L. M. (Barney) Anderson

The Waterfowl Handbook

Minnesota Department of Natural Resources Hunter Education Program

The Waterfowl Handbook

Welcome

Welcome to the Advanced Hunter Education Program: Waterfowl Clinic. This clinic is one of a series of hunter education programs offered by the Minnesota Department of Natural Resources (DNR), Division of Enforcement. We are pleased that you have a special interest in this session which covers a variety of topics such as waterfowl identification, management, hunting techniques, and compass reading. By the time you've completed the clinic, we hope you will have developed a better understanding of Minnesota's waterfowl and a true sense of appreciation for these magnificent birds.

There are several question periods included in the agenda, so please wait until the appropriate time to ask them. You'll find space to record notes from the clinic at the end of this handbook.

Information about the DNR Division of Enforcement's Hunter Education Programs

The Division of Enforcement has three hunter related education programs. For the beginner there is the Firearms Safety Program (FAS). The FAS program emphasizes the safe handling of firearms in the field and in the home. It is designed for the hunter and the non hunter alike. It is required in Minnesota and other states for persons of certain age groups to purchase a hunting license. The program is open to those twelve years of age or older. As is the case with all of the division programs, it is instructed by highly trained volunteer instructors.

The division offers the Minnesota Bowhunter Education Program (MBEP) for all bowhunters twelve years of age and older[1]. It is designed for beginning to experienced bowhunters. The seminar is based on the International Bowhunter Education Program materials. The seminar is required to participate in selected bowhunts in Minnesota as well as to purchase bowhunting licenses in some states.

The Advanced Hunter Education Program (AHE) is offered by the Division of Enforcement. It is open to those 14 years of age and older[2]. It is designed for the outdoors person and hunter that have some firearms handling experience. The basic seminar is a six-session program that covers such topics as hunter behavior, laws and regulations, planning a hunt, survival, map and compass, small game, big game, and more. Participants that successfully complete this seminar, BESIDES EXPANDING THEIR KNOWLEDGE, receive a card which can be used when purchasing a hunting license in states which have a hunter education requirement.

The AHE certification can also be earned through a format of individual clinics. By completing this waterfowl clinic, you are a step closer to earning your AHE certification. Part of the certification involves attending five approved single topic clinics, one of which must include a shooting activity. Also, a take home, open book examination must be completed. In addition to this clinic, you can choose from black bear, white-tailed deer, wild turkey, planning a hunt, survival in the outdoors, map and compass, firearms safety in the home, and more.

You can get information on other clinics and all of the DNR Safety Training Programs by calling toll free 1-800-366-8917. You can also find information at the DNR website at **www.dnr.state.mn.us/enforcement/safety**.

If the reader finds errors, omissions or has suggested changes to these materials, please contact our Camp Ripley office at 1-800-366-8917 or write: DNR Enforcement, Nelson Hall, attention Enforcement Education Program Coordinator, 15011 Hwy 15, Little Falls, Mn. 56345-4173.

[1]Persons 12 through 15 years of age must have an FAS card.
[2]Those 14 and 15 years old must have an FAS card

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Foreword

by Ray Norrgard

The concepts of decoy placement, calling, and blind design for waterfowl hunting are all presented in this handbook. Included with these basic hunting techniques are passages on regulations, safety, waterfowl management, and hunter behavior. In short, it will tell you how to hunt ducks and geese.

Yet this handbook alone cannot make you a waterfowler. No book, regardless how complete or well written, can do that. Neither will audio cassettes, video tapes, or seminars. These are only starting points, basic building blocks that can provide a firm foundation.

The rest must come from you. You see, waterfowling is more than learning the skills to produce feathered targets. It is embracing the wind and rejoicing in the sound of wings. It is knowing the birds, their lives, and their needs for survival. Finally, it is reaching across time to the earliest hunters, living a tradition that bonds mankind and nature; and then passing that tradition on to future generations.

To those willing to make the trip, we salute you. Keep your powder dry and the wind at your back. Listen for wings in the wind, revel in it, and pass it on.

Introduction

by Chuck Vukonich

Some have said that waterfowl hunters hunt to be happy. This comes from pleasurable experiences and strenuous effort. It's pleasing to smell marsh odors, to sip coffee, and watch ruddy ducks in the decoys, or feel the warmth of sunshine even as ice forms and expands to open water.

At the same time, there is effort and even annoyance in trudging through muck to reach a duck blind or wrapping decoys with half-frozen fingers. Discomfort often accompanies a hunt. Perhaps it is the combination of pain and pleasure that creates a truly memorable hunting experience.

Waterfowl hunting brings other rewards too. It strengthens bonds of companionship between parents and children, or friends. Most duck hunters learn more about a companion in one day on a marsh than several years of more casual acquaintance.

Waterfowl hunting satisfies an inner drive of tradition or instinct. I'm not sure which one. A hunter's anticipation of these experiences may be difficult for non-hunters to understand. It's hard to explain a loss of sleep and appetite the night before the duck opener.

As young waterfowlers mature, they accumulate fond memories of days afield with friends and faithful dogs. Memories of first days on the marsh bind us to the past and raise new expectations. Even during the off-season these memories are often relived while painting weathered decoys, reloading ammunition, or flipping through a photo album. Hunting days long past may be relived a thousand times over.

So waterfowl hunting is more than getting your limit of greenheads or scoring a large season kill. On the contrary, few waterfowlers take pleasure in the kill itself. They have reverence for the birds they hunt. They contribute to waterfowl habitat management with their time and money. A complete waterfowling experience includes watching the shifting clouds and the eager obedience of a well-trained retriever. It is reliving these hunts and renewing the ritual with a son or daughter that brings fulfillment.

To some it may mean more than this–but certainly nothing less.

Tim Smalley, MnDNR

Responsible waterfowl hunters find genuine happiness surrounded by cattails and open water with family and friends.

Natural History of Waterfowl—The Life Cycle

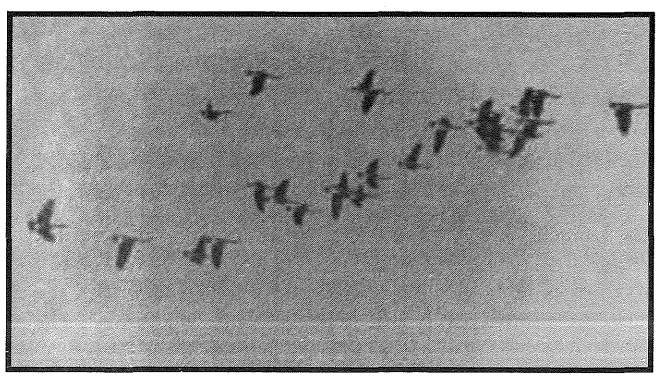
by Tony Rondeau

Like all creatures, waterfowl have seasonal as well as daily needs. Birds are at different life stages during each of the seasons. These stages include hens nesting in familiar surroundings, young of the year making their first flight, and the annual exodus to the wintering grounds. These patterns form the annual life cycle waterfowl must follow in order to survive.

Spring migration

The urge to return to the nesting area begins as early as late January. Mallards and Canada geese are typically the first to leave the wintering grounds, while ruddy ducks may not depart until well into March or April. The urge to migrate is triggered by increased day length and fat deposits amassed while on the wintering grounds. Increasing daylight stimulates the release of hormones which creates restlessness and the desire to select a mate. Fat reserves provide the energy required for the long flight north. If there is a shortage of food to build these fat stores, migration is delayed.

Ducks begin pairing on the wintering grounds, however, the selection process often continues as the birds move north. Geese usually retain their mates from the previous year. The destination of breeding pairs is determined by the female. She will usually return to her natal area or previous nesting location. As the birds approach the breeding grounds, courtship activity increases. Stops to feed during migration become shorter and pair bonds become much stronger.



United States Fish and Wildlife Service

Canada geese and mallards are the first to begin spring migration.

Minnesota is situated on the eastern edge of the Prairie Pothole Region, the principal waterfowl nesting area of North America. The length of the state (406 miles north to south) presents a range of spring weather conditions. Early arrivals may find open water on the Mississippi River and in the southern part of the state, while western prairie wetlands and northern lakes are still frozen. The sudden return of cold weather may concentrate early arrivals on a few areas of open water or even force a temporary southward movement.

Variable weather and local water conditions make it difficult to predict the arrival of spring waterfowl. Table 1 provides a range of dates when certain species are expected to arrive in west central Minnesota.

Temporary spring wetlands encourage a wider distribution of birds than is typically seen in the fall. Waterfowl use wetlands of various sizes and depths as they seek insects and other invertebrates. These food sources provide critically needed protein for nesting hens.

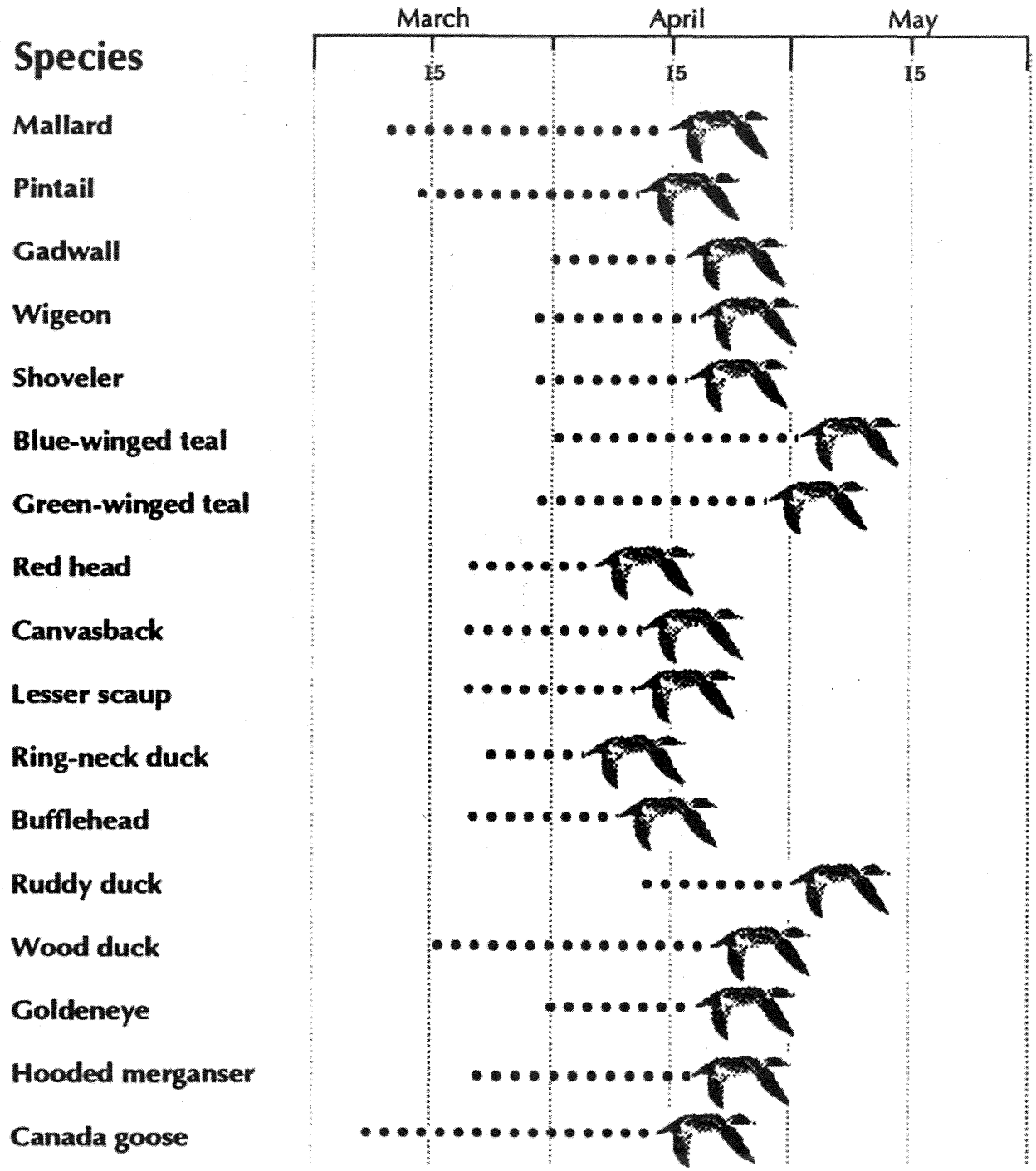
Breeding

Breeding chronology varies among species and often by habitat or latitude. Mallard and pintail, for example, begin breeding in early April, about a month before late nesting species such as blue-winged teal and gadwall. All species defend established territories against birds of the same species during feeding and courtship activities.

Breeding territories include wetlands of various size, permanence and vegetative composition. A need for protein rich food during the pre-nesting and egg

Table I

Arrival Chronology of Migrating Waterfowl in West-Central Minnesota



laying period prompts ducks to feed on aquatic invertebrates. Fairy shrimp, scuds, worms, and small snails are typical menu items. Animal foods compose 75–100 percent of a hen's diet during the breeding and nesting season. Peaks in the abundance of aquatic invertebrates differ among wetland types. Very shallow wetlands warm up first, and although they may be dry a few weeks later, they produce the most food during this critical time. Food abundance peaks later in more permanent wetlands, benefitting broods and molting adults. Each type of wetland plays an important role in the life cycle of waterfowl.

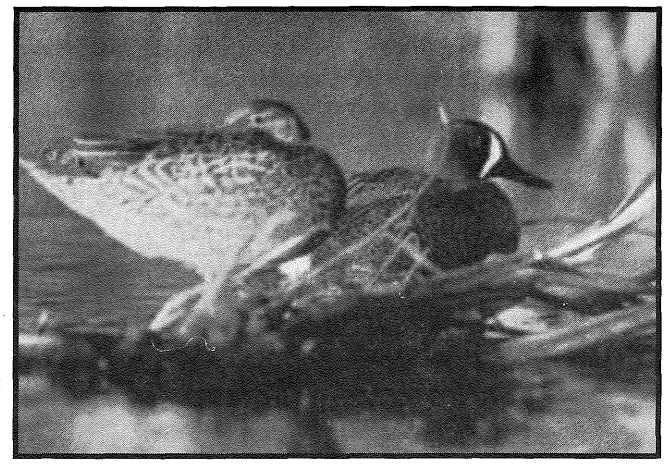
The small shallow wetlands also allow breeding birds to avoid others. The less they are disturbed, the greater the chance of breeding success. Drakes defend their territory from other pairs and unattached males while maintaining the bond with their mates.

During courtship drakes preen and display their brilliant spring plumage. Most of these displays are exaggerated forms of normal activities. Tail wagging, scratching, head throws, stretching, even feeding and drinking actions develop new meaning at this time of year.

Although the displays of diving ducks are often less complex than puddle ducks, courtship flights are a different story. Drake puddle ducks may leap into jump flights to gain attention from females, but diving ducks conduct these flights at break-neck speed, twisting and turning with a rush of wings, only to splash onto the water where the courtship ritual begins again.

Canada geese do not mate until they are at least two years old. Young geese break their family ties soon after spring migration and move to other areas. Some move only a few miles; others may travel hundreds of miles north on a migration. Mated pairs of Canada geese remain together through nesting and brood rearing, and will vigorously defend their territories. Nesting success, as well as gosling survival, is much higher than with most waterfowl species because of this strong pair bond and the selection of over-water and island nest sites.

Unlike Canada geese, most male ducks play no role in nesting or brood rearing. One day when the hen leaves her nest to feed or preen, she will find the male gone. The drake may be off attempting to mate with other hens or in a bachelor group, preparing for molt—a loss of primary feathers and temporary inability to fly.



Chuck Vukonich

Temporary spring wetlands provide abundant invertebrates, critical for the well being of breeding pairs.

Nesting and re-nesting

As waterfowl pairs complete the breeding cycle, hens search for secure nesting cover. This habitat must provide water, space, resting area, food, protective cover, and security from predators. The type of habitat used depends on the species. Canada geese typically use a muskrat lodge or other structure within small wetlands that have a good mix of open water and emergent cover.

Diving ducks prefer to nest over water in deeper marshes. Most diver nests are in stands of cattails or bulrush but some are on islands or floating vegetation. Most puddle ducks, like mallards, utilize fairly dense stands of grass or leafy vegetation in upland areas to nest. The mallard, however, is very adaptable and will sometimes build a nest on the edge of a wetland, muskrat lodge or artificial over-water nesting structure.

Several species of Minnesota waterfowl nest in tree cavities or artificial nest boxes. Wood ducks are the most familiar, but common goldeneyes and hooded mergansers are also cavity nesters, that are common in the forested portion of the state.

In Minnesota, the nesting period (including re-nesting) for all waterfowl species extends from the bitterly cold days of March to the steamy hot days

of July. The timing helps disperse some of the competition for limited food resources.

Most hens usually lay one egg a day (occasionally missing a day) until a clutch is complete. Clutch sizes vary but average between 9–12 eggs for ducks and 1–8 for geese. A late spring or inadequate food supply may result in smaller clutch sizes. Near the end of egg laying, the hen will pull down feathers from her breast and place it in the nest bowl. Incubation typically begins when the last egg or two is laid and ranges from 23 to 30 days.

Waterfowl nests can be destroyed by farming activities, but more are lost to predators like red fox, raccoon, skunk, mink or ground squirrels. In areas of Minnesota where predators are abundant and ducks are concentrated because of limited nesting cover, nest success may be less than 10 percent. Cavity and over-water nests have a somewhat higher success rate. Most ducks will re-nest if their first clutch is destroyed, especially during wet years when a diversity of wetlands and high protein food remains available. However, hens attempting second and third nests generally have fewer eggs per clutch. Hens that nest successfully will often return to the same area in subsequent years. Geese are generally less persistent in their re-nesting attempts.

Brood rearing

Newly hatched ducks and geese leave the nest 12 to 24 hours after hatching. The hen may lead the young a mile or more to water. Subsequent moves are not unusual as the birds seek better quality food and cover. Habitat used by broods differs among species. It must provide security from predators and adverse weather. Diving ducks seek open water where they can dive to escape danger. Puddle ducks, on the other hand, prefer relatively dense stands of emergent vegetation in which to escape predators.

Ducklings initially feed almost entirely on aquatic invertebrates. After about four or five weeks they supplement their diet with seeds and other vegetation. Goslings feed on succulent vegetation.

Because young waterfowl are unable to maintain a constant body temperature, they must be brooded periodically by the hen for the first two weeks of life. Even with plenty of attention, predators, exposure, and starvation can cause high mortality among ducklings. It is estimated that about 20 percent of waterfowl broods are lost entirely. Of those remaining, only about 50 percent of the young will survive to flight stage.

Ducklings grow fast, and can reach full size in only 7–10 weeks. Resident Minnesota goslings take several weeks longer to reach full size, but can fly about 60 days following hatch. Young waterfowl typically feed early and late in the day, and loaf at mid-day. Flight feathers are developed during the last two weeks of this growth period. Ducklings strengthen their flight muscles by rearing up and

Nesting Biology Comparisons in Minnesota

	Mallard	Canada Goose
Nest Initiation	May	April
Preferred nest site	Uplands—some islands, over water	Mostly over water, some islands, uplands
Nest vegetation	Tall, dense grass, sometimes shrubs	Generally open
Number of mates	May have several	Generally one—paired for life
Clutch size	9–12	4–7
Nest defense	none	Rigorous, both male and female
Nest success	Generally low	Generally high
Renesting	Generally yes—as many as five attempts	Generally no
Hen predation	Generally high	Generally no
Brood survival	Generally low	Generally high

Source: *Ducks, Geese, and Swans of North America.* Wildlife Management Institute.

beating their wings in the air. Soon each duckling will lift off the water for the very first time. Awkward at first, they quickly learn the aerial movements of the adults.

About this time, duck hens congregate and undergo a complete molt of their body feathers. During the molt, ducks lose the ability to fly for about a month. Canada goose pairs molt while tending their brood and regain their flight feathers about the same time goslings reach flight stage. High quality wetlands are critical for food and security while waterfowl are flightless. Following the molt, adult and juvenile birds concentrate in larger groups on marshes and shallow lakes serving as migration staging areas.

Pre-migration

Late summer flocks are often composed of many species, but when they move to staging areas the birds begin to sort themselves out. Feeding activities intensify, short flights strengthen muscles and drakes begin to develop colorful fall plumage. Geese and many of the puddle ducks begin to feed on waste grain and greens in agricultural fields.

Canada geese are attracted to large, open water areas where they regroup in extended family flocks. Ducks may wander, even flying into Canada or the Dakotas.

Fall migration

Waterfowl become restless during the waning days of autumn. Day length shortens and temperatures begin to drop. Biologists know that weather and day length trigger fall migration in most waterfowl. Blue-winged teal begin migration in September. Pintails are usually gone before the first hard frost. Mid-fall migrants include wigeon, ringnecks, gadwall, shoveler, canvasback, and redheads. These birds too, seem to have an internal clock that prompts them to leave about the same time each year. On the other hand, Canada geese, scaup, goldeneye, and most mallards are the last to leave the breeding grounds, usually lingering until freeze up. Even then, many will only move far enough south to find open water and food.

Ray Norrgard

Weather and day length trigger fall migration in most waterfowl. Scaup are among the last to leave the breeding grounds.

Ray Norrgard

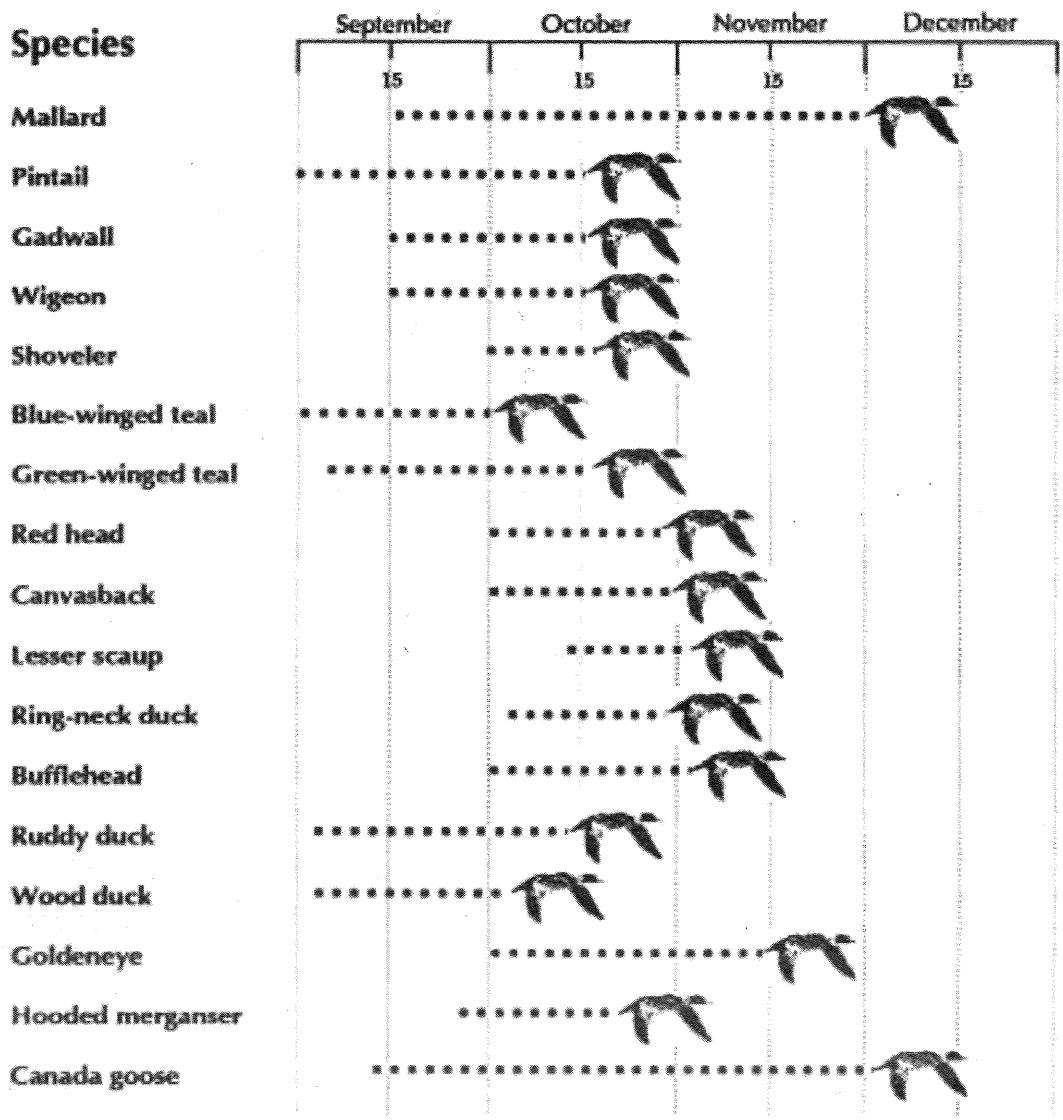
Prime waterfowl production habitat includes a variety of wetland types combined with secure upland nesting cover.

Most waterfowl begin their migration at dusk. Ducks migrate almost exclusively at night but will continue into the day if they have not reached suitable habitat. Canada geese, however, continue their migratory flights throughout the day. Ducks and geese recognize familiar landmarks when homing to breeding and wintering grounds and seem to use them as directional aids. Lake Christina in western Minnesota, Swan and Heron lakes in the southern half of the state, and the Mississippi River Valley are good examples. It is also believed that waterfowl use star position for navigation. Even the Earth's magnetic field may provide some guidance.

The chronology of some of the more common species of waterfowl moving through western Minne-

Table 2

Fall Migration Chronology of Waterfowl in West-Central Minnesota



sota during the fall of the year are displayed in Table 2.

Waterfowl use several corridors to traditional wintering areas when they leave their staging areas. One of the best examples of this is the Mississippi River from mid-Iowa to mid-Missouri. From these points, migrants generally set their course for individual wintering areas. Most ducks from our area head toward the Gulf Coast. Some species, however, migrate to the east or west coasts, or in the case of blue-winged teal, to Central or South America. Minnesota has several thousand Canada geese and mallards that do not migrate, or migrate only a very short distance.

Wintering grounds

By mid-December, fall migration is essentially complete. It is important to remember that even though only about 30 percent of North Americas waterfowl are produced in the United States, most either winter here or pass through on their migration to more southern destinations.

Winter habitat needs of waterfowl vary by species, requiring a wide diversity of habitats and available food. Some species are flexible, while others have more specific requirements and must move about the wintering grounds to meet their needs.

Mallards seem to be at home anywhere there is open water and plenty of food. They feed in the corn and small grain fields of Kansas and Nebraska, rice fields in Texas and California, coastal marshes along the eastern seaboard, and flooded pin oaks along the Mississippi River bottoms.

Redheads winter along the Gulf of Mexico, principally on the Laguna Madre in Texas, where they feed extensively on aquatic plants. Scaup, on the other hand, prefer the open waters of the Gulf.

Canada geese over winter in many areas of the country. Minnesota has several local flocks which remain throughout the entire year. Grain, particularly corn, becomes an important part of their diet during this time. Because most geese are paired (not the Canada goose undertaking courtship activities) and have a large body size, they are less subject to winter-related stress than ducks.

The quality of winter habitat affects waterfowl survival and the condition of the birds that return in the spring. Waterfowl must arrive at the nesting grounds with high energy reserves for successful reproduction.

Tony Rondeau

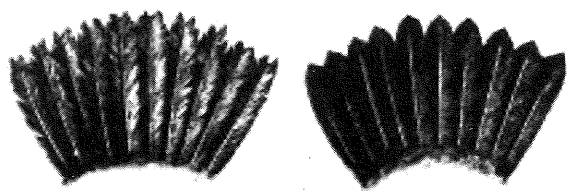
Cornfields and other cropland are important sources of food for wintering geese.

Marsh Notes

Young Bird or Adult?

When you retrieve a duck or goose, take a moment to examine it.

Look at the tail feathers of your bird for notches near the midvein. These notches are produced when down feathers break off the tips of the first tail feathers. If notches are present your bird is less than one year old. If no notches are present the bird may be an adult, or a juvenile that has already replaced its first tail feathers with new ones.



Juvenile Tail

Adult Tail

A Glimpse at History

Year	
1000	• Native Americans hunted over decoys. Minnesota was a waterfowl paradise of prairie wetlands, beaver ponds, and wild rice lakes.
1600	• European immigrants were impressed by the numbers and diversity of North American waterfowl. Wild game was a household staple. Thomas Morton, a New England hunter, reported that the profit from one week's take of feathers alone paid for an entire year's supply of ammunition.
1800	• Market hunting was an honorable, well-paying, but sometimes dangerous profession. (1820)
	• Refinement of the percussion firearm and use of live decoys led to a dramatic increase in waterfowl harvest. (1820)
1850	• Drainage of wetlands was promoted socially, legally, and politically.
	• Breech loading shotguns with choked barrels joined the market hunter's arsenal.
	• Railroad lines and freezers helped put waterfowl on the tables of every fashionable restaurant. Heron Lake, Minnesota, attained a national reputation for canvasback concentrations. (1870)
	• The first waterfowl hunting laws took effect. Minnesota outlawed spring shooting, artificial lights, night shooting, and, for a time, artificial decoys. (1870)
	• Searing drought, repeating shotguns, smokeless powder, and a ready market for birds took its toll as waterfowl populations plummeted. (1890)
	• Carp began habitat destruction as they invaded every suitable watershed in the country. Minnesota established the first daily bag limits for waterfowl. (1890)
	• The Minnesota legislature provided the first salaried game wardens. (1891)
1900	• Congress passed the Lacey Act prohibiting interstate sale of wildlife contrary to the laws of the states. Minnesota prohibited market hunting. (1901)
	• Minnesota required a $1 license to hunt small game and waterfowl (1903) and prohibited the use of dogs for waterfowl hunting. (Repealed in 1911)
	• The federal government published *Distribution and Migration of North American Ducks, Geese, and Swans* by W. W. Crooke, preparing the way for scientific management. (1906)
	• Shotguns larger than 10-gauge were outlawed for waterfowl hunting. (1919)
1920	• The U. S. Supreme Court upheld the Migratory Bird Treaty Act, removing barriers to federal management of waterfowl. The federal government established a 25-bird daily bag limit. (1920)
	• The first large-scale banding of waterfowl was conducted by Frederick Lincoln, U. S. Biological Survey. This work led to the flyway concept and scientific population management. (1922)
	• The Upper Mississippi National Wildlife Refuge was established. It was the first refuge established through the purchase of private land, and it remains one of the largest. (1924)
	• Minnesota law limited the use of live decoys to six at any one blind. (1925)
	• Aldo Leopold promoted active wildlife management and protective laws. (1925)
	• Minnesota Congressman August Andresen broke a congressional deadlock to pass the Migratory Bird Conservation Act, providing funds to expand the National Wildlife Refuge System. (1929)
	• American Waterfowlers, the first national organization devoted to waterfowl conservation was formed. (1929)
1930	• A great drought gripped the nation, afflicting people and wildlife.
	• Minnesota established the Department of Conservation. More than 200,000 small game licenses were sold annually for the first time. (1931)

Year	
1930 (Cont'd.)	• Congress passed the Migratory Bird Hunting Stamp Act. The first "federal duck stamp" sold for a dollar. (1934)
	• Minnesota reduced the length of the waterfowl season to 30 days and delayed the opener until October 21. (1935)
	• The first major survey of the continental waterfowl breeding grounds was conducted. (1935)
	• Mexico signed a migratory bird treaty with the U.S. (1936)
	• The Pittman-Robertson Federal Aid in Wildlife Restoration Act passed congress. The 11 percent excise tax on guns and ammunition goes to wildlife projects. The Carlos Avery Wildlife Management Area in Minnesota was among the very first projects funded. (1937)
	• Ducks Unlimited was formed from the merger of American Wildfowlers and More Game Birds in America. (1937)
	• The first permits were required for some types of work in public waters in Minnesota. (1937)
	• More than 100,000 federal duck stamps were sold in Minnesota for the first time. (1938)
	• The U. S. Fish and Wildlife Service was created from the U.S. Biological Survey. (1939)
	• The Delta Waterfowl Research Station was established at Delta Marsh, Manitoba.
1940	• Conservation took a back seat to the world drama of war.
1945	• Federal duck stamp sales in Minnesota exceeded 175,000 for the first time. More than 2 million birds were harvested during the 45-day season. (1946)
1950	• North American Flyway Councils were formed to recommend annual waterfowl hunting regulations. (1951)
	• Wetland drainage was rampant because the federal government encouraged, assisted, and financially supported the conversion of wetlands to other uses. (1950s)
	• The annual Minnesota waterfowl harvest topped 2 million birds for the last time. (1951)
	• Minnesota established the "Save the Wetlands" acquisition program–the first of its kind in the nation. (1951)
1955	• A $1 surcharge on Minnesota small game licenses was established to purchase wildlife management areas. (1957)
	• The Save the Wetlands Club was started in Fergus Falls to purchase wetlands to protect them from drainage. (1957)
	• The Minnesota waterfowl harvest dropped below 1 million birds. (1959)
1960	• Congress authorized the U.S. Fish and Wildlife Service to purchase waterfowl production areas through a loan against future duck stamp sales. (1961)
	• Giant Canada geese, once thought to be an extinct subspecies, were "discovered" by Harold Hanson at Rochester, Minnesota. Successful restoration efforts have increased giants throughout the country. (1962)
1965	• More than half of the prairie wetlands in the U.S. had been drained.
	• Major oil spills on the Mississippi and Detroit Rivers killed thousands of waterfowl. (1967)
	• The Minnesota Waterfowl Association began to restore waterfowl habitat. (1967)
	• The Minnesota Department of Natural Resources was authorized to do cooperative wetland projects on private land. (1967)
	• 48,000 acres of wetlands were drained in western Minnesota in just four years. (1968)
	• The Minnesota Waterfowl Association successfully pushed legislative authority for the Wildlife Lake Designation Program, allowing management of some important waterfowl lakes. (1969)
1970	• The federal government pushed for expansion of crop land. Despite the establishment of the Federal Waterbank Program in 1971, more than one-fifth of wetlands inventoried in Minnesota in 1974 were drained by 1980.
	• The Minnesota Waterfowl Association began cooperative wetland restoration on private land. (1974)

Year	
1975 (Cont'd.)	• Congress passed The Clean Water Act, affirming the U.S. Army Corps of Engineers' responsibility to protect wetlands under "404" permitting. (1977)
	• The Minnesota Waterfowl Association pushed through the legislative authority to establish a state waterfowl stamp. (1977)
	• The Minnesota Legislature required a public waters and wetlands inventory and permitting system to expand wetland protection. (1979)
1980	• Ducks Unlimited set up a U.S. Habitat Program in Minnesota, North Dakota, South Dakota, Montana, and Alaska. (1984)
	• The U. S. Fish and Wildlife Service initiated wetland restorations on private land with financial support from Ducks Unlimited and the Minnesota Waterfowl Association. (1984)
1985	• Ducks Unlimited began the "MARSH" waterfowl habitat program throughout the U.S. (1985)
	• Congress enacted the "Farm Bill," providing for millions of acres of Conservation Reserve (CRP) land. "Swampbuster" provisions strengthened wetland protection. (1985)
	• The North American Waterfowl Management Plan was signed by Canada, the U.S., and Mexico to pledge cooperative efforts in waterfowl conservation. (1986) Mexico formally joined in 1988.
	• The Emergency Wetland Resources Act provided additional congressional funds for wetland restoration. (1986)
	• Continental waterfowl populations dropped to their lowest point since 1935. (1986)
	• The National Wetlands Forum documented the broad public benefits of wetlands and continuing losses. (1986)
	• Steel shot was required statewide for Minnesota waterfowl hunters. (1987)
1990	• President George Bush committed (albeit temporarily) to a national no-net-loss wetland policy. (1990)
	• Minnesota passed "No Net Loss" wetland legislation. (1991)
	• A national Wetland Reserve Program was piloted in Minnesota, Wisconsin, Iowa, Missouri, Mississippi, and Louisiana as part of the "1990 Farm Bill." (1993)
	• 300,000 ringnecks congregated at one time on Drumbeater Lake, a 367-acre waterfowl refuge. (1993)
	• Concern continues that the nation's waterfowl populations cannot fully recover without significant changes in land and water management. (1994)

Waterfowl Management

by Tony Rondeau and Jeff Lawrence

Introduction

For thousands of years, waterfowl populations have fluctuated. Abundant wetlands during wet periods allowed increased production of young. Drought had the opposite effect. Because adult waterfowl tend to be relatively long-lived, enough breeding birds survived the droughts to rebuild the population when habitat conditions improved.

The majority of North America's waterfowl are raised on the vast prairies of what is now known as the Prairie Pothole Region. Extending from Iowa through western Minnesota, the Dakotas, eastern Montana, and the Canadian provinces of Manitoba, Saskatchewan, and Alberta, this area was also destined to provide rich farmland. The plow and the gun both had an impact on waterfowl populations.

We were well into the twentieth century before we were able to influence any real control over hunting harvest. The effects of the plow have been much more difficult to address. Although waterfowl populations still rebound during wet years, the peaks fall far short of the abundance witnessed just decades ago.

The size of any population is determined by the delicate balance between birth and death. Enough ducklings hatched and raised to flight stage must survive as breeding adults to offset breeding birds that have been lost. Known as 'recruitment', this principle guides hunting regulations and habitat programs.

Habitat management

Prime waterfowl breeding habitat is a diverse mixture of fertile wetlands and secure upland nesting cover. Wetland types should range from shallow, seasonally flooded types to larger, more permanent basins. Puddle ducks favor smaller seasonal marshes during the breeding season while many diving ducks and Canada geese prefer larger more permanent wetlands. Unfortunately, seasonal wetlands have been most likely to have been drained. Almost 90 percent of Minnesota's prairie wetlands have been lost to agriculture, roadways, and numerous forms of development.

To counteract those losses, wetland managers have developed programs to protect and manage the remaining wetlands with broad-based legislation, outright purchase or some from of long-term easement. In recent years, the practice of wetland restoration has gained more and more acceptance as a tool to improve ecosystem integrity and manage duck habitat.

Extensive stands of native prairie once provided the secure nesting cover needed by species such as mallard, teal, pintails, and gadwall. Wolves and coyote were primary predators and waterfowl accounted for only a small part of their diet. Nest predators such as red fox and raccoon were scarce in the presence of larger carnivores. During the conversion of 99 percent of Minnesota's native prairie to crop-

Lowell Washburn, Iowa DNR

The red fox is the primary predator of ground nesting waterfowl in Minnesota. It is estimated that they kill almost 1 million nesting hens in the entire Prairie Pothole Region each year.

land, the prairie wolf followed the bison into history. Red fox, raccoon, and skunk did well in the expanding farmland. In addition to farm grain, rodents, and insects, these predators consumed numerous duck eggs and hens incubating eggs in the remaining grassy cover.

Consolidation of wetlands, polluted runoff, and rough fish have degraded prime migration habitat. Reduced food supplies resulting from this degradation concentrates migrants on fewer and fewer wetlands. This has a considerable impact on bird distribution and their vulnerability to environmental catastrophes and lethal disease outbreaks.

Numerous land and water management programs have been implemented to increase duck populations and habitat use by restoring nesting cover and reducing predation rates on nesting waterfowl and restoring breeding and migration habitat. Collaborative partnerships with other land management agencies, the private sector and retirement of highly erodible farmland have been successful in recent years. Programs such as Reinvest in Minnesota (RIM), the Conservation Reserve Program (CRP), the North American Waterfowl Management Plan (NAWMP), and others have directed considerable support to the conservation of waterfowl habitat in Minnesota.

Population management

Background

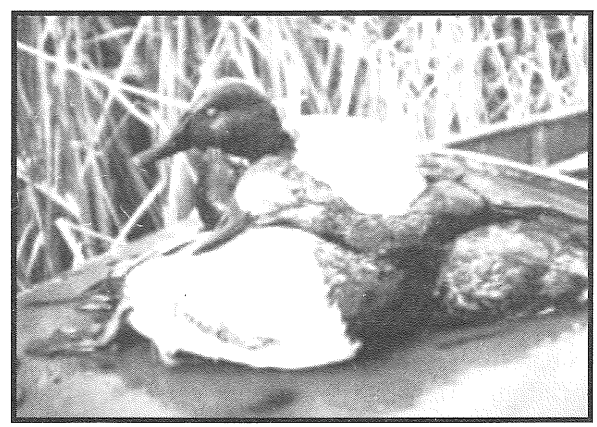
The migratory nature of waterfowl, unlike many other game species, complicates management of the harvest. North American waterfowl are harvested in Canada, the United States, Mexico, and some species in Central and South American countries. Treaties between the U.S., Canada, and Mexico, establish the basis for setting regulations. Waterfowl seasons begin as early as September 1 in Canada (and some special hunts in the U.S.), and do not end until January or February in the southern states and Mexico.

Waterfowl have high reproductive potential and under good conditions a female can lay a large number of eggs and produce several young. Historically, nesting and brood success was high, and many waterfowl species produced a large harvestable surplus. Due to lack of nesting cover, high predation rates, recurring drought, and other factors, the recruitment of young into the population has declined. To maintain or increase waterfowl populations under these conditions, total annual mortality must be reduced.

Annual survival rates for mallards have averaged 60 percent for young, 56 percent for adult females, and 65 percent for adult males in the 1980s. Historically, about 50 percent of the annual mortality was due to hunting; however, since restrictive regulations were implemented in 1988, only 45 percent of adult male and 12 percent of adult female mortality is due to hunting. Most losses of males occur during the fall, due to hunting, disease, lead poisoning, and other factors. However, most losses of females occur during the spring and summer. Females are especially vulnerable to predation when nesting. It is estimated that red foxes kill almost 1 million nesting female ducks in the Prairie Pothole Region each year.

While there are many causes of annual mortality, we have the most direct control over hunting mortality. Disease losses can be reduced in some cases through habitat management, and predation can be reduced through habitat or predator management. But, hunting mortality is the only factor we can influence on an annual basis to affect population status.

In addition to waterfowl that hunters bag and take home, there are also non-retrieved losses. It is estimated that about 20 percent of the total duck or goose kill is not retrieved. While some of these losses are unavoidable, hunters can improve their performance and increase their success at retrieving downed waterfowl by:

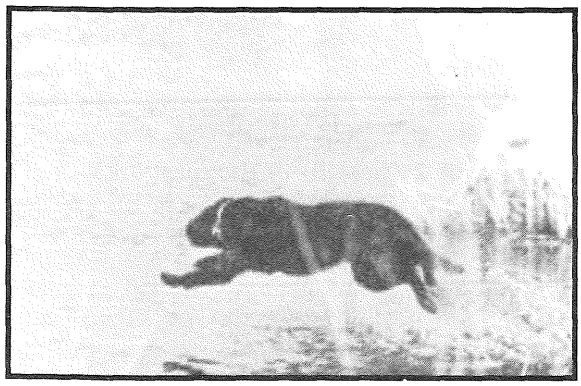


Chuck Kartak

Hunting regulations are necessary to avoid overharvest of waterfowl. Canvasbacks are particularly vulnerable.

- Patterning their shotguns and knowing how their guns perform with different shot and loads.
- Practicing prior to the season by shooting clay targets. Hunters who can center the duck or goose in their patterns will dramatically increase chances of a clean kill.
- Learning to estimate range and only shooting at birds within their effective range. Effective range depends upon the gun, shotshell load, hunter skill, and a variety of other factors; however, it is rarely greater than 50 yards.
- Employing techniques that attract birds closer. These include calling, using decoys, and good camouflage.
- Planning shots so the birds will fall in an area where they can be readily retrieved.
- Using a trained retriever.

Other sections of this handbook detail techniques that will help hunters improve their performance, and retrieve more downed waterfowl.



Mitch Anderson

Using trained retrievers and only shooting within effective range dramatically reduces unretrieved losses.

Information and databases

To effectively manage waterfowl populations, it is important to have some measure of population size, recruitment of young into the population, mortality, and causes of mortality. Establishing this information base is extremely important to ensure that appropriate hunting regulations are set each year.

Breeding waterfowl and habitat surveys are conducted each May by the U.S. Fish and Wildlife Service, Canadian Wildlife Service, and several states throughout the majority of waterfowl breeding habitat in North America. These surveys are conducted by counting ducks from airplanes along established transects. Ground crews obtain complete counts on a sample of the transects, so biologists can correct for birds not seen from the air. Wetlands are also counted to provide an index of habitat conditions. The Minnesota Department of Natural Resources cooperates with the U.S. Fish and Wildlife Service to survey waterfowl in the better breeding habitats in Minnesota. July waterfowl production and habitat surveys are also flown to estimate the number of waterfowl broods and summer habitat conditions.

Annual waterfowl banding provides information on migration routes, harvest pressure, mortality, and other information. Currently, over 100,000 ducks, mostly mallards, blue-winged teal, pintail, wood ducks, and black ducks, are banded prior to the waterfowl season each year. A portion of waterfowl hunters and others report retrieved bands, providing essential information for waterfowl population management. Occasionally, special markers like Canada goose neckbands are used to provide additional information on distribution and survival of the birds.

Hunters are surveyed by the U.S. Fish and Wildlife Service following the waterfowl season each year to provide an estimate of total duck and goose harvest. In addition, a sample of hunters is asked to send in one duck wing or one goose tail from each bird they harvest in order to determine species composition, age, and sex in the harvest.

Fall and winter migration surveys provide information on waterfowl distribution each year. A coordinated January waterfowl count ensures that all state and federal agencies conduct counts during the same week.

Combined, these databases provide the basic information essential to set annual waterfowl regulations that are based on waterfowl population status, hunter activity, and harvest.

Establishment of waterfowl regulations

Waterfowl regulations are set by a complex process, yet one that allows input from many private and public groups before final regulations are implemented. Within the basic constraints of the Migra-

tory Bird Treaty Act between the U.S. and Canada, the U.S. Fish and Wildlife Service sets season frameworks, within which each state can set its annual hunting season regulations.

States each have one voting representative on one of the four flyway councils. Minnesota is a member of the Mississippi Flyway Council, consisting of the10 states bordering the Mississippi River and Michigan, Indiana, Ohio, and Alabama. In addition, Ontario, Manitoba, and Saskatchewan participate, but do not vote on U.S. regulations issues. The councils each have a technical section, comprised of biologists who make recommendations to the councils. States submit proposals on specific regulation changes (e.g. goose zones) to the flyway councils, who vote on the acceptability of the proposals and recommend basic season frameworks. The council meets two times each year, in March and July, to act on regulatory issues. These recommendations are then submitted to the U.S. Fish and Wildlife Service.

Final information on the status of waterfowl populations is not available until July 25 each year. Following announcement of this information, the councils make their recommendations to the U.S. Fish and Wildlife Service in early August. There is also a public meeting held each year to receive input from concerned individuals, conservation organizations, anti-hunting organizations, individual states, and others who have comments on the proposed regulations. Comments are also received in writing. After receiving input, the Director of the U.S. Fish and Wildlife Service submits recommendations to the Secretary of the Interior, who has final approval. Once approved, the Service publishes the final frameworks (for example, earliest opening date and latest closing date, number of days, bag limit, and zones) in the *Federal Register*. States select their seasons within these frameworks. States may choose more restrictive regulations than those published in the *Federal Register*.

The process of proposed regulations, public input, and final regulations must be completed prior to the opening of waterfowl seasons. Waterfowl regulations are often announced later than other hunting regulations so waterfowl population status and public and state input can be considered in the decision making process.

Waterfowl regulatory tools

The basic tools used to regulate harvest include season length (number of days of hunting) and bag limit (number of birds that can be taken). In addition, a variety of other tools have been imposed to allow for fair chase, including no hunting over bait or live decoys, no more that three shells in a shotgun, no shotguns larger that 10-gauge, and many others. All states within a flyway have the same number of regular duck season days and the same bag limit.

Some states select zones or splits to time their duck and goose seasons according to peak migrations or to protect specific population segments. For example, the West Central Goose Zone in Minnesota is designed to regulate harvest on the Eastern Prairie Population of Canada geese, that nest on the west coast of Hudson Bay and migrate through Manitoba, Minnesota, and Iowa. Lac qui Parle is a major migration staging area for these geese en route to their wintering grounds in Missouri.

Waterfowl harvest in Minnesota

Minnesota is one of the top duck harvest states in the U.S., typically fourth or fifth in total duck harvest after Louisiana, California, Texas, and sometimes Arkansas. Minnesota's duck harvest during the restrictive regulation period in the late 1980s and early 1990s has ranged from 250,000 to 500,000. In some years of abundant duck populations, Minnesota has harvested over 1 million ducks. The top species in Minnesota's duck harvest is the mallard (about 33 percent or the harvest) followed by the wood duck (about 15 percent of the harvest). Depending on the year, either ring-necked ducks, green-winged teal, lesser scaup, or blue-winged teal are number three, four, or five in abundance in the bag.

In recent years, Minnesota has also ranked among the top states in Canada goose harvest, along with Wisconsin, Illinois, and Maryland. Canada goose harvest has been 150,000 per year during the late 1990s. The Canada goose will likely increase in the waterfowler's bag, with the continuing upward trend in population.

Waterfowl Hunter Behavior and Safety

Hunting behavior

> *Shall the Minnesota Constitution be amended to affirm that hunting fishing and taking of game and fish are a valued part of our heritage that shall be forever preserved for the people and shall be managed by law and regulation for the public good?"*
> —Question on the Minnesota General Election Ballot, November 1998

On election day, November 1998, 1,567,844 Minnesotans, (77.2 percent of those who voted) said *yes*, that hunting and fishing in Minnesota are important enough activities to protect them by including language in the Minnesota Constitution to do so. Hunters need not be concerned about their right to hunt, right? 461,179 people on the same day said *no*. Even with protection from the amendment, hunters need to be aware that there are those who oppose the action of hunters and/or are against hunting. Hunters need to know how to conduct themselves in order to continue to be accepted by the people of Minnesota.

People are judged by their actions. How we behave and how we follow the rules affect other people. Rules are developed to be followed. As a hunter, you must be aware of how your personal behavior and activities, as well as the actions of your companions, will affect others.

When driving a car, we are expected to drive carefully following the rules of the road. When we play any sport we are expected to follow the rules of the game. Hunters, too, are expected to behave responsibly while hunting—to hunt according to the rules.

Many of our rules are in the form of game laws which are designed to fulfill one or more of three basic needs:

1. To protect people (hunters and non-hunters) and property.
2. To provide equal hunting opportunities for all hunters.
3. To protect game populations.

Other rules are unwritten. They are referred to as ethics and can be defined as a standard of behavior or conduct that the individual believes to be morally correct.

Usually, if a large number of the population (a group of hunters, for example) believes in the same ethic, then they have it made law by the governing body—the state legislature in the case of game laws. It is the lack of good ethics on the part of a few individuals who call themselves hunters, that create the need for ethics becoming laws. As laws multiply, so do restrictions. Such restrictions can lead to excessive control that spoils hunting.

Because each game species has different habitats, the species that a person hunts may require a special set of ethics. Therefore, each hunter must develop his or her own ethics for the game they are hunting.

Future opportunities to enjoy hunting in Minnesota will depend upon the hunter's public image. If hunters are viewed as "slobs" who shoot up the countryside, vandalize property, and disregard the rights of landowners and citizens, they will lose the privilege to hunt on private land, and public land as well. However, if an increasing number of hunters follow the honorable traditions of their sport and practice a personal code of hunting ethics which meets public expectations, the future of hunting will be assured.

A real threat to hunting today is the way it is being promoted and increasingly thought of as a competitive event. The escalating win/lose fever resulting from competition can only serve to discourage restrain and encourage risk-taking. Until hunters make it very clear that hunting is not competitive as are the shooting sports, there will continue to be accidents and unacceptable hunter behaviors.

To make hunting safe and place it in its proper perspective, hunting should most appropriately be thought of as a ritual, or rite. Webster's dictionary defines rite as "a ceremonial or formal solemn act, observance or procedure in accordance with prescribed rule or custom,...." To suggest that hunting should be a solemn act demonstrates respect. "In accordance with prescribed rule," affirms the importance of learning and following the rules. By following rules, hunters eliminate unnecessary risk. Risk-taking need not, or should not ever be, a part of the hunting ritual.

Definition of ethics and laws

Ethics are standards of behavior or conduct which are considered to be morally right. Ethics begin with an individual's standard of behavior. Each individual must make a personal judgment about whether certain behavior is right or wrong. If we believe that a specific action is morally right, then it is ethical for us to act that way.

For example, if a hunter truly believes that it is right to shoot a duck with a shotgun while it is sitting on the water, then it is ethical for that particular hunter to do so. The hunter's behavior is consistent with his or her personal code of ethics. If, however, a hunter believes it is wrong to shoot a sitting duck, then it would be wrong to do so. Such action would not be ethical.

Most hunters have a personal code of ethics which is very similar to the laws which are associated with hunting. Usually, hunters agree that the hunting laws are fair and just, and find these laws easy to obey.

Personal code of ethics

Personal ethics are "unwritten laws" which govern your behavior at all times–when you are with others, and when you are alone. They are our personal standard of conduct. Our personal code of ethics is based upon our respect for other people and their property, for all living things and their environment, and our own image of ourselves.

"The hunter ordinarily has no gallery to applaud or disapprove his conduct. Whatever his acts, they are dictated by his own conscience rather than by a mob of onlookers."—Aldo Leopold

The basis of a personal code of ethics is a "sense of decency." You must ask yourself repeatedly, "What if someone else behaved the way I am—would I respect that person?"

Many of us probably developed a personal code of ethics long before we became hunters. Because we want the respect of our parents and family, our friends and neighbors, we develop a standard of acceptable behavior. Some of us went on hunting trips, even before we were old enough to hunt and learned what was acceptable from the example of others.

However, in today's common, single-parent families, many beginning hunters do not have a role model to guide their development of hunting ethics. Also, because only about three percent of the population lives in a rural setting, many hunters do not have opportunities to begin hunting until they are in their late teens and early twenties. When they do, they may begin with others of their age and hunting experience. Without an experienced hunter to help form their hunting ethics, they may not know what is best for them and hunting.

Hunters must be willing to reconsider their hunting ethics. This may require changes in attitude and behavior. Concerned, experienced hunters are needed to assist less experienced hunters in "doing what is right." Positive role models will ensure good hunting traditions for the future.

Positive Role Model

Hunting enthusiasts and "role models" are needed in Minnesota today. POSITIVE ROLE MODELS will do more for hunting than laws and regulations. This may require hunters to refuse to go along with certain members of their party or even to change hunting groups.

Are you a **Positive Role Model**?

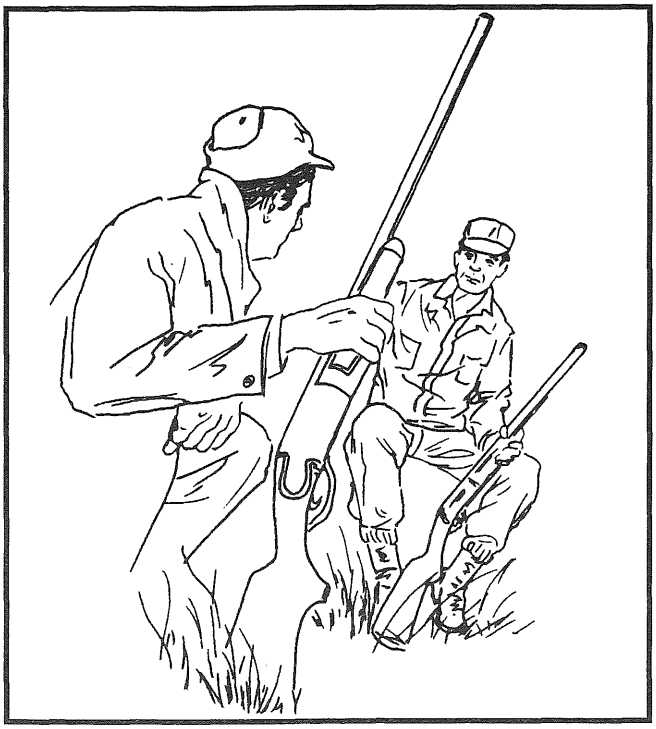
Stages of the hunter

Your personal code of ethics and your hunting behavior may change through the years. Research has found that it is usual for a hunter to go through five expectation stages.

1. First is the "shooter stage"— time when shooting the firearm or bow is of primary interest.
2. Next is the "limiting-out stage"—when the hunter wants, above all, to bag the legal limit of game he or she is entitled to.
3. The third stage is the "trophy stage"—the hunter is selective, primarily seeking out trophy animals of a particular species.
4. Next is the "technique stage"—the emphasis is on "how" rather than "what" they hunt.
5. The last stage is called the "mellowing-out-stage"—this is a time of enjoyment derived from the total hunting experience: the hunt, the companionship of other hunters, and an appreciation of the outdoors.

When hunters mellow out, bagging game will be more symbolic than essential for their satisfaction. This hunter does not hunt to kill, but rather kills to have hunted.

Hunters' personal codes of ethics will change as they pass through each of these five stages—they often become more strict and impose more constraints on their behavior and actions when hunting. These self-imposed restrictions, however, will add to the enjoyment of the hunting experience.



Each hunting season, ethical hunters invite novice hunters to accompany them in the field. They take the time to share their hunting knowledge with their companions and introduce them to the enjoyment of hunting.

Responsible hunters appreciate hunting more. Only they understand the new sense of freedom and independence that comes from hunting legally and responsibly.

Ethics for consideration

Many people have proposed ethical standards which they feel should be adopted by all hunters. Some are presented for your consideration. Consider each ethic carefully. Decide whether it is right or wrong in your opinion. If it is right, incorporate it into your personal code of hunting ethics and practice it when afield. In the final analysis, your standards of conduct while hunting will be the true indicator of your personal code of ethics.

Hunter-landowner relations

Responsible hunters realize they are guests of the landowner while hunting on private land. They make sure they are welcome by asking for permission before they hunt. On the rare occasions when permission is denied, they accept the situation gracefully.

To avoid disturbing the landowner early in the morning, a responsible hunter obtains permission to hunt on private land ahead of time.

While hunting, the responsible hunter takes extra care to avoid disturbing livestock. If hunting with a dog, special precautions should be taken to ensure it does not harass cattle, chickens, or other farm animals. Disturbances can cause dairy cows to reduce their milk production, and poultry may crowd together in the chicken coop and suffocate. Beef cattle can suffer a weight loss costly to the rancher.

Responsible hunters leave all gates as they find them—and if closed, they make sure the gates are securely latched. They cross fences carefully and avoid loosening the wires and posts. They only enter on the portions of private land where the owner has granted permission to hunt. They never assume they are welcome on private property simply because other hunters have gotten permission to hunt there.

Responsible hunters avoid littering the land with sandwich wrappings, pop cans, cigarette packages

or other garbage, including empty casings, empty shell boxes, and shells.

They never drive or walk through standing crops, nor do they send their dog through them. When driving across pastures or plowed fields, they keep their vehicles on the trail or road at all times. They understand that the ruts left by vehicles on hillsides can cause serious soil erosion. They hunt as much private property on foot as possible. When parking their vehicle, they are careful not to block the landowner's access to buildings, equipment, and roadways.

If they see anything wrong on the property such as open gates, broken fences or injured livestock, they report it to the landowner as soon as possible.

Responsible hunters limit the amount of game they and their friends take on a landowner's property. They realize the landowner may consider several bag limits as a sign of greed.

Unless they are close personal friends of the landowner, responsible hunters do not hunt on a specific farm or ranch more than two or three times each season. They do not want to wear out their welcome.

Before leaving, they thank the landowner or a family member for the privilege of hunting the property and they offer a share of their bag if they have been successful. In appreciation for the landowner's hospitality, a thoughtful hunter offers to help with chores. If the offer is accepted, they cheerfully pitch bales, mend fences, fork manure, etc . They may even use their special skills such as plumbing, mechanical ability, painting or carpentry.

If they own property elsewhere such as a farm, ranch or lake cottage, responsible hunters will invite their host to use them. They note their host's name and address and send a thank you card in appreciation for the landowner's hospitality.

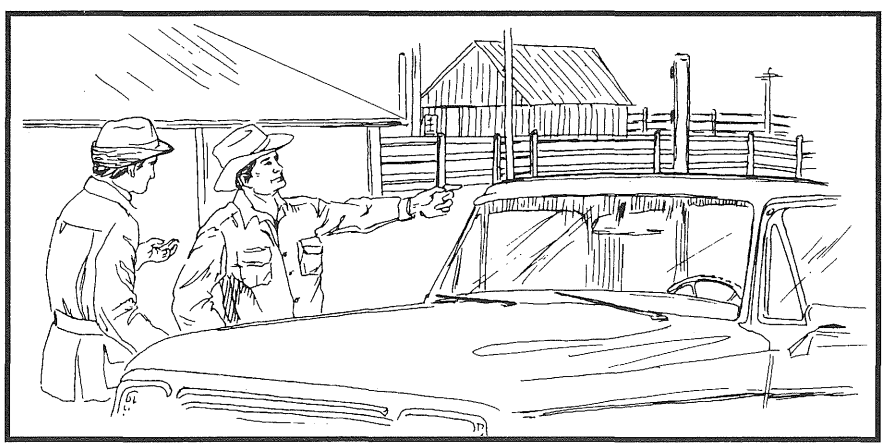
Remember, a landowner has no respect for trespassers. It only takes a moment to request permission and you may be able to come back again.

Regard for other people's feelings

When hunting on public lands, responsible hunters show the same respect for other users of the land and their property as they show for landowners on private land.

They hunt in areas where their activities will not conflict with other's enjoyment of the outdoors. And they treat the land with respect—being careful not to litter or damage vegetation. They limit the use of vehicles to travel to and from their hunting area, always remaining on trails or developed roadways.

They know that alcoholic beverages can seriously impair their judgment while hunting. They restrict drinking to the evening hours after the firearms have been put away. Even then, they drink in moderation to be sure that their actions do not offend others.



Responsible hunters respect the right of landowners and get permission to hunt on private land. These hunters ask and find out what they can and cannot do while hunting as a guest of the landowner.

Responsible hunters recognize that many people are offended by the sight of a bloody deer carcass tied to vehicles or a gut pile lying in full view of the road. People may also be put off if hunters parade vehicles through a campground or the streets of a community with a gun rack full of firearms. Having respect for the feelings and beliefs of others, responsible hunters make a special effort to avoid offending non-hunters. They are consistently aware that many of these people are their friends, neighbors, relatives, and even members of their immediate family.

They appreciate the fact that many people do not hunt and understand some people are opposed to hunting. They respect these people as human beings whose likes and dislikes differ from their own. They accept the fact that hunters, non-hunters, and anti-hunters are equally sincere in their beliefs about hunting.

Relationship with other hunters

Responsible hunters show consideration for their companions. When leaving for a hunt, they are ready to go at the appointed time and they do not invite others to join the group unexpectedly.

In the field, their consideration extends to other hunters as well. They realize that hunting satisfaction does not depend on competing with others for game.

Responsible hunters avoid doing anything that will interfere with another's hunt or enjoyment of it. They do not shoot along fence lines adjacent to fields where others are hunting, nor do they try to intercept the game others have flushed. If disputes arise with other hunters, they try to work out a compromise—perhaps a cooperative hunt—which everyone can enjoy.

Responsible hunters do not hog shots—they do the opposite. They give friends a good shot whenever possible. They show special consideration for the inexperienced or hunters with disabilities by allowing them to hunt from the most advantageous position.

Responsible hunters stop and thank the landowner for the privilege of hunting on their land. If the hunter is successful he or she may offer to share the game or, by some other means, show their appreciation for the opportunity to hunt private land.

Each hunting season, responsible hunters invite novice hunters to accompany them in the field. They take the time to share their hunting knowledge with their companions and introduce them to the enjoyment of hunting.

They do not shoot over their limit to fill the bag of others, this includes shooting a deer and having a young hunter tag it. They realize that young hunters want to harvest their own game. Responsible hunters do not take their limit unless they plan to use all they have taken.

They observe the rules of safe gun handling at all times and firmly insist that their companions do the same. They politely tell others when they think their behavior is out of line.

Self-respect

Responsible hunters realize it is their responsibility to know how to take care of themselves in the outdoors. They respects their limitations.

They never place their lives or the lives of others in jeopardy by failing to notify someone where they intend to hunt and how long they expect to be gone. If their plans change, they leave notes on their vehicles designating their destination, time of departure, and expected time of return.

They respect the limitations of their health and physical fitness. They consult with their doctors regularly to be sure they are capable of strenuous hunting activity. If unfit, they condition themselves before going hunting. They have their vision checked and, if necessary, wear glasses or contact lenses to correct any visual impairments.

To cope with unexpected outdoor emergencies, responsible hunters learn and practice first aid and survival skills. They know how to recognize and cope with hypothermia.

Respect of wildlife

Responsible hunters are naturalists. Their interest in wildlife extends beyond game animals to all living things. They're thrilled by the sight of a bald eagle as well as a white-tailed deer. They know and study nature's ways, and realize that wildlife can be enjoyed year-round—not just during the hunting season.

When hunting, their pursuit of game is always governed by the"fair chase" principle. Simply stated, this principle demands that hunters always give their quarry a "fair" chance to escape.

When hunting big game, responsible hunters will always attempt to get close enough to their quarry to ensure a quick, clean kill. They realize that in doing so, their quarry may notice them and escape, but they always give their quarry this sporting chance.

Responsible hunters never shoot indiscriminately at a flock of game birds or a herd of big game in the hope of hitting one. They will always attempt to kill their quarry quickly.

Through considerable practice before a hunt, they will learn the distance at which they can be most confident of killing game cleanly. They will ensure their rifles are accurately sighted in and determine the most effective shot size for their shotguns.

Once afield, they will expend an extraordinary effort to retrieve all game—even if it means interrupting their hunting to help another hunter locate a wounded animal. When possible, they will use a trained hunting dog to retrieve game birds.

If it appears they have missed their shot, responsible hunters will always carefully inspect the spot where their quarry stood to ensure the animal was not hit.

Responsible hunters show respect for their game after it is taken, as before. They never allow the meat or other usable parts of the animal to be wasted. Even though they may not want the antlers or hide, they recover them to give to others who will use them. For example, the fur and feathers of many game birds and mammals are used to make flies for fishing.

Respect for the environment

Responsible hunters are caretakers of the environment. While hunting they are aware of the damage they may do to the plant life and to the soil. They try to minimize their impact. They avoid needless destruction of vegetation. They down living trees or trim branches only if it is legal or with permission. They avoid actions that may cause erosion. They use only what is necessary, remove their garbage, and minimize any evidence of their presence.

Respect for laws and enforcement officers

Responsible hunters obey all laws governing their hunting activities, even those with which they disagree. Instead, they work through their elected representatives to change laws which they feel are unjust.

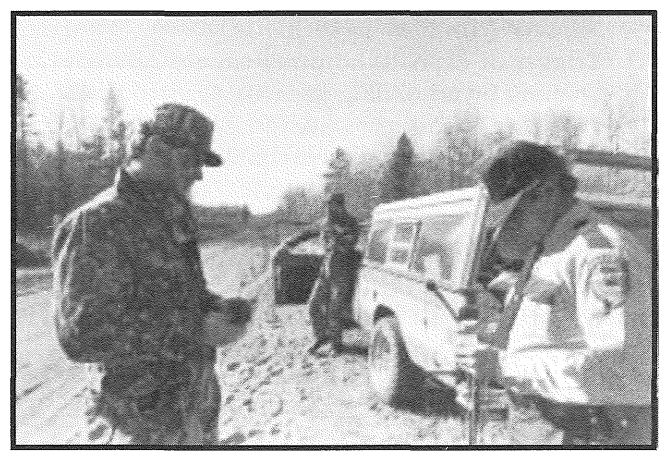
Responsible hunters will not ignore illegal acts of others. They insist that all members of their hunting party obey the law and they report law violations to the appropriate law enforcement agencies. If asked to serve as witnesses, they accept this responsibility.

When they meet a state or federal wildlife officer, wildlife biologist or technician checking hunters, they are cooperative and provide the information requested. If they do not understand the need for certain information, they ask for an explanation.

Hunters realize the officer's responsibility is to protect wildlife and their hunting rights.

In summary, ethical hunters should have **respect for**, and be **responsible to:**

1. Landowners
2. Non-hunters
3. Other hunters
4. Themselves
5. Wildlife
6. The environment
7. The laws and the officers whose duty it is to enforce them



MnDNR

Responsible hunters fully cooperate with conservation officers and wildlife officials, knowing that they protect and enhance their hunting opportunities.

Hunting Safety

Basic rules of firearm safety

Most hunters practice safety, however, there are some who do not. Each hunting accident that occurs sends the message that "hunting is a dangerous activity." Safety must be part of your hunting plan. Develop a "safety attitude"; hunt with safety in mind.

To prevent hunting accidents, the basic rules to follow when handling firearms are:

1. Treat every firearm as if it were loaded–even when you think it is not.
2. Always keep the muzzle pointed in a safe direction.
3. Be sure of your target and what is beyond.

What can you do to hunt safely?

Discuss with your hunting group how your group can plan to avoid incidents. Discuss situations that might occur. Listed below are some causes of hunting accidents. Discuss how to avoid them. They are:

1. Victim out of sight of shooter.
2. Victim covered by shooter as shooter swings toward game.
3. Victim mistaken for game.
4. Victim moved into line of fire.
5. Firearm removed from or placed in vehicle.
6. Firearm discharged in vehicle.
7. Horseplay with loaded firearm.
8. Insecure rest; firearm fell.
9. Shooter stumbled and fell.
10. Trigger or exposed hammer caught on object.
11. Loading or unloading firearm.
12. Defective firearm or bow.
13. Careless handling of firearm.
14. Improper crossing of obstacle.

There are many other causes of hunting accidents, all of which are significant. Develop a "safety attitude." Always follow safe hunting techniques and be sure those who hunt with you do the same.

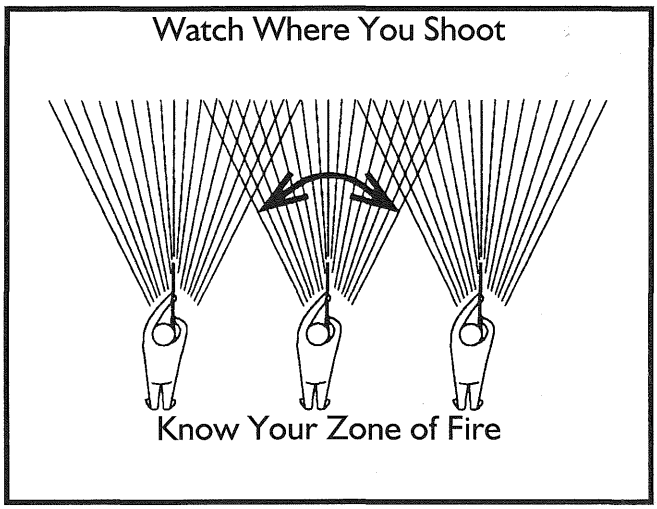
Knowing why hunting accidents happen helps you develop safe hunting practices. After considering the causes listed above, adopt the following practices:

1. Know what might be beyond your target (game animal). This area will be far beyond your target because bullets used to take big game can travel
   3½ miles or more. The distance traveled depends upon the type of bullet, the angle of the rifle barrel when fired, and the altitude (with the higher altitudes allowing greater range). Shotgun slugs can travel a mile if shot at the proper (or improper) angle. Small bore rifle bullets can travel 1½ miles or more. Shot pellets, 300 yards or more. Be aware of these ranges any time you are about to pull the trigger.
2. Always establish your safe zone of fire, and insist that your hunting partners do the same. Be sure you are not in another hunter's zone of fire.
3. Carefully load your firearm after you have left camp or your vehicle and have reached your hunting area. Carefully unload and double check the chamber before returning to camp or your vehicle.
4. Care for and maintain your firearm. Have a competent gunsmith check your firearm if you have any doubts about its condition.
5. Handle your firearm carefully when crossing rough terrain; unload your firearm when crossing fences or other obstructions.
6. Learn the different methods of safe carrying methods and use them at all times. The method will depend upon the circumstance of your hunt.
7. Do not permit horseplay or careless handling of firearms at any time.
8. Correctly identify your game target. Be sure to see what is there, not what your mind wants to see. If you are unsure of your target, don't shoot.

These are just a few suggestions. Develop your own safe hunting practices and follow them. You are responsible for hunting safely and helping other hunters to do the same.

Responsible hunters learn before they hunt how to shoot safely and accurately. They practice regularly so they are familiar with their firearms and check their equipment to see that is operating properly. They know the range and the effectiveness of their ammunition and make sure they have the right ammunition for the gun being used and the game hunted. Their gun is accurately sighted-in

Keep the action of the firearm open except when actually shooting or when storing an unloaded gun. Use the right ammunition for your firearm. Carry only one type of ammunition to be sure you will not mix different types.



Plan the hunt to eliminate risk
When a hunting accident occurs, there are only two possible explanations: either someone did not know or understand the rules, or someone failed to follow the rules.

Practice safe gun handling at all times
More firearms accidents happen in non-hunting situations than during actual hunt-

Firearm safety when traveling

Whether your firearm is being carried in a car, boat, motorcycle, or in any other vehicle, you must follow these safe firearm handling rules:

1. Be sure the firearm is unloaded.
2. Place the firearm in a protective case.
3. Position the firearm securely so it will not move about during travel.
4. Be aware of laws and regulations regarding transportation of firearms for the area you are in or will be traveling through. Laws and regulations are different in various localities.

Safe firearms carrying practices

There are several ways to carry a firearm safely and at the same time have it ready for a quick, safe shot in the field. Whichever carrying method you use, these basic rules apply:

1. Keep the muzzle pointed in a safe direction, away from yourself and others.
2. Keep the safety in the "on" position when carrying a firearm. Remember that the safety is a mechanical device and can fail.
3. Keep your finger outside the trigger guard until you have positively identified your target, determined that it is safe to shoot, raised your firearm to a shooting position, and determined that it is still safe to shoot.

Firearm safety in the field

1. Be positive of your target's identity before shooting. Look past your target to be sure it is safe to shoot. Do not shoot where a bullet or pellet can ricochet, such as water, rocks, trees, or metal.
2. Take time to fire a safe shot. If you are unsure or must move too quickly, pass up the shot. When in doubt–don't.
3. If you fall, control where the muzzle points. After a fall, check your firearm for dirt and damage and make sure the barrel is free of obstructions.
4. Unload your firearm before attempting to climb a steep bank or to cross terrain where you may be unsure of your footing.
5. When you are alone and must cross a fence, unload your firearm and place it under the fence with the muzzle pointed away from where you are crossing. Use an article of cloth-

ing such as a cap or glove to lay the muzzle on to reduce the possibility of an obstruction getting into the barrel. To cross a fence when hunting with others, unload the firearms and keep the actions open. Have a companion hold your firearm while you cross. When you have crossed over the fence, take the unloaded firearms so they may safely cross the fence.

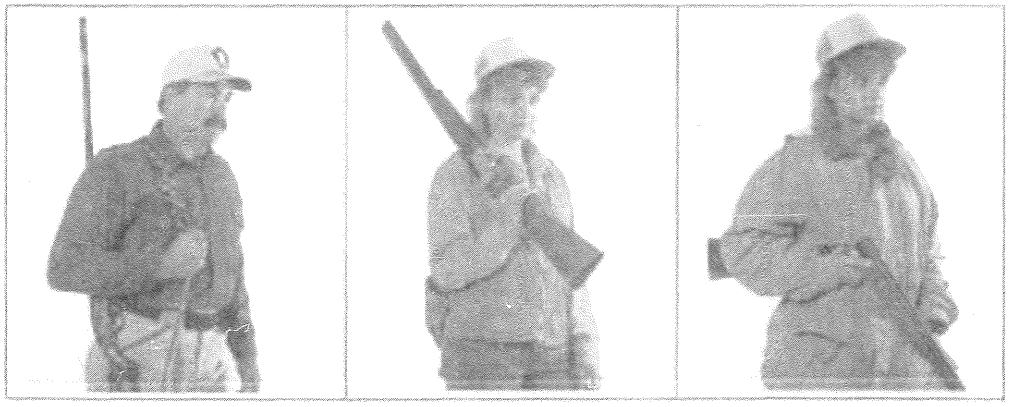
6. Never use your scope sight as a substitute for binoculars.
7. If you and your group take a break while afield hunting, or if you meet and talk to other hunters, unload the chamber or open the action of your firearms. When hunting with dogs, never leave firearms unattended.
8. Alcohol, drugs, and shooting do not mix. Drugs and alcohol impair your judgement. It is illegal to hunt while intoxicated.
9. Beware of fatigue. When you become tired, quit hunting. Fatigue can cause carelessness, clumsiness, and an inclination to see things that are not there. Any of these factors can contribute to hunting incidences.
10. Hypothermia can cause the same carelessness and clumsiness that fatigue does. Dress properly for the weather. If you become cold, you are more likely to mishandle your firearm, thus allowing accidents to happen.
11. Be aware of special safety procedures necessary for the specific species of game you are hunting.
12. When finished hunting, unload your firearm before returning to your vehicle or camp.
13. If a hunting companion does not follow firearm rules, you should not hunt with that person. Handling a gun carelessly demonstrates disregard for your life and the lives of others.

Loading and unloading

Loading and unloading firearms at the proper time and place can greatly reduce the risk of having an

Common Carrying Positions

Double-Hand Carry | Cradle Carry | Elbow Carry



Sling Carry | Shoulder Carry | Trail Carry

incident. Keeping the muzzle pointed in a safe direction is the rule, but in many situations, just having the firearm loaded is unnecessary and creates risk. All it takes is a movement, a slip or a fall, and a loaded firearm is pointed at someone.

Hunters should set rules for themselves when loading and unloading:

- Load when you are in position—actually in the woods, in the blind or in the stand. Do not load in camp, near buildings or parking areas, or when in a group of people.
- Load only when you know your zone of fire, that is, point the firearm in the direction you can safely shoot.
- Load only when there is no danger of slipping, falling, or dropping the firearm.
- Unload whenever you are unable to give your full attention to controlling the firearm.
- Unload before setting the firearm down.
- Unload before exiting a tree stand.
- Unload and set your firearm down before crossing a fence.
- Unload before approaching landowners, hikers, or other hunters.
- Unload before retrieving or carrying game.
- Unload before crossing slippery or rough terrain.
- Unload and consider putting your firearm in a lightweight "stocking type" case before returning to camp, the parking area or the highway.

These basic rules of safety aren't covered by law and regulation. This is all the more reason why hunters need to sit down and decide for themselves the rules for the hunt. Your actions determine safety and how others look at hunting.

Cold weather a factor in hunting accidents

Cold weather is very much a factor in Minnesota's hunting accidents. If we look at the way we hunt, our attitudes toward the cold, and the effect the cold has on our ability to think and move, it's easy to see the connection.

Minnesotans learn to tolerate the cold. We shiver, stiffen up, and sometimes lose the sense of touch in our fingers and toes. When we hunt with firearms in Minnesota, we may tell ourselves that this is how we should expect to feel on opening day.

Cold causes us to use up energy—blood sugar—faster (hypoglycemia) and our body temperature drops (hypothermia). What many hunters fail to consider, however, is that as this begins to happen, we shiver, begin to lose our sense of balance, and start losing our ability to think clearly. The risk of dropping the firearm or falling increases. Our judgement begins to fail. We may even forget to keep the muzzle pointed in a safe direction.

The scary part is that we actually lose our ability to think clearly, to concentrate on what we're doing. Too long in the cold and a hunter can end up both clumsy and careless. Hypothermia is not limited to below freezing temperatures. Getting wet on a windy day in 50 degree weather can be as dangerous as freezing temperatures. Even on a nice, sunny fall day where a hunter is walking and begins to sweat, then stops and sits, chills may set in, indicating the beginning of hypothermia.

The ability to resist the cold can vary greatly among people in a group. A key symptom to watch for is severe shivering. If you or someone else starts to shiver, that's the signal to get warm and dry immediately. Severe shivering is the "final stage" in which a person still can think clearly enough to help themselves.

Turn In Poachers (TIP)

In many states, the illegal killing of fish and wildlife—poaching—has become a serious problem. The Minnesota DNR estimates that the accidental and illegal killing of white-tailed deer may be more than one-half of the annual harvest taken by licensed hunters.

Minnesota's economic loss to poaching has been projected to be $25 million or more, calculated on the basis that the average deer has an economic value of $600. This enormous loss does not include moose, waterfowl, fish, pheasants, grouse, and other game birds, or a significant number of protected species.

TIP is a non-profit grassroots movement formed by a group of concerned conservationists who are dedicated to preserving our vast treasury of fish and wildlife.

How the program works

Basically, TIP encourages Minnesotans to make anonymous reports of fish and wildlife violations for a cash reward. Anyone wishing to report a game and fish law violation may call the toll free number 1-800-652-9093, or 651-297-3999 in the seven-county metropolitan area. To protect the person's anonymity, the caller is assigned a code number to use when communicating with the DNR's Division of Enforcement.

Information provided by the caller is recorded on a numbered form which is sent to the Conservation Officer assigned to the area nearest the violation. If the tip leads to an arrest, the investigating officer returns the form to TIP via the Division of Enforcement headquarters in St. Paul.

Each tipster is told to watch local newspapers for an announcement of an arrest. Once they read of the arrest, they can call the same toll-free or metro area phone number, identify themselves by the code number, and make arrangements for the reward to be paid.

TIP rewards

Rewards paid to tipsters fall into three categories: $100 minimum for small game, fish, and non-game species violations; $250 minimum for big game and endangered species; and up to $1,000 maximum for violations such as large numbers of animals taken illegally or a commercial poaching venture. TIP is aimed at controlling the persistent violator and poaching rings that exist in Minnesota. However, no leads are turned down. If a call is received about a hunter shooting too many ducks, the report will probably be pursued—a violation is a violation.

Sometimes poachers use heinous methods to kill wildlife, from leg snares to wire nooses that can slowly strangle a luckless deer. After all, poachers are mostly concerned about how they can avoid getting caught. If they cripple a deer while spotlighting at night, they will simply leave it to find another animal that they can kill quickly.

You can help

TIP works only if the public supports the program. Citizens must be willing to make anonymous tips to stop game and fish lawbreakers. Financial support is also important. TIP is not an enforcement arm of government. It is a private, non-profit foundation whose board of directors is composed of citizens throughout Minnesota. Like any foundation, it survives primarily on donations.

For more information on TIP, call toll-free at 1-800-652-9093 or 651-297-3999 in the metro area.

Questions for the Conservation Officer

Introduction

Plan your hunt and hunt your plan. This advice is a 'must' for waterfowl hunters that want a safe and successful hunt. Part of the plan includes knowing and following the waterfowl hunting regulations. Often hunters accept what they think they have heard to be the correct regulation. Hunters must study and learn the regulations each season since regulations are updated yearly. Also, hunters must know the regulations for the area of the country or part of the state they will be hunting–regulations vary for different parts of the country.

> **Note:** The regulations that are addressed in the following paragraphs were correct at the time of writing. It is the hunter's responsibility to determine the current regulations.

Frequently misunderstood regulations

The questions and answers that follow address some of the more common waterfowl hunting regulations that hunters are concerned about.

1. *You have driven to western Minnesota to hunt ducks on a large Wildlife Management Area. As you unpack your equipment the night before your hunt, you realize that you have left your small game license and state and federal waterfowl stamps at home. You remember that when you were checked fishing a few years back, and had left your license back at the vehicle, the conservation officer (CO) had you send it to him. Would it be legal for you to go ahead and hunt the next day with your license and stamps at home, and if checked, you would be able to send them to the CO?*

   Answer: NO. First, Minnesota law requires you to have your license in possession when afield and returning from an activity requiring a license. This includes stamps. Second, though licenses are numbered and must be sold in sequence, stamps are not recorded and thus there is no way to prove you had indeed purchased one before you were checked.

2. *You are afield hunting Canada geese with a partner. You are in a two-goose zone and have three geese in the day's bag. A small flock approaches your spread and comes into range. Can you both fire?*

   Answer: NO. Federal law prohibits "party hunting" for migratory game birds. Since you already have three birds and only need one more, only one of you can legally shoot now. Additionally, if you both were to fire, there is a chance that both of you would hit different birds, putting yourselves over limit.

3. *You and some hunting friends are discussing the upcoming waterfowl season. One of the group comments that he heard something about all hunters having to wear blaze orange this fall, and thus you will have to wear blaze orange while duck hunting.*

   Answer: NO and YES. Your partner is probably referring to the law that requires small game hunters to wear one item of clothing that is blaze orange above the waist. However migratory bird hunters are exempt. But, during the firearms deer season, persons afield for hunting, trapping or assisting must wear blaze orange that complies with the deer hunting requirement; except waterfowl hunters on the water or in a stationary shooting location are exempt. This does not include walking to and from these locations, however. You should always wear the required blaze orange in these instances.

4. *You have just finished putting out your decoy spread, and are ready to begin hunting ducks. As you load your firearm, you realize that when you were grouse hunting the day before, you had removed the plug from your shotgun, and did not replace it. You don't have it with you, but wonder if*

as long as you only put three shells in your firearm, would it be OK to continue to hunt waterfowl.

Answer: NO. Federal law requires that your firearm not be capable of holding more than three shells. Only putting just three shells in would not meet the requirement since your firearm is still capable of holding more than three shells. You must either construct a plug on site and install it or return home and get your plug and install it.

5. *You and two friends are going to take your new 18-foot boat to a large lake for a late season diver hunt. You just purchased the boat, and have never used a boat for hunting waterfowl before. You have heard that " duck boats" are not considered watercraft, and are not subject to the boating rules.*

   Answer: NO and YES. A "duck boat" used during the duck hunting season is not considered a watercraft for registration purposes. However, a boat used for hunting waterfowl must have one wearable personal floatation device (PFD) on board for each person, plus a throwable device if the boat is 16 feet or longer. Your boat would not be required to be registered when used for hunting ducks during the waterfowl season. Note: this does not exclude it from registration for the rest of the year and only applies for waterfowl hunting during the season. If you tossed in a rod to troll for muskies on the way in, your duck boat becomes a watercraft subject to all rules.

6. *May I use a duck blind that is in public waters if I didn't build it?*

   Answer: YES. An unoccupied blind on public land or in public waters is OK to use by the public. It is not the property of the one who constructed it. It is unlawful to use force or threaten to use force against another person to gain possession of a blind.

7. *What makes a blind in public waters a "permanent blind"?*

   Answer: It was an Attorney General's opinion that, "any blind built so that it withstood wind, waves, and one winter's ice action," is a permanent blind and thus, it would be unlawful to hunt from.

8. *Is it OK to have lead shot along when I am jump-shooting potholes for ducks, just in case I come across some pheasants?*

   Answer: NO. It is unlawful to possess any shot while taking migratory waterfowl that hasn't been approved by the director of the United States Fish and Wildlife Service. This means that you have two choices. You can either bring lead shot and hunt strictly upland game, or you can bring only steel (or other approved for waterfowl loads) and hunt both upland game and waterfowl with the non-toxic shot.

9. *What about wounded birds? I hunt out of a motorized boat and may need to chase after a wounded duck with a boat. Do I need to unload and case my gun prior to starting the motor?*

   Answer: YES. Any time your motor is running, all firearms need to be unloaded and in a case. Experienced hunters unload and case their firearms, then start the motor and drive their boat to the last location of the wounded bird (they usually dive under water). They stop the motor, uncase and load their gun, wait for the bird to surface again, and then fire a shot to kill the bird. They then unload and case their firearm, and then start the motor to retrieve the bird. Sometimes striking the bird with a paddle or oar will also work, thus saving on ammunition and time.

The rules of the hunt

by Ray Norrgard

Waterfowl hunting regulations are established to control annual harvest, distribute the harvest among waterfowl hunters, and ensure safety for everyone. These regulations are particularly important to Minnesota because we rank near the top in the nation for both number of waterfowl hunters and total waterfowl harvest. In contrast to many other high ranking harvest states, Minnesota is also an important waterfowl production area. Adequate protection of locally breeding waterfowl is a priority.

The annual development of harvest regulations is more complex for waterfowl than any other game species. The process involves all the states and Ca-

nadian provinces organized into four flyways, with overall responsibility assigned to the U. S. Fish and Wildlife Service. Open seasons for waterfowl occur from early September to March. While daily bag limits and season length often receive the most attention, there are a number of other regulations that Minnesota waterfowl hunters should be familiar with. (Note: The regulation discussion that follows was current as of its writing. Rules and regulations are subject to change each year. Each year, please study and follow the most current regulations.)

Waterfowl hunting stamps

Every waterfowl hunter 16 years of age and older must have a valid federal Migratory Bird Hunting and Conservation Stamp. In addition, resident hunters 18 years of age or older and under the age of 65 must have a valid Minnesota Migratory Waterfowl Stamp unless they are hunting on their own property. All non-resident waterfowl hunters must have the state stamp.

Both stamps must be in the hunter's possession and signed across the face of the stamp. The federal stamp must be signed in ink. Proceeds from the stamps are used to protect and manage waterfowl habitat.

Ray Norrgard

Obtaining the required licenses and understanding regulations is an important part of preparing for your hunt.

4 o'clock closure

Waterfowl hunting ends each day at 4 p.m. during the first part of the season. This regulation reduces hunting pressure on hens that have nested successfully in some years. The nesting effort delays a hen's opportunity to prepare for migration.

Old-timers referred to these birds as "marsh hens" because they are often encountered apart from organized flocks on small marshes. The 4 o'clock closure allows these successful hens, the most important part of our breeding population, a chance to feed undisturbed and "catch up" with other ducks. One of your most important pieces of hunting equipment is a watch.

Non-toxic shot

Non-toxic shot (steel, bismuth, or tungsten) is required for all waterfowl hunting in Minnesota. Why non-toxic shot? Prior to this regulation, lead shot was recognized as the silent killer of over 2 million waterfowl nationally each year (approximately four times the number harvested by Minnesota hunters). Lead ingested while feeding is ground by the gizzard and absorbed into the blood stream causing poisoning. Waterfowl affected, but not killed outright, are more susceptible to disease, predation, and have reduced reproductive potential. Bald eagles can be affected by eating waterfowl poisoned by lead. Hunters cannot have any lead shot in their possession while hunting waterfowl. Also, remember that shotguns cannot be capable of holding more than three shells when used for waterfowl hunting.

Youth waterfowl hunting day

One day in mid-September, waterfowl hunters age 15 and younger, when accompanied by a non-hunting adult (age18 and older, no license required), may take ducks, geese, mergansers, coots, and moorhens from one-half hour before sunrise to 4 p.m. The daily duck bag limits are the same as the regular waterfowl season, except only one goose (any species) may be taken. There are no license requirements, except hunters ages 13–15 must have a firearms safety certificate in their possession. All other migratory bird hunting requirements apply.

For more information on waterfowl hunts

For information on specific waterfowl hunts or public hunting areas, contact your regional DNR wildlife office, or call the DNR Information Center at 651-296-6157 (metro or outside Minnesota) or at 1-888-MINNDNR.

Refuges

Refuges play an important role in providing undisturbed resting areas for both resident and migrant waterfowl. Refuges encourage migrant flocks to stay in the state longer, allowing additional hunting opportunities on adjacent areas.

There are several refuge types that Minnesota waterfowl hunters should be familiar with:

- **National Wildlife Refuges:** These areas are managed by the U.S. Fish and Wildlife Service. Waterfowl hunting is allowed on portions of some national wildlife refuges. Be sure to check the hunting synopsis and refuge headquarters for details.

- **State Duck Refuges:** Portions of wildlife management areas and waterfowl production areas (state and federally-owned, respectively) may be posted as "State Duck Refuge." The posted areas are closed to all trespassing from September 1 through the end of the waterfowl season.

- **State Goose Refuges and State Waterfowl Refuges:** State goose refuges and waterfowl refuges are closed to the hunting of geese or all waterfowl as the signs indicate. These areas, however, are open to other types of hunting and trapping. Because private lands are often included within the boundaries of these areas, be sure to check land ownership and obtain permission before entering.

- **State Game Refuges:** State game refuges are closed to all hunting and trapping unless specifically opened. Most have been established by the Commissioner of Natural Resources and may include both public and private land. Be sure to check with local authorities on specific regulations for any of these areas. The annual hunting synopsis lists those open to hunting.

Wildlife Management Areas and Waterfowl Production Areas

These areas are open to public hunting unless otherwise posted. Motorized watercraft are not allowed on the federally-owned Waterfowl Production Areas or most of the state-owned Wildlife Manage- ment Areas. Areas open to motors are listed annually in the hunting synopsis.

Migratory Waterfowl Feeding and Resting Areas

Areas posted as "Feeding and Resting Area" are open to waterfowl hunting but do not allow the use of outboard motors. By reducing the disturbance of resting flocks, these areas provide some of the same benefits as refuges while still allowing hunting.

Feeding and Resting Areas may be established by the DNR when a petition, signed by at least 10 resident licensed hunters, is presented to the commissioner. The proposed areas are generally discussed at the annual public input meetings sponsored by the DNR. Electric motors of less than 30 pounds thrust are allowed in some instances. Check the annual hunting synopsis for a list of areas.

Designated Wildlife Lakes

Lakes designated for wildlife management are open to waterfowl hunting unless otherwise posted. The only waterfowl hunting regulation that comes with designation is the prohibition of air boats. Lakes are designated through a public hearing process and allow the DNR to manage the lake primarily for wildlife habitat. These lakes are listed in the hunting synopsis.

No open water hunting

Waterfowl hunting in Minnesota is prohibited on open water unless natural vegetation provides at least partial concealment of hunters. This does not apply to hunters lawfully pursuing wounded birds. However, remember that motors or sails cannot be used unless your shotguns are unloaded and cased. Whenever there is a question, check with the conservation officer in the area you plan to hunt.

Personal flotation devices

Every person on board a boat used for waterfowl hunting must wear or have ready access to a U. S. Coast Guard approved personal flotation device (PFD), or life preserver. The cold water and weather conditions often encountered while hunting waterfowl dictate extra caution while boating. Hunters should wear PFDs whenever their boats are underway.

Party hunting prohibited

The Minnesota law authorizing small game hunters, as members of a hunting party, to take a group limit does not apply to the taking of migratory game birds. It is a violation of federal law for any person to take, possess or transport more than an individual limit of waterfowl, woodcock, rails or snipe.

Transporting

At all times, until delivery to the hunter's residence or a commercial processing facility, ducks must be transported with a fully-feathered head and wing attached. Geese need a feathered wing only. This differs from regulations for upland game birds that require the feet and feathered head to remain attached.

Baiting waterfowl

Baiting of waterfowl is not permitted. Baiting means placing, exposing, depositing, distributing, or scattering shelled, shucked, or unshucked, corn, wheat or other grain, salt, or other feed to lure waterfowl over any area where hunters are trying to take them. A baited area cannot be hunted for 10 days following complete removal of all such corn, wheat or other grain, salt or other feed.

The taking of all migratory game birds, including waterfowl, is permitted on or over standing crops, flooded standing crops (including aquatics), flooded harvested cropland, grain crops properly shocked on the field where grown, or grains found scattered solely as the result of normal agricultural planting or harvesting.

This listing is intended to clarify some of the major waterfowl hunting regulations. It is not an exhaustive list of the laws. Be sure each year to carefully review the synopsis of hunting regulations published by the DNR. If any regulations seem unclear, contact a DNR conservation officer or the DNR Enforcement Division, 500 Lafayette Road, St. Paul, 651-296-4771.

Reporting Bird Bands

Biologists use information reported by hunters to manage waterfowl. If you shoot a banded bird, please call 1-800-327-BAND (1-800-327-2263). The operator will want to know the band number and how, when, and where it was recovered. You will receive a certificate of appreciation with information about the bird. The band is yours to keep.

Thank you for your help.

Preparation is the Key

by Ray Norrgard and Chuck Kartak

Waterfowl hunting can be a year-round activity. As each hunting season ends, preparation begins for the next year. Start by evaluating the past year. How was your location? Did your equipment perform as expected? Which hunting skills need work?

All of these concerns require solutions long before opening day. Develop a calendar of things you want to accomplish before the next hunting season. Here are some ideas.

Location

If you are considering a new hunting area, start gathering information months in advance of the waterfowl season. Talk to other hunters familiar with the area. Contact wildlife agencies for general information on typical regulations, public hunting areas, and hunting conditions.

Local hunting strategies can be fine tuned by reviewing maps and aerial photographs. Identify waterfowl concentration areas and probable flight patterns. Conservation officers and sporting good dealers often have a good idea of past hunting activity.

If possible, visit areas during spring migration. Although differences exist between spring and fall use, first-hand field experience can confirm potential hunting areas. A second visit in September will confirm vegetation patterns and the presence of birds. Talk to private landowners following spring planting. The local coffee shop may be a better place to make initial contact than interrupting a landowner's busy work schedule. Keep in mind that permits for special hunts often require early application. Check the hunting synopsis on regulations as soon as it comes out in late summer to take advantage of these opportunities.

Ray Norrgard

Scouting may well be **the** most effective waterfowl hunting technique.

Equipment

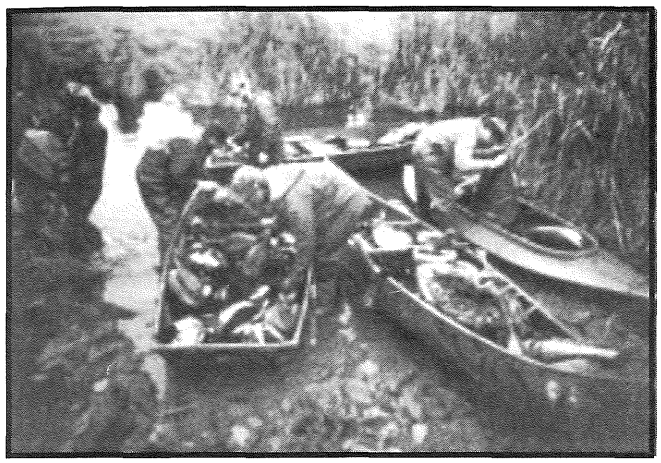
Identify equipment needs immediately after the hunting season to allow ample time for new purchases or repairs. Talking to other hunters and reputable sporting goods dealers can help fine tune selections and locate difficult to find items.

The need for proper clothing is often overlooked. Whether you opt for modern fabrics or the traditional cotton duck and wool, clothing can make or break a hunting trip. Keep in mind the benefits of layering, the need for inner clothes that don't soak up sweat, and outer clothes that seal out moisture.

Repair work on firearms is best done during the winter. Don't expect immediate service if you delay taking action until the gunsmith's busiest time in late summer and fall. Winter is also a good time to check gun fit. Stock modification can be time-consuming work whether you do it yourself or require a professional.

Early spring is an excellent time to test shot patterns and shotshell loads. The weather is about the same as that experienced during hunting, ensuring a proper evaluation of guns and loads.

Purchasing watercraft is best done in summer. Require a "test drive" of new or used boats to make sure they fill your needs. Avoid square front "john boat" designs if wind driven waves are a part of your hunting. Standard canoes should also be approached cautiously unless they are used for transportation only.



Chuck Kartak

Select the watercraft that best fulfills your hunting needs, keeping safety foremost in your mind. Standard canoes and "john boat" designs should be approached with caution.

U.S. Fish and Wildlife Service

Clay targets provide the opportunity to refine the smooth swing so necessary in waterfowl hunting.

Boat and decoy painting is also best done in summer. The warm temperatures ensure proper drying and allow adequate ventilation. The same is true of repair work involving epoxy or other glues. It is much more pleasant to test leaks in boats and waders during summer.

Hunting skills

Decoy setting, calling, waterfowl identification, and shooting are not skills that are developed overnight. Unfortunately, the amount of time most of us are able to spend hunting is simply not adequate to really fine tune our abilities. One solution is to decoy and call waterfowl during spring migration. There is the same excitement of working birds and their colors are never more intense. Calling can continue all summer. Working with partners, taping your "performance," and preparing for contests will all contribute to improved skill.

There are many opportunities during summer to improve shooting skills. Skeet and sporting clays are the best shotgun games to refine the smooth swing so necessary in waterfowl hunting. Many hunters find it helpful to join a local shooting league to ensure regular practice.

Depending on personal hunting style, summer walking, rowing or paddling will help prevent sore muscles or worse during the hunting season. Don't forget that conditioning is also important for dogs. Swimming is undoubtedly the best exercise, particularly for older dogs whose joints can suffer from running over rough ground or on pavement. Combine the exercise with retrieving to keep both body and mind in tune.

Checklist

The best time to develop a checklist is weeks before the hunting season. The best time to refine it is right after a hunting trip that was compromised by a forgotten item. Although checklists must be personalized, the sample provided here should stimulate thought.

The anticipatory stage of hunting can be one of the most enjoyable. Preparing well in advance will avoid the stress and frustration of last minute packing. Or worse, forgetting something that will make your day on the marsh not only uncomfortable, but potentially hazardous.

Basic waterfowling list

- Hunting license and stamps (signed)
- Hunting regulations
- Waterfowl ID booklet
- Shotgun (check shell capacity - three shell limit)
- Spare shotgun (if on an extended trip)
- Non-toxic shot
- Camera and film
- Binoculars
- Waterproof storage container
- Maps and compass
- Matches in waterproof container and candle
- Flashlight with extra batteries

- Spare flashlight
- Pocket knife
- First aid supplies (band-aids, hand cleaners, large compress, antibiotic salve, and pain killer at a minimum)
- Toilet paper
- Shooting glasses
- Duck and goose calls
- Spare duck or goose call
- Thermos and food
- Water
- Money for phone calls
- Blind (if required)
- Spare keys for vehicle
- Decoys

Add to your favorite hunting clothes:

- Rain gear
- Extra hat, gloves, socks, boots
- Complete change of clothes in vehicle
- Blaze orange vest and hat during firearms deer season

For water hunting add:

- Favorite watercraft
- Outboard motor, if required (gas, oil, shear pins)
- Current registration and running lights for motorboats
- Pushpole/oars/paddles
- Extra oar or paddle
- Personal flotation devices (PFDs)
- Rope and anchor
- Extra rope
- Bailing scoop
- Waterproof gloves for handling decoys
- Hip boots or waders

For field hunting add:

- Small shovel
- Canvas or insulated pad to lie on

Marsh Manners

The young man approached his grandfather eagerly.

"What'cha doing?'

"Making up some goose loads," replied the old man as he turned from his loading bench.

"Magnums?"

"Nope. What I've got here is about 90 pellets of BB steel," smiled the old man, holding up a sample of his work. He gestured to a well-used pump shotgun in the gun rack. "In ol' Betsy there, this load will kill a big honker stone cold dead at 50 yards."

"What do you use if it's over 50?" questioned the youngster.

"Calls and decoys," was the response with just a hint of humor.

"But what would you use if they don't work?"

The old man fixed the youth with a solemn stare over the top of his glasses. "Binoculars" was his only reply.

Plan the Risk Out of Your Hunt

by Mike Beno

Any fisherman smart enough to bait his own hook will high-tail it off the water when a good autumn wind-lashing comes round. And as he puts the coals to his outboard and dashes back in, that wise fisherman just might pass a beat-up boat dressed in dead grass tan, heavily laden with gear, racing with equal speed in the opposite direction.

Dirty weather? We love it. Wind and rain, cold and snow, it all sends ducks our way. So, when it comes to weather, the more the better, right?

Not only does it push ducks in, but the ducks that are flying want to land. The interesting thing about duck hunters is that we want to go out when even a duck wouldn't fly. That's part of what makes duck hunting great. But it's also part of what makes duck hunting dangerous. You have to be prepared to deal with those conditions. If not, you can run into serious problems.

There is a blurry boundary between hanging tough through some uncomfortable conditions and asking for trouble. Often, your best option is not to go hunting at all. Other times, an early exit from the blind is the only prudent course to take. In between lie all the hours waterfowlers may pursue their sport. And the only way to pursue this sport is with safety considered.

A harsh dose of the elements affects safety in many ways. It strains your equipment. It affects your judgment. It increases the risk of gun accidents. And, make no mistake, it can kill you all by itself. Year in and year out, more duck hunters perish from water-related mishaps than from gun accidents.

As bad as that sounds, safety is not difficult to build into duck hunting. All it takes is a little planning and some awareness to ensure you'll never become a statistic.

Advanced preparation should begin with a checklist and that doesn't mean a roll call for gear and groceries. Your safety checklist is far more important. Many waterfowlers die each year because they spent more time shopping for a shotgun than making sure they have the equipment and skills needed to survive.

Tim Smalley, MnDNR

Overloading and too little freeboard are an invitation to capsizing and the most common cause of duckhunter drowning.

Extreme weather will test your equipment, and in an emergency, you need every edge you can get. With that in mind, check your boat. Are all its seams tight, oarlocks solid, and do its running lights work? Are your oars in good condition? Is your trailer shipshape from tires to winch? Has your motor been checked by a real mechanic? Are your fuel lines pliable and reliable? Do you have spare shear pins and the tools to replace them? What about a backup starter cord?

Add a small survival kit to your checklist. Some items to consider are matches and fire starter, compass, knife, signaling devices such as whistle, or flares, survival blanket, and hard candy to ward off hypothermia.

You've heard it before, but it pays to remember; hypothermia can kill. The condition begins when your body's core temperature falls below normal. Most people consider hypothermia a cold-weather hazard, but conditions are ideal for a person to fall victim in wet and windy weather with temperatures of 30 to 50 degrees. Intense shivering, diffi-

culty in thinking and speaking, muscular rigidity and drifting into a stupor are some signs of hypothermia. To prevent hypothermia, your safety checklist should include waterproof, breathable garments to keep you dry. Wet clothing loses 90 percent of its insulating capacity. Beware of the wind, which drives cold air beneath and through clothing. Wind also refrigerates wet clothing by evaporating moisture from its surface.

The quickest path to hypothermia is by getting wet, and the quickest way to get wet is by ignoring basic boating safety. Most duck hunters don't consider themselves boaters. A boat, after all, is only a means to cross a slough and to haul hunting gear. And hunters do haul gear. Often you will see two people in a canoe with their dog plus guns, shells, lunches, thermoses, blind material, and stools. It's almost as if going out with an overloaded boat is part of duck hunting. It's not, don't do it.

The Minnesota DNR recommends that hunters add these safety tips to their checklists:

Personal flotation device

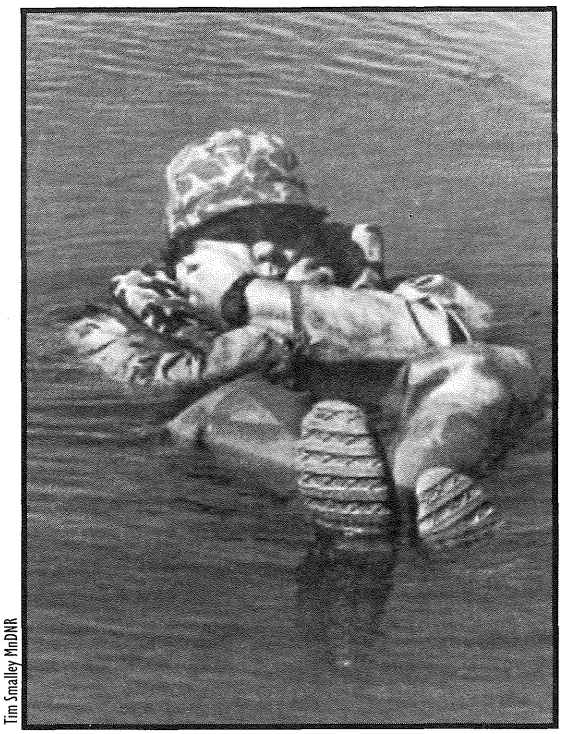
A Coast Guard approved personal flotation device (PFD) must be readily accessible for each person in the watercraft when traveling to and from the blind. Camouflage float coats, float pants and float suits are even better choices than traditional PFDs, because they not only provide buoyancy, but considerable protection from hypothermia. In 50-degree water, with or without a common "May West" life jacket, survival time is around 15 minutes. A float coat can raise that to three hours. Float pants, or an entire float suit, can raise that to eight hours or more.

Avoid alcohol

Even a small amount of alcohol can impair judgment and reduce visual awareness. Contrary to what many people believe, beer and other alcoholic beverages do not warm you up, but actually speed up cooling the human body and bring on hypothermia.

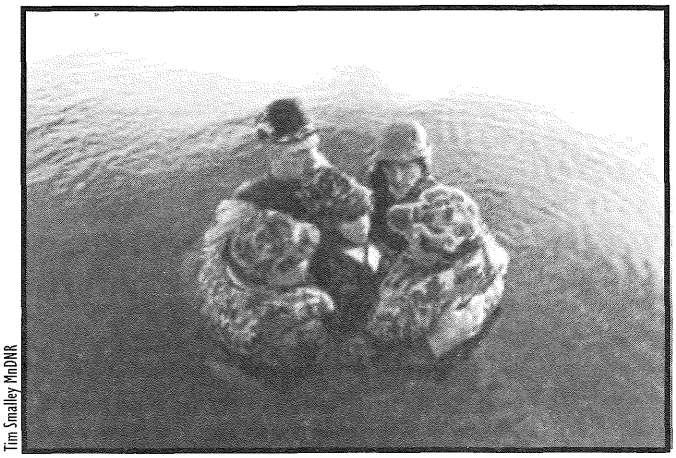
Watch your weight

Note the capacity plate on your boat indicating how much horsepower and weight the craft can handle. Overloading can bring a dangerous loss in freeboard. Consider bulk as well as weight when loading your boat. Do you have adequate room to move? If you are piling gear on the seats, you invite danger by changing your boat's center of gravity. If you have too much gear, an option is to load your



Tim Smalley MnDNR

Effects of hypothermia are reduced by assuming a tucked position and crossing arms across chest. You must be wearing a life jacket to perform this maneuver.



Tim Smalley MnDNR

Huddling together with two or more people will extend survival time 50% longer than swimming or treading water. The huddle reduces heat loss and morale is boosted by communications with others in the group.

decoys and other floatable gear into a small skiff or canoe to be towed behind the power boat.

Watch the weather

Get an up-to-the-minute weather report before you leave home. Keep a sharp eye on the weather as you hunt.

Tell a friend

Let a friend or family member know where you are going and the approximate time to expect your return.

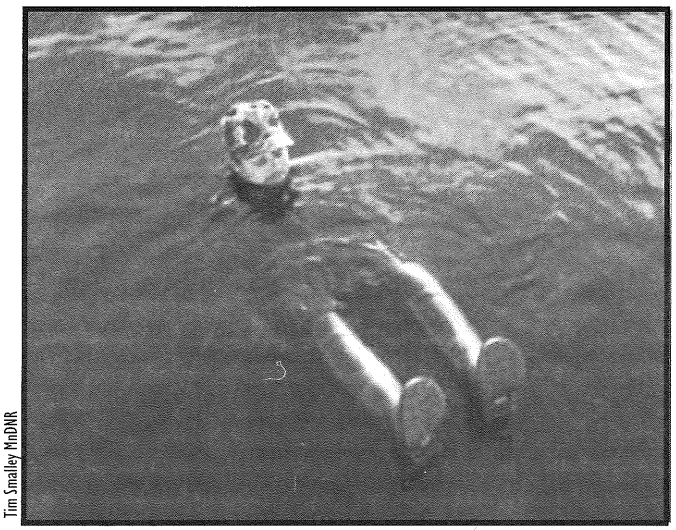
A safe arrival at your blind does not preclude danger. Cold can impair you both physically and mentally. Since clear thinking and judgment are among the first faculties impaired by hypothermia, cold is insidiously dangerous. How many "firearms accidents' are caused by people who aren't thinking straight?

A brush-up on basic gun handling rules is a must for any hunter's safety check list. Becoming reacquainted with the three basic gun handling rules is a good start. But common sense and alertness should rule your behavior on a par with rote rules. Quick shots can cause trouble. The point is to load only when you're in the exact spot your intend to hunt; unload when the hunt is over.

Even if hunters observe safe gun handling practices, cold and wet conditions can foil their best intentions. As the body cools off, it reduces blood flow to the extremities. The result, as all hunters know, is cold, stiff hands. The loss in dexterity is a distinct danger where guns are involved.

Stationary hunters should periodically stand, move, flex and stretch to make sure everything's still working properly. When seated in a cramped boat or blind for many hours, a hunter often becomes too stiff to even mount a gun, let alone swing it safely.

The average duck hunter works vigorously for an hour or so before sunlight, sits all day, then works frenetically again when the sun goes down. As any athlete knows, short bursts of strenuous work can injure those who are not prepared. Before attempting to shove a boat out of the muck, row it for a half-mile, and then carry bags of equipment off balance for hundreds of yards, take a few minutes to stand, stretch, and flex.



Tim Smalley MnDNR

Contrary to popular belief, you can float in waders and hip boots with a little practice. By keeping knees bent in a sitting position, enough air is trapped in boot shins to keep you afloat. In this position, waders and hip boots will not turn you upside down.

Finally, preseason checklists should include names of hunting partners. The object is to include those who share your outdoor values. Talk with your partners and develop a consensus on what you'll do in the field and how you intend to do it. Hunting is relaxation, not a time for stress or conflict. Nothing causes more stress or conflict than an unruly group.

In the outdoors, or anywhere, it is dangerous to defer to the thinking of a group. When you know something is illegal, unethical, dangerous, or bizarre, respect your own judgement. Speak up when talking about something that can put peoples' lives at risk. That's not a time to be shy.

Setting hunting goals can be dangerous. People sometimes subject themselves to conditions they shouldn't because they've set a goal that should no longer apply. Hunters who stay out all day in deteriorating weather in order to get their limit are asking for trouble. Maybe they have made bets about who gets the first duck. Goal-oriented hunting can get people in trouble with the law, too. They may be tempted to trespass, shoot too early or too late. They may put themselves or their partners at risk by taking chances with firearms.

All it takes is common sense and a little forethought to develop a safe hunting plan.

Marsh Notes

Hunting insurance

Be sure to notify someone where you plan to hunt and when you plan to return. Leave a note in your car with more detailed information on your location once you arrive at your hunting area. Include the name of a person to call in case of an emergency. It's also a good idea to store an extra set of dry clothes in the vehicle and an extra set of keys in an accessible but concealed location. These precautions are life savers if you become lost or run into difficulty.

Waterfowl Identification

by Ray Norrgard and Dick Anderson

Daily bag limits are established to protect the waterfowl resource, especially species that are less numerous or particularly vulnerable. These regulations depend on the hunter's ability to identify their quarry. While there are 41 species of waterfowl native to North America, fewer than 25 migrate through Minnesota in the fall. Of these, only about seven will be subject to special regulations.

Books, pamphlets, and videos are available to introduce hunters to basic waterfowl identification. Carrying an identification booklet into the field also serves as a handy reference for identifying birds in the hand. Unfortunately, this may be too little, too late.

A good pair of binoculars and time spent in the field during spring and early fall will do wonders for your identification skills. Concentrate on the species that are typically subject to special regulations: mallard (especially hen), wood duck, pintail, black duck, redhead, canvasback, and hooded merganser. Also, be aware of fully protected species that frequent Minnesota wetlands. They include loons, swans, pelicans, cormorants, egrets, herons, and grebes.

Hunting conditions are rarely ideal for identifying waterfowl. Weather, light conditions, mixed flocks, and the excitement of the hunt can all make identifying birds in flight more difficult. Asking yourself a series of questions to help recall species under special regulations is an approach many waterfowlers find useful.

Start with the location. Which species are likely to occur? Small, shallow marshes are most often frequented by puddle ducks. Larger marshes and lakes will attract diving ducks. While some species, like the mallard, are found throughout Minnesota, others are not. Pintails, for example, are most common in western Minnesota; black ducks in the east.

Watch for flock formation and wingbeats. Are flocks well organized? Are wingbeats fast or slow? Regimented flock formation and slow wingbeats usually mean geese or swans. Most puddle ducks have relatively well organized flocks in flight and medium fast wingbeats. Teal and divers have fast wingbeats and more erratic flock formation. Birds that glide occasionally during flight are likely to be cormorants or pelicans. Grebes are rarely seen in flight. They prefer to dive to escape danger.

Landing patterns provide another clue. How do they approach the decoys? Geese and puddle ducks cup their wings to cut air speed. Divers and mergansers approach fast and low to the water, often waiting until just before landing to cup their wings.

What are the characteristics of the silhouette? Canada geese and swans have long necks and large wings. Diving ducks appear to have large, round bodies in relation to their wings. Most puddle ducks appear oval with relatively large wings.

Head position can be helpful for identifying some species. Wood ducks, for example, carry their heads high in flight. Mergansers, on the other hand, fly with their heads in a straight line with their bodies. Loons often appear to fly with their heads even lower than mergansers.

The silhouette of the tail is distinct for some species. Relatively long, square tails are typical of wood ducks and cormorants. Long, pointed tails are a key to identifying pintails. Feet extending behind the tail in flight almost always means divers.

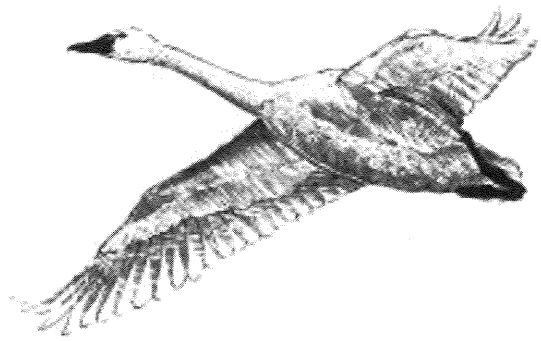
Finally, ask if the birds are light or dark? Under poor light conditions, color fades into shades of dark or light. For example, the rusty red head and black chest of the drake redhead can appear remarkably similar to the green head and brown chest of the drake mallard in poor light. Large amounts of white or very light color should always put hunters on alert. Swans, drake canvasbacks, and loons, for example, show large amounts of white. The accompanying chart highlights other light and dark patterns to watch for.

Marsh Notes

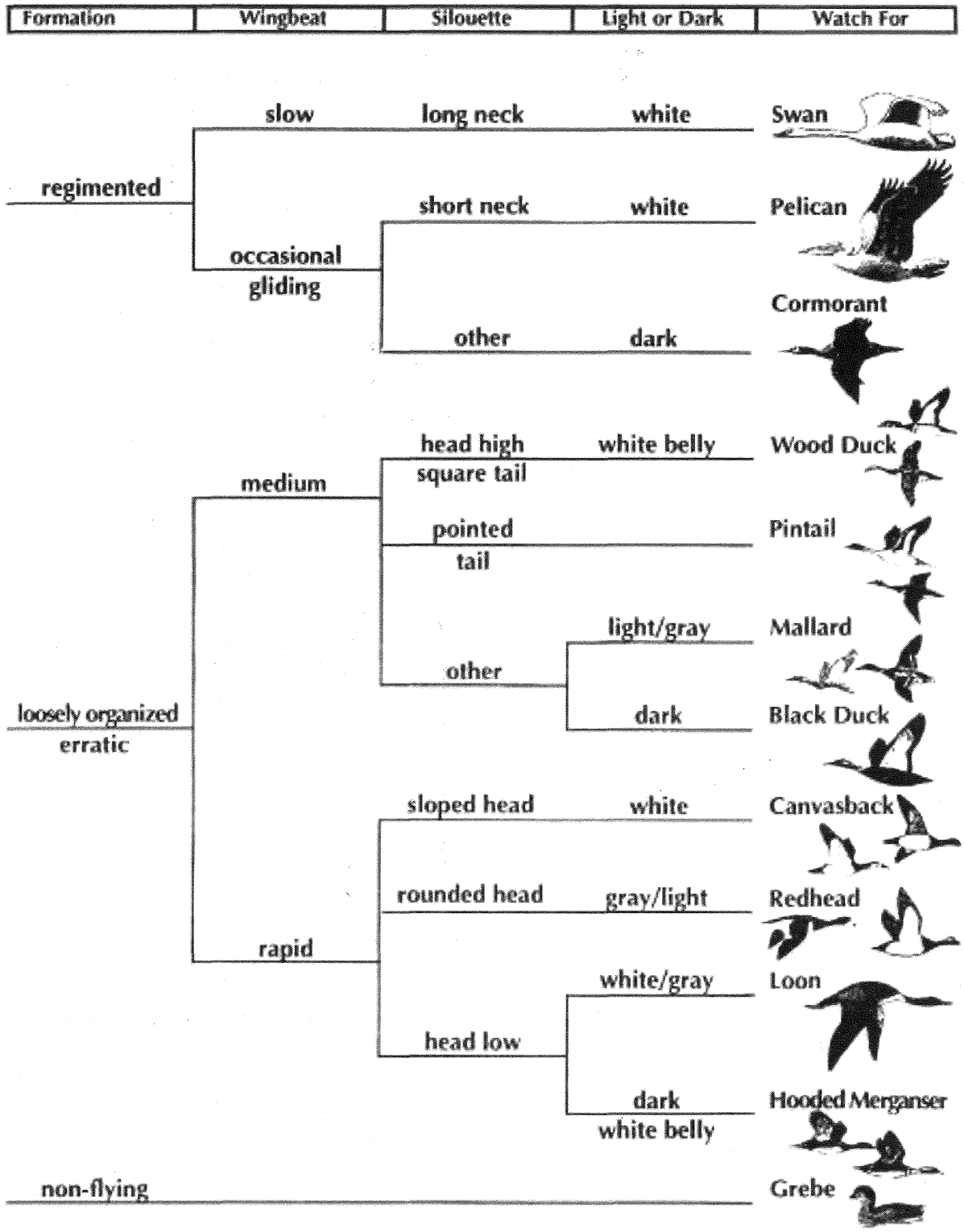
The trumpeter Swan is a rare species and protected by law. Fines may exceed $1,500.

Trumpeter Swan Features:

- All white plumage
- Long neck
- Length: 4.5–5.5 ft.
- Weight: 20–30 lbs.
- Wingspan: 7–8 ft.
- Voice: Resonant trumpeting call
- Protected species
- (Swans in their first year of life are grey and their bills may be pinkish)



The Identification of Protected and Restricted Species of Waterfowl



Source: *Ducks, Geese, and Swans of North America.* Wildlife Management Institute.

Basic Ballistics for Waterfowlers

by Ray Norrgard

Although no one can dispute that waterfowl are sometimes killed by a single pellet, consistent clean kills require at least four body hits on ducks and five on geese. The first step in achieving consistency is selecting the right shotshell load.

The "best" shotshell load for waterfowl hunting depends on a number of factors. Most important are the size of the bird, the hunting conditions, and the shotgun being used. No single recommendation can cover all waterfowl hunting situations. There is a proven process, however, that can help you select the most appropriate load.

First, identify the shot sizes that match your expected quarry. There is a relationship between the size of the waterfowl and the appropriate range of shot sizes. Relatively dense patterns are needed to consistently achieve four body hits on small ducks. On the other hand, hunting large geese requires fewer pellets, but over four times the pellet energy to ensure adequate penetration.

Dense patterns are most easily attained using small shot sizes. Unfortunately, small pellets rapidly lose energy in flight. High retained pellet energy can be achieved using the largest shot sizes. However, so few of the largest pellets can fit into a shotshell that it is impossible to achieve dense patterns. The dilemma faced by waterfowl hunters is finding the right balance between pattern density and pellet energy.

The shot size selection guide in Table I provides a starting point for load selection. The shot sizes listed provide adequate pellet energy at reasonable distances. The minimum required pattern density ensures multiple body hits on birds when centered in the pattern.

How do you know if your load selection will give you an adequate pattern? The only way is to pattern the load with your gun at the distances you will likely be shooting. There is no substitute for patterning. It is the second, and perhaps most critical, step in selecting the right hunting load. Hunters often find that different shotgun barrels pattern differently even when marked at the factory with the same choke. The same is true of the popular interchangeable screw-in chokes. A particular shotgun may do better with specific shot sizes, payloads, or load velocities.

Weather conditions can also affect the performance of shot shells. Cold temperatures can reduce velocities and pellet energy downrange. Cross winds can cause shot patterns to drift downwind and disperse prematurely. When hunting under severe conditions, select the largest pellet sizes that still provide adequate pattern density. Test these densities by patterning under similar weather conditions. Autumn-like weather often occurs in early spring.

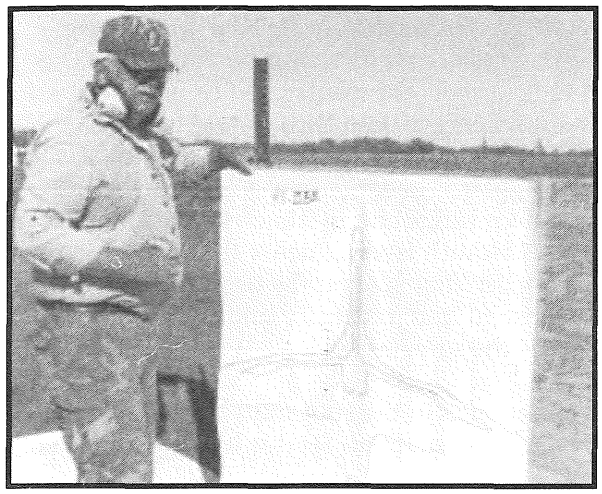
There has been an explosion of interest in recent years in improving downrange patterns. The improvements go beyond pattern density. In fact, competitive clay target shooters are often more interested in producing patterns with evenly-distributed pellet strikes than in ultra high densities. The even distribution means more broken targets when the target is not perfectly centered. It's an idea that hunters should note.

The biggest improvements in patterns have come through modification of factory shotgun barrels. Four modifications are typically employed. They include lengthening forcing cones, reboring chokes, porting the muzzle, and back boring the entire barrel.

Table I

Steel Shot Selection Guide

Waterfowl Type	Minimum Pattern Density (No. of Pellets in a 30" Circle)	Recommended Steel Shot Size
Small ducks	140	3, 4
Medium ducks	110	2, 3, 4
Large ducks	85	1, 2, 3
Small geese	55	BB, 1, 2



Paul Telander

Patterning your shotgun is as important for the waterfowler as sighting in is for the deer hunter.

Lengthening forcing cones refers to reboring the constriction in front of the chamber and sometimes the constriction within the choke. The purpose is to create a more gentle angle that is less disruptive to the shot charge. Although it has proved very effective in improving lead shot patterns by reducing pellet deformation, it typically provides relatively minor improvements with steel shot. Some shooters feel it also reduces recoil.

Reboring chokes has become relatively common. Because steel shot patterns much more tightly than lead, many hunters have opened up their traditional full chokes to modified or improved cylinder. The evenness, and in some cases, density of down range patterns often improve, especially with large shot sizes. Pattern improvements have also sometimes occurred after increasing the parallel portion of the choke between the choke forcing cone and the end of the muzzle.

Porting the barrel refers to cutting holes or slots on the top and sides of the barrel just before the choke. The idea is to release excess gasses before they disrupt the shot charge as it leaves the barrel. By placing the porting on the top and sides, the release of gas pressure reduces muzzle jump and recoil. This is a real benefit to the shooter, but hunters should remember that it increases muzzle blast to the sides. In other words, shooters reap more benefits from porting than hunting companions sharing their blind.

Backboring the barrel from the chamber to the choke is expensive but effective. It varies from simply improving the consistency of the internal barrel diameter to enlarging it to the same size as the chamber. Backboring reduces friction, disruption of the shot charge, and recoil. Waterfowl hunters should remember that steel shot wads are constructed of a much stiffer plastic than target loads and will not seal as large an internal bore. This is especially true during cold weather. If you are going to consider backboring, be sure to deal with a reputable gunsmith who has a proven track record with this technique.

Non-toxic shot in the late 1990s

Lead poisoning of waterfowl was first documented in the 1870s. In the early 1960s, it was determined that waterfowl were dying from lead poisoning as a result of the lead shot they ingested while feeding. In response to this problem, steel shot was developed as a substitute. Lead shot has been phased out over a period of years and was banned for waterfowl hunting in the entire United States in 1991. Beginning in 1999, Canada required the use of non-toxic shot for waterfowl hunting.

Ammunition manufacturers continue to research and develop non-toxic shot for use in waterfowl hunting. Steel shot was the first non-toxic shot to be used as a replacement for lead. In addition to steel shot, currently bismuth, tungsten-iron and tungsten-polymer are approved for waterfowl hunting.

There are similarities and differences between the non-toxic shot that can be used for waterfowl hunting today. All can effectively harvest waterfowl if proper hunting techniques are applied. The hunter must be able to judge distance, know how his or her shotgun patterns at the distance they shoot ducks or geese, and practice their shooting skills before the season begins.

There are different sources and supplies of the different shot materials. Lead shot is produced by pouring molten lead over a sieve-like device with openings that will determine the shot size. The molten lead pellets are cooled by either being dropped into water or from a tower. Lead shot is readily available and inexpensive.

Steel shot is made by cutting low carbon, soft steel wire into short lengths which are formed and ground to proper size. The pellets are then annealed and coated with a rust inhibitor or copper plated.

This process, similar to that used to manufacture ball bearings, is much more expensive than the method used for lead shot. There are ample supplies of iron worldwide.

Bismuth is a byproduct of lead, zinc, copper, and several other metal mining operations. It is used mainly for cosmetics, alloys, and medications. Its availability depends on the demand for the other metals. The annual worldwide consumption of bismuth is only 6 million pounds which is equal to the amount of lead used in the United States during the 1980s in waterfowl hunting each year. Thus, if the demand for bismuth shot increased, the price may rise. Bismuth is brittle and not easily formed into pellets unless tin is added. Bismuth shot can and has flaked, both before and while being shot.

Tungsten is a gray-white metal that is mined in China, Russia, Bolivia, the United States, and numerous other countries. It is used for alloys, cutting tools, electric contact points, light bulb filaments, and military munitions. The annual worldwide consumption is over 50 million pounds. There are ample supplies available for production of shot.

Tungsten-iron shot is made by blending two metal powders (40 percent tungsten and 60 percent iron) and forming or pressing them into the shape of a sphere. The pellets are then sintered or bonded together by a heating process. The shot is then coated with a rust inhibitor.

Tungsten-polymer shot is made by a similar process. Tungsten powder and powdered polymer (plastic) is blended, heated, and pressed into pellets.

An important difference between the types of non-toxic shot that can currently be used is the density of the material, that is, the weight when compared to an equal volume of the shot. Refer to the Pellet Density Chart for comparisons.

Pellets per ounce of shot is another way of comparing the density of the shot material. The more dense the material, the less shot pellets per ounce. Shot size #4 is a size which all currently non-toxic shot is manufactured. Refer to the table listing the number of #4 pellets in one ounce of material to compare the density of the different shot materials.

Since 1972, waterfowl hunters have been using steel shot as the non-toxic shot for hunting. Compared to lead shot, the hunter had to use shot two or three sizes larger than they would have used when they could shoot lead because steel shot is less dense or lighter. The larger steel shot size gave a greater down range energy than would a smaller shot size. Bismuth is more dense than steel, therefore, a smaller shot size can be used. Tungsten-iron is very close to lead in density and tungsten-polymer is the same as lead.

Other differences in the shot material include the hardness of the material. Steel is harder than lead. Shot manufacturers developed a plastic shot cup to hold the steel pellets as they traveled down the barrel of a gun to protect the guns' barrel. Bismuth is soft and can be used in older firearms and using similar wads as in the lead shot slug. The Tungsten-iron manufacturer has designed a special shot cup that has twice as many "petals," that is, three on the inside and another three surrounding the first three overlapped to protect the gun barrel. Tungsten and steel shells are safe in all shotguns approved for steel shot.

Tungsten-polymer has the same hardness as lead. The manufacturer uses the same components to load Tungsten-polymer as it does its lead shot. Some Tungsten-polymer pellets may deform as they are forced through the choke of a shotgun but, since the polymer is plastic, they will return to round after they have passed through. This is unlike lead pellets, some of which also deform as they go through the choke. Once deformed, lead pellets do not return to round; they remain deformed. The deformed pellets do not fly straight or true. The deformed pellets become "flyers." They may cause a shot pattern with some pellets spread apart from a majority of the pellets. Tungsten-polymer and bismuth shells are safe for shotguns designed for smokeless powder ammunition.

Pellet Density	
Pure Tungsten	19.3 gm/cc
Lead	11.1 gm/cc
Tungsten-Polymer	11.1 gm/cc
Tungsten-Iron	10.4 gm/cc
Bismuth	9.4 gm/cc
Steel	7.9 gm/cc

Number of #4 Pellets in 1 oz. of Shot	
Tungsten-Iron	140
Lead	135
Tungsten-Polymer	135
Bismuth	157
Steel	192

#6 Shot Downrange Energy (ft-lbs)*

	Ft per Sec	20 Yds.	30 Yds.	40 Yds.	50 Yds.
Tungsten-Polymer	1,330	3.5	2.8	2.3	1.9
Tungsten-Iron	N/A	N/A	N/A	N/A	N/A
Lead	1,330	3.5	2.8	2.3	1.9
Bismuth	1,300	2.9	2.3	1.9	1.5
Steel	1,450	2.3	1.8	1.4	1.1

#4 Shot Downrange Energy (ft-lbs)*

	Ft per Sec	20 Yds.	30 Yds.	40 Yds.	50 Yds.
Tungsten-Polymer	1,330	6.2	5.1	4.2	3.6
Tungsten-Iron	1,400	6.4	5.2	4.4	3.8
Lead	1,330	6.2	5.1	4.2	3.6
Bismuth	1,300	5.2	4.2	3.5	2.9
Steel	1,450	4.3	3.3	2.7	2.2

#2 Shot Downrange Energy (ft-lbs)*

	Ft per Sec	20 Yds.	30 Yds.	40 Yds.	50 Yds.	60 Yds.
Tungsten-Polymer	N/A	N/A	N/A	N/A	N/A	N/A
Tungsten-Iron	1,400	10.8	8.9	7.6	6.5	5.7
Lead	1,330	9.8	8.1	6.8	5.8	4.9
Bismuth	1,275	9.2	7.6	6.4	5.4	4.6
Steel	1,450	7.1	5.7	4.7	3.9	3.2

#BB Shot Downrange Energy (ft-lbs)*

	Ft per Sec	20 Yds.	30 Yds.	40 Yds.	50 Yds.	60 Yds.
Tungsten-Polymer	N/A	N/A	N/A	N/A	N/A	N/A
Tungsten-Iron	1,400	19.8	16.5	14.2	12.5	11.0
Lead	1,330	18.8	15.8	13.5	11.8	10.4
Bismuth	1,330	16.9	14.1	12.1	10.5	9.2
Steel	1,450	13.2	10.7	8.9	7.5	6.4

*Data from Federal Cartridge Company

To many hunters, the biggest difference may be the price of the non-toxic shot shells. Steel is more expensive than lead. The tungsten-based shot shells and the bismuth shell are three or more times as expensive when compared to steel or premium lead.

One might ask: "Why use non-toxic shot other than steel?" The answer may be "the greater potential to kill waterfowl." Initial reports from individuals considered very good waterfowl shooters, are that the tungsten and bismuth shot shells currently available, seem to kill waterfowl better. This is probably due to the higher down range energy of these loads. This may indicate that for the hunter that consistently shoots at closer ranges, 40 yards or less, steel shot will do the job. For the hunter who does a lot of shooting at the 40 yard range, the alternate non-toxic shot may harvest more waterfowl. Refer to the tables on Downrange Energy for comparisons of the different non-toxic shot materials.

The shot sizes made available by manufacturers vary. The waterfowl hunter must study the available information. Then select the shot and sizes that may be best for the type of hunting you will do. Then select the shot in the shotgun you will use to hunt and determine which combination will work best for you.

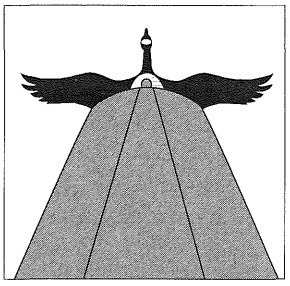
Waterfowl hunters must be aware that hunting and shooting are looked down at by more and more Americans. Shooting at longer ranges will only increase the risk of more people becoming anti-hunting. The hunter must decide whether to let the duck or goose go by, even though he or she may have a non-toxic shot shell with the down range energy to kill at 40 or more yards.

Marsh Notes

Gun Mounting

One of the most important elements in shotgun shooting is properly mounting the gun. The mount should start with the stock inside the elbow and the end of the muzzle in line with target. The muzzle should move with the target as the stock is lifted up and away from the shooter. The stock should meet the shooter's face just before coming back to the shoulder. The eyes never leave the target.

Gun mounting can and should be practiced at home with an unloaded gun. Wearing hunting clothes and sitting as if in a blind will help correct problems encountered under hunting conditions. Have a partner use a flashlight to provide a moving "target" on the wall. A few minutes practice once in a while can greatly improve shooting during the fall.



Range Estimation

Before leading the goose, aim directly at the bird. If more than half is hidden by the end of the muzzle, the goose is too far away for a clean kill.

Patterning Your Gun

Patterning your shotgun is as important to the waterfowl hunter as "sighting in" is to the deer hunter.

- Set up a patterning sheet at least 40 inches square and mark an aiming point near the center of the paper.
- Choose the gun and load combination you'll be testing, then measure a distance that approximates the typical range you will be shooting at when hunting.
- Make sure you have a safe backstop, one not made of steel. Wear eye and ear protection for additional safety.
- Shoot at least three patterns, each on a separate sheet. Then by counting the number of hits inside a 30-inch circle drawn around the densest pattern area, you can determine the pattern density.
- Shoot several pattern tests using different shot sizes, shot charges, chokes, and distances. By comparing the results, you will be able to determine which combination provides the best performance for your type of hunting. Record the results, including weather conditions, for future reference.

Hunting Blinds

by Ray Norrgard

Waterfowl hunting blinds may be as simple as tufts of grass in a fence row or as complex as large, collapsible boat blinds complete with comfortable seats and a heater. Regardless of their design, blinds are an integral part of nearly every waterfowling trip.

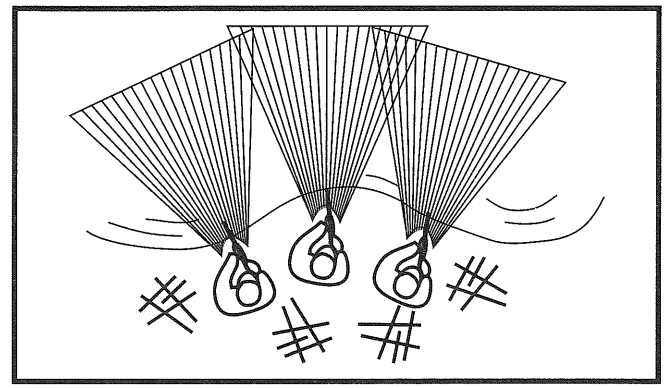
The basic purpose of a blind is to make the hunter less visible to approaching waterfowl. Because it is generally believed that ducks and geese can discern color, most hunters concentrate on camouflage patterns for clothing and equipment. Brown dominated patterns are the best for most marsh hunting situations. However, rocky shorelines, field hunting, and snow may call for gray, green, or white dominated camouflage patterns.

Just as important as color are silhouette and movement. Even relatively small amounts of natural cover can break up the outline of hunters and boats. The silhouette of the blind itself should be unobtrusive, although migrant waterfowl new to an area can be remarkably tolerant of blind size and shape. Masking hunter movement is important. Hand and head movement, in particular, are difficult to control in the excitement of decoying and calling birds.

Keep in mind the probable direction and altitude of incoming waterfowl when designing and positioning the blind. Hunting divers on big water, for example, generally means that birds will be approaching at a relatively low angle, reducing the need for overhead coverage. Setting up on a beaver pond for mallards presents nearly the opposite situation with decoying birds overhead at tree top height. Here overhead coverage can be critical.

Although waterfowling is often associated with cold gray skies, the shadows created by bright sun can be a great asset. Whenever wind and flight patterns allow, keep the sun at your back. This will deepen the shadows on your face, hands, and gun, reducing visibility to passing birds. It will also greatly aid waterfowl identification.

One of the most critical aspects of blind design is shooting safety. Paying close attention to natural shooting zones, hunter position, and equipment placement can greatly enhance safety.



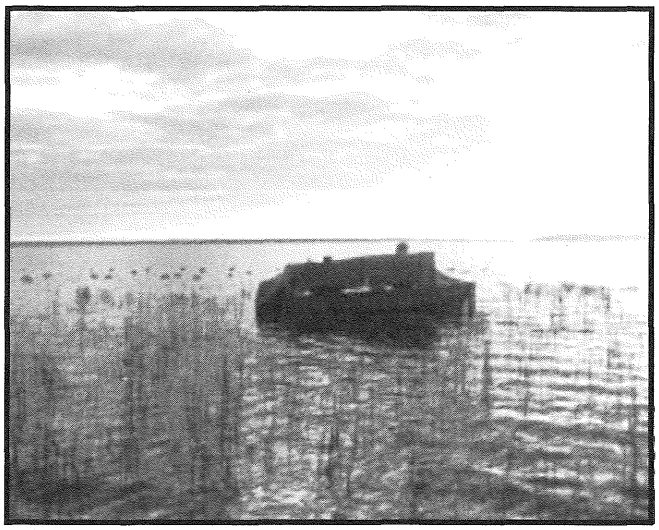
An important aspect of safety is clearly recognizing safe zones of fire.

Natural shooting zones include all the likely shooting angles if only one hunter is in the blind. They result from the flight path of waterfowl and the blinds location. The center point of the zone is where the flight path of the bird passes closest to the blind. Determined by the wind, origin, intended destination of the flight, and decoy placement, the flight path will generally be consistent throughout a morning or afternoon unless one of the factors changes.

As a result, the blind can be positioned so that natural shooting zones correspond as closely as possible to safe shooting zones. In most cases, this means placing a multiple hunter blind or multiple blinds either parallel or perpendicular to the predicted flight path of birds.

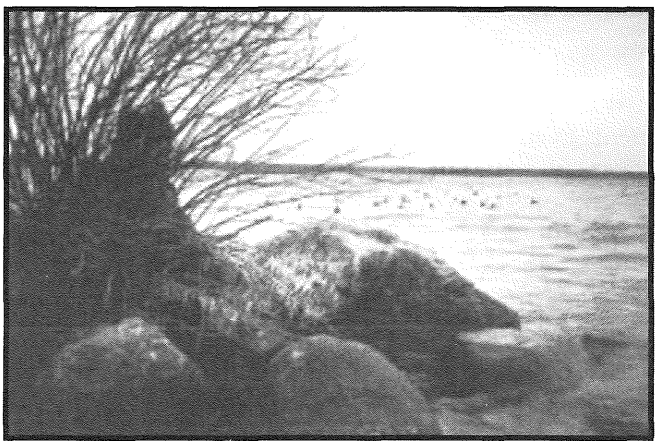
Hunters can also be positioned within a blind to enhance safe shooting. Sitting right next to your hunting partner does more than simplify the sharing of coffee. Proximity provides both a visual and a physical barrier to an unsafe swing. In addition, you should have a clear understanding within the blind whether shooting will take place from a standing or sitting position. The blind can even be designed with a cover or high sides to dictate shooting position.

Placement of your equipment within the blind is also important. Even though shotguns should be readily accessible while hunting, care must be taken to ensure that the muzzles are pointed in a safe direction when at rest. Their resting place should be stable and positioned out of the way of hunting dogs and other disturbances that could cause them to fall. Other equipment should be out of the way of your feet to ensure firm footing when shooting.



Rob Naplin

A hunting blind can be elaborate or simply using natural cover to break up the hunter's silhouette.



Rau Mprrgard

Marsh Notes

Selecting a blind location

Consider the location of other hunters when selecting a blind location. Crowding benefits no one. Maintain at least 200 yards from other hunting parties whenever possible.

Blind construction

Although state law allows wetland vegetation to be used in blind construction on wildlife management areas, try to avoid creating an eyesore through excessive disturbance to a site. Remember, state law requires that all materials brought into such an area for blind construction must be removed by the end of the day.

Blinds are an important aspect of waterfowling. They deserve as much consideration in planning and preparation as your decoys, calls, and shotgun. A well thought out blind will add to both your success and your safety.

Talking Their Language

by Ray Norrgard

History

While the evolution of waterfowl decoys is associated most strongly with the Atlantic Flyway, it was the Mississippi Flyway where duck calling and call making first developed into an art. From Minnesota to Louisiana, mallards and ingenuity led to the evolution of duck calling as we know it today.

How they work

Duck and goose calls employ the same general design. The basic parts include the barrel, keg or bell, tone channel, reed, and wedge. The keg and tone channel may be combined into a single piece called the stem.

The key component of any call is the reed. Vibration of the reed from air flow produces the sound. How the reed vibrates depends on how the air is manipulated. The barrel, keg, and tone channel all play a critical role in modifying air flow. The wedge secures the reed over the tone channel. A loose or ill-fitting wedge will spell disaster for waterfowl callers.

Getting started

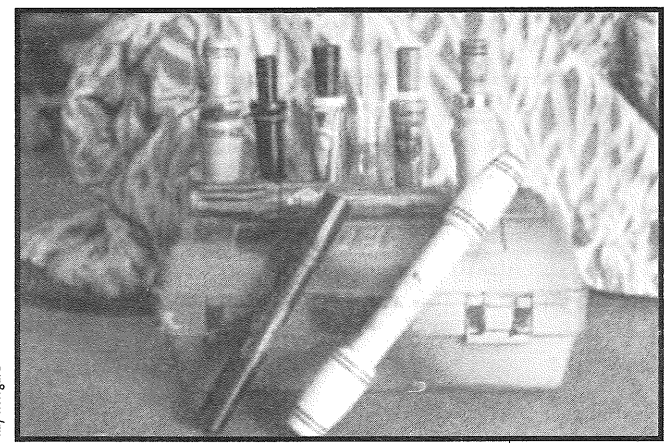
Place the call in either hand with thumb and forefinger encircling the keg. Your lips should touch the opposite end of the barrel as if you were drinking a bottle of pop. Slightly relax your call hand. Gripping the call too tightly will interfere with good calling mechanics.

There are four ways to control the air flow through the call. Skilled callers use all four to produce the combinations of rhythm, tone, and volume that represent true expert calling. The volume of air is controlled by compressing your diaphragm. It is nearly impossible to generate the controlled air pressure needed in calling without bringing this important muscle into play. The diaphragm is the same muscle you use when coughing.

The throat and mouth provide two additional means to control air pressure. Although they play a role in modifying tone, they are most important in controlling the beginning and ending of each individual note. Your tongue and larynx are the primary muscles that come into play.

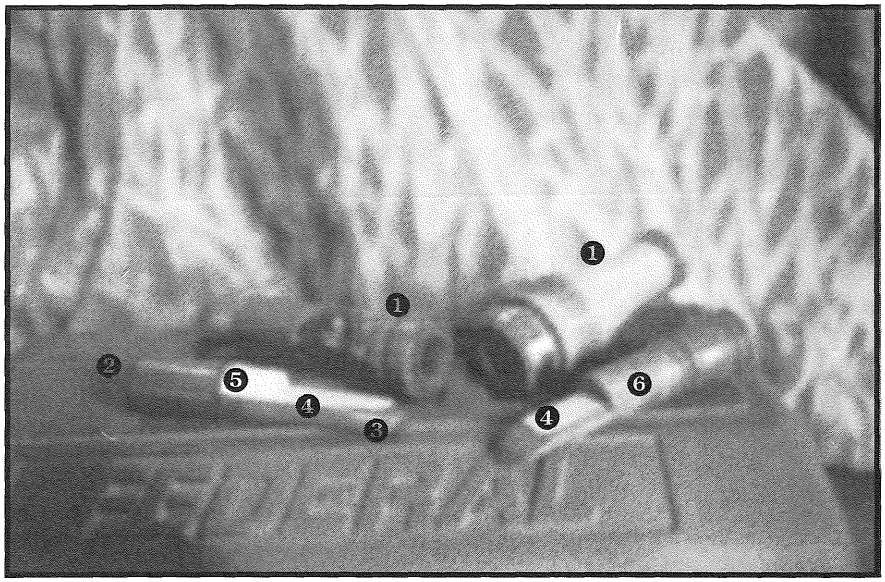
Finally, the fingers of your call hand play a critical role in controlling the air leaving the call. The back pressure created within the call by opening or closing your hand over the keg refines the tone and volume of each note.

The best way to learn calling is under the personal guidance and training of an experienced caller. Videos that illustrate the proper use of your hands can be very helpful. The use of audio tapes is also beneficial when used in combination with video or personal instruction. Record your calling and play it back to evaluate your progress.



Ray Norrgard

Waterfowl calls come in a variety of styles and materials.



The basic parts of the call include:

1) barrel,
2) keg or bell,
3) tone channel,
4) reed,
5) wedge,

The keg and tone channel may be combined into a single piece called

6) the stem, as in this Arkansas-style call.

Calling ducks

Minnesota is important as both a waterfowl production and migration state. We encounter ducks while hunting that are in all stages of migration. As the season progresses flocks typically become larger. They are more inclined to use and respond to vocalizations. Be prepared to modify your calling style in response to bird behavior.

All puddle ducks respond to the call of the mallard. The most important sound you will ever learn in duck calling is the basic quack of the hen mallard. Important in its own right, it is also the basis for other calling sequences. Learn to vary the tone, volume, and duration of the quack by using all four air flow techniques and you will be well on your way to mastering other calling sequences.

The feeding call of the mallard may well be the second most important call for working birds. This is not the high speed "chuckle" or "chatter" typical of contest calling. It is a series of clucks mixed with soft quacks. The feeding call will rarely spook ducks even when imperfectly executed.

The lonesome hen, greeting, and comeback calls are all variations of a series of simple quacks. In any series, the quacks should be higher in pitch and volume at the start of the series and move down the scale to the end. Although some callers assign a very definite number of notes to each type of series, it may be more useful to compare them in relative terms. The comeback call, for example, is used when ducks appear to be losing interest in the decoys. The series is demanding and characterized by 5–9 quacks, high volume, and fast tempo.

The other extreme is the lonesome hen sequence. With as few as three quacks, the notes are drawn out in a much more relaxed manner. The greeting call falls somewhere between the lonesome hen and the comeback call. Just where depends on the caller and the attitude of the ducks. The key is being able to gauge their response and adjust to it.

No discussion of duck calling would be complete without the highball or hail call. Long, loud and often high pitched, this series mimics no natural call made by ducks. Used only to attract the initial attention of ducks, it is really an exaggerated caricature of a greeting call. Used under hunting conditions it generally consists of 9–15 notes, with the first one-third to one-half of the notes consistent in pitch and volume before breaking down the scale. Although it has its place in Minnesota waterfowling, the highball tends to be overused by novices, much to the irritation of those unfortunate enough to be hunting the same area.

There are a growing number of duck hunters in our state who have mastered the calls of species other than the mallard. For early season gunners the call of the wood duck can be used very successfully. With the purchase of a specially-designed call and a small investment of time, the wood duck vocaliza-

tions can be easily mastered. A few simple "peeps" on a wood duck call can also influence ring-necked ducks and blue-winged teal, which often frequent the same habitat.

Some western Minnesota hunters would feel ill-equipped without a pintail and wigeon whistle hanging from their necks. Typically used as a greeting or confidence call after the birds have been attracted, the whistles of the drakes are not difficult to master. Although they differ from one another, both can generally be employed with the same call.

The vocalizations of diving ducks can be imitated with a standard mallard call, although specialty calls are available. Most drakes and some hens make a "prr...prr" sound that can be approximated by vibrating your tongue against the roof of your mouth while calling. The key to diver calls is starting with the call hand open and closing the fingers to end each note.

Many hunters believe that the calls of different species should not be used unless that species is represented in the decoy spread.

Calling geese

As with ducks, Minnesota hunters are likely to experience a variety of behavioral differences in geese. Small flocks of local geese are typical of early season hunting. The flocks of both resident and migrant geese become larger and often more vocal as the season progresses.

Although snow and blue geese are encountered in some areas of Minnesota, most goose hunting in our state focuses on the Canada. There are three general categories of vocalizations that are important to the goose hunter. They are honks, clucks, and the murmur.

With the tremendous increase in resident Canada geese, nearly every citizen is familiar with the goose honk. Many hunters, however, are surprised by the number of variations that occur. The basic honk consists of two notes. It is mimicked by building moderate air pressure in the call while your call hand is nearly closed; then increasing the air pressure rapidly with your diaphragm while simultaneously opening one or more fingers. The call hand plays a critical role in establishing the pitch and intensity of the note. Although the honk is rarely given by geese on the ground, it is the goose hunter's equivalent of the mallard highball. Most novice callers err by dragging out the length of the honk. It should be a relatively brief note, breaking and ending crisply.

The backbone of the experienced goose caller's repertoire is the cluck. Essentially consisting of an abbreviated honk without the beginning low note, the cluck is the greeting call of Canada geese. When working a flock it may be initially mixed with basic honks to mimic flock conversation. As the birds respond, fast clucks and double clucks are used to escalate the level of excitement in the calling.

Rapid clucking is typical of young geese preparing to land. That is precisely the verbal picture the hunter should strive to portray. Little is more comforting to a hungry or tired flock of geese than the image of other geese already landing.

The murmur is a relatively soft close-in call. The call hand is kept nearly closed while rapidly grunting into the call. This is considered relatively unimportant by many experienced goose hunters because of its limited range, particularly in windy conditions. By the time geese are able to hear the murmur they are often already within shotgun range.

Snow and blue geese have already migrated over 700 miles by the time they reach Minnesota. Migration accentuates the tendencies of these naturally gregarious and talkative birds. The basic honk is much shorter, higher pitched and more frequent

Ray Norrgard

Knowing when to call is every bit as important as knowing how.

than the Canada. In many ways it is more similar to the big goose's cluck than its honk.

As in Canada goose hunting, the basic honk serves to attract. The pace of the calling intensifies as the flock begins to respond. Effective use of the call hand will slightly modify the pitch of each honk to create the mixture of tones occurring naturally in a wild flock. The illusion is even more effective when several hunters join in the calling.

Although exceptions exist to nearly every rule, calling intensity is often the critical factor when working snow geese. The premise is simple. Call as excitedly as you can for as long as you can.

The murmur is probably even less important when calling snow and blue geese than when calling Canadas. The noise of the incoming birds can be simply overwhelming. The exception is when the flock consists of mostly adult birds. With all geese it is the young birds that do most of the talking.

Back to the basics

Regardless of your mastery of duck and goose calls, an occasional review of a few basic rules will increase your success. The best instructors are the birds themselves. Pay close attention to flock behavior. Remember to talk to the birds rather than call at them. Learning when to call is every bit as important as knowing how to call. Not even the best video and audio tapes can substitute for time in the field. Fortunately, in Minnesota we have the opportunity to talk to ducks and geese nearly year round.

Purchase the best quality calls you can afford and always carry a spare. A high quality call will not make a good caller out of a poor one, but it can help a good caller become even better. Calls are not indestructible. Foreign material, lost parts, and freezing weather can render a call useless.

Keep calling fun. When recreation becomes so serious we can't smile and laugh at failures, then we have lost its whole purpose.

Marsh Notes

Vocal drakes

The notoriety given the vocal tendencies of the hen mallard have led some hunters to believe that male ducks are the silent type. Not so, according to wildlife experts. Pintail and wigeon "drakes," for example, are often more vocal than the hens of the same species.

Marsh Manners

Nash Buckingham said it with humor: "A duck call in the hands of the unskilled is conservation's greatest asset." Incessant calling on a hunting marsh, however, is no laughing matter. Not only can the constant noise spoil hunting aesthetics, it can also eliminate other hunters' opportunities to decoy birds.

What about hunters who knowingly call and compete for birds already working another hunter's decoys? Gaining success by ruining another's hunt damages the tradition of waterfowling.

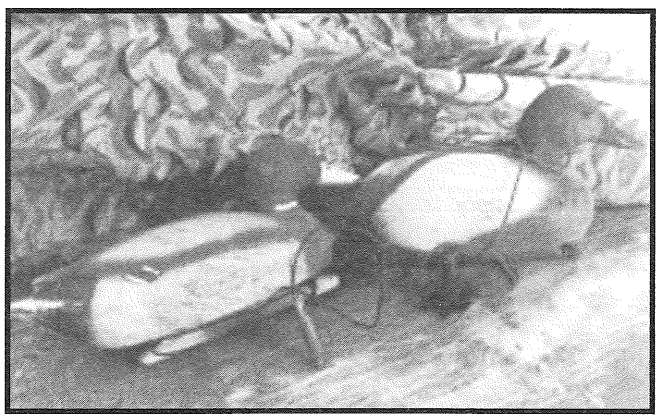
The Art of Decoying

by Ray Norrgard

Introduction

The first use of decoys to lure waterfowl is not precisely known. It was the market hunters of the Atlantic Flyway, however, who raised the use of decoys to an art form. As many as 600 decoys of wood or cork were often used in combination with open water blinds to hunt waterfowl. Combined with the repeating shotgun, it proved a deadly combination for open water flocks.

Old-time gunners would be amazed at the variety and versatility of modern decoys. The light weight and durability, in particular, would warm the hearts of those who handled and repaired hundreds of solid wood decoys at a time. Yet as much as decoys have changed, their purpose remains to attract birds within close range. Market gunners wanted their shots well within 40 yards, the closer the better—a concept worth considering today. For them, ammunition was expensive and time consuming to load. Today, waterfowl are too precious to waste by taking low percentage shots.



Ray Norrgard

Decoy weights should match the hunting conditions. Grapple style anchors, for example, hold better on sandy lake bottoms.

The basics

Five basic guidelines apply to all waterfowl decoying. They are site selection, wind direction, landing area, migration behavior, and natural patterns.

- Site selection is the most critical. Decoys must be placed where waterfowl want to be. Scouting in advance for feeding and resting areas is best. A preliminary review of maps and aerial photos can help focus the search. The more familiar waterfowl are with the hunting area, the more carefully you must choose your site. Migrating flocks, for example, respond to major landforms and water areas, as well as birds already using the area. Within a few days, however, their feeding and flight patterns become much more definite and difficult to influence.

- Wind is an important factor influencing how waterfowl respond to decoys. Waterfowl will nearly always approach decoys directly or quartering into the wind. Establishing the blind and decoy rig to take advantage of a crossing wind generally provides the best shooting for a multiple hunter blind. A wind from the front or directly behind the blind encourages birds, particularly divers, to swing to one side making it more difficult to establish safe shooting zones.

- The key to putting decoying birds in proper position for hunters is to clearly establish a landing area. The proper position of the landing area in relation to the rest of the decoy rig depends on the species of waterfowl hunted. Puddle ducks, like mallards, are strongly inclined to land just downwind of the major concentration of decoys. Divers, on the other hand, tend to focus on a landing area toward the upwind side of the rig. Geese, whether on land or water, seem to prefer landing to one side of the decoys.

- Waterfowl migration behavior should influence how the decoys are set. Waterfowl in early migration tend to be in small groups, unhurried and relatively familiar with their surroundings.

Decoy rigs should likewise be relatively small, usually less than a dozen, particularly for puddle ducks. Birds well into migration tend to be more social and in larger flocks. As they move into a new area, they are more easily influenced by large decoy spreads. Flocks sometimes include more than one species, especially among diving ducks. Multiple species decoy rigs should clearly group puddlers, divers, and geese separately. Separation of species within each group is also a good idea, but need not be as distinct.

- Knowledge of natural patterns of waterfowl behavior can be a tremendous asset. How waterfowl arrange themselves when using your hunting area can provide clues to their activity and visual expectations. Most natural patterns fall into one of three basic categories, random, clustered, or linear. It is important to note that none of these patterns are regimented with equal spacing between birds or some kind of inherent specific design. They are simply tendencies that can be used to guide decoy layouts.

Random patterns are typical of small groups of feeding waterfowl. In reality, they are random only to our eyes since each bird is purposefully positioned to find food. Alarmed flocks quickly change their pattern. All the birds will turn into the wind. Puddle ducks will move closer together while divers and geese typically spread out to allow room for take off.

Cluster patterns may also represent feeding flocks. In such cases the birds are actively moving while feeding. Clusters often seem to be made up of similar species in mixed flocks of ducks or family groups in the case of geese. When no feeding activity is evident, the birds are generally using the area for rest. As in random patterns, when all the birds within a cluster are facing directly into the wind it is generally a sign of alarm.

Linear patterns are more typical of large flocks on open water. These large flocks tend to elongate with the wind. Often the birds are at rest. Strong winds encourage birds to face into the wind even when not alarmed.

Natural patterns and the other general guidelines should be considered whenever setting out decoys. No two decoy rigs should ever be exactly the same. The challenge is to use these principles in your specific hunting situation to attract flights of waterfowl to the front of your blind. Be flexible. If birds are not behaving as expected, it may be necessary to move decoys, change patterns or even reposition the blind.

Special techniques

A number of special techniques can be used to increase the attractiveness of your decoys and build the confidence of decoying flocks.

Magnums

Magnum or extremely large decoys can increase the initial attraction of your decoy rig. This is particularly true in vegetation like wild rice or during early season when small numbers of decoys are generally used. Canada goose decoys can be used with duck decoys to get the same effect.

White decoys

The color of most ducks and Canada geese in Minnesota are relatively subdued during early season. It usually makes sense to mimic this pattern. However, brightening the white on canvasbacks, goldeneyes, and scaup can pay dividends on big water when strong initial attraction is needed. Snow goose or swan decoys can serve the same purpose if these species are using the same general area.

Flags and kites

"Flags" and kites can provide the visibility and movement needed to attract attention. Flags are usually two-foot squares of black cloth stapled to

Ray Norrgard

"Flagging" to attract the attention of passing flocks is a special technique that can be effective for geese and diving ducks.

short poles. Waved at passing flocks, they can attract geese or divers from a distance. Don't overdo it. Once the flock turns in your direction, put the flags away until needed.

Kites have been used effectively on field feeding geese. The trick is to keep the kite airborne at low altitude while "pumping" the string to imitate the sometimes erratic flight of landing geese.

Tip-ups and swimmers

Decoys rigged with separate lines through anchors and to the blind can be manipulated to "swim" and "tip up" like a puddle duck. On still days the ripples created can be seen at great distance from the air. The ripples also create movement among nearby decoys. Although cumbersome to set up, this technique can contribute to success, particularly on "blue bird days."

Confidence decoys

Confidence decoys represent marsh birds that waterfowl associate with secure surroundings. Egrets and herons, for example, may serve well in early October. Coot or gull decoys would be a better choice when hunting big water. Remember that confidence decoys should represent a natural situation. It is usually best to place confidence decoys to one side of your set.

Selecting decoys

The wide variety of duck and goose decoys currently available can be confusing when purchasing your first spread. Here are some ideas to help sort things out.

Decoy silhouette is more important than a detailed paint job. Head positions, in particular, should represent relaxed or feeding birds. Except for the situation noted under special techniques, decoy paint should be relatively subdued and never shiny.

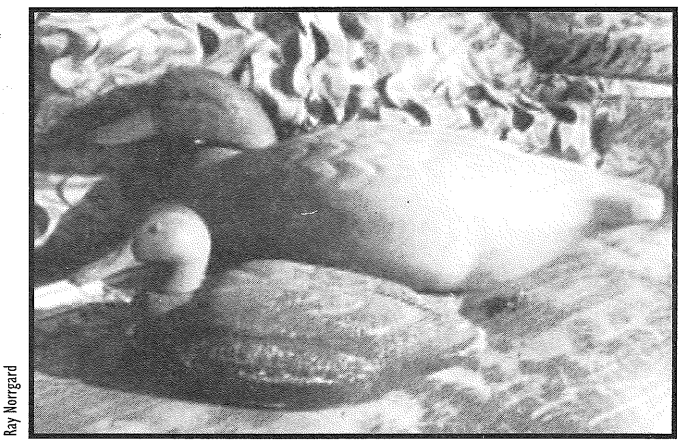
Although a variety of duck species are available, all species of puddle ducks will respond to mallard decoys. Likewise all the divers will respond to scaup decoys. Other species of decoys can be used effectively, but are simply not necessary under most conditions.

With modern society's emphasis on bigger and better, some hunters are sold on magnum decoys. Certainly these decoys offer added visibility. They are also bulky and expensive. Standard sized decoys make a lot more sense when traveling to remote locations or during late season when more decoys are used.

Decoy line should be one and one-half (1½) times the depth of the water where decoys will be used. Heavy line is a lot easier to handle, especially in cold weather. Decoy weights should be six to eight ounces. Smooth weights make good sense in wild rice or heavy, submerged vegetation. Special designs with extra holding power may be necessary on smooth lake bottoms.

Water decoys are available with either weighted or unweighted keels. Select weighted decoys for big water or windy conditions. You may want to choose unweighted keels if the decoys have to be carried long distances.

Most hunters build up their arsenal of decoys over time. With proper care modern decoys should last a lifetime.



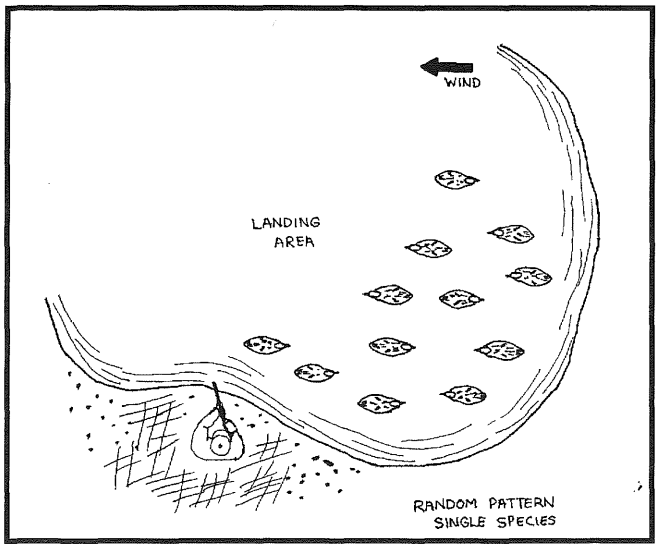
Ray Norrgard

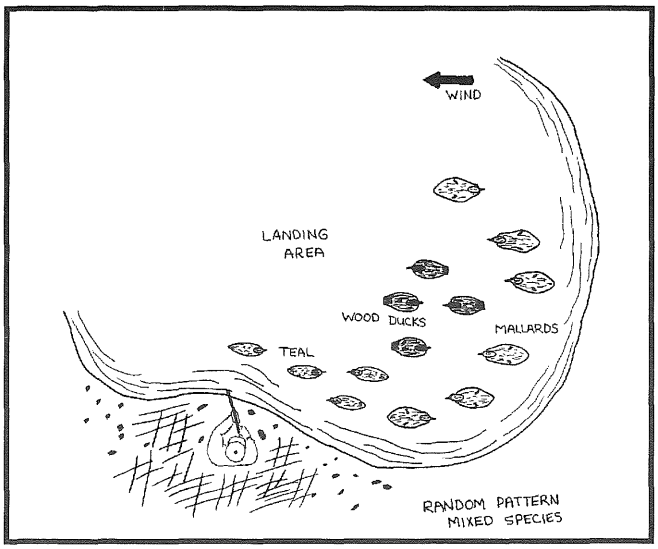
Extremely large decoys can be seen by passing waterfowl at long distances.

Typical decoy layouts

Random pattern

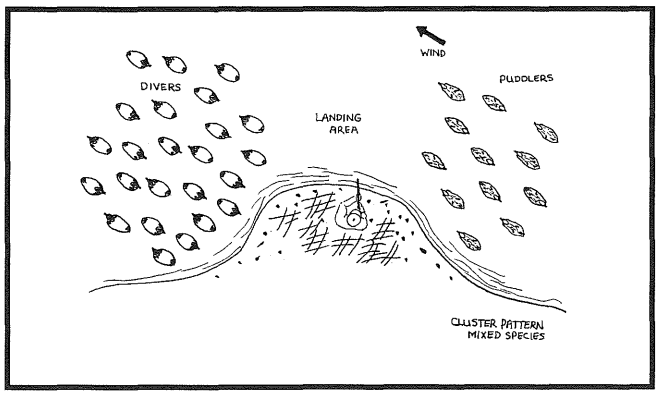
The random pattern is typically used for puddle ducks on small ponds early in the season. Decoys should have anchor lines rigged so they face every direction. Effectiveness can be greatly enhanced by using tip-ups or swimming decoys to provide movement. Two of the many variations are illustrated here.

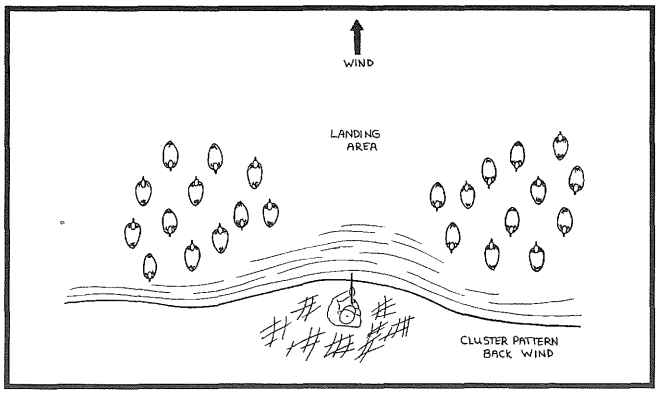


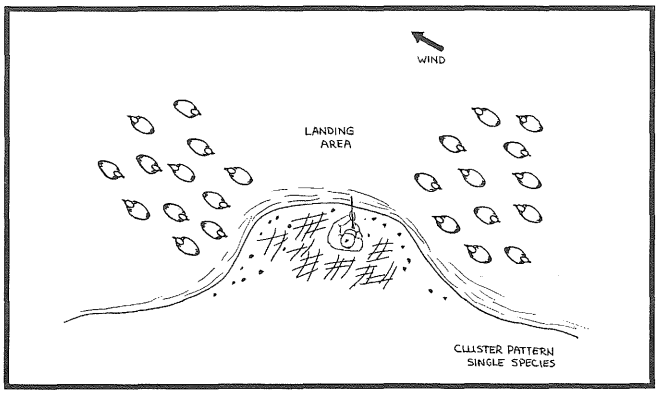


Cluster pattern

These patterns can effectively represent both feeding and resting situations. They are generally used on larger water areas rather than random patterns. It is difficult to get flocks to key in on the landing area if more than two major clusters are used. Cluster patterns can be used with puddle duck decoys, divers or both. This can be one of the most effective approaches for small shoreline points or when it is not possible to set up with a crossing wind. Three variations are shown.

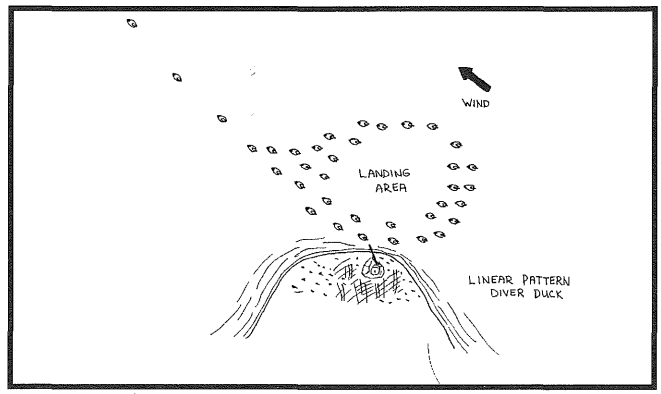


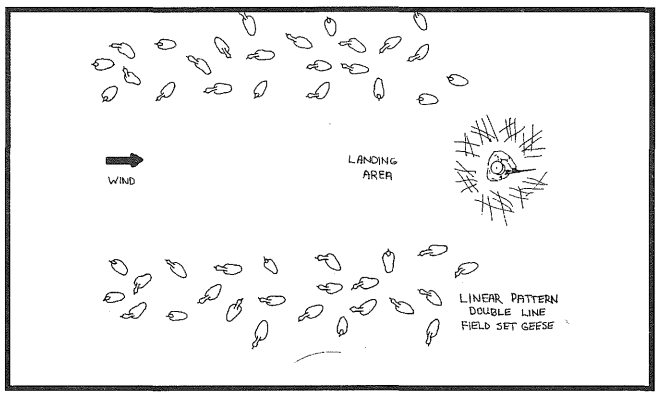


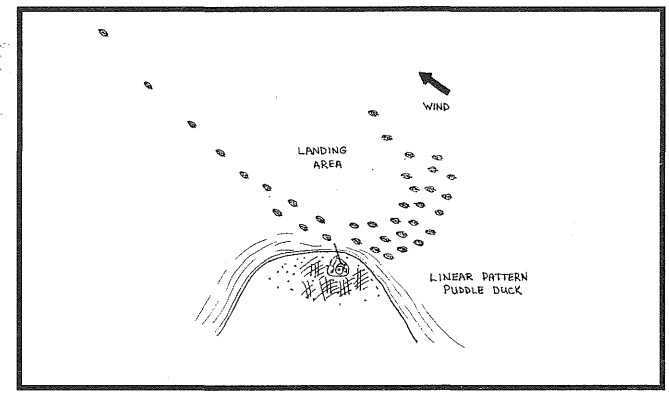


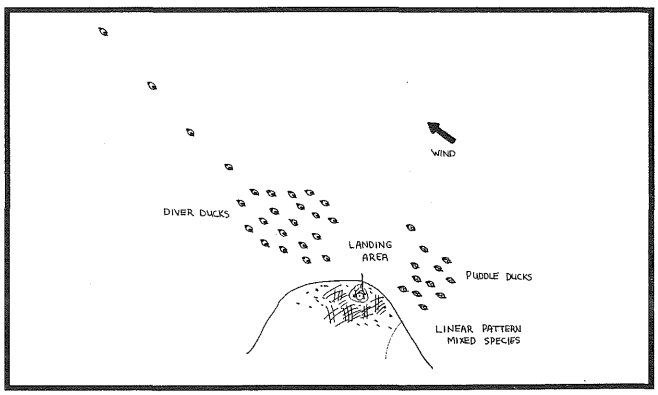
Linear pattern

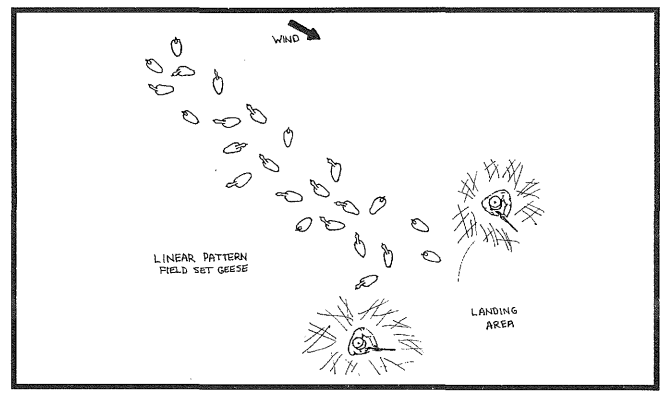
The classic fish hook and tadpole decoy layouts are really caricatures of a natural linear pattern. The key is to build up the leading portion of the layout with relatively tightly spaced decoys to serve as a focal point. The "tail" should have decoys widely spaced. Two or three decoys clustered in the tail will pull shy birds away from the head. Linear patterns are the only really effective way to use sixty to several hundred decoys in the same layout. This is a very popular approach for long narrow points, islands, and other open water situations. Although basic examples are provided, don't get tied to a specific layout. Avoid the tendency to get a regimented appearance when setting up a large spread. Five variations are shown.











Marsh Manners

State law

In order to prevent preemption of hunting spots, state law prohibits setting out decoys on public land or public water more that one hour before legal shooting time. The only exception is on public water when there is no emergent vegetation and the hunter has control of adjacent private land.

Decoy consideration

Few occurrences are more disconcerting to serious waterfowlers than having another hunter set up decoys so close as to spoil any opportunity to work passing flocks. Provide a minimum of 200 yards between decoy sets, more if at all possible. Never shoot at birds obviously working another hunters' decoy spread. It will probably be a low percentage shot for you and eliminate opportunities for the other hunter to enjoy one of the greatest thrills of waterfowling.

Marsh Notes

Where eagles dare

The site of a soaring bald eagle is thrilling anytime, but it is especially welcomed by those who hunt late season divers. The presence of eagles can make rafting flocks uneasy. Some of the nervous birds often take flight providing additional opportunities for decoying.

Decoy tradition

Dawn breaks on a hunter crouched in a dense stand of bulrushes. He tenses as canvasbacks swing low over the decoys. The time? Before the birth of Christ. The place? Humbolt sink near what is now Lovelock, Nevada.

Although the marsh suffered the ravages of modern settlements, the decoys survived. Archaeologists discovered them in a nearby cave in 1924. Carefully wrapped in rush matting, the decoys were stored in a false bottomed basket by an unknown hunter more that 2000 years before. Constructed of rushes, twine, feathers, and mineral paint they are remarkable renditions of canvasbacks.

Artificial Waterfowl Nesting Structures

Goose and duck nesting structures

Building and placing waterfowl nest structures is about returning something to the resource that has provided you with so many hours of enjoyment while hunting. Private landowners and outdoor enthusiasts can also enjoy many hours of waterfowl watching with this kind of activity.

The use of artificial nest structures is one of a number of techniques that waterfowl biologists use to help in the never-ending battle to maintain waterfowl populations. The loss of wetlands and the alteration of natural habitats to benefit people has forever changed the ability of waterfowl to survive and reproduce without human interference, and, in some cases assistance. This is not entirely true for all species of waterfowl. Geese, for example, have adapted so well to human habitat alterations such as golf courses, manicured lawns, and very reduced hunting opportunities, that they have over populated the Twin Cities. However, even though there are many geese in the state, you may still want the enjoyment of improving the habitat on your land and watching geese use the structures you built. Mallard ducks have fairly stable local populations in Minnesota, but because it is the duck preferred by most waterfowlers, there is always room for more.

Mallards and geese have different nesting requirements and habitat needs so it is important to read the biological requirements of each species. Before you begin your project, check to see that your site has the necessary habitat components. If not, try to improve or provide what is needed.

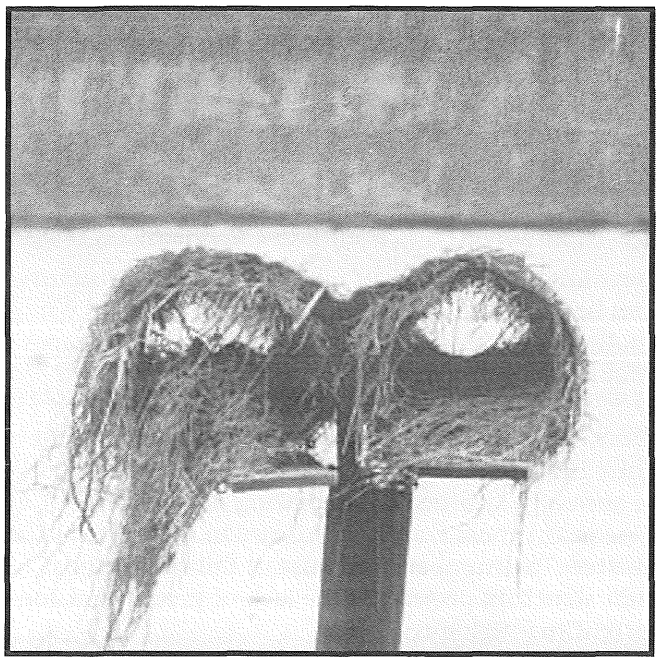
Before you start, count the cost of the project. No one wants to start a project only to abandon it later because you could not provide all that was required to finish the job. Some things to consider are initial costs of materials, your ability to construct the structure, aesthetics, and maintenance costs. The initial cost and maintenance costs will vary depending on the design, materials used, how many and how long the structures will last. Nesting structures can be designed to be aesthetically pleasing by using materials with earth tone colors and curved shapes that better blend in with the environment.

Ducks and geese do not carry nesting materials to their nests like other birds, another one of the costs is annually locating and replacing nest material. One of the most convenient times to do this is in the winter. The number one cause of failure for most nest structure projects is the lack of proper and consistent maintenance.

It may take several years before your newly placed nest structures are occupied. Waterfowl need some time to get accustomed to structures especially when there have never been any in the past. Once they first occupy the nest, however, there is a very good chance that they will return year after year. As time goes by, add more structures if space allows, because most projects seldom exceed 75 percent occupancy.

You will want to know if all of your efforts have paid off. To do this, you will have to check the nests to determine if they are being used. The best time to do this is during nesting or right after the nesting season. When checking nests during the nesting season, be sure to wait until most of the birds are finished laying eggs. Ducks and geese are less likely to abandon their nests if disturbed after the laying process. If you flush a bird from a nest, cover the eggs with a little nest material or down to protect them from predators and the weather. Checking the nests will help you determine use as well as potential predator problems. Keeping records of the visitors to your nests each season can be fun as well as useful. By keeping records you can determine if you should add nesting structures and it might be helpful for others who want to try attracting waterfowl to their own property.

Mallards will occasionally nest in over-water structures. To do this successfully you must provide a nest that has either side or overhead protection.



Roger Strand (photo edited)

Photo of a Double Hen House which can be constructed and placed in an over water location. Mallard hens that use this type of nesting structure have high hatching success.

Geese, on the other hand, nest in the open. Plans and materials to build a cylinder style nest to accommodate both geese and mallards in one structure are provided (see photo). The interesting thing about this design is that the goose will provide predator control for itself as well as the mallard duck which is generally ineffective in protecting its nest against predators.

Nest location

Wildlife biologists at the Minnesota Fish and Wildlife service in Morris, Minnesota, have found that cylinder-shaped nest structures mounted on a pole, floating raft, attached to goose nesting structures, or on large round bails, will attract and produce mallards. Insurance against predation on all structures is minimized by using barriers such as unclimbable poles, maintaining 100 + yards from shore when using floating structures, and having nesting geese nearby. However, there are no guarantees. Successful nests are sometimes a matter of "luck." What you think will be the best structure won't be used, and the one you think will be poor gets high use. Keep trying.

If you want to talk to the specialists, call the Morris Wetland Management District Office at 320-589-1001. For written inquiries, contact the Morris Wetland Management District, Rt.1, Box 877, Morris, Minnesota 56267.

Mallard nesting structure—the double hen house

Introduction and background

Mallards pairs begin arriving in Minnesota in early to mid-March. The pair selects a breeding site that can include several ponds in a square mile area. Many hens home back to the general area where they first learned to fly, and occasionally to the same field or nest structure where they previously hatched a clutch.

Most mallards nest at one year of age. Hens usually begin nesting in late March to mid-April. They prefer to nest in grass fields where the residual vegetation is more than one foot tall and dense enough to provide overhead cover. Although mallards may nest side-by-side, nests are usually scattered throughout fields at densities ranging from one to eight nests per 40 acres. Mallards will also nest over water on muskrat houses and in clumps of cattails.

Mallard nests are frequently destroyed by farming operations (especially hay mowing) and predators (skunks, raccoons, foxes, crows and ground squirrels). If a nest is destroyed, the hen often attempts to nest again. She may make repeated attempts to hatch a clutch, even into July.

Because mallards occasionally nest on cattail clumps over water, hens can often be enticed into using over-water nest structures. Because mallards can not effectively defend their nests, nest structures must be placed over water far enough from shore that they are not accessible to predators. Predator guards can also be used to protect the structure.

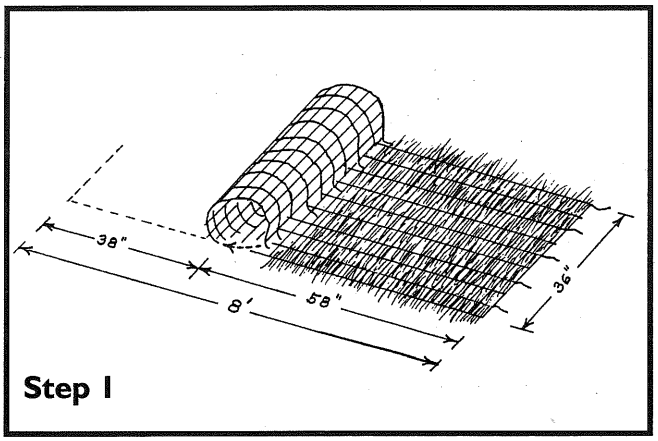
Construction of the double hen house

The materials needed to construct each cylinder include:

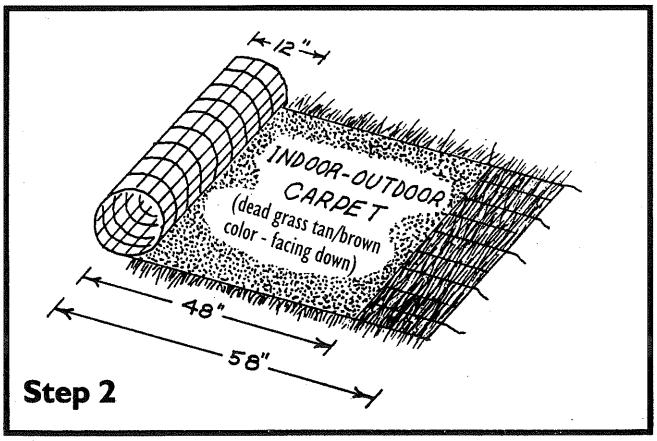
- 12½ gauge, 2" x 4" mesh wire 36" wide by 98" long
- a piece of tan/brown indoor/outdoor carpet, 36" by 54"
- marsh/grass hay
- 10′ of soft 12½ gauge wire

To mount the hen house you will need:

- 8–12′ of 1½–2" diameter galvanized pipe or highway sign pole or similar sturdy pole
- 36" T-support bracket to attach to the support pole (can be welded to the pole or T-welded at the mid-point of the bracket which will slip over the support pole)
- a predator guard for the support pole if the pole is not smooth



Step 1



Step 2

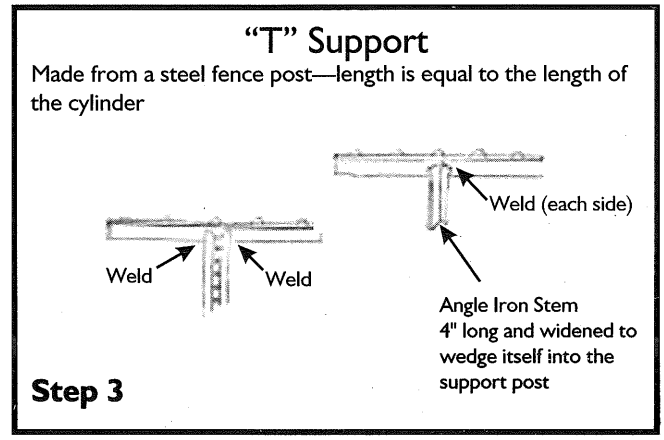
- the use of safety glasses, leather gloves, dust mask, etc., are a must for safe construction of the hen house.

Construct the cylinder by:

- Cutting the wire mesh to 98" leaving alternating wires long enough to be used for fastening.
- Roll the wire mesh up 38 inches, insert the long ends of the wire through itself and fasten forming a 12" diameter cylinder (see Step 1).
- Spread a thin mat of hay (½" or less) over the remaining wire mesh (see Step 2).
- Place the 36" by 54" piece of indoor/outdoor carpet (tan/brown color facing out) over the hay.
- Spread another thin layer of hay over the carpet.
- Continue by rolling the first cylinder you made over the hay/carpet making the new cylinder as tight as possible (1" or less between inside and outside wire mesh and fasten with the wire ends). You now have a wire cylinder within a wire cylinder with hay and carpet sandwiched in between. To help insulate and retain moisture in the nest, the overlapping carpet should be at the bottom of the completed cylinder. Avoid sharp wire ends that may break eggs or injure the hen.
- Use the same procedure to complete the second cylinder.

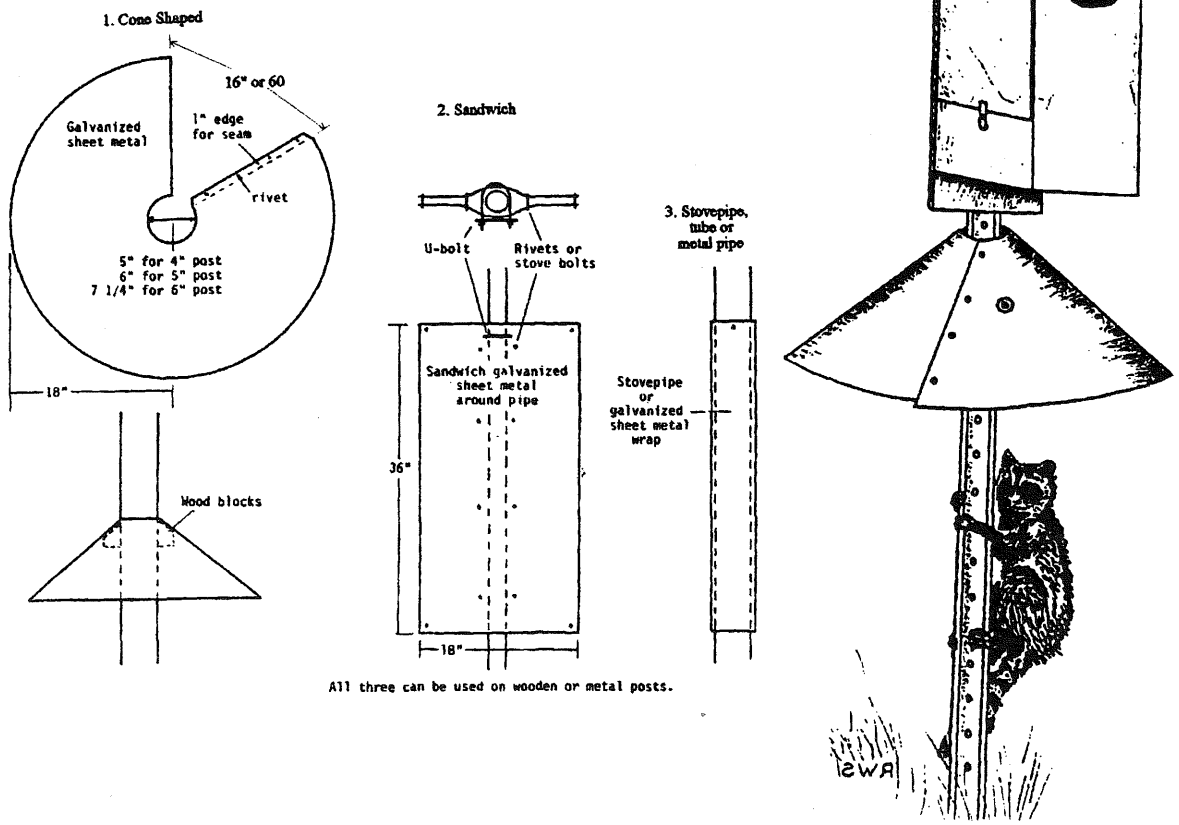
Cylinder mounting system is constructed by:

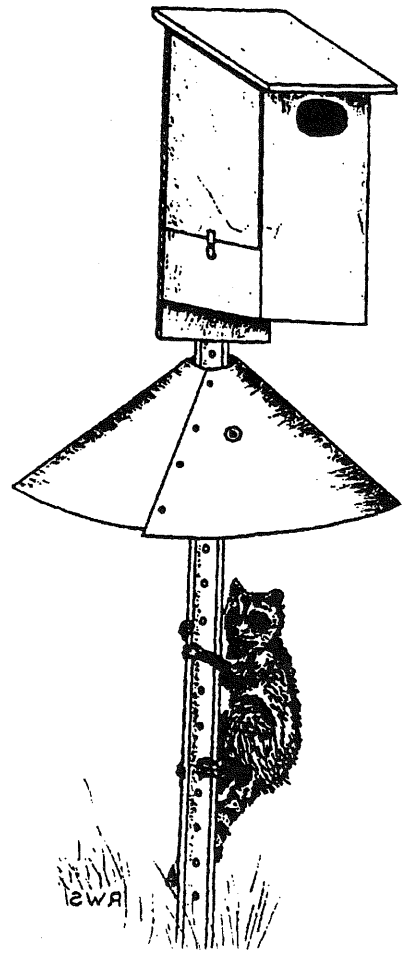
- Welding a short (4") angle iron stem or a pipe which will fit over the support post to a 36-inch support. The support post can be cut from a steel fence post (see Step 3).
- The angle iron can be of a size that will fit inside of a round support pipe. If so, it must fit tight so that wind will not cause the mounted cylinders to pivot or swing. Holes can be drilled so a bolt can be put in place when the T-support is placed



Step 3

Predator Guards





Predator Guard Considerations:

- Any reasonable variation of the above illustrations are likely to be effective in deterring predators.
- Mink and raccoon both can climb poles and are the primary problem animals. Raccoon will try to climb around a guard, and mink will try to pass through the inside if a hole (as large as a mink's head) is left. Chicken wire or similar barrier will prevent this.
- The optimum "stovepipe" barrier is 8" diameter and 3' long, fastened only at the top with a wire barrier inside to deter mink. Other variations such as PVC or smaller diameter are likely to be effective and are better than nothing.
- Earth tone colors that blend into the environment are preferred.

on the support pole to prevent the cylinders from pivoting.

Predator guard construction:

The are a number of options to reduce predation on the nest.

- Predator guards are normally not required if a smooth pipe is used as a support pole. If you are using a rough pole or highway sign pole which has holes in it, then a predator guard is needed. Select an option for your predator guard from those diagramed.
- A goose basket attached to the top of the cylinders can be used as a predator deterrent. Geese will drive most predators from their nest sight. If a goose would use the basket while the hen mallard is nesting, the mallard will be protected by the goose.

Placing the double hen house structure

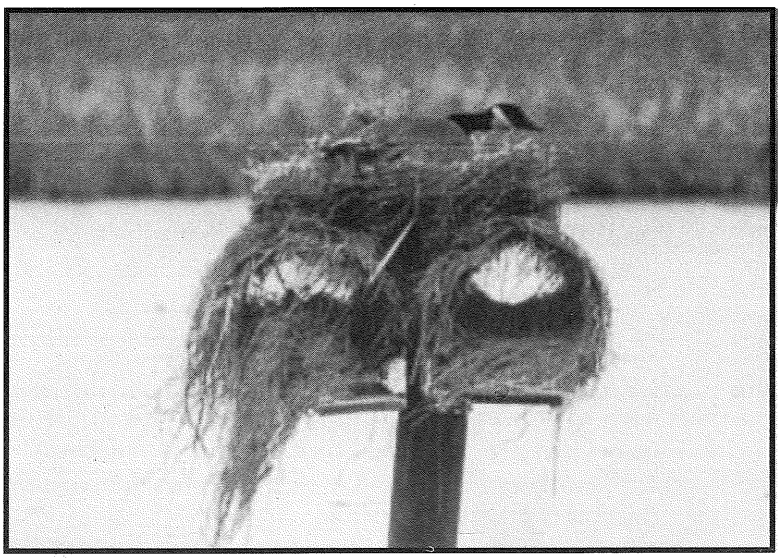
- The structure can be placed anytime during the year. However, it is the easiest to place in late winter when it is safe to walk on the ice. Cut a hole in the ice at the edge of emergent vegetation or in a small opening. Pound the support pole firmly into the soft bottom leaving two to five feet of the pole above the surface of the ice.
- Attach a predator guard if one is necessary.
- Attach the T-support to the support pole so when the cylinders are attached they will be 90 degrees to the prevailing wind.
- Attach the two cylinders together side-by-side at four points using heavy wire and hang them like saddle bags over the T-support. Assure that the cylinders are securely attached to the supporting system.
- Attach a wire across the bottom fourth of each end of each cylinder. This is used to hold the nesting material in the cylinder. Firmly tuck some nesting material under each wire to keep nesting material from being blown out.
- Fill each cylinder half full of hay for nesting material. Arrange the nest material so the hen can see through the cylinder.

Regular maintenance of the structure is critical for success. Ideally, structures should be maintained annually in late winter or early spring (February–April). Refurbish with new nesting material each year.

Goose nest option

Mallards can not defend their nests from predators. Canada geese, however, can and will defend their nests. If you have a location where you would like to have geese nesting (the population is not causing local problems), a wire mesh can be cut and attached in a circle on the top of the double mallard cylinders. When filled with prairie hay, geese have nested on top of the double hen cylinders. Mallards will nest in the cylinders with geese nesting on top.

Note: You may observe some older cylinder nest structures with a board extending in front of the cylinder. This was thought necessary for the hen to land and enter the cylinder. This has been found unnecessary. If fact, the board acts as a landing platform for avian predators which then can take the nesting hen.



Roger Strand

Wire mesh can be added to the top of the double mallard nesting cylinders and filled with prairie hay to create a goose nest. A goose nesting on top of the mallard structure will keep predators away.

A wood duck house

by Dick Anderson

Build, install, maintain, and keep records

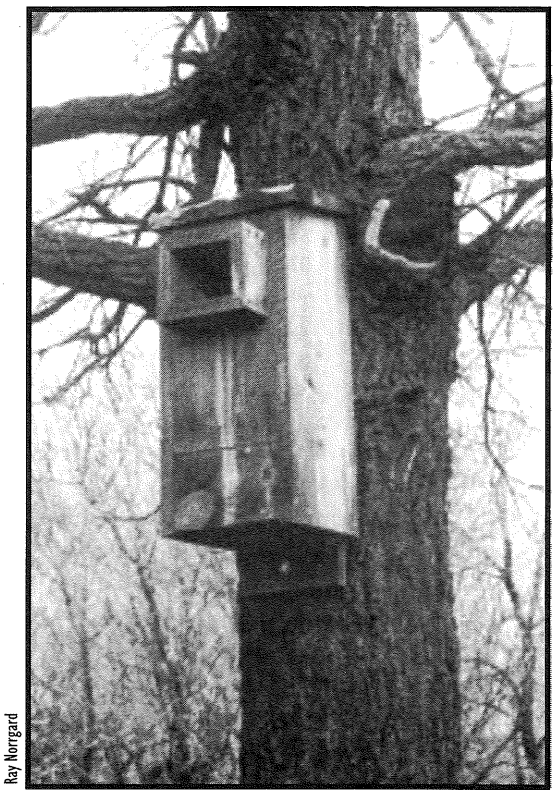
Building and erecting a wood duck house is one way to give something back to the resource and help introduce a young person to the outdoors. It's a great project, relatively inexpensive, and a lot of fun as well.

Properly designed and installed, wood duck houses benefit the wood duck population, especially in areas that lack large, old hardwood trees. These large, old trees provide the nesting cavities woodies like. The houses provide artificial "cavities" where natural ones do not exist.

The wood duck *(Aix sponsa)* was once headed for extinction because of large scale logging and development. Propagation of wood ducks was suggested as early as 1838 as a means for perpetuating the dwindling wild population. An early conservationist predicted: "The only chance to preserve them is to change their habits by domestication, which in some instances has been done with success. The Canada goose and the mallard have been tamed without difficulty; and many others like the wood duck, which has not been thought worthwhile to tame, will doubtlessly become dependent on humane care."

However, the wood duck now ranks as one of the most plentiful duck species. One reason for this comeback is improved habitat created through management programs. Another is control of excessive harvests. But there are other reasons. Many individuals augment local populations by constructing nest boxes. This activity provides enjoyment for nature groups and private landowners throughout the wild duck's range.

If you choose to construct wood duck boxes, do so only if you will be able to clean and maintain your boxes each year. Without yearly maintenance, the boxes quickly become useless and eyesores. Recruit someone to take over your duties or remove the boxes when you are no longer able to maintain them.



Ray Norrgard

To reduce predation, provide a properly sized hole with extension and a suitable depth.

Constructing nest boxes

Create your own wood duck boxes using the accompanying or similar plans. You may want to choose a material such as rough-sawn cedar to increase the life expectancy of your box.

The material you use to construct the box may affect its usefulness and ability to be used successfully. Testing in Minnesota has shown rough-sawn cedar to be the coolest material for box construction. Most rough-sawn, one-inch thick wood will work for box construction.

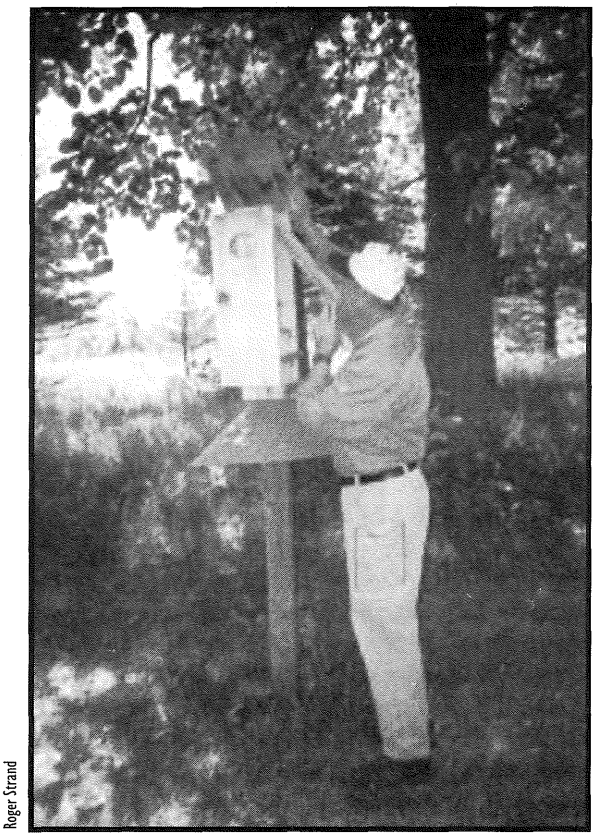
Early nesting wood ducks do not have a problem with excessive heat build up in the box. Late or renesting ducks may have very hot June heat affect their ability to produce ducklings. The maximum temperature the hen and eggs can withstand within the box is 107° F. When exposed to direct sun on hot June days, many of the plastic, metal and plywood boxes have had temperatures exceeding 107° F. These units must be placed in a shaded location to avoid the June heat. Painting the unit white may

help reflect some of the heat. Units placed over water may subject them to additional reflected sunlight (heat) from the waters surface.

Choosing a location

In selecting sites for setting up nest boxes, particular attention should be placed on the food and cover requirements of wood ducks. Woodies breed over much of the eastern half of the United States and southern Canada. In addition, there is a western population occurring in the Pacific Northwest. They are attracted to woodland streams, lakes, and ponds where they can feed on aquatic insects, as well as seeds and fruits. In areas where desirable trees and shrubs are not available, they often use cattail and bulrush marshes.

Shallow water depths, 3–18 inches, are particularly attractive to wood ducks. There should be a mixture of open water and plant cover with about 50–75 percent of the area covered with emergent or woody vegetation. The water should be available throughout the incubation period. However, additional water areas within a half-mile can compensate for the loss of temporary wetlands. Wood ducks have been known to travel up to one mile to reach water after leaving the nest.



Roger Strand

Wood duck boxes must be maintained annually. Placing boxes at an easily reached height makes maintenance easier.

Roger Strand

Wood duck boxes mounted on a pole that places the box opening about 6' from the ground with predator guard attached allows for an ideal nest structure for the wood duck. Using a pole allows the structure to be placed where it's the most advantageous; not wherever there is a tree. This height allows for easy maintenance and monitoring. Studies have shown this may be a preferred height.

Young wood ducks, like other ducklings, feed primarily on insects and other animal life for the first six weeks. The high protein content of these foods is critical for early development and growth.

Mounting the box

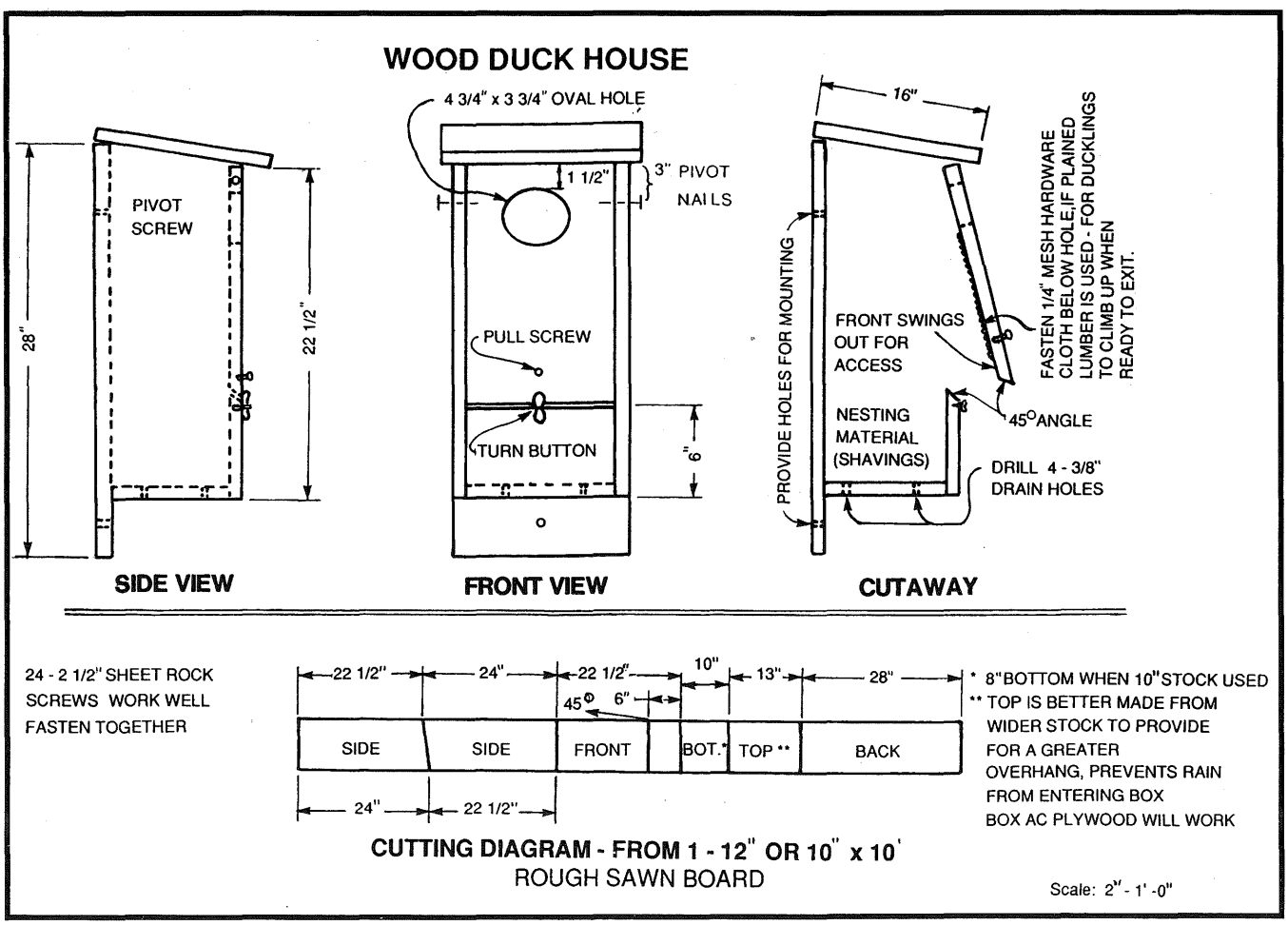
From writings of Dr. Roger Strand
Used with permission.

There are many successful ways to put up a wood duck nesting box. However, before automatically hauling out a ladder and attaching your new box to a tree, stop to consider a mounting method which utilizes a six foot, free-standing pole. Among the advantages and considerations are:

1. No ladder is needed for side-opening boxes; thus, they are safer to install and much easier to maintain and monitor. For top-hinged boxes, a six-foot stepladder will suffice.
2. A box can be placed exactly where desired, ideally within easy view.
3. Wood duck hens use low-mounted houses; some studies say they prefer them. There is no need for the hole to be higher than six feet from the ground.
4. Once the essential sheet metal, cone-shaped guard is in place below the box, the pole-mounted unit will effectively repel land-based predators such as raccoon and mink and nest competitors/predators such as squirrels.

Additional thoughts and suggestions:

1. Eight-foot treated landscape timbers (flat on two sides and 3" x 4½" on end) work well and cost about $4 apiece. Using a post-hole digger, carve a hole two feet deep and tamp the pole securely in place. Mount box with the hole just even with the top of the remaining six feet of pole. If discarded highway sign poles are available, pole



placement is even easier and cheaper, and can then be done in wet or shallow-water areas.
2. Shade is desired, but avoid pole placement where mink, raccoon, and squirrels could access the structure from a nearby tree trunk or limb (at least 8 feet from the closest tree).
3. In sun-baked locations, boxes made of man-made materials, especially if dark in color, may become too hot for survival of the eggs and comfort of the hen (late season). For such open, sunny areas, consider using a natural-cedar wooden house, which will remain cooler on hot June days.
4. Mount cone predator guard directly below box, so the metal lip ends up at least three feet from the ground.

Nesting material in the bottom of the box is critical. Wood ducks will **not** provide their own. Therefore, wood shavings are the best material. Sawdust packs down and does not make good nesting material.

Predators

Predators can be a major problem limiting nest box success. Raccoons are the worst in northern states like Minnesota. Provide a properly sized entrance hole with an extension and suitable depth from the bottom of the entrance hole to the top of the bedding to reduce predation. A 12-inch piece of galvanized tin around the tree/pole just below the box will deter many predators. On trees, the tin should be overlapped at the ends so it can be expanded as the tree grows.

Yearly care

Boxes must be cleaned and cared for every year. If not, in two or three years, a number of problems may occur making the boxes unusable. The box may be destroyed by storms or filled with debris by birds or squirrels. Weathering can loosen nails and crack boards. Nesting material can deteriorate or be lost through cracks.

In addition to cleaning the boxes, take time to caulk cracks, re-nail loose boards, check drain holes, and be sure the boxes are securely fastened. Replace the old bedding with fresh shavings (available at lumber yards, sawmills, and places that make bedding for poultry). Boxes should be ready no later than April 1 each spring.

Monitoring

You may want to check your wood duck boxes during May and early June to record the number of eggs or to identify the kinds of animals that are using them. If you find more than 16 wood duck eggs in a box, this could be an indication that more than one hen has used the box. Such dump nesting, could mean there is a shortage of nesting cavities in the area. Adding additional nest boxes for the coming year should be considered. Wood duck hens have a strong homing instinct and the surviving young from your boxes will probably return to nest in the same area the following year.

Watching ducklings jump from the box

Almost everyone who maintains wood duck boxes would like to see the ducklings leave the box. Here is one method of predicting when that will be: Check boxes one week to10 days after the first hens have been seen in the area. Record the number of eggs and the date. If there are 12 or more eggs in the nest, you may be too late for this method. For example, suppose you find eight eggs on May 6. Check again in two weeks. If the number of eggs is 14 (an average clutch size), subtract 8 from 14 = 6. This tells you the number of days the hen continued to lay eggs after your first inspection. Generally they lay one egg per day. Add six days to May 6 = May 12. May 12 would be the date of the last egg laid and the start of incubation. Add 26–30 days to May 12 and you have the approximate date the ducklings will jump: June 9. Start checking the box for ducklings a couple days before the predicted hatching date in the evening when the hen is off the nest. The ducklings will hatch one day and leave the box the next. The hen will call the young out and lead them to water when she feels it is safe. This usually occurs between 6 a.m. and 10 a.m.

Using a Compass and a Map

Hunters' responsibility

To know:

- How to get where you want to go,
- Where you are (whose land you are on),
- How to get back to where you started from.

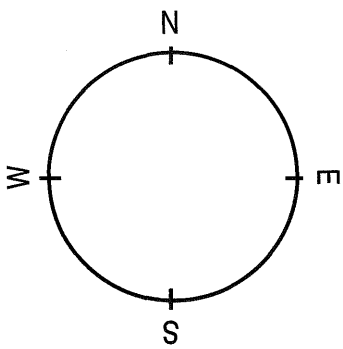
A safe and responsible hunter learns to use a compass and to read and use a variety of maps so they do not get lost. Getting lost generally occurs when a person lacks navigating skills or poorly planned their outing or both. Getting lost results in much undue stress to family, partners and friends, not to mention the considerable cost incurred in attempting to find the lost hunter. Many people, when lost, are found carrying a compass. When asked why they didn't use the compass to find their way back, their reply is either they didn't know how to use a compass or they didn't believe what the compass was telling them.

The following section on map and compass is designed to introduce you to navigating with the use of map and compass thus helping you to be a responsible hunter.

How to use a compass

Using the compass alone

Learn the directions on the compass first: North, South, East, and West. Look at the figure and see how they are positioned. North is the most important.



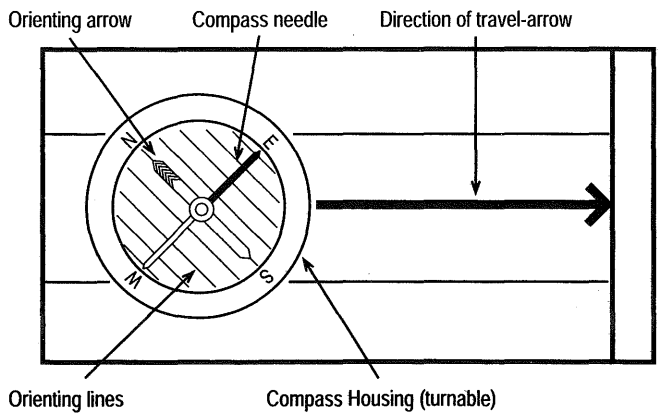
The orienteering compass

The red and black arrow is called the compass needle. On some compasses, the arrow might be red and white, but the red part of it is always pointing towards the earth's magnetic north pole. The needle is contained in the compass housing. On the edge of the compass housing, there is a scale from 0 to 360. Those are the degrees, or bearing. Generally, the letters N, S, E, and W are used for North, South, East, and West. If you want to go in a direction between two of these positions, you would combine them. For example, if you want to go in a direction just between North and West, you simply say: "I would like to go northwest."

Let's use that example: You want to go northwest. You find out where northwest is on the compass housing. Then you turn the compass housing so that "northwest" on the housing comes exactly there where the large direction of travel-arrow meets the housing.

Hold the compass flat in your hand so that the compass needle can turn. Then turn yourself, your hand, the entire compass (just make sure the compass housing doesn't turn) until the compass needle is aligned with the lines inside the compass housing.

Now, it's time to be careful! It is extremely important that the red, or north part of the compass needle, points at north in the compass housing. If south points at north, you would walk off in the



exact opposite direction of where you want to go! So always take a second look to make sure you did it right!

Another problem you might encounter is local magnetic attractions. If you are carrying something made of iron, it could disturb the arrow. Even a staple in your map might be a problem. Make sure there is nothing of the sort around. There is the possibility for magnetic attractions to exist in the soil as well. This is known as "magnetic deviation." While rare, magnetic deviation might occur if you're in a mining district.

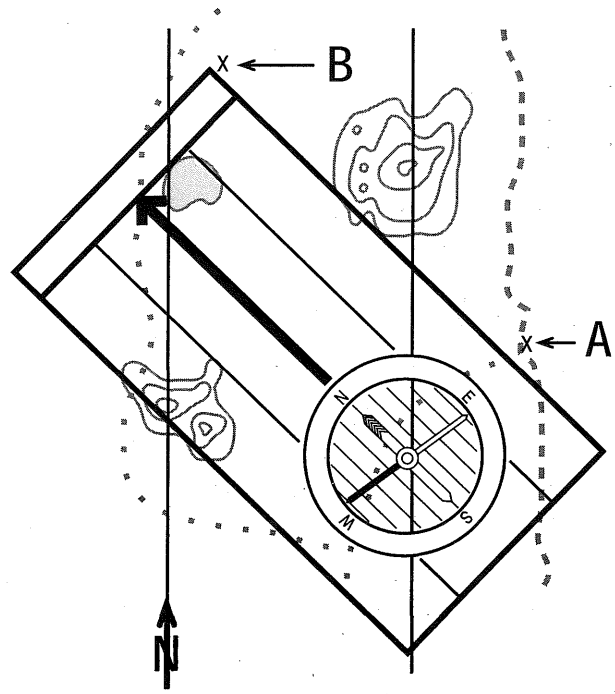
When you're sure you've got it right, walk off in the direction the travel-arrow is pointing. To avoid getting off the course, make sure to look at the compass quite frequently, say every hundred yards at least, but don't stare down on the compass. Once you have your direction, aim on some point in the distance, and go there.

When do you need this technique?

You'll need to use this technique if you don't know where you are and you're without a map. However, you do know that there is a road, trail, stream, river, or something long and big you can't miss if you go in the right direction. And you know in what direction, or the approximate direction, you must go to get there. Then all you need to do is to simply turn the compass housing so that the direction you want to go in is where the direction of travel-arrow meets the housing and follow the steps listed above.

Using the compass in conjunction with a map

It takes practice, but before long you'll be able to use a compass along with a map to help you navigate terrain you've never been in before safely and accurately. Say you want to go from the trail crossing at "A," to the rock at point "B." Of course, to use this method successfully, you'll have to know you really are at "A." Put your compass on the map so that the edge of the compass is at "A." The edge



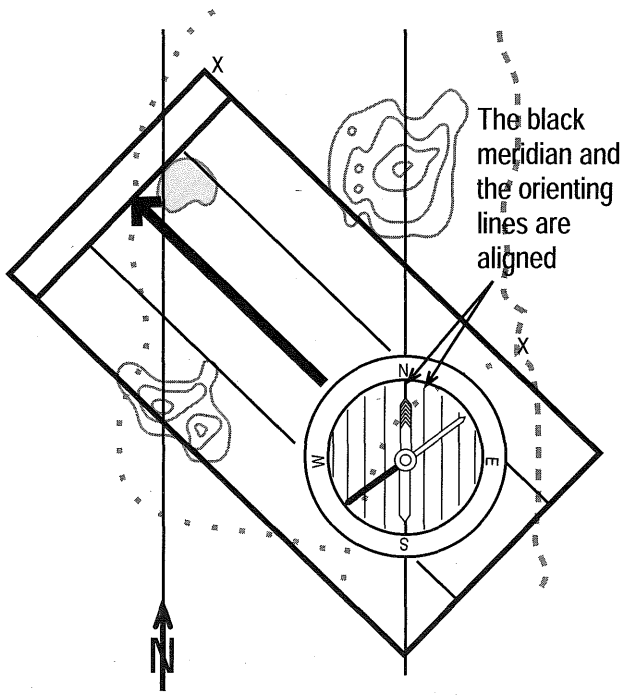
you must be using is the edge that is parallel to the direction of travel-arrow. Then put "B" somewhere along the same edge, like it is on the drawing. Of course, you could use the direction arrow itself, or one of the parallel lines, but it's usually more convenient to use the edge.

Take careful note: the edge of the compass, or rather the direction arrow, must point from "A" to "B." If you do this incorrectly, you'll walk off in the exact opposite direction of where you want to go! So, take a second look. Beginners often make this mistake.

Keep the compass steady on the map. Next, align the orienting lines and the orienting arrow with the meridian lines of the map—the lines on the map go-

ing north, that is. While you have the edge of the compass carefully aligned from "A" to "B," turn the compass housing so that the orienting lines in the compass housing are aligned with the meridian lines on the map. During this action, you don't need to be concerned with what happens to the compass needle.

However, there are a number of serious mistakes that can be made here. First, let's discuss the problem of going in the opposite direction. Be absolutely certain that you know where north is on the map, and be sure that the orienting arrow is pointing towards north on the map. Normally, north will be "up" on the map. It is possible, though, to make the



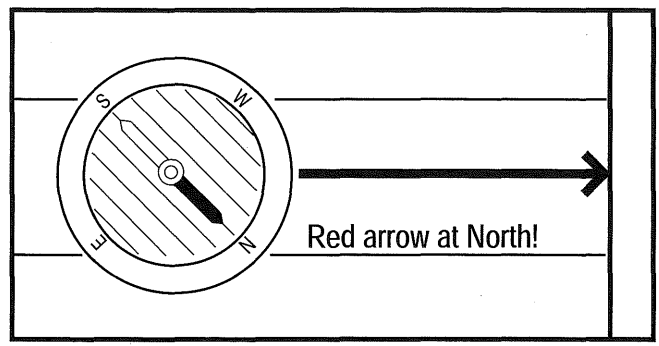
mistake of letting the orienting arrow point towards south on the map.

Keep an eye on the edge of the compass. If the edge isn't going along the line from "A" to "B" when you have finished turning the compass housing, you will have an error in your direction which will take you off your course.

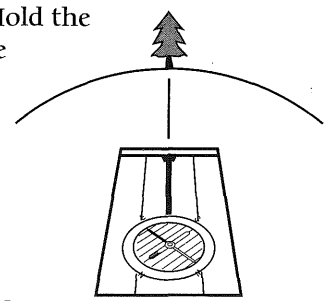
When you're sure you have the compass housing right, you may take the compass away from the map. Now, you can read the bearing off the housing, from where the housing meets the direction arrow. Be sure that the housing doesn't turn, before you reach your target "B"!

Hold the compass flat in your hand so that the compass needle can turn. Then turn yourself, your hand, the entire compass making sure the compass housing doesn't turn. Turn it until the compass needle is aligned with the lines inside the compass housing.

The mistake is again to let the compass needle point towards the south. The red part of the compass needle must point at north in the compass housing, or you'll go in the opposite direction.



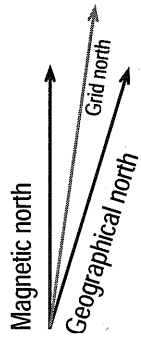
It's time to walk off, but you'll need to do that in a special way as well in order to do so with complete accuracy. Hold the compass in your hand, the needle well aligned with the orienting arrow. Then aim, as carefully as you can, in the direction that the travel-arrow is pointing. Fix your eye on some special geographic feature—one that is located as far as you can see in that direction. Then go there. As you go, be sure that the compass housing doesn't turn. If you're in a dense forest, you might need to aim several times. Hopefully, you will reach your target "B" when you do this.



At this time, you may want to go out and practice reading your compass.

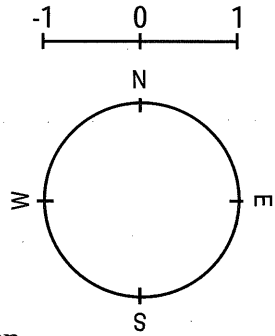
Magnetic declination

Unfortunately, there is something called "magnetic declination." Magnetic declination occurs when the compass needle points towards the magnetic north pole and the map is pointing towards the geographic north pole, but they are not the same place.



First, you'll have to know how large the declination is, in degrees. This depends on where on earth you're standing. Topographic maps from the U.S. Geological Survey give the declination for the map. You have to remember, the declination changes significantly in some areas, so you'll need to know what it is this year.

The declination is given as, for example, "fifteen degrees east." When you look at the figure, you can pretend that plus is to the right, or east, and minus is to the left and west—like a curved row of numbers. When something is more than zero, you'll subtract to get it back to zero. And if it is less, you'll need to add. So, in this case you'll subtract fifteen degrees to the bearing by turning the compass housing, according to the numbers on the housing. Now, finally, the direction of travel-arrow points in the direction you want to go. Again, be careful to aim at some distant object and off you go.



There is a fast method to find the declination wherever you are. This method is advantageous because it corrects for any local conditions that may be present. This is what you do:

1. Determine by map inspection, the grid bearing from your location to a known, visible, distant point. The further away, the more accurate it gets. This means you have to know where you are, and be pretty sure about one other feature in the terrain.
2. Sight on that distant point with the compass and note the magnetic bearing. Do this by turning the compass housing so that it is aligned with the needle. You now read the number from the housing where it meets the base of the direction of travel-arrow.
3. Compare the two bearings. The difference is the declination.
4. Update as necessary. You shouldn't need to do this very often, unless you travel in a terrain with lots of mineral deposits.

Uncertainty

You can't always expect to hit exactly what you are looking for. In fact, you must expect to get a little off course. How much you get off course often depends on the things around you, for example, how dense the forest is, if there is fog, and above all, visibility. Ultimately, it depends on how accurate you are. You do make things better by being careful when you take a course, and it is important to aim as far ahead as you can see. As a rule of thumb, under normal forest conditions, the uncertainty is one-tenth of the distance traveled. So, if you go 200 yards on course, it is possible that you end up a little off course, by perhaps twenty yards or so. If you're looking for something smaller than twenty yards across, there is a chance you'll miss your mark.

Practice! Practice! Practice! Get a compass and a topographic map of an area that you're familiar with and use them together.

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The waterfowl handbook

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For more information, contact:

Department of Natural Resources
500 Lafayette Road
St. Paul, MN 55155-4040
651-296-6157 (Metro Area)
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