight
  - Feathers are duller than males and have brown-tipped edges
  - No spurs or beards, in most cases
  - Head is covered with hair and fine feathers, unlike the male, which has a bald head
  - No fleshy growth (called a snood) between the eyes like males

Turkey Hunting Safety

There are several safe hunting practices for turkey hunting. By following these simple rules, you can reduce your risk of being mistakenly identified as a wild turkey by hunters. Look through the following list of safe turkey hunting practices.

- Positively identify your target. Be absolutely certain it's a legal turkey before pulling the trigger.
- Wear and display the required amount of fluorescent orange.
  - Helps you to be seen by other hunters.
  - **It's the law!**
- Never carry harvested turkeys in the open. Cover with a fluorescent orange vest, or completely conceal from view in a game bag.
- *Never* stalk turkey sounds. This could be another hunter calling.
- Protect your back.
  - Sit with your back against a large tree, rock, or other large natural barrier.
  - Shields you from unseen hunter approaching from the rear.
- Shout **"STOP"** at hunters who approach you—don't move. Alert hunters to your presence without moving, which could cause them to fire.
- *Never* wear red, white, blue, or black, the head colors of a male wild turkey.
- Pre-select a zone-of-fire. Shoot at a turkey only in the predetermined area.
- Choose safe and responsible hunting partners. Don't hunt with anyone who is not safe and responsible.

Male Turkey

Safety TIP

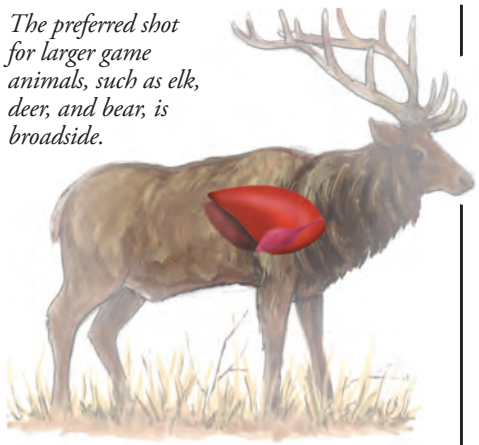
Be seen! Wear fluorescent orange.

Hunter in full camo

Hunter with orange hat and vest

Remember ...

Never shoot at sound or movement. Positively identify your target as being a legal turkey. Make sure the bird is fully and plainly visible before you shoot.



The preferred shot for larger game animals, such as elk, deer, and bear, is broadside.

The most effective firearm shot for a turkey is to the head and neck. The preferred shot angle for bowhunters is broadside, aiming for the heart or lungs.

VITAL SHOTS

Every hunter wants to bring home the game he or she is seeking; true sportsmen strive to do it by causing a minimal amount of suffering. To achieve these twin goals, it's important that you understand the anatomy of the game you're after and learn how to place a shot for a clean kill.

How Projectiles Kill Game

A bullet kills game differently than shot pellets or a broadhead-point arrow used in bowhunting. It is important to understand these differences in order to select the best shot placement.

- Bullets kill game by causing massive tissue damage and shock to vital organs.
- Shot pellets need to penetrate through the animal's hide or bird's feathers into a vital organ. The damage created disrupts the functioning of the vital organs.
- Broadhead-point arrows kill game by cutting through blood vessels or vital organs, causing massive blood loss.

Where To Aim

- The most effective shots are delivered to an animal's vital organs—heart and lungs. In large game animals, these organs lie in the chest cavity behind the front shoulder. A lung shot is the most effective shot for big game.
- The brain is not considered a vital organ when hunting big game because it occupies a small, hard-to-hit area. All too often, hunters aiming for the brain do not hit their target. Animals injured due to a misplaced shot to the brain often escape the hunter and suffer some time before dying. The area of the vital organs also contains major blood vessels and arteries. A shot in this area causes a lot of bleeding. If the animal doesn't die immediately and tries to flee, it will leave a blood trail that's easy to track.

  An exception to the no-head-shot rule occurs while turkey hunting with a shotgun. For more information, see the Turkey Hunting section below.
- Aside from being a good marksman, the key to a clean kill is patience. Hunters should limit shots to the vital organs only. If you do not have a clear shot to the vital organs, wait until the animal presents the best possible shot.

Turkey Hunting

An exception to this rule of thumb occurs when hunters pursue wild turkeys with a shotgun. Because of the thick feathers and heavy wing bones protecting the vital organs, shot may not be able to penetrate to the vital organs. When hunting wild turkeys with a shotgun, greater success is achieved when hunters shoot at the head and neck area of the bird.

Choosing the Proper Shot Angle

The shot angle is the angle at which the animal is standing in relation to the hunter. Knowing which angles offer the most effective—and least effective—shots is an important part of being a responsible hunter.

Broadside

The broadside shot angle is the preferred shot angle for both firearm and bow hunters for larger game animals, such as elk, deer, and bear.

- **Firearm:** The broadside position offers several excellent shots for a firearm hunter. The best target is the shoulder and chest area. The correct firearm and ammunition combination for the game you are hunting will break the shoulder bone and enter the lungs or heart.
- **Bow:** The broadside angle offers the best shot for the largest big game animals, such as elk, deer, and bear. For most big game, you should aim for the area just behind the front shoulder, about one-third of the way up from the bottom of the chest. An arrow will penetrate the ribs but not the shoulder bone; so wait until the near leg is forward, and aim behind the shoulder.

Quartering-Away

The quartering-away shot angle is when your target is facing away from you, but at an angle. The animal is usually looking away from you.

- **Firearm:** For firearm hunters, the area just behind the shoulder is the best aiming spot for direct penetration of the vital organs. Focus on hitting the chest area above the opposite front leg.
- **Bow:** The quartering-away shot angle offers a good opportunity for a clean kill on antelope, white-tailed deer, mule deer, black bear, and other big game of similar size or smaller. This is not a good shot for bowhunters on larger game because their massive stomachs and intestines will block a clean shot to the lungs or heart. The opposite front leg is a good reference point for aiming.

Quartering-Toward

The quartering-toward shot angle is when the animal is facing toward you, but at an angle. Since the animal will be looking in your direction, it most likely will spot your movements.

- **Firearm:** The quartering-toward angle presents a clean shot to the vital organs. A shot can be taken at this angle if the gun is already pointed at the animal. For an effective hit, aim at the front of the shoulder of the near front leg. *Caution:* A smaller caliber bullet may deflect off the shoulder bones of large game, such as elk, deer, or large bears. Be certain to use a firearm and ammunition powerful enough for the game you hunt and the angle of shot you might select.
- **Bow:** This angle offers a poor shot opportunity and **should not be taken.** Heavy shoulder bones shield the majority of vital organs from broadhead-tipped arrow penetration. Also, bowhunters should never fire an arrow at an animal that is looking at them.

Head-On

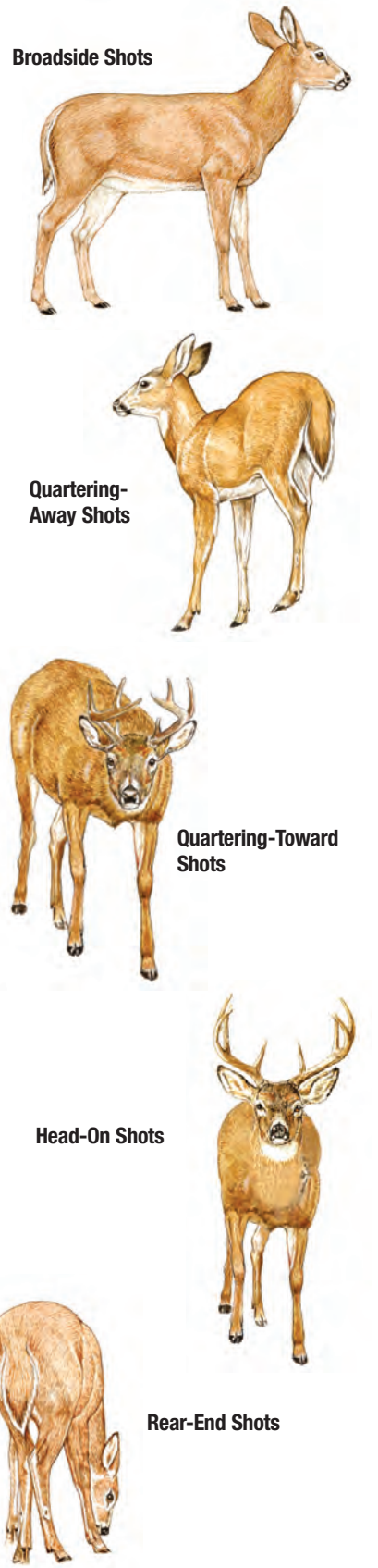
The animal will certainly detect your movements with a head-on shot angle.

- **Firearm:** A head-on shot can be effective if you have an adequate firearm and your firearm is already positioned for the shot. However, head-on shots rarely result in a clean kill and ruin a lot of meat. Shots at this angle rarely strike the game's vital organs or major blood vessels. It is highly recommended that you wait for a better shot. Aim at the center of the chest to hit the vital organs.
- **Bow:** These angles offer very poor shot selection and **should not be taken**. Heavy bones in front and muscle mass and non-vital organs in back block penetration of the main vital areas.

Rear-End

The rear-end shot **should not be taken** by hunters using firearms or bows.

Shot Angles



Approach downed game from above and behind the head; wait a short distance away, watching for any rise and fall of the chest cavity.

Trailing Wounded Game

It is a hunter's ethical responsibility to stop the hunt and search for any animal he or she has wounded.

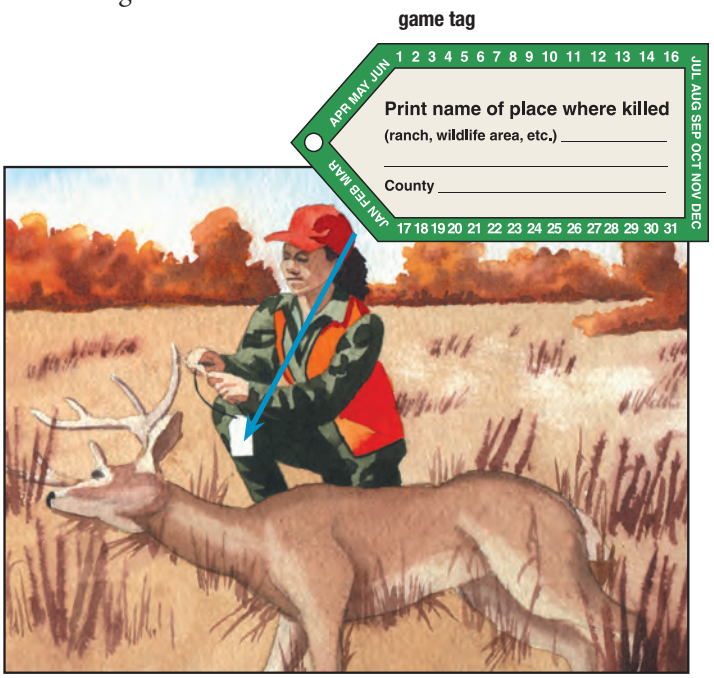
- *You should wait for at least a half-hour to an hour before trailing a deer, unless the downed deer is in sight.*
- *Make a practice of carefully observing every movement of a game animal after you shoot it. Investigate the ground and trail after shooting before assuming you missed.*
- *Once at the site of the shot, look for signs:*
  - *Blood on the ground or vegetation*
  - *Broken twigs or branches, or scattered leaves*
  - *A "dew" line if early in the morning*
  - *Tracks*
  - *Hair, meat, or bone fragments*
  - *Downhill trails, especially toward water*
- *If you lose a trail, search in a circular or grid pattern and try to pick up the trail again.*
- *Use fluorescent orange flagging to mark the blood trail in case darkness or weather forces you to quit the search and return the next day. Marking the blood trail also shows where to look for more signs if you lose the trail. Be sure to remove the orange flagging after use.*

Remember...

It's difficult to hit a vital area on an animal that is running or moving straight away from you. Rather than risk crippling the animal or ruining the meat, wait for a better shot.

Approaching Downed Game

- A downed deer or other large animal should be approached carefully from above and behind the head.
  - If the animal appears to be dead, wait a short distance away for a few minutes. Watch for any rise and fall of the chest cavity.
  - Notice if the eyes are closed—the eyes of a dead animal are usually open. You can be certain that the animal is dead if the eye doesn't blink when touched with a stick.
- If the animal is still alive, it should be finished with a quick shot to the base of the ear. If you wish to mount the head, place your shot in the heart-lung area. For bowhunters, the only option is placing an arrow in the heart-lung area.
- Once the animal is dead, immediately tag it, including the date of kill. Then begin field dressing.



FIELD CARE OF GAME

The way you handle game after it's harvested can have a significant impact on the quality of the meat.

Field Care Basics

- Tag immediately, as required by law.
- Three factors that cause meat to spoil:
  - Heat
  - Dirt
  - Moisture
- Heat is the number-one concern. Bacteria grow rapidly in a carcass, especially if it's allowed to stay warm. Meat begins to spoil above 40° Fahrenheit. The higher the temperature—and the longer the meat is exposed—the greater the chance of spoilage. This is particularly true with large game.

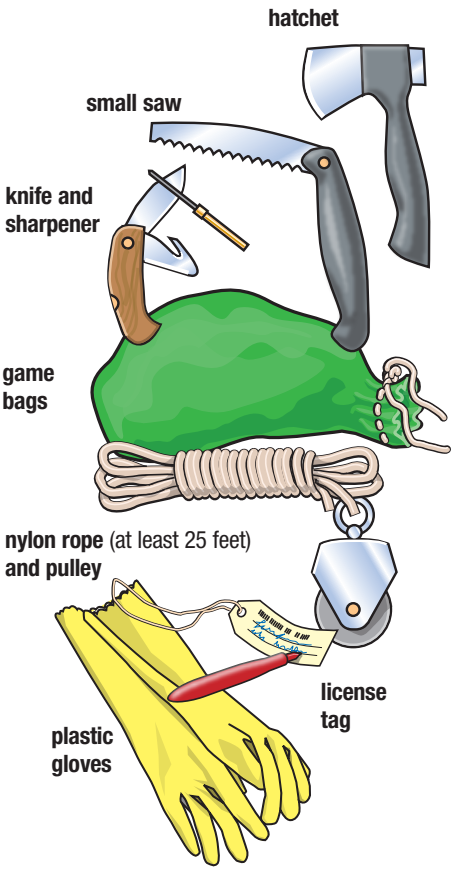
Field Dressing Deer

- To reduce your risk of exposure to disease, wear disposable plastic gloves while handling animals. Wash hands and arms thoroughly with soap and water before and after dressing.
  - **Step 1:** Start your cut at the bottom of the breastbone. Using a clean, sharp knife, make a shallow cut by lifting the skin and muscle together.
  - **Step 2:** Open the body cavity. Position the knife within the cut with the blade facing upwards. Insert two fingers (one on each side of the knife blade in the shape of a "V") in the slit next to the breastbone, and push the entrails away from the blade. Do not pierce the entrails. Make an incision following the midline from the breastbone to the pelvis.

  - **Step 3:** Remove the reproductive organs. Use a smaller incision to prevent contamination when dragging or carrying the deer.
  - **Step 4:** Cut the skin and muscle from the bottom of the breastbone to the brisket. Hold the knife with blade facing upward.
  - **Step 5:** Split the rib cage at the breastbone. Cut through the breastbone with a knife, or use a small saw on older or large animals.
  - **Step 6:** Follow the previous incision from the pelvis to the anus. Split the pelvic bone with a saw. Carefully cut around the urethra. ***Do not sever.***
  - **Step 7:** Carefully remove the anus. Cut around the anus, loosening the connective tissues. Tie off the anus with rubber bands or string. Pull the anus and large intestine into the body cavity.
  - **Step 8:** Make your final cuts. Hold open the rib cage. Reach into the cavity, and cut the diaphragm free from the rib cage down to the backbone. Avoid cutting the stomach or intestines to reduce contamination.
  - **Step 9:** Roll the carcass onto its side to spill out the entrails. Loosen connective tissues as needed. Remove the windpipe and esophagus.
  - **Step 10:** Place the liver and heart in resealable plastic bags and chill. **Do not eat the meat** if the organs smell bad, exhibit greenish discharge, have blood clots, or are discolored.
  - **Step 11:** Clean, ventilate, and dry the body cavity. Prop open the body cavity with a clean stick or branch. Remove all visible dirt, feces, hair, and bloodshot areas. Clean out the entrail residue, and drain excess blood.
  - **Step 12:** Wipe the inside of the body cavity with a dry cloth or paper towels. Use clean water and dry the insides thoroughly if you choose to rinse out the cavity.
- In warm weather, it's helpful to place squirrels and doves in a cooler after dressing, as long as they remain dry.
- Dispose of entrails carefully. Don't leave them lying by the side of a road or near a residence where they can be dragged home by a dog.
- If you plan to process the animal yourself, skin the animal as soon as possible to allow the carcass to cool.
- Take to a professional meat processor or cut up at home.
- Finally, a sure way to ruin meat—as well as earn the disapproval of non-hunters—is to tie the animal to the hood or roof of a car, where it's exposed to heat, exhaust fumes, road salt, and airborne dust.

Credit: Field Dressing Deer Techniques courtesy of Penn State University-College of Agriculture Science-Agriculture Research and Cooperative Extension

Game Care Kit



Other typical items include:

- *Black pepper to repel insects*
- *Cheesecloth bags for organs you plan to use as meat (heart, liver)*
- *Cooler and ice*
- *Disposable plastic gloves*
- *Fluorescent orange flagging*
- *Foil*
- *Gambrel and pulley system*
- *Hand towels*
- *Large bag for caped or trophy head*
- *Plastic bags for cleanup*
- *Plastic or cotton gloves*
- *Salt (noniodized) for hide care*

Remember ...

If gut shot ...

- *Field dress as soon as possible to remove the entrails.*
- *Trim all visible feces or ingesta with clean knife. Clean the knife regularly between cuts.*
- *If you need to wash the cavity to remove contamination, dry it thoroughly with a dry cloth or paper towels.*
- *Prop open the body cavity to circulate air.*

Field Dressing Larger Game

Here are some additional tips for dressing large game.

- *Because it's harder to move larger animals, you may need to skin and quarter the animal to pack it out, particularly in a remote area.*
- *If you're unable to hang the animal for skinning, begin by making a lengthwise cut and removing one side of the hide. Then turn the animal onto the skinned hide and skin the other side.*
- *To keep dirt off the meat, use the inside of the removed hide as a protective mat as you quarter the animal.*
- *Put each quarter in a game sack and attach the sacks to a backpack frame for the hike out.*

Remember...

A clean kill improves the flavor of game meat. A wounded animal that has to be chased down yields strong-flavored meat because waste products, produced by stress, accumulate in the flesh.

Transporting Game

- Keep the dressed game cool and free of insects. If you've quartered the animal, pack the quarters in ice chests—don't cut up the deer beyond quartering until you reach your final destination. Be sure to keep proper "evidence of gender" if required by your game laws.
- Most hunters take their game to a commercial meat cooler, where a typical white-tailed deer can be properly aged up to three or four days at 40˚ Fahrenheit.

Animal Diseases

Identify possible diseased animals or animals with infected wounds or parasites:

- Irrational or odd behavior before harvesting—rabies
- Bad odor—gangrene
- Blisters on lungs or other organs—bovine tuberculosis
- Seeing outline of skeleton through skin—Chronic Wasting Disease
- Hair loss or skin irritations—mange
- No fear of humans—brain worm (elk)

Chapter Review Exercise

1. Unlike still hunting, stalking involves ____.
   a. following signs left by the animal.
   b. spending at least ten times longer being still and observing rather than walking.
   c. using a game call.
   d. using dogs to locate the game.
2. _____ is a hunting technique that involves a group of hunters who are spread out and move to push the game towards other hunters waiting at the end of the cover.
3. Most elevated stand falls occur when the hunter is _____ and _____ a stand.
4. ____ should be worn at all times while climbing a tree and when on a tree stand.
   a. Climbing boots
   b. Thick outerwear
   c. A fall-arrest system
   d. Camouflage outerwear
5. The only time it is safe not to wear a fall-arrest system is when _____.
6. To get your firearm into an elevated stand safely, ____.
   a. climb into the stand using the cradle carry.
   b. climb into the stand and have your companion carefully toss your firearm up to you.
   c. climb into the stand using the sling carry.
   d. haul up the unloaded firearm after you have secured yourself in the stand.
7. While turkey hunting, you should never _____ turkey sounds.
8. Before you pull the trigger while turkey hunting, you should ____.
   a. use your mouth call to get the turkey closer.
   b. be absolutely positive your target is a turkey.
   c. shout "STOP."
   d. move your arms to get the turkey's attention.
9. The most effective place to shoot an animal is the vital organs, which are the _____ and _____.
10. A ____ shot is the most effective shot on deer, antelope, and similar-sized game.
    a. quartering-away
    b. broadside
    c. head-on
    d. quartering-toward
11. When approaching a downed deer or other large animal, you should ____.
    a. approach from the front and make noise to startle the animal.
    b. approach from above and behind the animal's head and watch the chest cavity for any movement.
    c. approach from the front if the animal's eyes are closed.
    d. any of the above are safe methods of approaching downed animals.
12. Once you are sure your quarry is dead, you should immediately _____ it and then begin field dressing.
13. ____ would *not* cause meat to spoil.
    a. Cold
    b. Dirt
    c. Moisture
    d. Heat

Matching: *Draw a line from the phrase found in Column A to its matching word or phrase in Column B.*

Column A	Column B
1. *Deer grunt*	*Most falls occur*
2. *Following tracks*	*STOP*
3. *Group of hunters "pushing" game*	*Arrow*
4. *Getting into and out of the stand*	*Sounds*
5. *Safest time not to wear a harness*	*Tag it*
6. *Safe tree for stand placement*	*Oak*
7. *Color not to wear when hunting wild turkeys*	*Stalking*
8. *Turkey hunters shout this to be safe*	*FREEZE*
9. *Causes massive tissue damage*	*Driving*
10. *After the animal is dead, do this first*	*Bullet*
	Red
	Both feet on the ground
	White

On Target Exercise Answers

1. Deer grunt *Sounds*
2. Following tracks *Stalking*
3. Group of hunters "pushing" game *Driving*
4. Getting into and out of the stand *Most falls occur*
5. Safest time not to wear a harness *Both feet on the ground*
6. Safe tree for stand placement *Oak*
7. Color not to wear when hunting wild turkeys *Red White*
8. Turkey hunters shout this to be safe *STOP*
9. Causes massive tissue damage *Bullet*
10. After the animal is dead, do this first *Tag it*

Chapter Review Answers

1. *a* 2. *Driving* 3. *climbing into and out of* 4. *c* 5. *both feet are on the ground.* 6. *d* 7. *stalk* 8. *b* 9. *heart, lungs* 10. *b* 11. *b* 12. *tag* 13. *a*

Advanced Hunting Techniques

Objectives
Students will be able to...

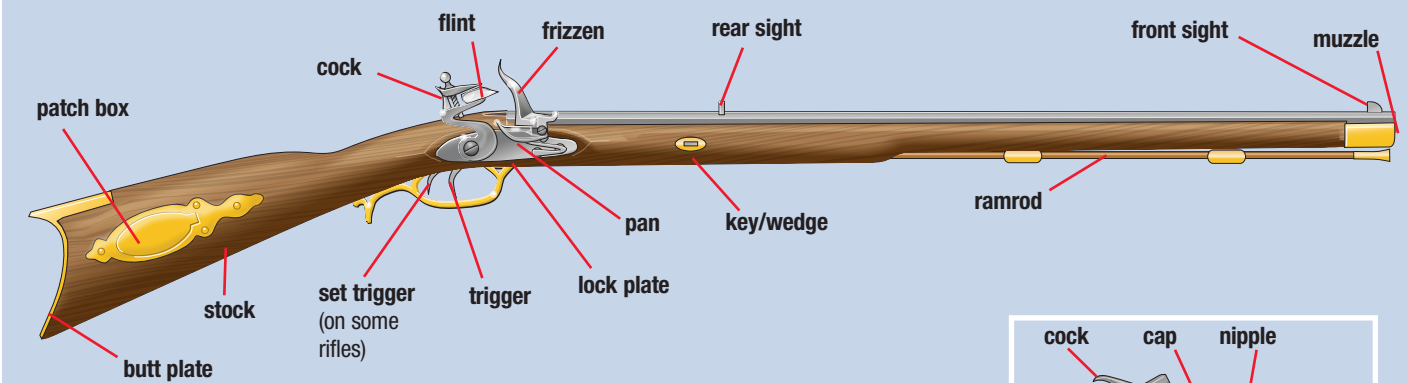
- Identify the common types of muzzleloaders, and explain their primary differences from modern firearms.
- Identify the basic parts of a muzzleloader.
- Explain at least three basic muzzleloader safety practices.
- Identify the basic accessory equipment used for muzzleloader hunting.
- Identify the different types of projectiles and propellants used in muzzleloaders.
- Explain the steps in loading a muzzleloader.
- Explain how to unload a muzzleloader.
- Identify the common types of bows and crossbows.
- Identify the basic parts of a bow.
- Identify the parts of an arrow.
- Identify at least three types of arrowheads or tips.
- Explain how an arrow kills game.
- Describe proper shooting practice for bowhunting, and explain why practice is important.
- Explain at least three basic bowhunting safety practices.
- List the steps to follow when recovering game shot with a bow or crossbow.

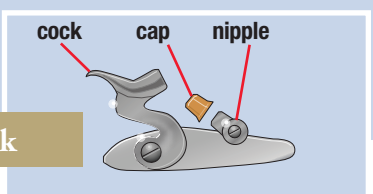
KNOW YOUR MUZZLELOADER

Primitive hunting arms include the muzzleloader firearm, the bow and arrow, and the crossbow. Today, these hunting arms are both collector's items and used for sporting purposes.

Muzzleloader is the term given to early firearms because they are loaded from the muzzle or open end. Read about the history of muzzleloaders in Chapter Three.

Muzzleloading Flintlock Rifle





Parts of the Percussion Lock

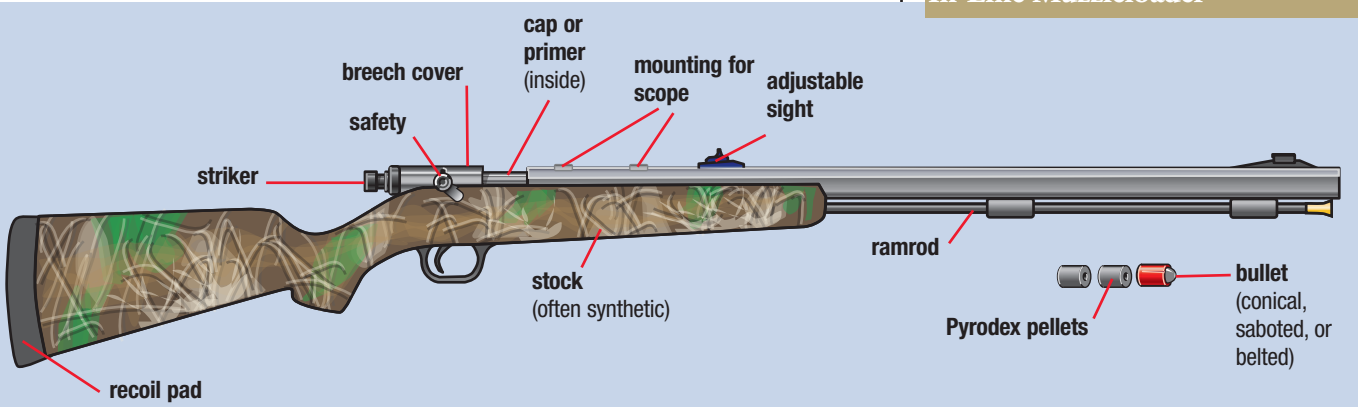
- On these early firearms, locks played the role of modern-day actions. Matchlock and wheel lock muzzleloaders are rare and valuable, but they also may be unsafe to use. Flintlocks and percussion caps are the muzzleloaders typically used for shooting competitions and for hunting. They are generally less expensive, lighter, more reliable, and easier to load and maintain than matchlocks or wheel locks.
- Muzzleloaders are most commonly rifles. However, there are also smooth-bored muzzleloaders—shotguns. Shotgun muzzleloaders can have either a single barreled or double barrels joined side-by-side. When loading the double-barreled muzzleloader, it's very important to avoid putting the two loads down the same barrel. Double-barreled guns usually have two locks, one for each barrel. This allows the shooter to fire each barrel separately before the gun is reloaded. Most double-barreled guns were designed with two triggers.

- Muzzleloading handguns come as both pistols and revolvers. Pistols are mainly single-shot. The revolvers contain multiple-shot chambers. Chain firing muzzleloading revolvers can be dangerous. When the chamber round is fired, it produces sparks that could accidentally ignite loads in another cylinder(s). Therefore, be sure to protect each load in the cylinder with a coating of grease to prevent sparks from entering the open end of the other cylinders.

MUZZLELOADER SAFETY TIPS

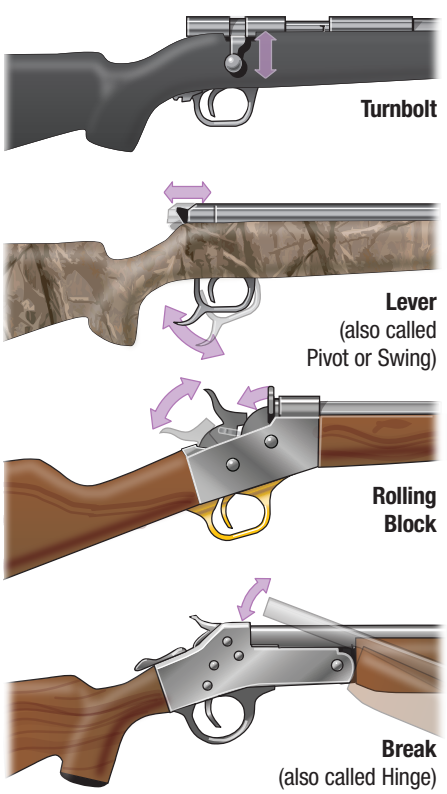
Muzzleloaders take a lot more knowledge to operate than modern firearms. They also present greater risks. Several rules need to be followed for safe operation.

In-Line Muzzleloader



- Keep the muzzle pointed in a safe direction. Do not lean over or stand in front of the muzzle.
- Use only black powder or a safe substitute, such as Pyrodex, in a muzzleloading firearm.
  - Don't use modern-day smokeless powders, which could cause serious injury if used in muzzleloaders.
- Wait until you're ready to fire before you prime or cap a muzzleloader.
  - Wear ear protection to avoid hearing loss.
- Wear shooting glasses; a long-sleeve shirt is also advisable. Burning powder creates smoke and residue that could get into your eyes or irritate your skin.
- Never smoke while shooting or loading or when near a powder horn or flask. Burning ashes can ignite black powder and cause an explosion.
- Load a muzzleloader directly from a calibrated powder measure—do not load from a horn, flask, or other container. A loose spark or glowing ember in the barrel can cause the powder to explode.
- Load only one charge at a time and load only from a calibrated measure—using too much or too little powder may cause damage or injury.
  - Never blow down the barrel when reloading. You may add enough oxygen to the residue from the last shot to ignite the powder.

In-Line Action Types



Remember...

Never use modern smokeless powder in a muzzleloading firearm! Modern powders could cause the firearm to explode, resulting in serious injury or death.

NEVER
Use Smokeless Powder in a Muzzleloader

- Use loading equipment made of brass, which does not create sparks while loading.
  - Do not cap or prime the pan until ready to fire, which prevents accidental discharge if the cock/hammer moves and causes a spark or hits the cap.
  - Stay with your charged muzzleloader at all times. It's difficult to tell if your muzzleloader has been tampered with in your absence.
- Unload a muzzleloader before bringing it into your home, camp, or vehicle. Powder may ignite in the barrel, causing damage or injury.

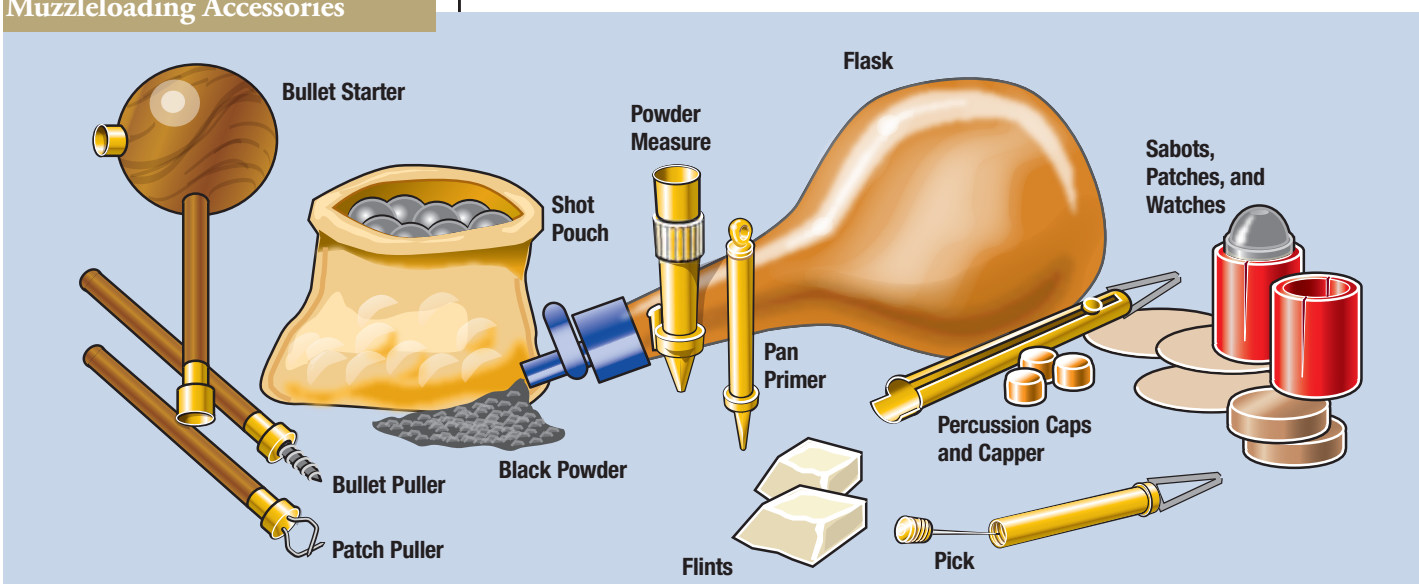
ACCESSORY EQUIPMENT

Shooting a muzzleloader is different from shooting a modern shotgun or rifle. A muzzleloader requires a number of accessories in order to be used safely and correctly. Most, if not all, of this equipment needs to be carried with you when you hunt or target shoot with a muzzleloader. The majority of this equipment is usually carried in a bag called a possibles bag.

Muzzleloading Accessories

- **Powder Horn or Flask**
  - Used to carry extra powder.
- **Bullet Starter**
  - Conventional or hollow point bullets.
  - Used to get bullet started down the barrel.
- **Pan Primer**
  - Smaller container used to carry and pour the powder into the flash pan of a flintlock.
- **Powder Measure**
  - Marked device used to measure the amount of powder charge to be used in the barrel of the muzzleloader.
- **Pick**
  - Used to keep the flash-hole clear of debris and residue.
- **Possibles Bag**
  - Pouch or bag used to carry all of the muzzleloading accessories.

Muzzleloading Accessories



- **Bullet Puller**
  - Ramrod adaptor that looks like a screw. Used to remove unfired bullets from the barrel.
- **Nipple Wrench**
  - Special wrench used to remove the nipple from percussion cap muzzleloaders.
- **Capper**
  - Used to put percussion caps on the nipple.
- **Percussion Caps or Flints**
  - Used to ignite the main powder charge.
- **Patches and Patch Puller**
  - Pieces of cloth used with round ball projectiles to create a tight seal in the barrel.
  - Puller used to pull out patches from an unfired muzzleloader or those used for cleaning.
- **Speed Loaders**
  - Pre-measured charge and bullet.
- **Brushes and Solvent**
  - Used to clean plastic residue and black powder fouling.
- **Ramrod**
  - A long wooden or synthetic rod used for seating the bullet against the powder charge and for cleaning the barrel.

PROPELLANTS AND PROJECTILES

Propellants

- **Black Powder:** A traditional powder made of potassium nitrate (saltpeter), sulfur, and charcoal. When ignited, it causes a dense cloud of white smoke. It comes in four sizes or granulations.
  - Fg: Coarse grain typically used in cannons, rifles larger than .75 caliber, and 10-gauge shotguns or larger
  - FFg: Medium grain typically used in larger rifles between .50 and .75 caliber, 20-gauge to 12-gauge shotguns, and pistols larger than .50 caliber
  - FFFg: Fine grain typically used in smaller rifles and pistols under .50 caliber and smaller shotguns
  - FFFFg: Extra-fine grain typically used as a priming powder in flintlocks
- **Synthetic Powder:** Pyrodex and Clear Shot are black powder substitutes that can be used in amounts equal to black powder, but loading may vary. Be sure to ask for instructions from a qualified gunsmith for loading procedures. Substitutes are not recommended for use in flintlocks because they may not ignite from sparks as easily.

Projectiles

Five types of projectiles are used in muzzleloaders. Most are melted and cast from pure lead.

- Round ball and patch
- Pure lead conical or mini-ball bullet
- Sabot bullet
- PowerBelt bullet
- Shot pellets for muzzleloading shotguns

Muzzleloading Projectiles

Round Balls

Round balls are traditional, but lose power and accuracy at medium and longer ranges. They usually use a cloth patch to engage the rifling.

Bullets

Bullets are preferred for hunting because of their greater accuracy and power. They may or may not need a patch or plastic sabot.

Sabot Bullets

Sabot bullets have an enclosing case or "sabot" of plastic to engage the rifling and impart spin to the bullet.

PowerBelt Bullets

PowerBelt bullets have a solid plug in the base which is driven into the bullet by the ignition of the powder, expanding the bullet sides to take the rifling.

Shot Pellets

Shot pellets spread, just as in a modern shotgun. They use fiber wads to hold them in the barrel.

Bullets are preferred for hunting because they are generally more accurate at certain ranges. Shot pellets are designed to spread, just as with today's shotguns.

Round balls are used mainly for target practice but also can be used for hunting.

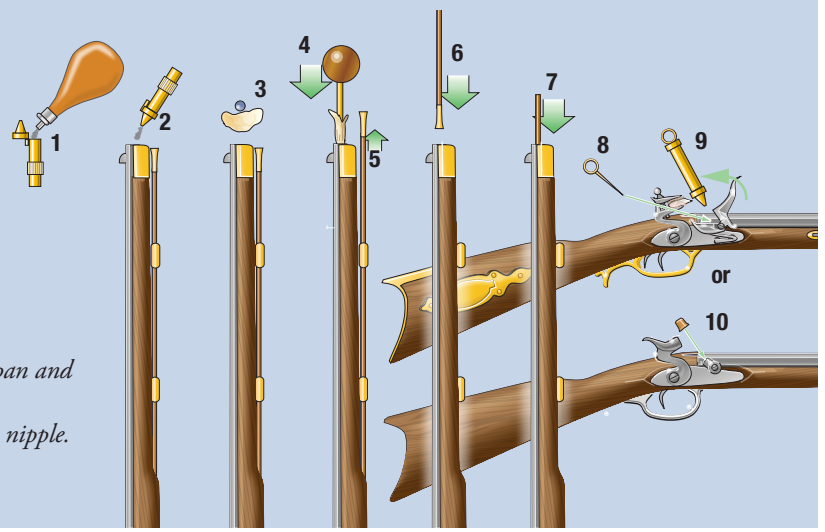
BASIC MUZZLELOADER SKILLS

Loading a Sidelock Muzzleloader

- Loading or charging a muzzleloading firearm presents some special concerns because it requires the muzzle to be pointed upward.
- For rifles, position the butt on the ground between your feet. You should be facing the underside of the barrel. The muzzle should be pointed upward and away from your body. Never work directly over the muzzle.
- Determine if the gun is already loaded by checking the barrel with a marked ramrod, which has an "unloaded" or empty marking. If you aren't sure, ask an experienced muzzleloader user or gunsmith.
- Measure out the proper amount and type of powder using the calibrated measure. Replace the powder horn's cap, and swing the horn to the other side of your body. Pour the powder into the barrel from the measure. Tap the barrel to make sure all powder falls to the breech end.
- Using a lubricated precut patch, center the patch over the muzzle. You can lubricate patches using a manufactured lubricant or using saliva by placing it in your mouth. Lay the ball on the patch with the sprue or flat side up, if the ball comes with this feature. Then seat the ball and start it down the barrel using the short starter.
- Use the longer ramrod to push the ball the rest of the way, making sure it's well seated on the powder charge. Push the ramrod in short strokes, gripping it just a few inches above the muzzle. If you use longer strokes, you might accidentally snap the rod and injure your hands or arm. Your ramrod should be marked to show when the ball is properly seated over a specific load, such as 70 grains of FFFg powder.

Steps for Loading a Sidelock Muzzleloader

1. *Measure powder charge.*
2. *Pour measured powder down barrel.*
3. *Place patch and ball on muzzle.*
4. *Tap ball into barrel with starter.*
5. *Take out ramrod.*
6. *Ram ball down barrel.*
7. *Be sure ball is completely seated.*
8. *Clear vent hole with pick if necessary.*
9. *On flintlock muzzleloader, pour powder into pan and close frizzen.*
10. *On percussion lock muzzleloader, place cap on nipple.*



Loading an In-Line Muzzleloader

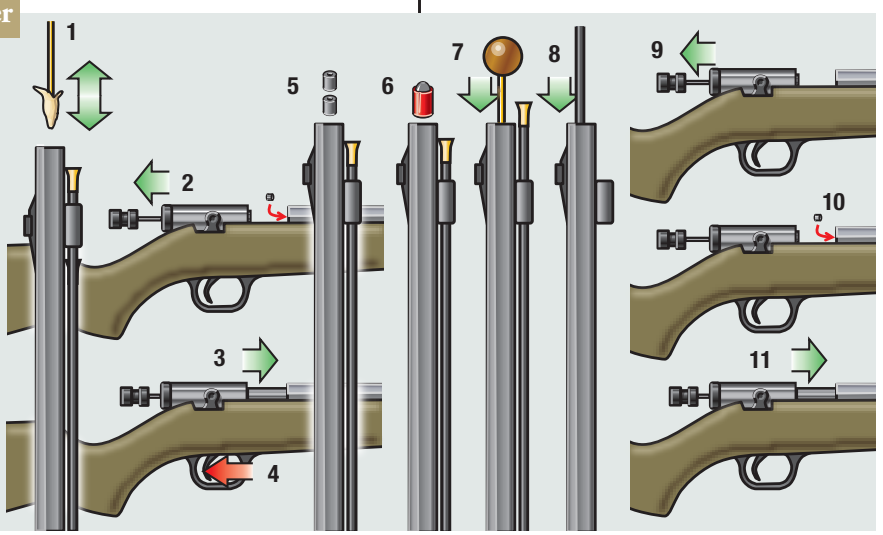
- Loading or charging a muzzleloading firearm presents some special concerns because it requires the muzzle to be pointed upward.
- For rifles, position the butt on the ground between your feet. You should be facing the underside of the barrel. The muzzle should be pointed upward and away from your body. Never work directly over the muzzle.
- Determine if the gun is already loaded by using a marked ramrod, which has an "unloaded" or empty marking. If you aren't sure, ask an experienced muzzleloader or gunsmith.
- Put the safety ON SAFE, if so equipped.
  - If you have just fired, wait one full minute in order to let smoldering sparks in the barrel burn out before reloading.
  - If you have not recently fired, use a cleaning rod to run a dry patch down to the bottom of the barrel and back up again to absorb any oils which could cause a misfire. Dispose of the patch.
- Retract the bolt (or breechblock) and place a percussion cap (or a 209 shotshell primer, depending on the gun) on the nipple or breech-plug. Close the bolt. The gun will now be cocked.
- Point the rifle in a safe direction. Push the safety to OFF and press the trigger to fire the cap with no charge in the barrel. This will clear any oil or debris out of the priming hole.
- Put the safety ON SAFE, and rest the butt of the rifle on the ground as described above. Pour in a measured amount of black powder or black powder substitute down the barrel, or drop the correct number of pre-made powder pellets down the barrel.
- Use the short starter rod to push the bullet into the barrel.
- With the long ramrod, push the bullet ALL THE WAY to the bottom of the barrel until you feel it solidly seat against the powder. (A bullet which is not firmly seated against the powder can cause dangerous pressures on firing.)
- Point the gun in a safe direction, and retract the bolt. Place a fresh percussion cap (or primer) on the nipple/breech-plug, and close the bolt. The gun will now be cocked, loaded, and ready to fire.

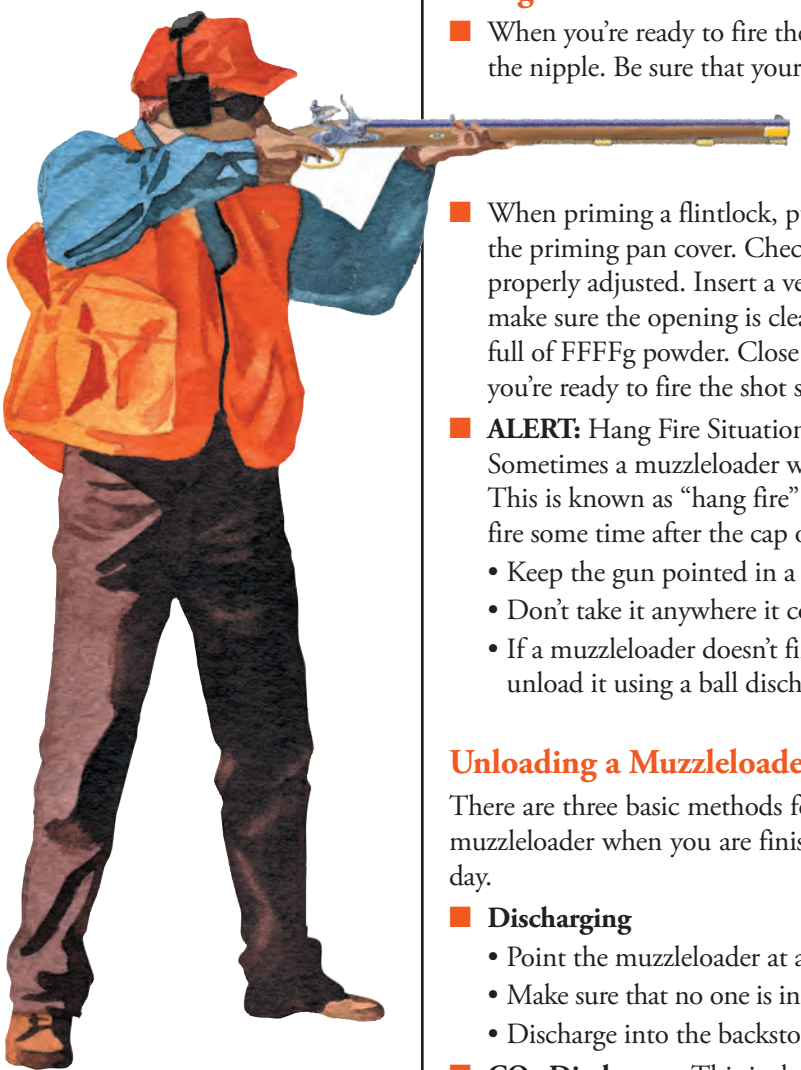
Remember...

Do not cap or prime until ready to fire.

Steps for Loading an In-Line Muzzleloader

1. *Check for load and swab bore dry.*
2. *Open breechblock to install cap/primer.*
3. *Point in safe direction and close block.*
4. *Clear channel by firing cap.*
5. *Drop in powder or pellets.*
6. *Place bullet in muzzle.*
7. *Use starter to push bullet into muzzle.*
8. *Use ramrod to seat bullet completely.*
9. *Open breechblock.*
10. *Install cap or primer.*
11. *Close block and put safety ON SAFE or fire.*





Firing a Muzzleloader

- When you're ready to fire the muzzleloader safely, place the percussion cap on the nipple. Be sure that your surroundings and your backstop are safe. Then aim and fire. After firing, place the hammer in the half-cock position and swab the barrel to remove sparks that might be inside.
- When priming a flintlock, pull the hammer to a half-cock position, and open the priming pan cover. Check your flint, making sure the setting is tight and properly adjusted. Insert a vent pick or fine wire into the barrel's touchhole to make sure the opening is clear. With your priming horn, fill the pan about ¾ full of FFFFg powder. Close the frizzen and pull the hammer to full cock when you're ready to fire the shot safely.
- **ALERT:** Hang Fire Situations
  Sometimes a muzzleloader will not fire immediately when the trigger is pulled. This is known as "hang fire" and requires great caution because the gun might fire some time after the cap or flint created the initial sparks.
  - Keep the gun pointed in a safe direction, preferably downrange.
  - Don't take it anywhere it could injure someone or damage property if it fires.
  - If a muzzleloader doesn't fire properly, get help from an experienced shooter to unload it using a ball discharger.

Unloading a Muzzleloader

There are three basic methods for unloading a muzzleloader when you are finished hunting for the day.

CO_2 Discharger

- **Discharging**
  - Point the muzzleloader at a suitable backstop.
  - Make sure that no one is in front of your position.
  - Discharge into the backstop.
- **CO_2 Discharger:** This is the safest method.
  - Follow the manufacturer's directions.
  - Place on the nipple or in the flash hole.
  - Point the muzzle in a safe direction.
  - Discharge the bullet and powder.
- **Un-Priming:** This is the most dangerous method and recommended only if absolutely necessary.
  - Remove the cap from the nipple or powder from the pan.
  - Cover the flash hole.
  - Use a bullet puller to remove the bullet and pour out the powder.

When a muzzleloader is unloaded, place your ramrod or loading rod in the barrel before leaning it against a good rest—this will prevent debris from falling down the barrel and blocking the touch hole.

Cleaning a Muzzleloader

- Firing a muzzleloader leaves a corrosive residue inside the barrel that causes pitting, which reduces accuracy. The buildup of residue, called fouling, also will make loading difficult.
- To avoid fouling, swab the barrel with a moist patch after each shot. The patches or cleaning rags used to wipe the barrel must be the correct size and should be made of cotton or approved synthetic materials. Follow the recommendations of retailers who sell muzzleloaders or those who regularly use muzzleloaders.
- Thoroughly clean a muzzleloader after each shooting session. Black powder residue can damage the barrel if left overnight.
- Clean the gun's lock regularly. Normally it's held in place by one or two bolts. Once the lock has been removed, scrub both sides with an old toothbrush and hot water. Make sure the entire lock is completely dry, and then lightly oil and replace it.

Steps for Cleaning a Muzzleloader

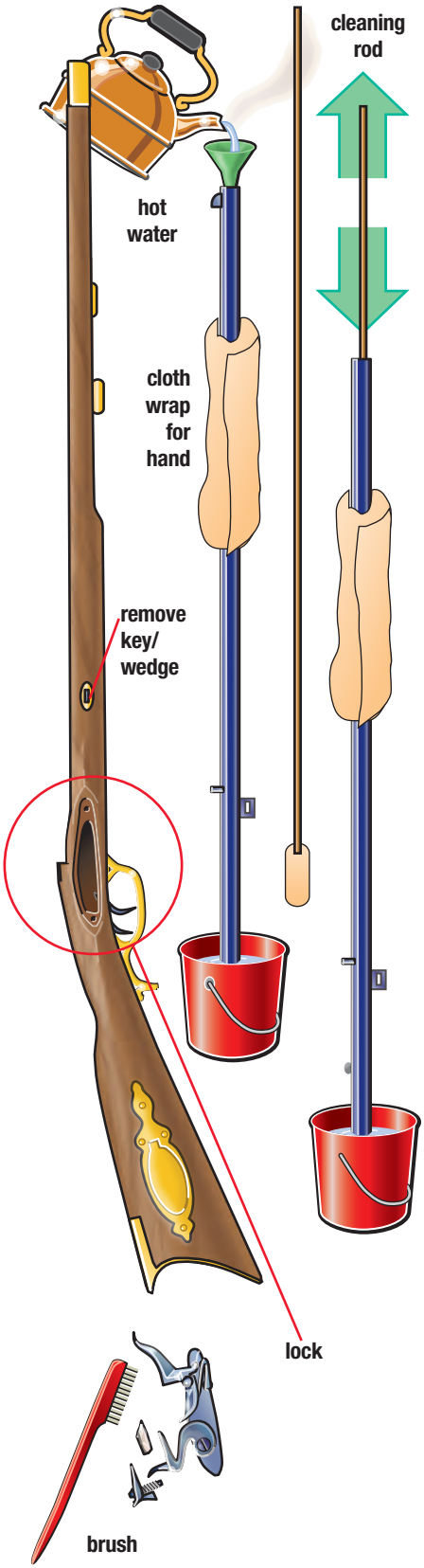
Sidelock Muzzleloader

- Disassembly
  - Make sure it is unloaded.
  - Remove the wedge.
  - Remove the barrel.
- Cleaning
  - Clean inside the barrel with warm, soapy water.
  - Clean residue from the barrel with solvent.
  - Dry with patches.
  - Clean the lock.
    - Remove the nipple or flint.
    - Scrub with soapy water.
    - Lubricate lightly (do not lubricate frizzen).
    - Clean the flash hole.
  - Wipe outside metal with lubricant.
- Reassembly
  - Place the flint in the cock and tighten.
  - Screw in the nipple with the nipple wrench.
  - Place the barrel in the stock.
  - Insert the wedge.

In-Line Muzzleloader

- Disassembly
  - Make sure it is unloaded.
  - Remove the breech plug.
- Cleaning
  - Clean inside the barrel with warm, soapy water.
  - Clean residue from the barrel with solvent.
  - Dry with patches.
  - Clean the breech plug.
  - Wipe outside metal with lubricant.
- Reassembly
  - Insert the breech plug into the muzzleloader.
  - Lubricate treads with breech plug grease.

Cleaning a Muzzleloader

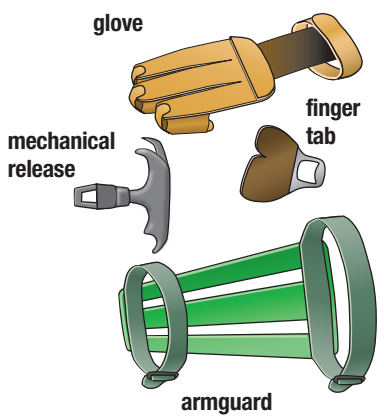


Matching Your Equipment

Before going bowhunting or shooting at the range, it is important that your equipment is matched properly to you and your purpose. You must match:

- *The bow to your body size, strength, and shooting style*
- *Bow draw weight to your draw weight and the game being hunted*
- *Arrow draw length to your draw length*
- *Arrow spine to your draw weight and length*
- *Your arrows to each other in size and weight*
- *Accessory equipment to the game being hunted and the hunting method*

Accessories



- *To protect the three fingers that draw the bowstring, archers wear three-fingered gloves or finger tabs, or use mechanical releases.*
- *A mechanical release snaps onto the string and is pulled back with the shooting hand. The archer pulls a trigger to release the string.*
- *An armguard protects the inner part of the bow arm during release as the string snaps back. The armguard prevents the bowstring from hitting loose clothing and also helps protect the arm if an arrow breaks during release.*

KNOW YOUR BOW AND ARROW

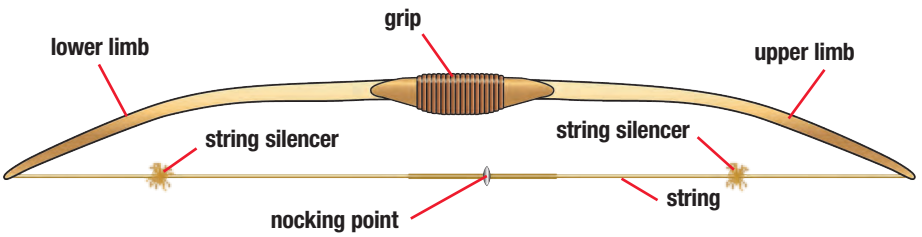
Modern bows can shoot arrows more than 200 yards, at speeds of more than 135 miles per hour. Any bow can be dangerous at any range and should be handled responsibly. However, the bow is a short-range hunting tool. Shots are usually limited to 40 yards or less; at this range, the arrow penetrates and can even pass through an animal. Most shots are taken at 20 yards or less.

Common Bow Types

Proper bow selection and fit are essential to your accuracy and performance when bowhunting.

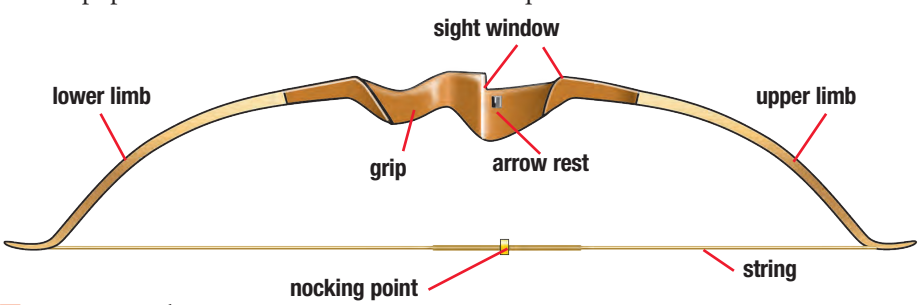
Longbow (Stick Bow)

- The "traditional" bow, which has straight limbs that form an arc when strung
- Used by those interested in traditional shooting with little additional equipment



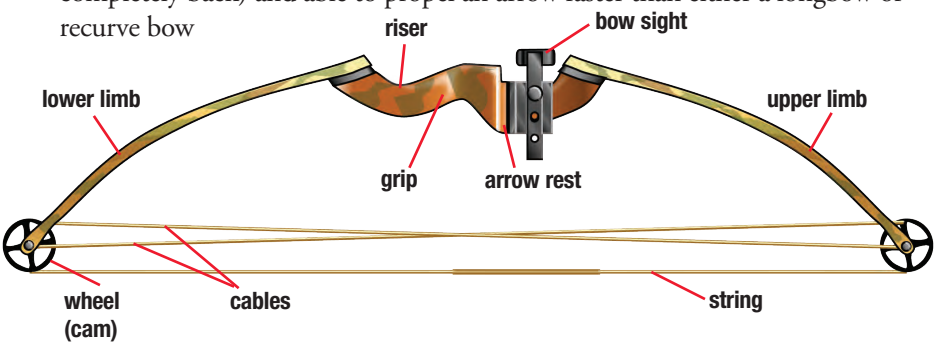
Recurve Bow

- Much like the longbow, but the limbs curve back away from the belly of the bow, which can provide more power in a shorter bow than the longbow
- A popular choice because it's smooth and quiet



Compound Bow

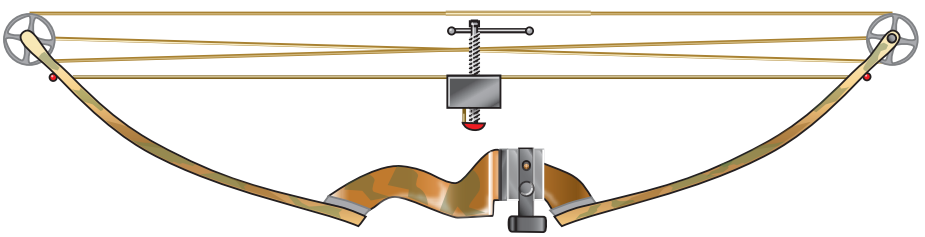
- The most popular bow for both hunting and target shooting
- A bow with many styles, but they work basically the same way; wheels and cables attached to the limbs make it easier to hold at full draw (pulled completely back) and able to propel an arrow faster than either a longbow or recurve bow



Stringing a Bow

The safe and easy way to string a recurve bow or longbow is to use a bowstringer. The push-pull or step-through method can be hazardous to yourself or your bow.

- A bowstringer is simply a strong cord with a loop or pocket at each end that fits over the limb tip of recurve bows and some longbows. By standing on the loose middle of the cord after it's attached to the tips, the limbs can be flexed as the handle is pulled. This allows the bowstring to be slipped safely into place.
- To replace compound bow strings, you must use a bow press or have double tears at the end of each cable. Double tears allow you to change strings by stepping on the string being replaced first and on the new string second. A bow press is used to place and hold tension on the limbs, allowing the strings to be changed. Inexperienced bowhunters should have a qualified dealer or individual replace the string on a compound bow.

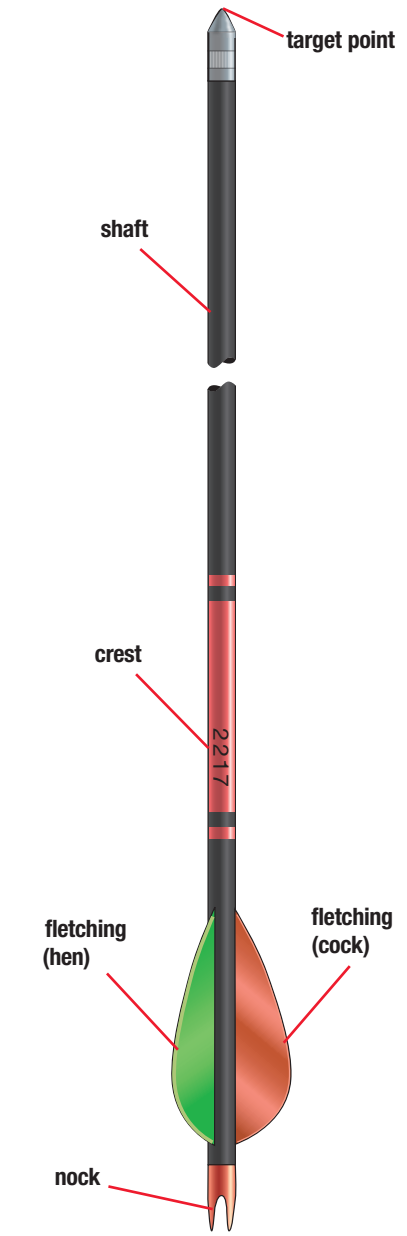


Parts of an Arrow

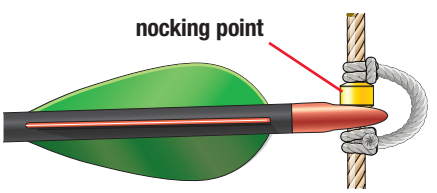
Arrows have five parts.

- **Shaft:** The long spine of the arrow. Modern arrow shafts are made of wood, fiberglass, aluminum, or carbon. The arrow, regardless of shaft material, must have the correct stiffness to match the bow. As an arrow is released, the shaft bends before straightening in flight. Incorrect stiffness will cause the arrow to fly off target.
- **Fletching:** The plastic vanes or feathers on an arrow. Fletching creates wind drag and also can cause the arrow to spin similar to a rifle bullet, providing stability and accuracy in flight. Fletching is made up of three or more vanes or feathers. One of the feathers will be a different color and is called the "cock" feather. The remaining feathers are referred to as the "hen" feathers.
- **Arrowhead:** The point of the arrow. Many different kinds of arrow points are available, each with a different purpose and advantage.
- **Nock:** A slotted plastic tip located on the rear end of the arrow that snaps onto the string and holds the arrow in position. There is a certain point on the bowstring, called the "nocking point," where arrows are nocked. Fine tuning of this location, by moving it up or down the bowstring, is usually required.
- **Crest:** The area that gives information about the arrow's shaft size and spine.

Arrow Parts

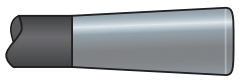


Nocking Point



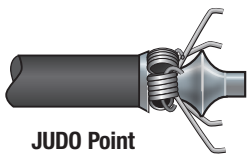
Types of Arrowheads

Bullet Point

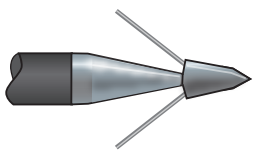


Blunt Point

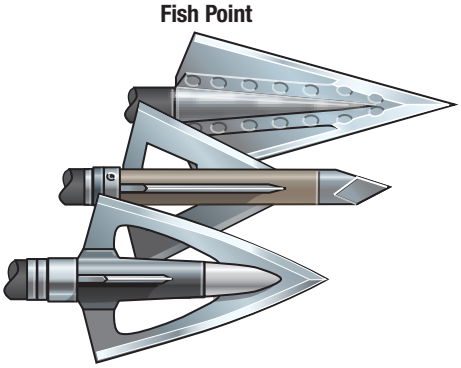
Field Point



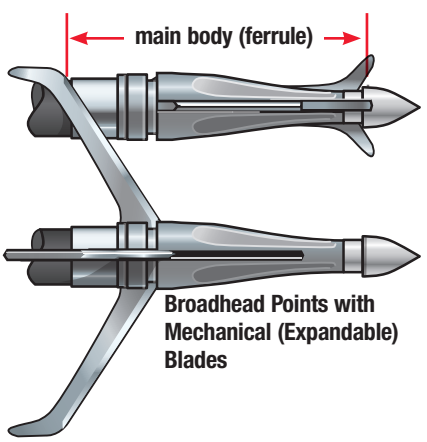
JUDO Point



Fish Point



Broadhead Points



Broadhead Points with Mechanical (Expandable) Blades

Common Types of Arrowheads

- **Bullet Point:** Steel point used for target shooting and small game hunting.
- **Blunt Point:** Used for small game hunting and some types of target shooting; made of steel, hard rubber, or plastic.
- **Field Point:** Steel point used for target shooting and small game hunting.
- **JUDO Point:** Designed with spring arms attached to catch in grass and leaves, preventing arrow loss; used for "stump" shooting and small game hunting.
- **Fish Point:** Long, barbed or spring-loaded arrowhead that spears fish and secures them until landed with an attached line.
- **Broadhead Point:** Used primarily for big game hunting. The number of steel blades it contains may vary. The only arrowhead that may be used for big game hunting is the broadhead. It must be solidly built and always razor-sharp. Many states have laws governing the minimum diameter and number of cutting edges of the broadhead used to hunt big game.
  - **Mechanical (Expandable) Blade Broadhead:** Blades are retracted into the main body of the broadhead (ferrule) before the shot. Upon impact, the blades expand to expose the cutting edges. These are recommended for use only with bows rated 50 pounds or more because most require additional energy to open upon penetration.

How Broadhead-Point Arrows Kill Game

- A broadhead-point arrow, unlike a bullet, kills game by causing massive blood loss as it cuts through an animal's blood vessels and vital organs. The vital organs include the heart, lungs, and liver. The brain size of animals hunted with broadhead-point arrows, such as deer or elk, is small and protected by a heavy skull and does not present a good target. Only shots at the heart-lung vital area should be taken to make sure of quick, humane kills.
- A significant amount of blood loss is required to cause death. A white-tailed deer, for example, has one fluid ounce of blood for each pound of body weight. It needs to lose one-third of its blood—or about 48 fluid ounces for an average-sized deer—to cause death. For this reason, it is very important to keep the cutting edges of broadheads razor-sharp. Dull broadheads will not cut through vital areas effectively and cause the required amount of blood loss.

Broadhead Safety

Many archers' injuries come from broadheads. Broadheads must be kept razor-sharp for hunting, which creates a safety problem if they are handled carelessly. To prevent injury:

- Use a special wrench to screw on broadheads. This device covers the blades while a broadhead is being tightened on an arrow. If a wrench isn't used, the slightest slip can cause a serious cut. When sharpening broadheads, always stroke the blade away from hands and body.
- Keep broadheads covered with a quiver while traveling to and from the field. Many arrow injuries occur while loading or unloading equipment in vehicles.
- While dressing bow-killed game, remember that the broadhead may remain in the animal. Use great caution until all parts of the broadhead have been found.

ARCHERY SKILLS

Stance and Grip

- Stand at a right angle to the target with your feet approximately shoulder-width apart. The stance should feel comfortable and balanced. If you prefer, you may slide your front foot back a little, creating a slightly open stance.
- Don't squeeze the grip. Hold it so that it is supported by your hand.

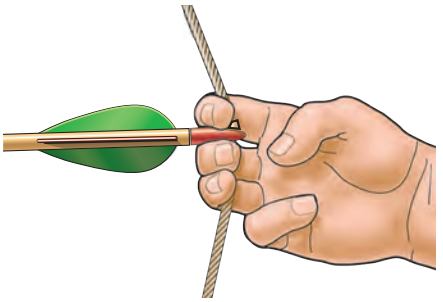
Nocking an Arrow

- A nocked arrow should be positioned about a quarter inch above the arrow rest on the bow handle. On most bows, a small brass band called a "nock set" or "nock point" is crimped onto the bowstring to mark the correct position.
- To nock the arrow:
  - Grasp the arrow between the thumb and index finger of the right hand (if you're a right-handed shooter).
  - With your left hand, hold the bow parallel to the ground about waist high, string toward the body.
  - Lay the arrow shaft on the bow's arrow rest.
  - Position the arrow so that the fletching will not hit the rest when the arrow is released.
  - Align the slot in the nock with the string, while making sure that the cock feather points up (while the bow is parallel to the ground).
  - Pull the arrow back until the string snaps into the slot.

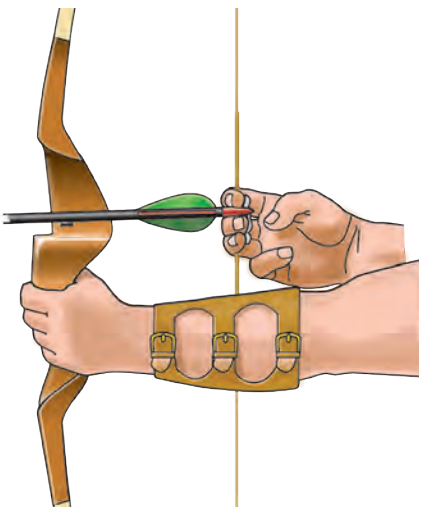
Drawing the Bow

To draw the bow:

- Grip the bow handle firmly in your left hand if you are right-handed, but don't squeeze.
- Raise your left hand above eye level. Your left arm may be slightly bent or straight out from your body.
- Raise the bow as you pull back the string with the three drawing fingers. At the same time, extend your left arm.
- Bring the string back to full draw.



When the arrow is nocked and the bow is raised, the cock feather points to the left if you are right-handed.



If you are right-handed, raise the bow as you pull back the string with the three drawing fingers of your right hand. At the same time, extend your left arm.

Safety TIP

A bow should never be "dry fired." Releasing a string without an arrow nocked transfers energy back to the limbs instead of the arrow. The bow can fly apart, injuring anyone nearby.

Archery Equipment Safety

Before practicing or hunting, an archer must examine the bow and each arrow for defects.

Repair or replace damaged bows, and throw away arrows with damaged shafts or loose or missing parts.

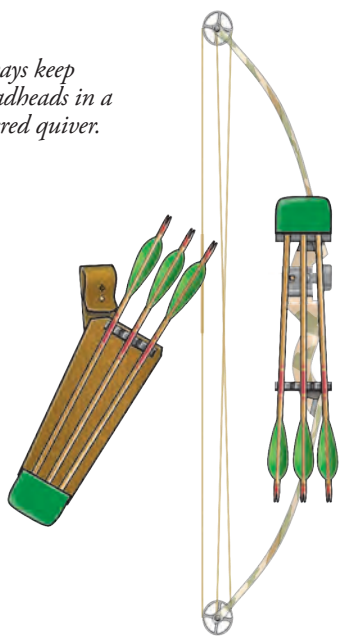
Check the bow for:

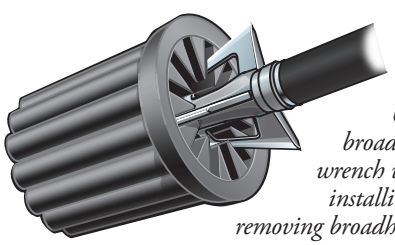
- *Cracks or separations in limbs, limb tips, cams, or riser*
- *Loose bolts, screws, or other fasteners*
- *Worn or frayed bowstring or servings*
- *Worn or damaged cables*
- *Broken, loose, or damaged arrow rest*

Check the arrows for:

- *Cracks and splinters in wood arrows—an arrow with a crack in it may shatter on release and be driven into the archer's arm*
- *Creases, dents, or cracks in aluminum arrows*
- *Crushed sidewalls on fiberglass or graphite arrows*
- *Cracked or broken nocks—nocks can be replaced*
- *Loose or missing parts*
- *Loose or missing fletching or vanes*

Always keep broadheads in a covered quiver.

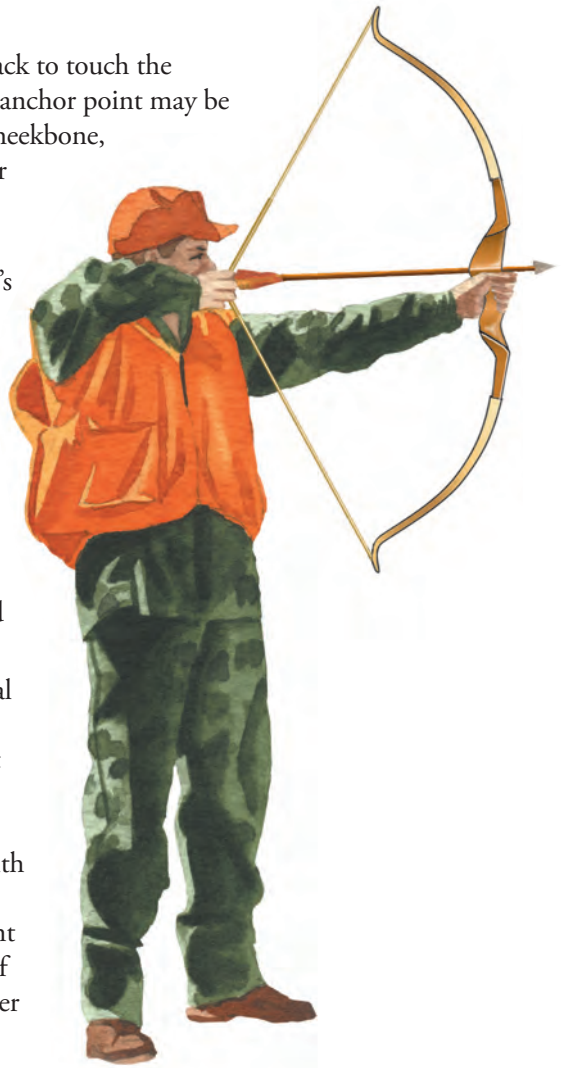




Use a broadhead wrench when installing or removing broadheads.

Anchoring

- Bring the three drawing fingers back to touch the "anchor point" on your face. The anchor point may be the corner of your mouth, your cheekbone, or your chin. Use the same anchor point each time you shoot.
- Practice will help you determine your best anchor point—one that's both comfortable and provides the most accurate shooting. Your fingers should touch the same anchor point each time you draw the bow.



Aiming

There are two main methods for aiming bows—instinctive aiming and bowsights.

- **Instinctive aiming** is more natural than the bowsight method. You simply look at the intended target with both eyes open and release. You adjust the aim for different distances by instinct developed with practice. Instinctive aiming takes longer to perfect than the bowsight method, but it eliminates much of the guesswork from shooting under some hunting conditions.
- **Bowsights** work best when the distance to the target is known. For instance, when hunting from a tree stand or blind, you can measure the distance to the area where you expect the game to appear. Then it's a matter of lining up the correct sight pin on the target. In hunting situations where it's hard to know the exact distance to the target, bowsights may not work well. The key to using bowsights is to practice judging distances.

Releasing

- Allow your fingers to slip quickly away from the string. This gives the arrow a straight, stable flight.
- Keep your bow arm pointed directly at the target after the release. If the bow is jerked on release, the arrow will fly off target.

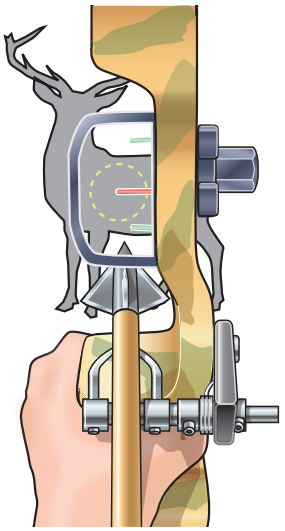
Following Through

- Follow through by leaving your drawing hand at the anchor point well after the string is released.
- Don't let the bow down; hold it on the target for a few seconds.

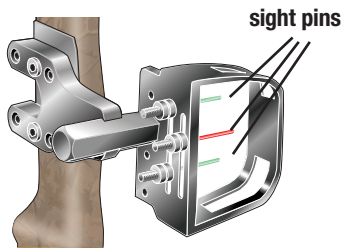
Practice Shooting

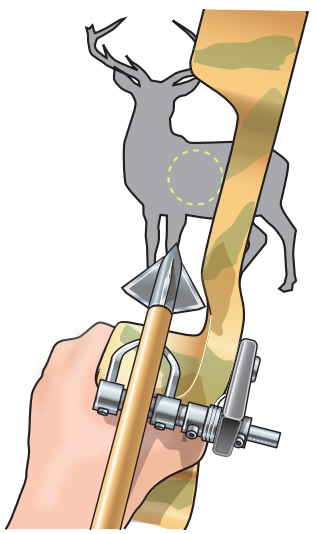
Practice makes perfect in bowhunting. Prior to the start of the bowhunting season, you should practice with your bow and equipment so that you become a skillful shooter. Practice from different angles and distances to increase your skills and raise your confidence. Shooting practice has many benefits:

- Develops skills necessary to place the arrow in the vital organs
- Establishes your personal maximum effective range
- Familiarizes you with your equipment
- Increases confidence
- Prepares you to shoot from different angles
- Builds upper body strength



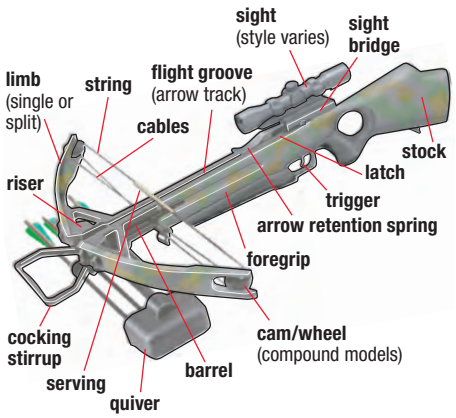
With bowsights, you line up the correct sight pin on the target.





With instinctive aiming, you simply look at the intended target with both eyes open and release.

Compound Crossbow



KNOW YOUR CROSSBOW

Comparing a Conventional Bow to a Crossbow

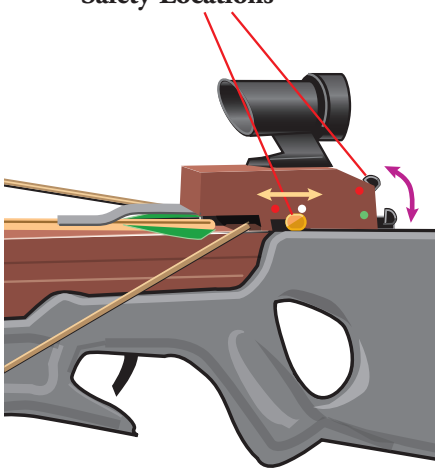
As the bow is shot, the string on a conventional compound bow pushes the arrow more than twice the distance as when a crossbow is shot. Therefore, to produce the same arrow speeds, a crossbow must have more than twice the draw weight of a compound bow.

Because of this much shorter "power stroke" (draw) on the crossbow it must have much heavier limbs. The powerful limbs move a short distance and stop quickly when an arrow is shot. Therefore, the crossbow must have more physical mass than a compound bow to absorb the shock, which otherwise would be transferred to the shooter. This short, heavy power stroke means the crossbow will create more noise when discharged than the conventional compound bow.

Parts of a Crossbow

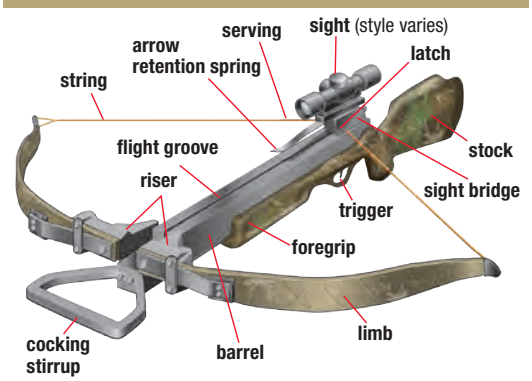
- **Riser:** Where the limbs attach.
- **Cocking Stirrup:** Used to aid in cocking the crossbow. The archer's foot is placed in the stirrup to prevent the bow from slipping when it is cocked.
- **Barrel:** Made of aluminum or polymer. A grooved track on top (**flight groove**) allows the arrow to lie in perfect alignment with the string for consistent accuracy.
- **Stock:** Made of wood or composite materials and available in many configurations.
- **Limbs:** Can be compound or recurve. A recurve crossbow must have long limbs and a longer barrel to deliver power similar to that of a compound crossbow.
- **Latch Mechanism:** Designed to capture the string when the crossbow is cocked (drawn), the latch holds the string in place until it's released by the trigger.
- **Sight Bridge:** Holds the sight.
- **Arrow Retention Spring:** Holds the arrow in the track until the trigger releases the latch mechanism.
- **Safety:** Prevents the arrow from releasing accidentally. May engage automatically or manually when the crossbow is cocked. Some crossbows have a dual safety system. **Note:** Since the safety is a mechanical device, it can be subject to failure. Always keep a loaded crossbow pointed in a safe direction.

Typical Safety Locations

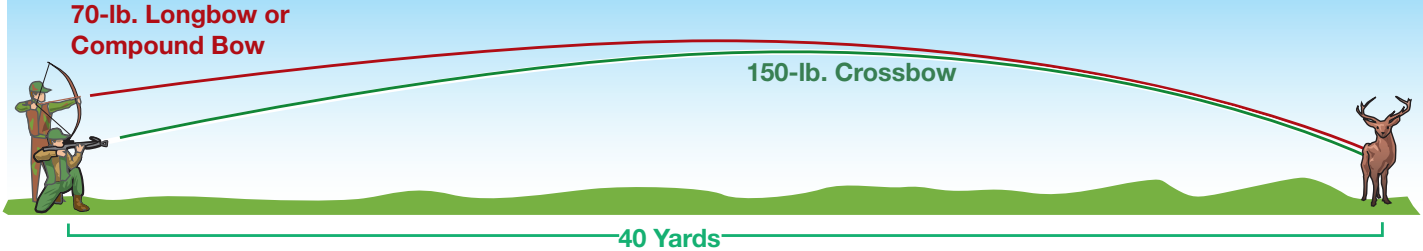


The safety may be located on the side or the back of the sight bridge. Check your owner's manual to learn how to use the safety for your specific crossbow correctly.

Recurve Crossbow



In range and power, a crossbow is equivalent to a longbow or compound bow that is about half the crossbow's draw weight.



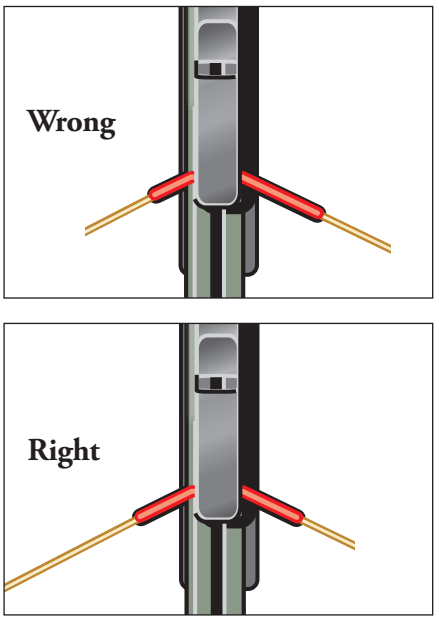
SHOOTING A CROSSBOW

Preventive Maintenance

Most manufacturers recommend applying a lubricant to the rail of the crossbow and applying string wax to the crossbow string outside the area where the serving rides on the rail. This attention to detail will greatly increase string life and help you achieve consistent accuracy.

Centering the Crossbow String's Center Serving Area

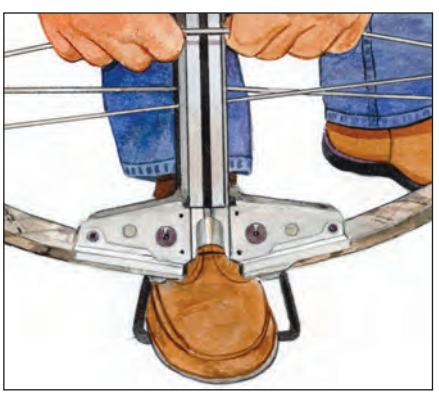
- The crossbow string's center serving area should be centered on either side of the latch system for consistent shooting when the crossbow is in the cocked position.
- For ease of centering, you may want to use a permanent marker to color the part of the serving on the string that is immediately outside the rail on both sides of the stock when the crossbow is uncocked.
- When the crossbow is cocked, you can glance down quickly and check to see if the string is centered.
- If the string is not centered, it can be adjusted in the latch by pulling back on the string and moving it until the marks are centered.
- A sudden shift of arrow groups to one side is a good indicator that the crossbow is being cocked with the string off center.
- Using a cocking aid—a harness or crank—will help ensure center cocking each time.



For consistent arrow grouping, it is important that the serving is always centered.

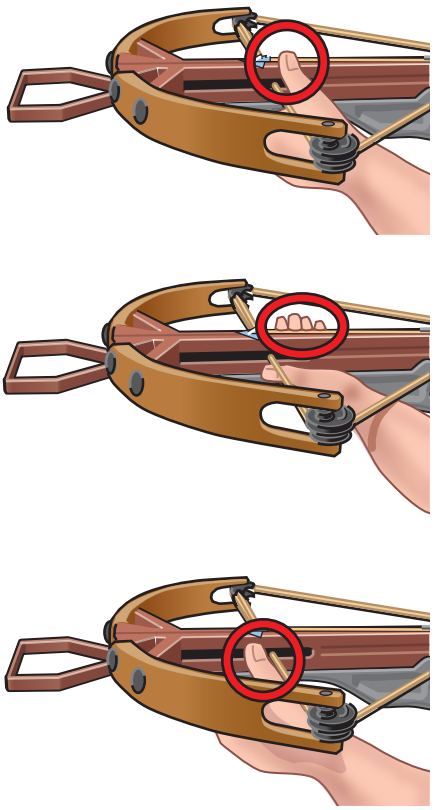
Cocking

- Place the safety on "fire" (the safety may be on the side or the rear of the sight bridge).
- When manually cocking a crossbow, place the ball of either foot in the cocking stirrup to prevent slippage.
- Bend over the stock and manually pull the string back, utilizing the strength of your hands, arms, legs, and lower back, or use a cocking device.
- Draw the string back along the barrel to the latching and safety mechanism.
- With the longer stock on recurve crossbows and some compound crossbows, you will have to lean to the side when cocking because it is not possible to bend over the stock and reach the string.
- When cocking by hand or with any type of cocking device, you must be extremely careful to center the string in the same trigger-latch position each time for consistent accuracy. A cocking aid ensures consistent string placement.
- When the crossbow is cocked, engage the safety. On some models, the safety is engaged automatically. Check the owner's manual to determine how the safety is engaged on your crossbow.
- Always keep the front end of a cocked crossbow pointed down range and in a safe direction, even if you do not have an arrow loaded.
- Do not take the safety off unless an arrow is mounted in the crossbow in the shooting position and you are ready to shoot.



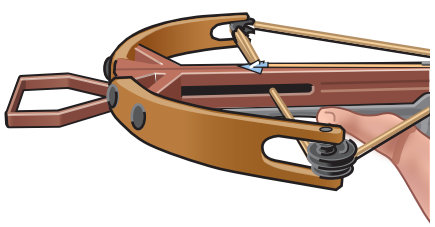
With the manual cocking method, you want to use all four fingers on both hands to avoid risking dry-firing.

Potentially Dangerous Grips



All three of the hand positions above are potentially dangerous and could lead to severe finger injury when firing the crossbow.

Correct Grip



With the leading hand in this position, there is no possibility of the cable passing over the fingers and injuring your hand.

COCKING DEVICES

Crossbow draw weights have become heavier in recent years as consumers have demanded more speed. As draw weights have increased, the need for cocking aids has become more important.

Although it is possible to cock the crossbow manually, most modern crossbow manufacturers also offer a device to assist in cocking, which is included with the crossbow when purchased or sold separately. Some devices come assembled on the crossbow itself. Two of the most common types of cocking devices are the cocking harness and the hand crank. Most individuals can cock even the heaviest draw-weight crossbow using either system.

- **Cocking Harness (also called a rope-cocker):** This device reduces the energy required to cock a crossbow by 50 percent.
  - It consists of a sturdy cord, wrist straps or handles, and pulley-equipped hooks or cocking sled that temporarily attach to the crossbow string.
  - The user cocks the crossbow in a single motion by standing up while pulling on the wrist straps or handles.
  - The cocking harness is very efficient, although it does require some manual dexterity. It allows less physically capable individuals to cock the crossbow themselves.
- **Hand Cranks:** These devices are either permanently attached to the stock or easily attached and then removed after cocking and prior to the shot. This device operates similarly to a boat winch, using gear reduction and a crank handle to reduce the heaviest draw weights to a fraction of their original weight.
- **Never use a cocking device to uncock the crossbow.**

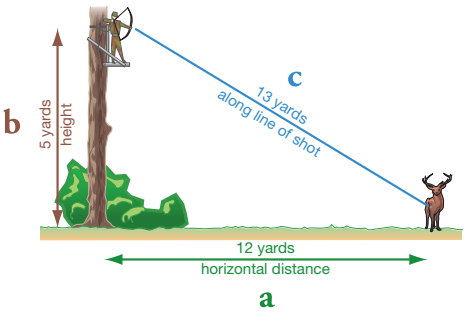
Cocking Harness

Hand Crank

- The recommended method of uncocking a crossbow is to shoot an arrow from the cocked crossbow into a safe backstop. If hunting from an elevated stand or tree stand, remove the arrow from the crossbow, and leaving the safety in the on position, lower the crossbow from your stand. When safely back on ground level, shoot a practice tipped arrow into a safe backstop such as a dirt bank or other suitable target. ***Never leave a crossbow cocked over an extended period of time; check the owner's manual that came with your crossbow for recommended lengths of time.***

GAME RECOVERY STEPS WHEN BOW AND CROSSBOW HUNTING

- Wait quietly for at least **30 minutes** after your shot. Allow the animal to lie down and die from massive blood loss.
- Locate and examine your arrow when the animal moves off.
  - Stomach contents on the arrow indicate a poor hit.
  - Wait several hours before beginning to track a gut-shot animal.
- Look for blood and other tracking signs.
  - Check nearby vegetation for indications that the animal went by.
  - Look for overturned leaves, broken branches, and footprints.
- Walk beside the game sign. Walking directly on blood or other sign may destroy the trail.
- Mark your trail with bright-colored material.
  - If you can't find new sign, a marked path will allow you to start from the last located sign.
  - If you lose the trail, begin to walk in widening arcs in the direction the animal headed.
- Approach downed game cautiously.
  - Walk up to the animal from the rear and stay clear of the legs.
  - Watch the animal's chest for signs of breathing.
  - The animal's eyes will be open if it's dead.
  - Tap the animal with a long stick to check for a response.
  - If it's still alive, quickly place another shot in the vital area.
- Tag immediately if required by law.



When judging distance from a tree stand, use the horizontal distance, not the greater diagonal distance. In this diagram you should aim for 13 yards, not 15 yards.

To calculate the horizontal distance from a tree stand to a target (a), with "b" being the height of your tree stand and "c" being the diagonal distance to a target (you can establish this number using a range finder), use this simple formula:

$$a = \sqrt{c^2 - b^2}$$

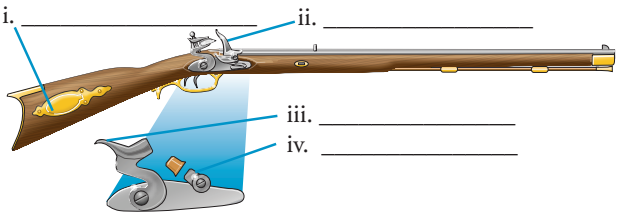
Safety TIP

Remember these safety tips when using a crossbow.

- *Do not walk with a loaded crossbow.*
- *Do not cock and load your crossbow until you are in your treestand.*
- *Unload your crossbow before climbing out of your treestand.*
- *Never point a loaded crossbow at your feet while standing.*
- *Do not rely solely on the safety.*
- *Carry a target arrow and shoot into a safe backstop to unload.*
- *Never place the haul line through the trigger guard.*

Chapter Review Exercise

1. Label the indicated parts of a muzzleloader.



2. An unsafe practice when using a muzzleloader is _____.
   a. loading directly from a horn, flask, or other container.
   b. wearing shooting glasses and ear protection when shooting.
   c. waiting until you're ready to fire before you prime or cap a muzzleloader.
   d. not smoking while shooting or loading.

3. _____ is the only type of powder that should be used in muzzleloaders.

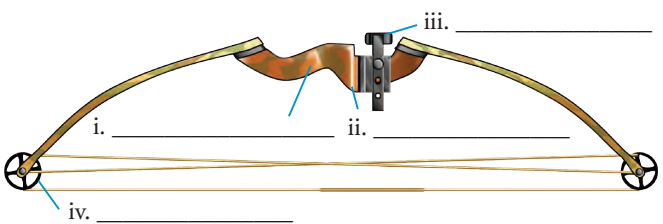
4. The last thing you do before firing a percussion lock muzzleloader is _____.
   a. place the hammer in the half-cock position.
   b. swab the barrel.
   c. place the percussion cap on the nipple.
   d. pull the hammer to full cock.

5. If you have a "hang fire" while using a muzzleloader, you should _____.
   a. tap the muzzleloader on the ground to reseat the powder charge.
   b. blow down the barrel.
   c. keep the muzzleloader pointed in a safe direction.
   d. pull out the bullet and remove the bad powder.

6. The safest way to unload a muzzleloader is to use a _____.

7. Name three common bow types.
   i. _____
   ii. _____
   iii. _____

8. Label the indicated parts of a compound bow.



9. _____ arrowheads are primarily used for big game hunting.

10. A good safety rule to follow when shooting a bow is _____.
    a. always carry arrows in the nocked position when hunting.
    b. use cracked arrows only for target practice.
    c. release an arrow only when the path to the target and beyond is clear.
    d. dry fire a bow as a strengthening exercise.

11. The impact of a broadhead-tipped arrow shot from a 150-lb. crossbow is _____ the impact of the same arrow shot from a 70-lb. compound bow.
    a. less than
    b. more than
    c. about the same as
    d. about half

12. For preventive maintenance, many crossbow manufacturers recommend applying a _____ to the rail of the crossbow.

Chapter Review Answers

1. i. Patch Box ii. Frizzen iii. Cock iv. Nipple 2. a 3. Black powder 4. d 5. c 6. CO_2 discharger 7. i. Recurve ii. Long iii. Compound 8. i. Grip ii. Arrow rest iii. Bow sight or suitable substitute iv. Wheels or cams 9. Broadhead-point 10. c 11. c 12. lubricant

Trapping and Furtaking Basics

Objectives *Students will be able to...*

- Explain the importance of trapping in wildlife conservation.
- Identify three types of traps and what species the traps are used to catch.
- Explain what is meant by "best management practices."
- Explain why it is important to maintain traps properly.
- State three trapping practices used to avoid trapping non-target species.
- State two methods used to dispatch trapped animals safely and humanely.
- Explain how to release non-target species caught in traps safely.

INTRODUCTION

The trapping of wildlife species for food and furs has long been a part of human existence. Since prehistoric times, man has utilized traps of one design or another to provide the basic needs for survival. However, in the modern era, trapping is more a tool of wildlife management and a form of recreation than a quest for food. Organizations and individuals opposed to trapping say it is unnecessary and harmful to the environment, but the opposite is true.

By identifying the best equipment and practices, wildlife management agencies should be able to manage furbearers effectively through regulated trapping. These practices will provide information that will help make traps more humane and trappers more efficient.

BENEFITS OF TRAPPING

- Helps control animal populations by minimizing:
  - Starvation
  - Spread of diseases
  - Damage or destruction of habitat
- Helps reduce damage to personal property:
  - Flooding caused by beaver dams
  - Destruction of trees
  - Killing of livestock or pets
- Protects certain endangered or threatened species from predators
- Provides funding through sales of licenses
- Provides recreation, food, and supplemental income

BEST MANAGEMENT PRACTICES (BMPs)

The International Association of Fish and Wildlife Agencies, with assistance from state fish and wildlife agencies, is developing a set of guidelines for regulated trapping in the United States. Best Management Practices will identify the best equipment and practices that can be used to trap furbearers. These suggestions will address the welfare of captured animals and focus on the safest, most efficient, humane, and practical trapping techniques. To learn more, visit **www.fishwildlife.org** and click on the "Focus Areas" tab.

Credit: Northeast Furbearer Resources Technical Committee
Trapping and Furbearer Management in North American Wildlife Conservation; 2001

Benefits of Trapping

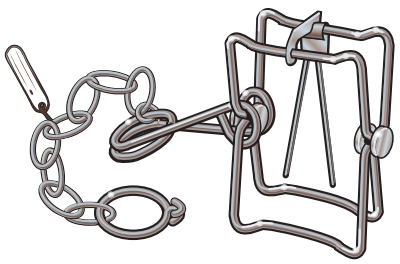
Helps reduce damage to habitat and personal property

Helps control spread of diseases

Types of Traps

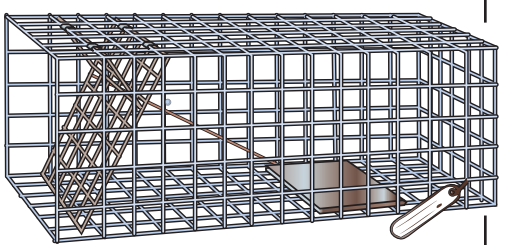
Quick-Kill Traps

Body-Grip Trap

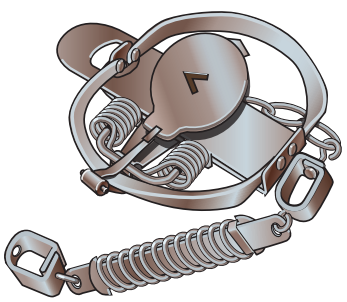


Live-Hold Traps

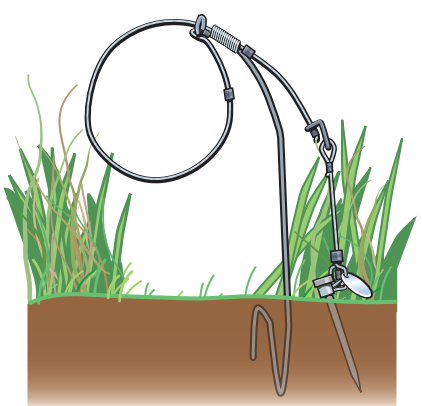
Box Trap



Foot-Hold Traps



Cable Restraint



TRAP CATEGORIES

Quick-Kill Traps

- **Body-Grip Trap**—In Pennsylvania, this trap is legal only in **water sets**
  - Designed to kill the captured animal quickly
  - Frame wires clamp furbearer's body
- **Snares**
  - Special type of body-gripping trap used only in **water sets** in Pennsylvania
  - Less expensive, lighter in weight, and less likely to freeze in cold weather than other types of traps
  - In Pennsylvania, snares are used only for beavers and must have a "stop-device" limiting its closure

Live-Hold Traps

- **Box Trap**—May be used only on land
  - Used when the possibility of catching pets is high
  - Mesh box has a swinging door to let animal in, but not out
- **Foot-Hold Traps**—Used on land or in the water
  - Trap holds an animal's foot and typically will cause little damage to the animal
- **Cable Restraint**
  - Less expensive, lighter in weight, and less likely to freeze in cold weather than other types of traps
  - In Pennsylvania, cable restraints are used only to trap fox and coyote from January to the end of the established fox and coyote seasons
  - Restraints must have maximum and minimum loop stops and must have breakaway devices to help prevent capture of non-target species
  - Trappers must successfully complete a Cable Restraint Certification or Successful Furtaking course before using cable restraints to trap

Which Trap for Which Animal?

- **Body-Grip Traps:** Mink, beaver, muskrat
- **Foot-Hold Traps:** Coyote, fox, raccoon, muskrat, bobcat, beaver, mink, opossum, skunk, weasel
- **Box Traps:** Raccoon, skunk, weasel, opossum, trapping near residential areas
- **Snares:** Lawful only for trapping beaver in Pennsylvania
- **Cable Restraints:** Lawful only for trapping coyote, and red and gray fox from January to the end of coyote and fox seasons

TRAP MAINTENANCE

Traps, just like bows and firearms, need to be maintained. Maintaining this equipment ensures that the traps will work properly. Properly working traps fitted with additional chain swivels will limit injury to captured animals. All traps in Pennsylvania must have a durable identification tag that displays the trapper's name and address or an assigned identification number. Contact the Pennsylvania Game Commission to be assigned an identification number.

TRAPPING PRACTICES

- Learn about the behavior of furbearers you plan to trap.
  - Allows for the placement of a trap line that will limit the possibility of non-target catches.
- Place traps away from well-traveled paths or residential areas.
  - Pets are not always on a leash.
- Use the appropriate bait or lure to minimize the capture of non-target species.
  - Species have selective needs for food.
  - Bait should not be visible. Prevents non-target species, such as hawks and owls, from being caught.

RELEASING NON-TARGET SPECIES

If you catch a non-target animal in a trap, you should release it quickly and without causing the animal harm. The steps listed below provide a procedure to release non-target species. Talk with experienced trappers to learn the best procedures for different species.

- Use a catchpole to restrain the animal.
- Pin the animal's head to the ground to restrain it.
- Cover the head to calm the animal.
- Use a shield (plywood barrier or similar material).
- Open the trap, and release the animal.
- Keep the barrier between the animal and you.

DISPATCHING TRAPPED ANIMALS

- The most humane way of dispatching or killing a trapped animal is to shoot it in the head with a small caliber firearm, such as a .22 caliber rimfire rifle, which will not damage the animal's fur. Prior to shooting, remember the five primary rules of firearm safety (**S.M.A.R.T.**, see Chapter Three).
- At some locations, traps can be set to drown the animal when caught. An example of this type of setup is a snare placed in the water. Finally, the least preferred way to dispatch a trapped animal is by using blunt force to the back of the animal's head.

CHARACTERISTICS OF A RESPONSIBLE TRAPPER

Trappers, just like hunters, need to conduct themselves in a safe and responsible manner. Responsible trappers:

- Get permission to trap on private property.
- Place traps only where targeted species will be caught.
- Use correctly sized, well-maintained equipment for the species being trapped.
- Check traps frequently—traps must be checked every 36 hours.
- Dispatch or kill animals quickly and humanely.
- Use as much of the animal as possible.
- Take precautions not to trap non-target species in areas of multiple uses.
- Release non-target species quickly.

How the Animals Are Used

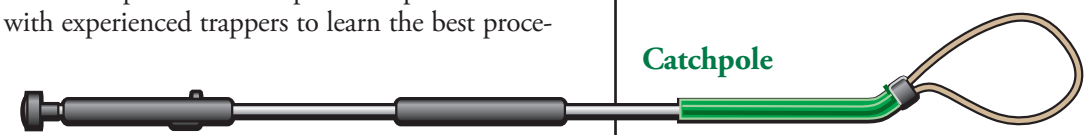
Furbearers are used for a variety of products and purposes.

- *Clothing*
- *Meat*
- *Building materials, paint, and soap (produced from the carcass after rendering)*

KEYWords

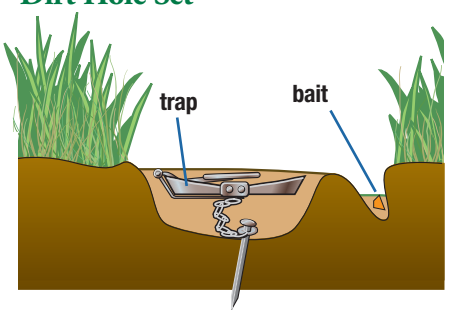
water set:
A trap or snare that, when set, is completely or partially submerged by water

Catchpole

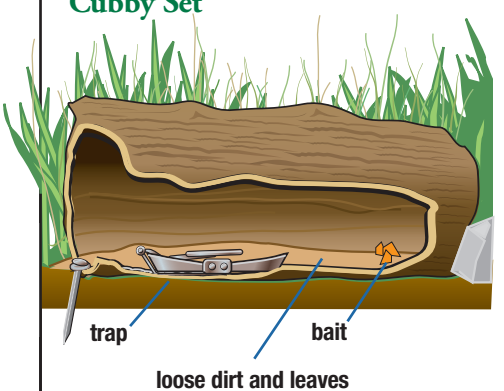


Trap Sets

Dirt Hole Set



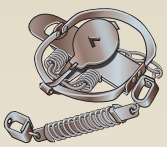
Cubby Set



are YOU ON TARGET?

Using the list of furbearers below, select which trap or traps are used to harvest these species.

Mink Beaver Muskrat Coyote Fox Raccoon Bobcat Opossum Skunk Weasel



1. Type of Trap

_____

_____

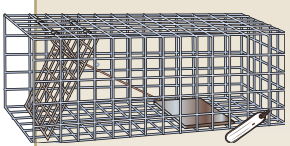
Species trapped with this device: _____

_____

_____

_____

_____



2. Type of Trap

_____

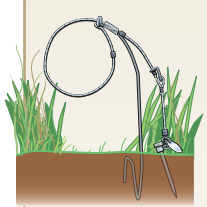
_____

Species trapped with this device:

_____

_____

_____



3. Type of Trap

_____

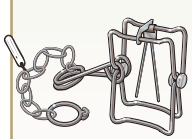
_____

Species trapped with this device:

_____

_____

_____



4. Type of Trap

_____

_____

Species trapped with this device:

_____

_____

_____

On Target Exercise Answers

1. Foot-Hold Trap – Coyote, fox, raccoon, muskrat, bobcat, beaver, mink, opossum, skunk, weasel
2. Box Trap – Raccoon, skunk, weasel, opossum,
3. Cable Restraint – Only for fox and coyote in Pennsylvania during the late season
4. Body-Grip Trap – Mink, beaver, muskrat

Chapter Review Exercise

1. What are five primary benefits of trapping?
   i. _____
   ii. _____
   iii. _____
   iv. _____
   v. _____
2. Best Management Practices identify the best _____ and _____ that can be used to trap furbearers.
3. Best Management Practices address the welfare of animals and focus on _____.
   a. quick trapping techniques.
   b. inexpensive trapping techniques.
   c. nationwide trapping techniques.
   d. safe, humane trapping techniques.
4. List three types of traps.
   i. _____
   ii. _____
   iii. _____
5. Body-grip traps are used for _____.
   a. raccoons.
   b. coyotes.
   c. minks.
   d. skunks.
6. All traps in Pennsylvania must have a durable identification tag that displays _____ and _____ or _____.
7. What are three trapping practices that are used to avoid trapping non-target species?
   i. _____
   ii. _____
   iii. _____
8. While releasing non-target species, use a _____ to restrain the animal.
9. True or False: When releasing a non-target species, pin the animal's back to the ground to restrain it.
10. Two methods that are used to safely and humanely dispatch trapped animals are _____ and _____.

Chapter Review Answers

1. i. Controls animal populations ii. Helps reduce damage to personal property iii. Protects certain endangered species iv. Provides fundring v. Provides recreation, food, and supplemental income 2. equipment and practices 3. d 4. i. Body-Grip ii. Snare iii. Box iv. Foot-hold v. cable restraint 5. c 6. name and address or assigned identification number 7. i. Learn animal's behavior ii. Place traps away from well-traveled paths or residential areas iii. Use the appropriate bait or lure 8. catchpole 9. False 10. firearms and drowning

End of Knowledge Section

Basic Shooting Skills

Objectives
Students will be able to...

(Review this chapter before attending your skills class.)

- Demonstrate or explain the five primary rules of firearm safety.
- List the three basic rules of good marksmanship.
- Define "sight alignment" and a "sight picture."
- Demonstrate or explain how to determine your master eye.
- Explain four rifle-firing techniques that will help improve accuracy.
- List four rifle shooting positions.
- Demonstrate or explain proper safe handling of firearms during a live-fire or simulated live-fire exercise.

GOOD MARKSMANSHIP AND ACCURACY

A fair amount of knowledge, skill, and experience is required to become a successful hunter. One of the most important skills is good marksmanship, which is accurately and consistently hitting the target where planned. When hunting, accuracy is the key for a clean kill. Good marksmanship is built on three basic rules:

- Proper sight adjustment or patterning
- Proper shooting method
- Practice

Know Your Accuracy Limits

Ethical hunters know their personal accuracy and don't shoot beyond their ability or skill.

- An 8-inch paper plate is the standard target for establishing deer hunting shooting accuracy. An 8-inch target is about the same size as the vital area of a deer. You need to be able to hit the paper plate consistently at the same distance and from the same shooting position you will be using when hunting. The fact that you can hit an 8-inch target at 100 yards from a bench rest does not mean you will be able to do the same from a standing or kneeling position.
- Before hunting, practice until you are confident you can hit the required target at the distances and from the shooting positions you expect to use in the field. When hunting, limit your shots to your most accurate range.

be **SMART** *with firearms!*

Safe Direction:
Keep your firearm pointed in a safe direction at all times.

Make Sure:
Positively identify your target.

Always Check:
Know what's beyond your target before shooting.

Respect Firearms:
Treat all firearms as if they are loaded.

Trigger Caution:
Don't touch the trigger until you're ready to shoot.

Safety TIP

If you are color-blind, you should be especially cautious when hunting. You may not be able to distinguish the fluorescent orange clothing of other hunters nor the color markings that help identify game.

Remember...

Good vision is the foundation for good shooting and hunting safety. Have your eyes examined on a regular basis.

Six Steps for an Accurate Rifle Shot

1. *Aim carefully.*
2. *Take a breath.*
3. *Relax.*
4. *Release half of your breath.*
5. *Squeeze the trigger slowly.*
6. *Follow through.*

KEYWords

parallax:
The apparent change in an object's location when viewed from different positions or angles

RIFLE FIRING

Dominant or Master Eye

- Just as you have a dominant hand, you also have a dominant eye. You need to aim with the dominant—or master—eye for the most accurate shooting.
- To determine your dominant eye:
  1. Form a triangular opening with your thumbs and forefingers.
  2. Stretch your arms out in front of you.
  3. Focus on a distant object while looking through the triangular opening and keeping both eyes open.
  4. Bring your hands slowly to your face, keeping sight of the object through the opening; the opening will come to your dominant eye naturally.
- If you're not sure, close one eye at a time. The weak eye will see the back of your hand; the strong one will be focused on the object in the triangle.
- Usually your dominant eye is the same as your dominant hand, but not always.
  - If you are left-handed with a right master eye (cross dominance) you can learn to shoot right-handed or "distract" your dominant right eye by closing or squinting it and forcing your left eye to take over.
  - If you are right-handed with a left master eye (also called cross dominance) you can learn to shoot left-handed or "distract" your dominant left eye by closing or squinting it and forcing your right eye to take over.
  - Before trying to learn to shoot with your non-dominant hand, get help from a certified shooting instructor.

Rifle-Firing Techniques

Using correct firing techniques will help you steady the rifle for the most accurate shooting. Bear in mind that these are only the basics. Further study will help you understand other factors that can affect your accuracy, such as wind, heat, and **parallax**.

- **Shooting from a Rest:** When shooting in the field, the safest and most accurate shots are taken from a rest—a log, large rock, or other stable object. Don't rest the barrel directly on a hard surface, or it will shoot higher than normal—put some padding, such as a hat or a jacket, under the rifle.
- **Open Sight Alignment:** Open sight alignment is the process of using your eye to line up the rear and front sights on a target. The sight picture is the image you see when the sights are aligned correctly with the target. To make sure that the bullet will travel to the target in your sight, it's necessary to sight-in your rifle. When properly aligned:
  - The front sight should be centered in the rear sight with the top of the front sight even with the top of the rear sight (see sidebar on next page).
  - The front and rear sights should form an "E" lying on its side (see sidebar on next page).

Breathing: Your breathing can move the rifle just enough to throw off your shot. When you're ready to shoot:

- Take a breath.
- Exhale until comfortable.
- Relax and hold your breath.
- Squeeze the trigger within six seconds—if you hold your breath too long, your heart beats faster, which increases your pulse and causes the rifle to move.
- Remove your trigger finger after six seconds if you haven't fired.
- Take a few breaths and repeat the process from the beginning.
- Sometimes the excitement of spotting game will make it more difficult to control your breathing. Try to relax and follow the correct procedure.

- **Trigger Squeeze:** Jerking the trigger or quickly pulling the trigger hand can move the gun enough to cause a miss. To squeeze off a shot smoothly:
  - Place the first section of your index finger on the trigger.
  - Don't tightly squeeze the stock with your trigger hand.
  - Apply slow and steady pressure on the trigger until the firearm fires.
  - Don't anticipate the shot—you should be surprised when the gun fires.
  - Practice will make holding your breath and proper trigger squeeze habitual.
- **Follow Through:** Proper follow through prevents you from jerking the gun before the bullet leaves the barrel. After you fire:
  - Continue to squeeze the trigger for two or three seconds.
  - Hold the shooting position and sight alignment.

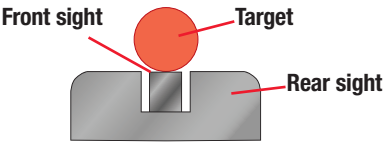
With an open sight, you line up the target with the blade or bead of the front sight within the notch of the rear sight.

With an aperture sight, you line up the target with the front sight within the rear peephole.

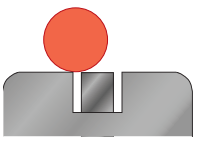
With a telescopic sight with a crosshair reticle, you line up the target with the crosshairs of the sight.

With a telescopic sight with a dot reticle, you line up the target with the dot of the sight. The dot must be centered.

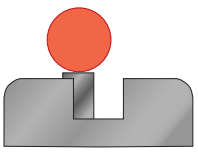
Aligning an Open Sight



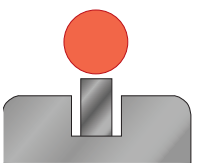
Sight correctly aligned on target



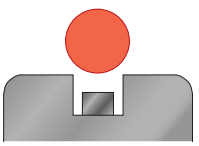
Misaligned—bullet goes right of target



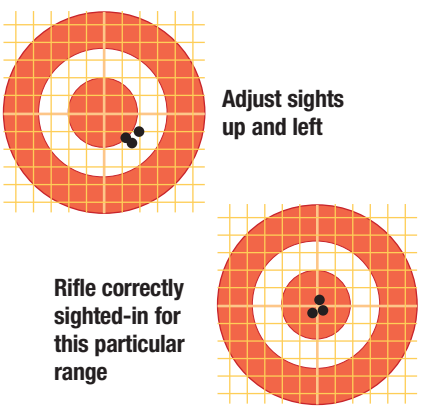
Misaligned—bullet goes high and left of target



Misaligned—bullet goes high of target



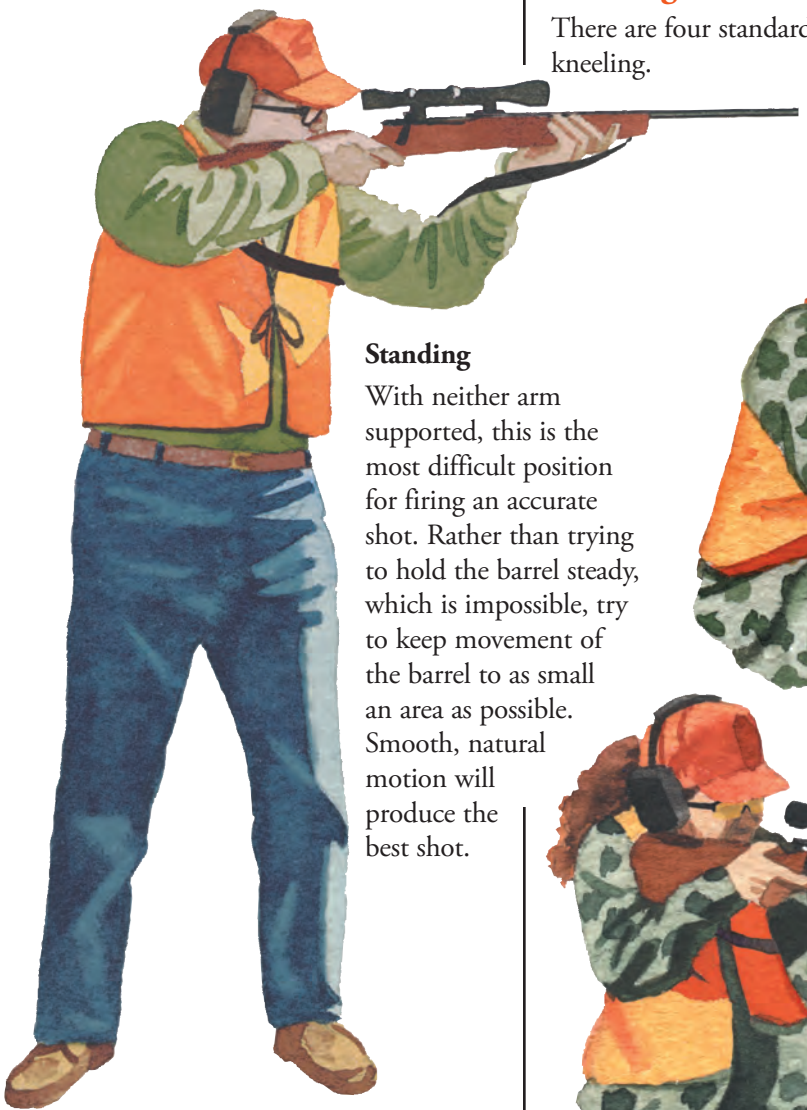
Misaligned—bullet goes low of target



Use a sight-in target to adjust your sights.

Shooting Positions

There are four standard rifle shooting positions: prone, standing, sitting, and kneeling.



Standing

With neither arm supported, this is the most difficult position for firing an accurate shot. Rather than trying to hold the barrel steady, which is impossible, try to keep movement of the barrel to as small an area as possible. Smooth, natural motion will produce the best shot.

Sitting

Both arms are supported by your legs. Next to the prone position, this is the steadiest position.

Kneeling

With only one arm braced, the kneeling position is less steady than the prone or sitting positions.

Safety TIP

Always wear suitable eye and ear protection when shooting. They will protect your vision and hearing for a lifetime of shooting enjoyment.

Prone

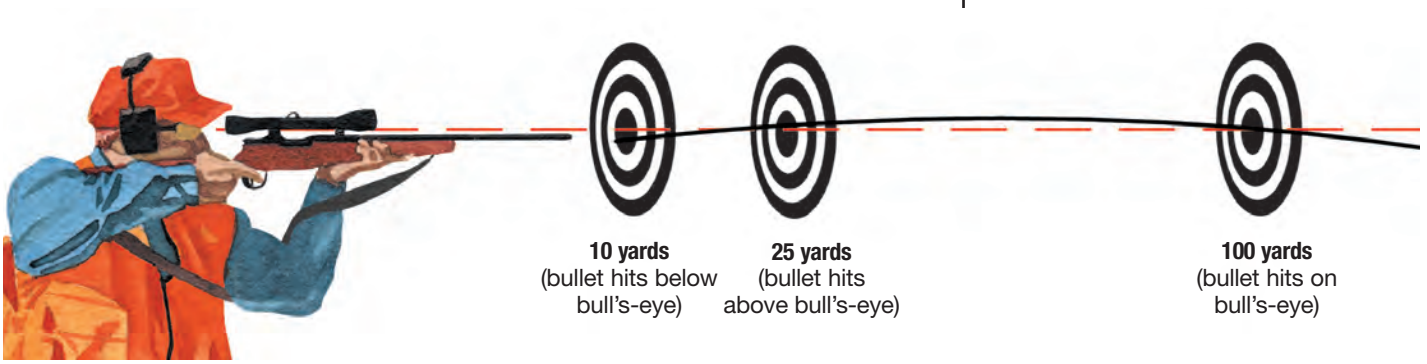
The prone position is the steadiest of the four positions. Because it's the easiest to hold, it's the best position for mastering the basic concepts of shooting— aiming, breath control, trigger squeeze, and follow through.

Sighting-In a Rifle

- Rifle bullets don't travel in a straight line. They travel in an arc, formed by the pull of gravity. "Sighting-in" is a process of adjusting the sights to hit a target at a specific range. Deer hunters, for example, often sight-in their rifles to hit the bull's-eye at 100 yards.
- All rifles should be sighted-in before every hunt using the ammunition you plan to use, especially rifles with peep or telescopic sights. Guns you sighted-in prior to your last outing could have been knocked out of alignment by a single jolt. That misalignment could mean the difference between a successful hunt and a disappointing experience.

Remember...

You must sight-in your rifle with the ammunition you plan to use. Be sure you sight-in and practice shooting your rifle before you go hunting.



- Other than ensuring accurate shots, sighting-in a rifle has other advantages:
  - Forces you to practice
  - Helps determine problems with your shooting technique
  - Builds confidence in your shooting ability

Sighting-In Steps

- Fire your rifle from a solid bench rest with the forestock resting on a pad or a sandbag. Don't rest the gun on its barrel—it will shoot higher than normal. Ideally, use an adjustable shooting tripod with sandbags. A spotting scope is also useful.
- Sight-in instructions are printed on some targets available from retail outlets or manufacturers. The sighting-in process for most centerfire rifles begins at 25 yards, and then should be repeated at 100 yards. The basic steps involve firing at least three shots carefully and consistently at a target. If the bullets form a small group of holes on the target, but not where you were aiming, the sights will have to be adjusted.
- When adjusting aperture or telescopic sights, the rear sights or dials are adjusted by a certain number of **minutes-of-angle** or "clicks" in a certain direction. Read the sight's instruction manual to see how much each click changes the sight at 100 yards.
- The rear sight is moved in the same direction you want your shot to move on the target. Moving shots from side to side is "adjusting for windage." Moving shots up or down is "adjusting for elevation."
- Specific instructions about trajectory and what fractions or inches you should be above the bull's-eye at 25, 50, or 100 yards are usually included on sight-in targets. You also might consult a ballistics chart or get help from an experienced shooter.

Optional Sighting-In Techniques

Use bore or collimator sighting-in initially to line up the rifle on the paper target. However, these techniques alone are not sufficient to sight-in a rifle. You must make final adjustments by shooting the rifle with the same ammunition you plan to use in the field.

- ***Bore sighting-in with bolt-action rifles:*** *Remove the bolt, brace the firearm on sandbags, and look directly through the bore. Correct the rifle's position until you see the bull's-eye in the center of the bore. Adjust the sights to give you a good sight picture.*
- ***Collimator sighting-in for rifles without bolt actions:*** *A collimator slips into the muzzle end of the barrel and allows you to adjust sights much like bore sighting-in.*

KEYWords

minutes-of-angle:
The standard measurement unit of shooting accuracy; one minute-of-angle (MOA) is 1/60th of one degree, or approximately one inch, at 100 yards

Point a shotgun. Focus your eye on the target.

Remember ...

Point a shotgun. Pull the trigger.
Aim a rifle. Squeeze the trigger.

Aim a rifle. Focus your eye on the crosshairs or front sight.

SHOTGUN SHOOTING

As with rifle firing, good shotgun marksmanship begins with proper preparation, which includes adjusting your gun and ammunition for maximum performance and mastering shotgun techniques.

Matching Choke to Your Quarry

- A choke allows you to fine-tune your shotgun for the type of game you're hunting. Built-in or attached to the muzzle end of the barrel, the choke is a constriction that controls the shot string, thus affecting pellet density at various distances.
- The tighter the constriction, the greater the distance that the cluster of pellets stays together. The looser the constriction, the faster the shot pattern spreads. Recall from Chapter Three that the most common chokes, ranging from tightest to most open, are:
  - Full
  - Modified
  - Improved Cylinder
  - Cylinder (unchoked)
- For example, someone hunting small, fast, close birds would generally use an Improved Cylinder or Modified choke, which creates a broad shot pattern that spreads quickly at close ranges. On the other hand, someone hunting a larger, less mobile bird that is usually farther away, such as a turkey, would select a Full choke, which keeps the shot in a smaller area. Pellet size also varies based on the size of the game. The chart below suggests choke selections for a variety of game. It is intended only as a guide—choice of choke may vary depending on ammunition, target distance, and hunting conditions. Always pattern your shotgun for the quarry you are hunting and the ammunition you are using.

Quarry	Commonly Used Choke (based on typical distance from quarry)	Suggested Shot Size
Goose	Improved Cylinder or Modifie	Steel 2, 1, BB (over decoys) Steel BB, BBB, T (pass shooting)
Duck	Improved Cylinder or Modifie	Steel 6, 4, 3 (over decoys) Steel 3, 2 (pass shooting)
Turkey	Full or Extra Full	Lead 4, 5, 6
Pheasant	Improved Cylinder or Modifie Modified or ull	Lead 6, 7½ (over dogs in heavy cover) Lead 4, 5, 6 (in corn fields, long range
Grouse	Improved Cylinder or Modifie	Lead 7½ or 8
Woodcock, rail, or snipe	Improved Cylinder or Modifie	Lead 8 (in heavy cover) Lead 7½ (open areas)
Dove	Improved Cylinder or Modifie	Lead 7½ or 8 Steel 6 (in waterfowl areas)
Quail	Improved Cylinder or Modifie	Lead 7½ or 8
Rabbit	Improved Cylinder or Modifie	Lead 5 or 6
Squirrel	Modified or ull	Lead 5 or 6

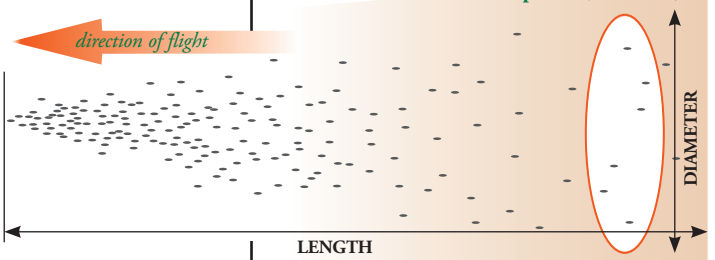
Patterning Your Shotgun

- No two shotguns will fire identical pellet patterns. In some cases, the pattern will be off center. In other instances, there may be gaps in the pattern. In addition to the firing characteristics of the gun, the gun's choke, the brand of shot shell, the shot size, and type of shot also affect the pattern. In order to select ammunition that provides the best performance, it's necessary to "pattern" your shotgun.
- Patterning can be done with a simple homemade target. All that is required to make the target is a marker, a nail, a two-foot length of string, and a sheet of blank paper large enough to hold a 30-inch circle. Hang the blank sheet of paper on a backboard or smooth wall. Tie the marker to one end of the string and the nail to the other so the two are 15 inches apart. Hold the nail in the center of the target while swinging the marker around the paper in a full circle.
- **To pattern your shotgun, follow these steps:**
  - Fire at the center of the blank paper from a distance of 40 yards, which is close to the maximum range for shooting game birds. At this range, the pellets should be spread fairly evenly on the paper.
  - Hold the end of the nail close to the center of the pattern. (This is not necessarily the center of the paper!) Stretch the string out from the nail and place the marker on the paper. While holding the nail in the center of the pattern, swing the marker around the nail on the outstretched string to draw a 30-inch circle on the blank paper.
  - Count each of the pellet holes in the paper, while marking them with the marker.
  - The pattern of pellets should be of a proper, even density to ensure a clean kill.
  - The pattern also should contain the correct minimum amount of pellets, which should be at least 55% to 60% of the total number of pellets in the load.
  - To determine the percentage of pellets that hit the target, count the number of pellet holes in the circle, and then divide that number by the number of pellets in the load.
- Continue this process using different choke and load combinations until you get an even pattern with a sufficient minimum density.
- After you have determined a proper choke and load combination for this distance, repeat the exercise at 30 yards, and then finally at 20 yards.
- Use the table on the previous page to guide you on initial choke and load combinations for the species hunted and the type of hunting you will do. Experiment with combinations in the range listed on the table until you have determined which combination(s) provides a proper pattern.

Shot Strings

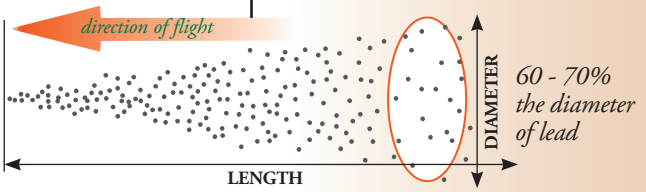
Lead Shot

1 1/4 ounces No. 4 shot 169 pellets (full choke)



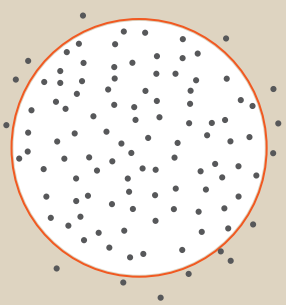
Steel Shot

1 1/4 ounces No. 2 shot 156 pellets (full choke)

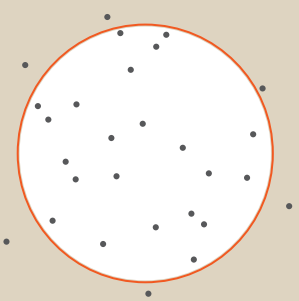


50 - 60% the length of lead

Shot Patterns



Desirable Pattern



Undesirable Pattern

Use a relaxed, balanced stance with your feet shoulder-width apart and your weight slightly forward on your left foot (if you're a right-handed shooter), and lean your body in the same direction.

Remember...

Shots at game birds in flight should be limited to your "maximum effective range." This is the distance at which you can hit the target consistently. Shooting beyond this distance leads to increased number of birds wounded and lost. Also, firing at game too close may destroy the meat.

Shotgun-Shooting Techniques

Unlike rifle shooting, quick reflexes and flexibility are very important for effective shotgun shooting. Proper shotgun techniques will help you develop the rapid, fluid response you need to hit your target.

Shooting Stance

- A shotgun is almost always fired at a moving target from a standing position. You must be able to swing freely over a wide arc and maintain control. That requires a relaxed, balanced stance.
- Stand with your feet spread about shoulder-width and knees bent slightly so that you are balanced perfectly. Bring your left foot slightly forward (if you're a right-handed shooter), and lean your body in the same direction. The position of the feet is important. The toes of your forward foot should point at about 45 degrees toward the target. Take the time to place your feet properly, even for a quick shot.
- Keeping your knees slightly bent makes it easier to swing with a moving target. The bent leg to the rear supports the movements of your hips, allowing you to swing smoothly.

Pointing

- Because targets usually appear suddenly and move quickly, there's no time to "aim" a shotgun. It's designed to be pointed, with the eye sighting along the top of the barrel or rib.
- The sight is usually a bead on the front of the gun. Your eye must be in line with the barrel, so it's important to position your head properly on the stock.
- When you bring the gun to your face, the stock should fit snugly against your cheek with your eye on that side above the centerline of the gun. If you can't assume that position comfortably, you may need to adjust the "gun fit."

Shouldering the Shotgun

- When you bring the shotgun to your shoulder, the stock should be brought to your cheek first and then back to your shoulder.
- A common error is lowering the head and cheek to the stock, instead of bringing the stock all the way up to the cheek. When done properly, with your head naturally erect, the gun butt always should come to the same spot on your shoulder.

Trigger Action

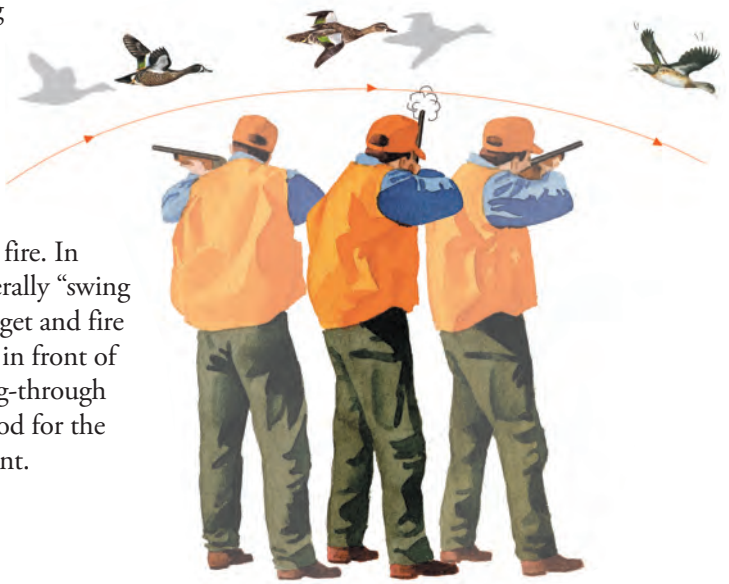
- Unlike rifle shooting, quick trigger action is important when hunting with a shotgun. Slap the trigger rather than squeezing it.
- Because the trigger is pulled quickly and the body and gun are typically in motion, breath control isn't necessary.
- Continue the shotgun's swing as you pull the trigger. Stopping the swing as you shoot will cause you to hit behind a moving target.

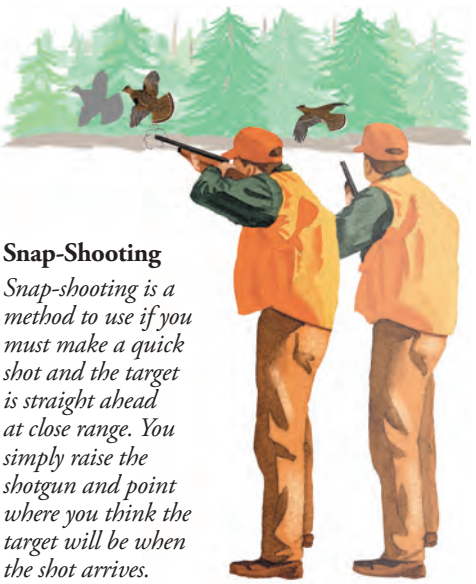
Leading the Target

The two most common methods of leading targets at long distances are swing-through and sustained lead.

Swing-Through

Point your shotgun at a moving target and swing with it. Increase the speed of the gun so that the muzzle passes the target, and then fire. In other words, literally "swing through" the target and fire at a blank space in front of the target. Swing-through is the best method for the beginning student.





Snap-Shooting

Snap-shooting is a method to use if you must make a quick shot and the target is straight ahead at close range. You simply raise the shotgun and point where you think the target will be when the shot arrives.

Sustained Lead

This method is a little more challenging because it requires more experience. You estimate the length of the lead necessary to hit the target and maintain that lead as you swing with the target, fire, and continue the swing.

Safety TIP

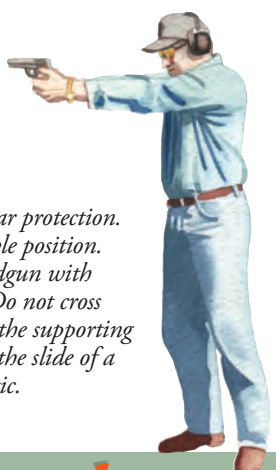
- *Permanent hearing loss happens a little bit at a time with each handgun blast. Choose an ear protection device with a high Noise Reduction Rating (NRR).*
- *Eye protection is important when shooting a handgun to prevent damage from a ruptured shell or firearm malfunction. Wear eye protection also whenever disassembling or cleaning a handgun.*

Double-action revolver ready for loading

Semi-automatic with magazine

Remember ...

- *Use a good holster with a safety strap.*
- *Draw your gun only when you see game.*
- *Cock your gun only when ready to shoot.*
- *Keep your finger off the trigger until ready to fire.*



Use eye and ear protection. Assume a stable position. Grip the handgun with both hands. Do not cross the thumb of the supporting hand behind the slide of a semi-automatic.

Remember ...

Semi-automatic handguns are not legal to use while hunting in Pennsylvania.

HANDGUN SHOOTING

Hunting with handguns has been growing in popularity in recent years. Many of the basic ideas of rifle shooting also apply to handguns.

Loading and Handling

- Single-action revolvers typically load through a gate on the right side of the frame. To rotate the cylinder, pull the hammer back to half-cock. For a safer carry in the holster or hand, leave an empty cylinder in front of the hammer.
- Double-action revolvers have cylinders that fall downward, exposing all chambers for loading.
- Semi-automatics usually fire rounds stored in a magazine that is inserted in the grip or handle.

Position and Grip

- Body position and grip are vital to hitting the target. The hand position on the grip of a pistol is especially important. Although the grip of the revolver and semi-automatic are different, the gripping method is the same.
- Hold the handgun high on the grip so that the recoil is directed back to the hand and arm in a straight line. This allows better repeat shots and more accurate shooting. Use a two-handed hold whenever possible, applying pressure from front to rear.
- When hunting, use a tree trunk, steady limb, or other stable object as a rest. Placing something soft, such as a hat or coat, on top of a hard rest helps with your aim.

Sight Alignment

- Sight alignment, which is important in rifle shooting, is even more important in pistol shooting because of the shorter distance between the sights. Typically, handgun sights consist of a square rear notch sight and a heavy square front blade sight. This arrangement is easy to align.
- Most handguns are initially sighted-in at 50 feet.

Aiming

- At the shooting range, many handgunners use a sight picture that places the bull's-eye on the top of the front sight, rather than placing it in the sights over the center of the target. However, hunters should hold the alignment directly over the vital area.
- Scopes with long eye relief have become popular with handgunners and offer exact sighting for hunters. Scopes may take longer to align on a target than open sights, but they're usually more accurate.

Shooting

The pistol shooting fundamentals of breath control, trigger squeeze, and follow through are almost identical to those in rifle shooting. Some important differences to remember include:

- The first joint of the finger should take up trigger pressure, not the tip as is often done with rifles.
- When a revolver is fired, powder flashing at the front of the cylinder can cause burns. Be sure to keep fingers away from the front of the trigger area.
- The slide and hammer of a semi-automatic handgun can deliver a bruising blow when held too close to the body. All handguns should be fired at arm's length.

Chapter Review Exercise

1. List the three basic rules of good marksmanship.
   i. _____
   ii. _____
   iii. _____
2. Ethical hunters know their _____ and limit their shots accordingly.
3. The proper method for pulling the trigger when shooting a rifle is to _____.
   a. pull the trigger quickly, moving only your finger.
   b. squeeze the trigger slowly.
   c. jerk the trigger.
   d. snap the trigger.
4. Sight alignment is the relationship between the shooter's eye and _____ _____.
5. Of the four standard rifle positions, the steadiest is the _____ position.
6. True or False: All shotguns fire identical shot patterns.
7. When patterning a shotgun, the number of holes made in a 30-inch circular target at a range of 40 yards should be _____ to _____ percent of the number of pellets in the load, based on the choke you are using.
8. Which shotgunning method is best for a beginning hunter and is performed by pointing at a moving target, and then moving past it and firing?
   a. snap-shooting
   b. swing-through
   c. sustained lead
   d. patterning

How S.M.A.R.T. are you? Fill in the blank spaces next to each letter in the acronym S.M.A.R.T.

S _____

M _____

A _____

R _____

T _____

On Target Exercise Answers

Safe Direction: Keep your firearm pointed in a safe direction at all times.
Make Sure: Positively identify your target.
Always Check: Know what's beyond your target before shooting.
Respect Firearms: Treat all firearms as if they are loaded.
Trigger Caution: Don't touch the trigger until you're ready to shoot.

Chapter Review Answers

1. i. Proper sight adjustment or patterning ii. Proper shooting method iii. Practice 2. personal accuracy 3. b 4. rear and front sights 5. prone 6. False 7. 55 to 60 8. b

Safe Hunting Skills

Objectives *Students will be able to...*

(Review this chapter before attending your skills class.)

- Demonstrate or explain the five primary rules of firearm safety.
- List the two main causes of hunting-related shooting incidents (HRSIs) in Pennsylvania.
- Demonstrate or explain how to identify and clear an obstruction from the barrel of a firearm.
- Correctly match types of ammunition to their respective caliber or gauge.
- Demonstrate or explain proper loading and unloading of three separate firearms using "dummy" ammunition.
- Demonstrate or explain four of the six safe-carry positions for firearms while in the field individually or in a group.
- Demonstrate or explain how to safely cross an obstacle or hazardous terrain with and without a partner.
- Demonstrate or explain how to make safe shot selections when presented with safe/unsafe and/or ethical/unethical shot opportunities.
- Demonstrate or explain knowledge about zone-of-fire while walking two or three abreast.

be SMART with firearms!

***S**afe Direction:*
Keep your firearm pointed in a safe direction at all times.

***M**ake Sure:*
Positively identify your target.

***A**lways Check:*
Know what's beyond your target before shooting.

***R**espect Firearms:*
Treat all firearms as if they are loaded.

***T**rigger Caution:*
Don't touch the trigger until you're ready to shoot.

Remember...

The most common hunting incidents result from mistakes in hunter judgment. Eighty percent of all firearm incidents occur within 50 yards of the muzzle.

The two primary causes of hunting-related shooting incidents (HRSIs) in Pennsylvania are:

- *Failure to positively ID the target before shooting*
- *Failure to maintain a safe zone-of-fire*

WHY FIREARM SAFETY IS IMPORTANT

Whenever firearms are being handled, an incident can occur if the firearm is not handled responsibly. Preventing hunting-related shooting incidents, or HRSIs, depends on knowing and understanding firearms, and handling them skillfully and safely. Responsible hunters practice safe habits until they become second nature.

Firearm Safety in the Home

- Statistics show that more than half of the fatal firearm incidents reported each year occur in the home. Since almost all incidents are caused by carelessness and lack of knowledge, it's the hunter's duty to help prevent firearm mishaps in the home.
- Most importantly, lock guns away where children can't reach them, and store ammunition in a separate location. Check to see that a firearm is unloaded before allowing it in any building or living area.
- Practice these safety rules if handling a firearm in the home.
  - Immediately point the muzzle in a safe direction when you pick up a firearm.
  - Keep your finger off the trigger.
  - Always check to see that the chamber and the magazine are empty.
- If a gun is taken from storage to show friends, be sure they understand safe gun handling rules and a responsible adult is present.

Hunting-Related Shooting Incidents (HRSIs)

- From a law enforcement viewpoint, a hunting-related shooting incident occurs when a hunter causes personal injury or death from the discharge of a firearm or bow.
- More broadly defined, a hunting incident is any unplanned, uncontrolled action that occurs while using a sporting arm. It can include near misses.
- Being responsible in order to prevent hunting incidents is your first priority.

- Causes of HRSIs are:
  - **Hunter Judgment Mistakes,** such as mistaking another person for game or not checking the foreground or background before firing
  - **Safety Rule Violations,** including pointing the muzzle in an unsafe direction and ignoring proper procedures for crossing a fence, obstacle, or difficult terrain
  - **Lack of Control and Practice,** which can lead to accidental discharges and stray shots
  - **Mechanical Failure,** such as an obstructed barrel or improper ammunition

Main Causes of HRSIs in Pennsylvania

The majority of HRSIs in Pennsylvania fall into two categories: hunters mistaking others for game or shooting at game when others are in their line of fire.

- Failure to positively ID target
  - Each year people are injured or killed when their movement is thought to be a game species moving through cover.
  - Never shoot unless the target is fully and plainly visible.
- Failure to maintain a safe zone-of-fire
  - Bullets and shot pellets do not stop when the target is missed, but continue to travel until they lose their energy and fall to the ground or impact with another object.
  - Never shoot if another hunter or person is in or near your zone-of-fire.

Be sure of the target and what is in front of it and beyond it. If you cannot see what lies beyond the target, do not take the shot.

Using Firearms at the Shooting Range

A successful hunt begins with target practice at the shooting range.

Many of the rules that govern safe firearm handling in the field apply to the shooting range. But a shooting range has some additional requirements.

- *Read all range rules that apply to the type of shooting you will do that day.*
- *If there is a range master, be sure to follow his or her instructions while shooting.*
- *When not shooting, unload your firearm and leave it on the range line or bench until you're given further instructions.*
- *Don't handle your firearm while other shooters are downrange. Step away from the firing line or bench until the range is clear and the range master instructs you to approach the line or bench.*
- *If no range master is present, all shooters must decide on safety commands beforehand so that it's clear when someone intends to go downrange.*
- *Anytime a person is beyond the firing line or downrange, unload your firearm and step away from the line until the other person returns.*
- *Under no circumstances should you shoot a firearm when someone is downrange or past the firing line.*
- *Always wear hearing and eye protection, even if you're watching others shoot.*
- *Respond immediately to anyone calling for a "cease fire."*

Title 34 Game and Wildlife Code: Providing Help to Accident Victims

"It is unlawful for any person who has caused an injury or witnessed another person being injured by a firearm or bow and arrow, while hunting or furtaking, to leave the area or to fail or refuse to give immediate and full assistance to the person injured."

KEYWords

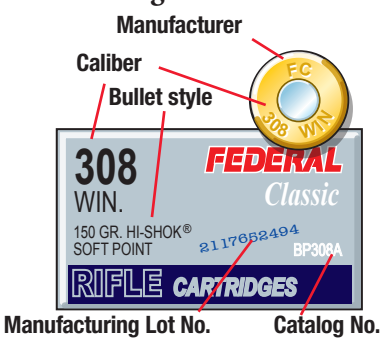
load:
The amount of gunpowder in the cartridge or shotshell together with the weight of the bullet or shot charge

Shotgun barrels should be marked with the gauge and the length of the chamber on the rear of the barrel.

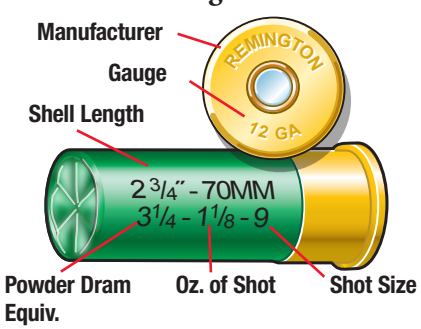
The data stamp of a rifle is usually stamped toward the rear of the barrel.

Cartridge and Box Markings

Rifle Cartridge Headstamp and Box Markings



Shotshell Markings



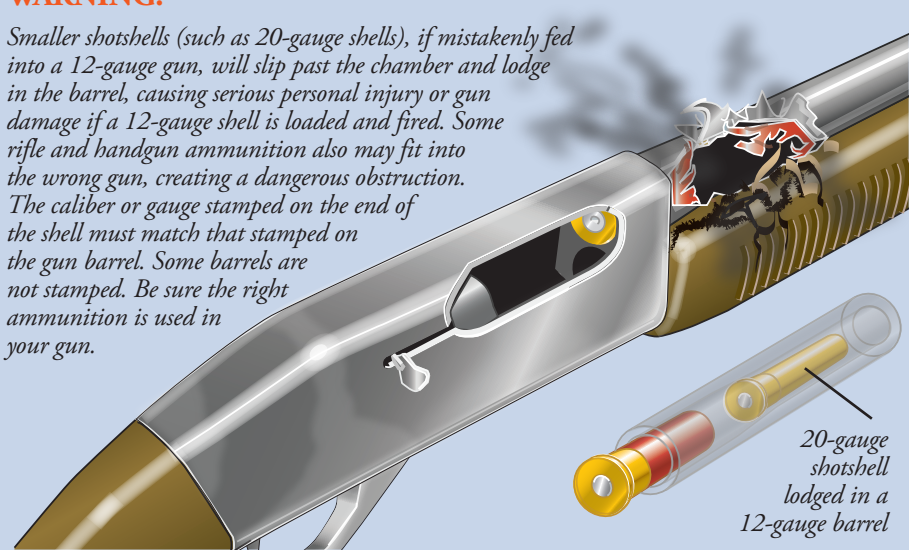
MATCH FIREARMS AND AMMUNITION…*CORRECTLY!*

With so many kinds of firearms and types of ammunition, it's not always easy to match the proper ammunition to your firearm correctly—but getting it right is very important. If you match the wrong ammunition to your gun, you can cause an explosion, injuring or possibly killing yourself and any bystanders.

- To match the proper ammunition to your rifle, shotgun, or handgun correctly:
  - Read the specific caliber or gauge marking on the side of the barrel. Match that size *exactly.* For example, if it says ".270 Winchester," you cannot use ".270 Weatherby." Shotgun barrels will give the gauge and the length of the chamber (for example, "12 gauge for 23/4-inch shel" or "20-gauge magnum for 3-inch shells").
  - Carefully read the information on the lid of the ammunition box. With shotgun ammunition, always check both the gauge and the shell length, and whether it's a magnum **load,** to make sure it matches the data on the barrel.
  - The final step is to match the information on the barrel to the information on the box *before you shoot.* If in doubt, ask a more experienced shooter or a qualified gunsmith. Some store clerks, although they sell ammunition, may not know the differences in sizes or the type of firearm you shoot.
- Safety practices that will help you avoid using the wrong ammunition are:
  - Purchase only the correct ammunition for your firearm. Buy the exact caliber or gauge and length of ammunition for which your rifle, handgun, or shotgun was designed. For example, shotshell must be the correct length for the shotgun. The data stamp on the barrel of the shotgun will identify which length of shells can be used.
  - Carry only the correct ammunition for the firearm you're using. Never mix ammunition such as carrying a caliber or gauge your companion uses. A common mistake involves putting a 20-gauge shotshell into a 12-gauge shotgun. The smaller gauge shell will slide through the 12-gauge chamber and partly down the barrel, causing an obstruction. The shooter, especially when excited by seeing game, then might insert a 12-gauge shotgun shell behind the 20-gauge shell.

WARNING!

Smaller shotshells (such as 20-gauge shells), if mistakenly fed into a 12-gauge gun, will slip past the chamber and lodge in the barrel, causing serious personal injury or gun damage if a 12-gauge shell is loaded and fired. Some rifle and handgun ammunition also may fit into the wrong gun, creating a dangerous obstruction. The caliber or gauge stamped on the end of the shell must match that stamped on the gun barrel. Some barrels are not stamped. Be sure the right ammunition is used in your gun.



SAFELY LOADING AND UNLOADING FIREARMS

Even something as simple as loading a firearm can result in tragedy if it isn't done properly. Here's how to do it safely.

Loading

Bolt Action

- Make sure the firearm is not loaded.
- Keep the muzzle pointed in a safe direction.
- Check the firearm's data stamp.
- Locate the correct ammunition by checking the cartridge data stamps.
- Select the proper type of ammunition.
- Load the firearm.
  - Non-removable box magazine firearms
    - Load the magazine with cartridges.
    - Close the action.
    - Put the safety on.
    - Keep your finger away from the trigger.
  - Removable box magazine firearms
    - Remove the magazine.
    - Load the magazine with cartridges, and insert it into the magazine well.
    - Close the action.
    - Put the safety on.
    - Keep your finger away from the trigger.

Lever Action

- Make sure the firearm is not loaded.
- Keep the muzzle pointed in a safe direction.
- Check the firearm's data stamp.
- Locate the correct ammunition by checking the cartridge data stamps.
- Select the proper type of ammunition.
- Load the firearm.
  - Close the action.
  - Place one round in the magazine.
  - Cycle the action one time.
  - Put the safety on.
  - Place the remaining cartridges in the magazine.
  - Keep your finger away from the trigger.

Break Action or Hinge Action

- Make sure the firearm is not loaded.
- Keep the muzzle pointed in a safe direction.
- Check the firearm's data stamp.
- Locate the correct ammunition by checking the cartridge data stamps.
- Select the proper type of ammunition.
- Load the firearm.
  - Place the ammunition in the empty chamber or chambers.
  - Close and lock the action.
  - Keep your finger away from the trigger.

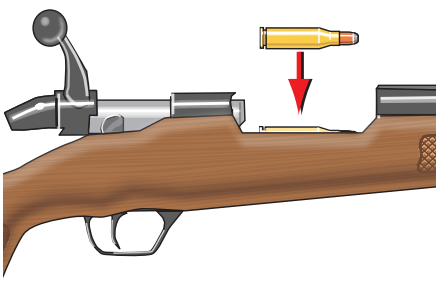
Remember...

Removal of ammunition from the magazine or removal of the magazine from the firearm does not mean the firearm is unloaded! Check BOTH the magazine AND the chamber. ALWAYS clear the magazine first, AND THEN check the chamber to make sure the gun is completely unloaded.

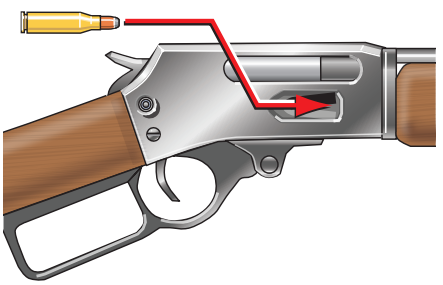
Loading Types of Actions

Bolt Action

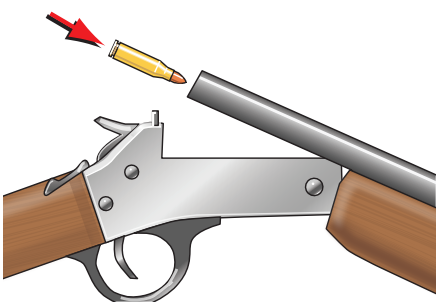
(Non-Removable Mag.)



Lever Action

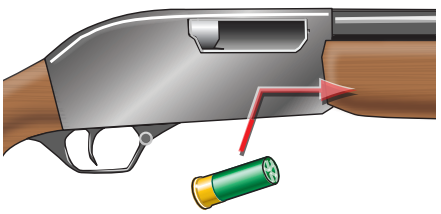


Break Action



Loading Types of Actions

Pump Action



- **Pump Action or Slide Action**
  - Make sure the firearm is not loaded.
  - Keep the muzzle pointed in a safe direction.
  - Check the firearm's data stamp.
  - Locate the correct ammunition by checking the cartridge data stamps.
  - Select the proper type of ammunition.
  - Load the firearm.
    - Load one shotshell into the tubular magazine.
    - Open the breech by unlocking the slide and pulling it to the rear.
    - Close the breech by moving the slide forward.
    - Put the safety on.
    - Load the remaining shotshells into the tubular magazine.
    - Keep your finger away from the trigger.

Unloading

- Point the muzzle in a safe direction.
- Make sure the safety is on.
- Keep your finger outside the trigger guard.
- Open the action.
- Remove the ammunition; eject cartridges or shells if it's the only way to remove them—use extra care with lever-action firearms.
- Count shells or cartridges to make sure the gun is empty.
- Check the chamber to make sure it's clear.

Remember...

When loading or unloading a firearm, hunting partners should stand back-to-back, facing away from each other.

Safety TIP

Hang fires happen when the firing pin has struck the primer and there is a delay before it fires. This can occur for several reasons, such as a faulty firing pin or spring, a defective primer, or other cartridge-related problems. A misfire is when the primer fails to ignite the powder.

Always treat a "misfire" or a "hang fire" as if the firearm is going to discharge at any second. Leave the action closed and stay in your shooting position. Most importantly, maintain muzzle control in a safe direction at all times. Failure to follow these safe handling practices could result in a tragedy.

CLEARING OBSTRUCTIONS

Unload

- Keep the muzzle pointed in a safe direction.
- Put the safety on, if possible. (Most firearms need to be on "fire" to open the action.)
- Empty/remove the magazine. (With tubular magazines, work the action several times to make sure the magazine is empty.)
- Open the firearm's action.
- Look into and feel the chamber to check for any ammunition.

Check the Barrel

- **Bolt Action:** Remove the bolt, and look through the chamber into the barrel.
- **Hinge Action:** With the action open, look through the chamber into the barrel.
- **Slide Action or Pump Action:** Remove the barrel and look into it.
- **Lever Action:** Use a cleaning rod to check the barrel.

Remove the Obstruction

- Use a cleaning rod to remove the obstruction.
- Make sure that the entire obstruction is removed before attempting to fire.
- **Never attempt to "shoot out" the obstruction.**

Remember ...

The only true safety is YOU!

Safety TIP

Never look down a barrel from the muzzle end to check for obstructions.

Safety Mechanisms

A safety is a device that blocks the action to prevent the firearm from shooting until the safety is released or pushed to the "off" position. The safety is intended to prevent the firearm from being fired accidentally. However, safeties should never be relied on totally to protect against accidental shooting. Safeties are mechanical devices and subject to mechanical failure from damage, lack of cleaning, or normal wear.

All safeties are located around the receiver of the firearm and are usually easy to spot. Common types of safeties are:

- ***Cross-Bolt Safety***
  - *Common on pump and semi-automatic firearms*
  - *A simple push-button action that blocks the trigger or hammer*
  - *Usually located at the trigger guard or ahead of the hammer*
- ***Pivot Safety***
  - *Common on handguns and bolt-action rifles*
  - *A pivoting lever or tab that blocks the trigger or firing pin*
  - *Located on the frame (blocks trigger) or on the bolt or slide (blocks firing pin)*
- ***Slide or Tang Safety***
  - *Common on some rifles and hinge-action shotguns*
  - *A sliding bar or button that blocks the firing action*
  - *Located on the tang (a metal strip behind the receiver) of hinge-action firearms or on the side of the receiver on some rifles*
- ***Half-Cock or Hammer Safety***
  - *Common on firearms with exposed hammers*
  - *Positions the trigger at half-cock, away from the firing pin*
  - *Engaged by placing the trigger at half-cock; some firearms automatically rebound to the half-cock position after the trigger is released*
  - *While not a true safety, it sometimes is described as a mechanical safety device by firearm manufacturers*

SAFELY CARRYING FIREARMS IN THE FIELD

There are several ways to carry a gun safely and still have it ready for quick action. Three rules apply to all carrying methods:

- Muzzle pointed in a safe direction and under control
- Safety "on" until immediately before you're ready to shoot
- Finger outside the trigger guard

Trail Carry

Sling Carry

Elbow or Side Carry

Proper Field Carries

- **Trail Carry:** Leaves a hand free for balance, but don't use it when you're behind someone. Not recommended when walking in snow or brush—debris can get in the barrel.
- **Sling Carry:** Easy carry for long treks through open country. Keep a hand on the sling when walking so that it doesn't slide off your shoulder if you trip. Not recommended for thick brush because the gun could be knocked from your shoulder.
- **Elbow or Side Carry:** Comfortable, but it has the least muzzle control. It also can snag in brushy terrain. Use it when no one is in front of you.
- **Two-Handed or "Ready" Carry:** Provides the best control, particularly in thick brush or weeds, or when you need to fire quickly.
- **Cradle Carry:** Comfortable and secure; reduces arm fatigue.
- **Shoulder Carry:** Good choice in waist-high brush. Don't use it if someone is behind you.

Shoulder Carry

Cradle Carry

Two-Handed or "Ready" Carry

Selecting the Right Carry When Hunting With Others

Carry selection is based primarily on muzzle control and terrain.

- If three hunters are walking side by side, the ones at the sides may carry their guns pointing either to the side away from their party or to the front. The one in the center should keep the gun pointing to the front or up.

- If three hunters are walking single file, the one in the lead should have the gun pointed ahead but never over the shoulder. The one in the middle must have the gun pointed to the side. The hunter in the rear may point the gun to either side or the rear.

- When facing another hunter, any carry is safe except the trail carry or forward-facing elbow carry.
- Remember that the same rules for safe carry apply when your hunting companion is a dog.

Crossing Obstacles

- Always unload guns before crossing fences or other obstacles or going over rough terrain.
- Cross wire fences close to a fence post to prevent damage to the fence.
- After unloading, place the gun on the other side of the fence or obstacle to be crossed, with the muzzle pointed away from you and your crossing point. Place your hat over the muzzle when placing your firearm on the other side of the obstacle. Then cross the obstacle and retrieve your gun.

- Pull a gun toward you by the butt—never by the muzzle.
- If two people are crossing, one person crosses first and then receives the unloaded guns from the other hunter.

Checking for Obstructions

Occasionally you may trip or stumble in the field, accidentally dipping the barrel into the ground or snow. Immediately check for an obstruction which may be plugging the inside of the barrel.

- Point the muzzle in a safe direction.
- Open the action, unload the firearm, and remove the bolt (if applicable).
- Check for debris in the barrel. If the firearm is a break action, look through the barrel from the breech end. Or use a barrel light to inspect the barrel for obstruction.
- Remove the obstruction with a portable cleaning rod.
- Recheck the barrel.
- Reload and close the action.

Remember...

In addition to gun handling, several other factors affect your safety during the hunt:

- *Weather, especially the sun's glare*
- *Pests, such as fire ants, snakes, and bees*
- *Your emotional state*
- *Your stamina, especially when hunts are physically demanding*

Shot Angles

SAFE SHOT SELECTION

The ability to take game animals or dispatch furbearers safely and humanely is based on knowing:

- Where to aim—requires knowledge of game anatomy
- The limitations of your firearm and your shooting skill
- What is next to, beyond, or beneath the target

With this knowledge, hunters and trappers can effectively reduce wounding losses and hunting-related shooting incidents (HRSIs).

Shot Angles

- **Quartering-Away Shots**
  - Target is facing away from you at an angle.
  - Very effective for deer and similar-sized animals.
  - Aim at the chest area above the opposite front leg for a lung shot.
- **Broadside Shots**
  - Best shot for elk, bear, and other large game animals.
  - Large target aiming area.
  - Aiming point is behind front shoulder.
  - If possible, wait until the nearest leg is extended forward; this moves the scapula out of the target area.
- **Head-On Shots**
  - Not recommended—rarely results in a clean kill.
  - Ruins a lot of meat.
  - Very narrow target area.
  - Should not be taken if hunter is using a bow.
- **Rear-End Shots**
  - Should not be taken by hunters using firearms or bows.
- **Quartering-Toward Shots**
  - Animal is facing toward you but at an angle; presents a clear shot at the vital organs.
  - Animal is likely to see your movements because it is facing your direction.
  - Use the chest area above the nearest front leg as an aiming point for a lung shot.

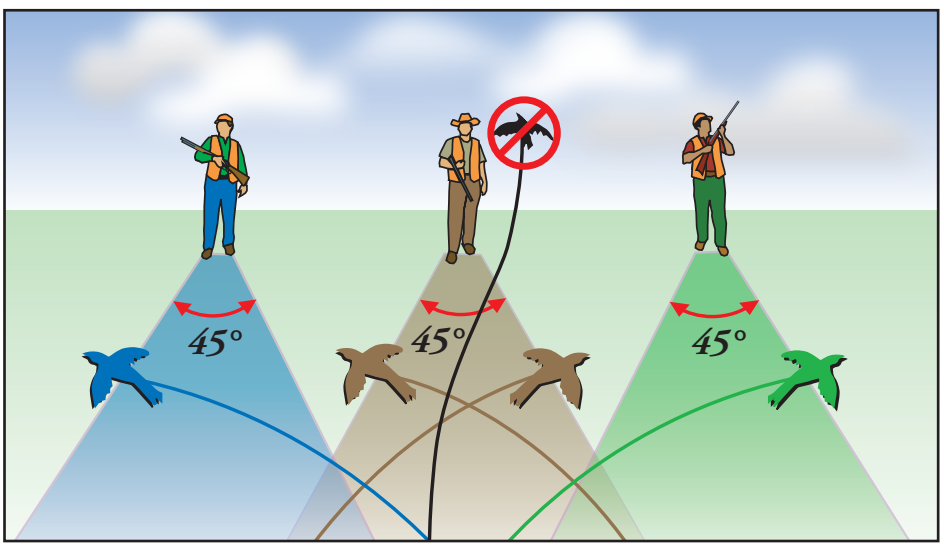
"Don't-Shoot" Situations

- Animal is running.
- Animal is on the crest of a hill.
- Animal moves out of your zone-of-fire.
- Animal is on private property.
- Animal is in or near a safety zone.
- Vital organs are covered by brush, trees, etc.
- You are unsure of what's behind the animal.
- Other animals in a group are blocking the target animal's vitals or are behind the animal.
- Distance is too great for the firearm or your skill.
- Your visibility is limited by fog, snowfall, sunshine, or nightfall.

SAFE ZONE-OF-FIRE

The area in which a hunter may shoot safely is referred to as a zone-of-fire. Before setting off in a group, hunters should agree on the zone-of-fire each person will cover. A zone-of-fire depends on many factors, including the hunter's shooting ability, the game being hunted, the hunting environment, and the hunting strategy being used. A hunter's zone-of-fire changes with every step. This is particularly true of groups hunting birds, rabbits, or other small game.

- For safety purposes, it's best to have no more than three hunters in a group. For new hunters, two is a safer number until they become familiar with maintaining a proper zone-of-fire.
- Hunters should be spaced 25 to 40 yards apart and always in sight of one another. Each hunter has a zone-of-fire approximately 45 degrees in front, or from 10:30 to 1:30 on a clock face. (Some states require an adult to be immediately beside a youth hunter. In this case, the adult should be a supervisor only—not a hunter.)
- Another way to visualize 45 degrees is to look at a spot directly in front of you. Stretch your arms straight out from your sides. Make a fist with your thumbs held straight up. Gradually move your arms toward the front until your thumbs are clearly in focus without moving your eyes. This will give you your outer boundaries.



- If three hunters are walking side by side hunting pheasants, the hunter in the center will shoot at birds flushed in the middle which fly straight away. The other hunters will shoot at birds flying toward their end of the line.
- If a bird turns and flies back across the line of hunters, it's best if all three hold their swings and do not fire. The same is true of a rabbit running back between the hunters.
- No hunter, especially when swinging on game, should allow his or her gun to point at a person. Better to pass up a shot than risk injuring someone or damaging property.
- Everyone hunting in these situations should wear fluorescent orange whether it's required by law or not.

Safety TIP

A hunter's zone-of-fire changes with every step. It's important to remain alert and aware of your companions' locations at all times.

Only one hunter should aim at the target. Also, hunters should only shoot if there is an adequate backstop. Don't shoot at a "skylined" animal.

Safety TIP

When hunting in a group, hunters should shoot only at game in front of them.

Other Safety Considerations

- ***Self-Control and Target Identification***
  - *Some hunters may become overly nervous or excited on a hunt, which can lead to careless behavior. They may fire at sounds, colors, movements, or unidentified shapes, or simply shoot too quickly. In the excitement after hitting their target, they may swing a loaded firearm toward their companions or run with the safety off toward a downed animal.*
  - *Self-control is an important part of hunter safety. Only shoot when you know the target is legal game and that no people, domestic animals, buildings, or equipment are in the zone-of-fire—remember that bullets can pass through game and continue on for some distance with deadly force.*
  - *Slow, careful shooting is not only safer, but it also produces a higher degree of success.*

- ***Accuracy***
  - *Shooting accurately is not only the key to successful hunting, but it's also a safety factor. Some incidents, often deadly ones, have occurred when stray bullets have hit people out of the shooter's sight. Be sure you have a proper backstop before you shoot.*
  - *Accuracy is also important to make a clean kill. No real sportsman wants to wound game and cause needless suffering. You must learn how to hit the vital organs of the game you hunt. Knowing your game, equipment, and skill level will tell you when you're in position to make a clean kill.*

Chapter Review Exercise

1. To minimize the risk of a firearm incident in the home, you should *never* ____.
   a. point the muzzle in a safe direction.
   b. keep your finger off the trigger when handling the firearm.
   c. store the firearm and ammunition together.
   d. check that the chamber and the magazine are empty.
2. Name the five S.M.A.R.T. rules.
   i. _____
   ii. _____
   iii. _____
   iv. _____
   v. _____
3. What are the two primary causes of hunting-related shooting incidents in Pennsylvania?
   i. _____
   ii. _____
4. You should use only ammunition that exactly matches the caliber or gauge specifications marked on the _____ of your firearm.
5. Different gauge shotshells should not be mixed together because ____.
   a. once mixed, it is impossible to separate them accurately.
   b. a smaller gauge shotshell can slip past the chamber of a larger gauge gun and result in serious personal injury.
   c. a 12-gauge shotshell can be chambered into a 20-gauge shotgun and result in serious personal injury.
   d. none of the above.
6. To load or unload a firearm safely, you should always ____.
   a. put the safety on.
   b. dry fire the firearm before loading and after unloading.
   c. point the muzzle in a safe direction.
   d. both a. and c.
7. True or False: You can "shoot out" any obstruction from a firearm barrel.
8. Before crossing an obstacle with a firearm, you should _____ the firearm.
9. If crossing a fence while hunting alone, you should ____.
   a. cross the fence with the gun held under your arm.
   b. unload the gun, place it on the other side of the fence with the muzzle pointed away from you, and then cross.
   c. set the gun down, cross, and then pull the muzzle to you.
   d. any of the above.
10. Circle the situation(s) that is an example of a "good shot."
    i. A running deer
    ii. Turkey sounds in the brush
    iii. Stationary deer, broadside on the side of a hill
    iv. A bear in thick brush
    v. A deer on posted property
    vi. A pheasant that flies in your zone-of-fire
11. Hunters should be spaced _____ yards apart and each have a zone-of-fire of _____ degrees in front.
12. True or False: Hunters should never shoot at game that comes back across the line of the hunters.

Chapter Review Answers

1. c 2. Safe Direction Make Sure Always Check Respect Firearms Trigger Caution 3. i. Failure to positively identify the target ii. Failure to maintain a safe zone-of-fire 4. barrel 5. b 6. d 7. False 8. unload 9. b 10. iii and vi 11. 25–40 yards and 45 12. True

Expanding Your Opportunities

Objectives *Students will be able to...*

- Identify opportunities for hunting and trapping on public and private lands.
- Describe how to become more involved in the shooting sports, hunting, trapping, and wildlife conservation organizations.
- Describe how to learn more about advanced hunting and trapping programs.

INTRODUCTION

Hunting and trapping opportunities exist in abundance on public and private lands throughout Pennsylvania. Unfortunately, many sportsmen and sportswomen do not take advantage of these areas. Through the years, hunters and trappers continuously return to familiar locations, never considering the possibilities that lie "around the corner." Other hunters and trappers are unaware of the opportunities that exist nearby and across the state.

- In addition to the excitement of hunting new fields or trapping forgotten areas, hunters and trappers can enhance their time afield by hunting different game species, trying more challenging methods, or using traditional equipment.
- Opportunities to apply hunting skills also exist before and after hunting season.
- Trap and skeet shooting, sporting clay courses, and 3-D archery courses are other activities that enhance hunting involvement.

PENNSYLVANIA GEOGRAPHIC INFORMATION

Pennsylvania has an area of about 28,682,880 acres of mountains, streams, valleys, forests, and fields. About 4,290,000 acres are owned by the public and are open to hunting and trapping. This land can be located using maps or the Internet, or by calling the agencies responsible for their management.

Public Land Area and Agencies Responsible for Management

- Pennsylvania Game Lands
  - 1.4 million acres
  - Agency: Pennsylvania Game Commission (**www.pgc.state.pa.us**)
- Pennsylvania State Forest Land
  - 2.1 million acres
  - Agency: Pennsylvania Department of Conservation and Natural Resources (**www.dcnr.state.pa.us**)
- National Forest Land (Allegheny National Forest)
  - 513,000 acres
  - Agency: United States Department of Agriculture Forest Service (**www.fs.fed.us**)
- Pennsylvania State Park Land
  - 277,000 acres
  - Some areas open to the public for hunting and trapping
  - Agency: Pennsylvania Department of Conservation and Natural Resources (**www.dcnr.state.pa.us**)

Hunting Opportunities on Public Lands

All states have federal- or state-owned public lands that are available for hunting. Public lands may have special regulations that regulate hunting on these properties and may require special permits. Be sure to check with the appropriate agency and obtain maps before you go out to hunt.

Public lands that may be open for hunting are:

- *Bureau of Land Management properties*
- *Bureau of Reclamation properties*
- *National Wildlife Refuge properties*
- *National forests*
- *National parks*
- *State parks and forests*
- *State-owned wildlife management areas*

Wildlife Conservation Groups

- **Ducks Unlimited**
  - *website:* **www.ducks.org**
- **National Wild Turkey Federation**
  - *website:* **www.nwtf.org**
- **Pennsylvania Federation of Sportsmen's Clubs**
  - *website:* **www.pfsc.org**
- **Pheasants Forever**
  - *website:* **www.pheasantsforever.org**
- **Rocky Mountain Elk Foundation**
  - *website:* **www.rmef.org**
- **Wildlife Forever**
  - *website:* **www.wildlifeforever.org**

Wear street clothes when you contact the landowner well in advance of the date you wish to hunt.

Organizations, Agencies & Clubs

- **4-H Shooting Sports**
  - *Firearms training programs*
- **Local sportsmen's clubs and organizations**
  - *Firearms training*
  - *Trapping education*
  - *Competitive and recreational shooting programs*
- **National Bowhunter Education Foundation (NBEF)**
  - *Bowhunting programs*
- **National Rifle Association**
  - *Firearms training programs*
- **National Trappers Association**
  - *Trapping education programs*
- **National Wild Turkey Federation (NWTF)**
  - *Wild turkey hunting programs*
  - *Youth education programs*
- **Pennsylvania Game Commission**
  - *Education*
  - *Hunter-Trapper Education instructor certification programs*

HUNTING ON PRIVATE LAND

Other hunting and trapping opportunities exist on privately owned land. Prior to going on private property, you need to get permission. How you present yourself and explain what you would like to do on the property will influence the landowner's decision.

Good Hunter/Landowner Relations

- Make contact at least a week in advance.
- Present yourself properly.
  - Wear street clothes—no hunting gear or firearms.
  - Dress neatly.
  - Be polite.
- Don't bring companions—a "crowd" could make the landowner uncomfortable.
- Explain exactly what you would like to do and who would be participating.
- Provide your phone number and address.
- Offer to help the landowner with work on the property.
- Offer to share part of the game or furbearers taken.
- Obey all of the landowner's rules and requests.
- Obtain written permission, if possible, and carry it with you.
- Accept "no" as an answer.
- Thank the landowner, whether permission is granted or denied.

GAME LANDS REGULATIONS

State Game Lands are public hunting grounds where lawful hunting and trapping are permitted during open seasons. To enable the Game Commission to effectively manage and protect these invaluable land holdings for this and future generations of hunters, trappers, and wildlife enthusiasts, it is prohibited to:

- Camp.
- Travel on lands using a motorized vehicle.
- Ride a non-motorized vehicle or animal except on roads normally open to public travel, routes designated as such, or while lawfully hunting or trapping.
- Ride a non-motorized vehicle or animal during any open season except when lawfully hunting or trapping.
- Injure, destroy, or cause damage to property of any kind.
- Remove or attempt to remove any man-made or natural object, except wildlife and fish lawfully taken.
- Consume, possess, or transport any alcohol, controlled substances, or drug paraphernalia.
- Occupy, construct, or maintain structures or other property except portable tree stands or blinds, provided no damage is caused to trees.
- Except on Sundays, be present from Nov. 15 through Dec. 15 and fail to wear a minimum of 250 square inches of fluorescent orange material on the head, chest, and back combined, visible from 360 degrees. This applies even to individuals who are not hunting and trapping.

Please refer to this year's copy of the Pennsylvania Hunting & Trapping Digest for a complete list of Game Lands Regulations.

MENTOR SOMEONE

You can expand your hunting and trapping opportunities by becoming a mentor or teacher to someone who is interested in those activities. As your skills increase, passing along your knowledge to someone else can be rewarding. By taking a friend deer hunting for the first time or showing a young neighbor how to set up a trapline, you are not only teaching, but you also are helping to pass on the heritage and traditions of hunting and trapping in Pennsylvania.

ADVANCED PROGRAMS

- There are many other training opportunities for hunters and trappers to take to improve their skills. Many organizations or clubs offer courses that focus on specific hunting and outdoors skills. These programs are fun, informative, and challenging.
- The Pennsylvania Game Commission offers a variety of courses that were created to make you a more successful hunter or trapper. Some PGC courses are species-specific, such as turkey hunting. Other classes focus on certain types of equipment like bows, muzzleloaders, traps, and cable restraints. These programs are presented in a two-part format. First, students study some information before attending the course. Then, during class, students will participate in hands-on learning activities introducing them to new skills and techniques.

Successful Bowhunting

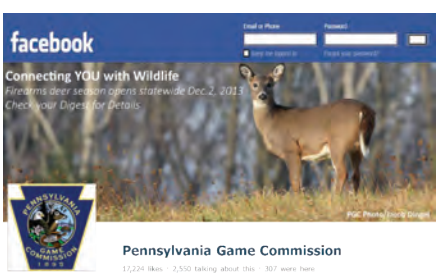
- This program is designed to meet or exceed the International Hunter Education Association (IHEA) and the National Bowhunter Education Foundation (NBEF) International Bowhunter Education Program's standards for bowhunter education. Students who complete the course receive a training certificate accepted throughout North America.
- *Successful Bowhunting* includes online study that takes about 4 to 6 hours to finish before attending a one-day, eight-hour class. Students at the class will learn about these skills and more:
  - Responsible bowhunting methods and techniques
  - Big game anatomy, recovery, and care
  - Using a map and compass
  - Distance estimation
  - Basic bow shooting and shot placement
  - Treestand use and safety

Successful Turkey Hunting

- If you are new to turkey hunting and want to pick up some knowledge and skills to help you increase your chances of success in the turkey woods, this course is for you. *Successful Turkey Hunting* will make sure you really enjoy your next turkey hunting experience.
- *Successful Turkey Hunting* also includes online study that takes about 4 to 6 hours to finish before attending a one-day, eight-hour class. Students at the class will learn about these skills and more:
  - Scouting methods and proper decoy use
  - Turkey hunting techniques
  - Using a map and compass
  - Distance estimation
  - Shotgun patterning and shot selection
  - Turkey calls and how to use them

Outreach Programs

- **NASP (National Archery in the Schools Program)**
  - *NASP is designed to introduce youth to the lifelong sport of archery. The program is a cooperative effort between state education and wildlife agencies, focusing on students in grades 4 through 12.*
  - **www.nasparchery.com**
- **Youth Field Days**
  - *Youth Field Days introduce participants to outdoor sports through supervised hands-on activities. These events are usually held from May until the end of September. Activities vary for each event, but usually include archery, trapping, hunting, fishing, canoeing, boating, and much more.*
  - **www.pgc.state.pa.us**
- **Junior Pheasant Hunts**
  - *These are special hunting opportunities for youth between 12 and 16 years of age, who have successfully completed the basic Hunter-Trapper Education course. Each year, sportsmen's organizations from around the state host these events. Hunting licenses are not required, but participants must wear the necessary amount of fluorescent orange and be accompanied by an adult.*
  - **www.pgc.state.pa.us**



Successful Furtaking

- This course is based on the Association of Fish & Wildlife Agencies (AFWA) standards for trapper training and their Best Management Practices. When finished with the course, a training certificate is issued to the student that will allow them to use cable restraints in Pennsylvania. Additionally, this training course allows students to purchase a furtaking license, which is required to trap furbearers. In order to hunt furbearers, students still need to successfully complete a basic Hunter-Trapper Education course.
- *Successful Furtaking* also includes online study that takes about 6 to 8 hours to finish before attending a one-day, six-hour class. Students at the class will learn about these skills and more:
  - Identifying furbearer tracks and signs
  - Setting cable restraints and snares
  - Running a trapline
  - Making water sets and land sets
  - Preparing hides
- More classes are being developed; just visit **www.pgc.state.pa.us** to see what classes are available and sign up!

SOCIAL MEDIA SPORTSMEN

- The Pennsylvania Game Commission's social networking pages provide information about the state's birds, mammals, and their habitats. This is done by sharing photos, posting information, and chatting with interested sportsmen and others who enjoy wildlife. Other posts include season openings, hunting regulations, and reports about game population from field officers. The sites are a great way for the agency to connect with sportsmen.
- The Pennsylvania Game Commission's **Facebook** page provides hunting and trapping season reminders, wildlife information, and safety tips. Additionally, hunters and furtakers can post pictures of their success in the field, interesting wildlife encounters, and shots of their outdoor adventures.
- By following the Pennsylvania Game Commission on **Twitter** @PAGameComm, sportsmen receive current updates from the field, news articles, and hunting and trapping opening day alerts. Share your favorite hunting and furtaking photos with other sportsmen by tagging @ PAGame Comm in your tweet.
- Subscribe to the Game Commission's **YouTube** channel for the latest in game forecasts and wildlife news. You'll also find clips featuring major habitat management projects, tutorials on deer aging, and how to use the agency Mapping Center. Additionally, you can find PowerPoint presentations on important wildlife issues, short films about various wildlife species, and so much more.

Chapter Review Exercise

1. True or False: One of the primary reasons hunters fail to identify opportunities on public and private lands is that they continuously return to familiar locales.
2. List three public land areas open to hunting in Pennsylvania.
   i. _____
   ii. _____
   iii. _____
3. How far in advance should you contact a landowner to ask permission to hunt on the land?
   a. At least one month
   b. At least one day
   c. At least one week
   d. At least two weeks
4. One of the ways to promote good hunter/landowner relations is to _____.
   a. offer to share part of all game taken.
   b. offer to give the landowner all of the game that is taken.
   c. offer to bring other hunters to the land.
   d. offer to pay a hunting fee.
5. Many agencies, organizations, and sportsmen's clubs offer _____ that provide instruction in specific areas of hunting and trapping.
6. One of the best ways to expand your hunting and trapping opportunities is to become a _____ to someone who is interested in the sport.

Chapter Review Answers

1. True 2. i. Game Lands ii. State Forest Land iii. National Forest Land iv. Some State Park Land 3. c 4. a 5. advanced programs 6. mentor

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Hunting Plan

Complete this form before departing on a hunt and leave it with a reliable person who can be depended upon to notify the authorities in case you do not return as scheduled. A word of caution: In case you are delayed and it is not an emergency, inform those with your hunting plan of your delay in order to avoid an unnecessary search!

1 Names of person filing this plan: _____
Telephone #: (_____) _____ - _____

2 Name(s) of others on hunt: Age: Address:

_____ ____ _____
Telephone #: (_____) _____ - _____

_____ ____ _____
Telephone #: (_____) _____ - _____

_____ ____ _____
Telephone #: (_____) _____ - _____

_____ ____ _____
Telephone #: (_____) _____ - _____

_____ ____ _____
Telephone #: (_____) _____ - _____

_____ ____ _____
Telephone #: (_____) _____ - _____

3 Radio ❑ Yes ❑ No Type: _____ Call sign: _____

4 Trip plans
Leaving from: _____ Going to: _____

Route details: _____

_____

Departing on: _____ / _____ ❑ am ❑ pm Returning: _____ / _____ ❑ am ❑ pm
date time date time

And, in no event, returning later than: _____ / _____ ❑ am ❑ pm
date time

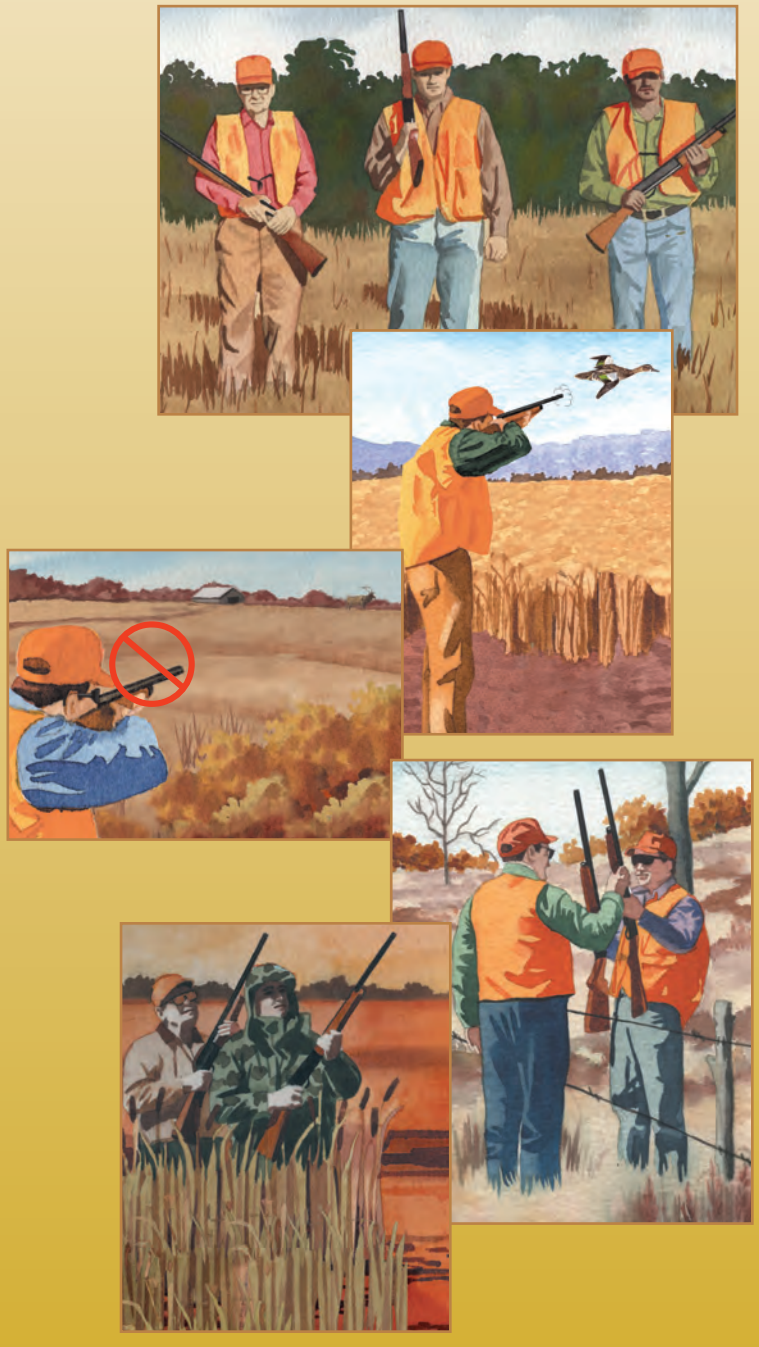
5 Alternate route if bad weather is encountered : _____

_____

6 Description of automobile Trailer license #: _____
Make: _____ Color: _____ License #: _____ Where parked: _____

7 If not returned by: _____ / _____ ❑ am ❑ pm
Call: date time
Local authority: _____ Telephone #: (_____) _____ - _____

be S.M.A.R.T. with firearms!



Each and every time you handle a firearm, follow these five primary firearm safety rules.

Safe Direction:

Keep your firearm pointed in a safe direction at all times.

Make Sure:

Positively identify your target.

Always Check:

Know what's beyond your target before shooting.

Respect Firearms:

Treat all firearms as if they are loaded.

Trigger Caution:

Don't touch the trigger until you're ready to shoot.

PENNSYLVANIA GAME COMMISSION 1895

TSSA
TREE STAND SAFETY AWARENESS FOUNDATION
Elevating Tree Stand Safety

treestandsafetyawareness.org

/TreeStandSafetyAwareness @TreeStandSafety @TreeStandSafetyAwareness

A B C BUILDING BLOCKS OF TREE STAND SAFETY

A ALWAYS REMOVE AND INSPECT ALL YOUR EQUIPMENT BEFORE USING

35% of falls involved inspection elements

Source: 10 State Multi-Year Study, Mayhew, G. 2017

B BUCKLE YOUR HARNESS SECURELY

86% of fall victims didn't wear a harness

Source: 10 State Multi-Year Study, Mayhew, G. 2017

C CONNECT BEFORE YOUR FEET LEAVE THE GROUND

99% of fall victims injured were not attached

Source: 10 State Multi-Year Study, Mayhew, G. 2017

REALTREE Family, Friends and the Outdoors

Hunter Safety System

SUMMIT

NPE

hunter-ed.com

AHLA AMERICAN HUNTING LEASE ASSOCIATION

Bear

SOLE SCRAPER

HuntStand

SPYPOINT