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WATERFOWL

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**Advanced Hunter Education Program
Minnesota Department of Natural Resources**

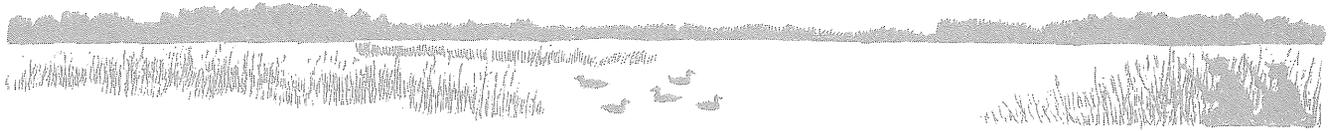
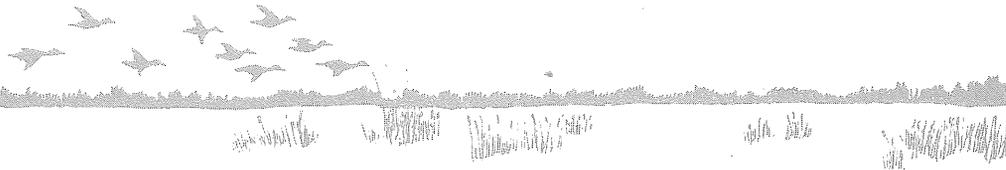


TABLE OF CONTENTS

FOREWORD	2
WATERFOWL QUIZ	2
 QUIZ ANSWERS	27
PREPARATION IS THE KEY	3
DECOY SETTING.	5
TALKING THEIR LANGUAGE	8
WATERFOWL NEED MORE THAN JUST WATER . .	10
HOW TO IDENTIFY DUCKS	12
THE RULES OF THE HUNT	15
DECOY SETUPS	18
HYPOTHERMIA: WHEN THE BODY'S FURNACE FAILS	20
BASIC BALLISTICS FOR WATERFOWLERS	22
BAG WATERFOWL WITH LEAD OR STEEL.	24
BIBLIOGRAPHY	26



FOREWORD

by Chuck Vukonich
U.S. Fish and Wildlife Service

It is said that waterfowl hunters hunt to be happy. This happiness is generated from pleasurable experiences combined with rigorous, dedicated effort. It's pleasing to be touched by agreeable marshland odors, or to sip coffee and watch ruddy ducks in the decoys, or feel a warm ray of sunshine on your face as ice thickens and expands to open water.

At the same time, there is effort and even annoyance as one trudges through muck to reach a duck blind or wraps the decoys with half frozen fingers. Often times pain and discomfort accompanies the hunt. Perhaps it is the meshing of this pain and pleasure that heightens our emotions into a truly memorable hunting experience.

Waterfowl hunting brings other rewards too. Bonds of companionship are strengthened between father and child — or between friends. Most avid duck hunters would agree that you can learn more about a person in one day on a marsh than in several years of more casual acquaintance. An inner drive is satisfied through waterfowl hunting, be it of tradition or instinct, I'm not sure. Why we anticipate these experiences may be difficult for non-hunters to recognize or appreciate. How do you explain to someone why you can't sleep the night before the duck opener or why your appetite decreases?

As young waterfowlers mature, their fond memories of days afield among friends and with faithful dogs inherently increases. Thoughts of our first day on the marsh with Dad bind us to our past, yet they also propel us with expectations into the future. Even during the off-season these memories are "hobbified" by painting the weathered decoys, reloading ammunition, or flipping through a photo album for that certain picture that is extra special. The hunting day may be long gone, but the experiences will be relived a thousand times.

So waterfowl hunting is more than getting our limit of greenheads or tabulating a large season kill. On the contrary, few duck hunters take pleasure in the kill itself. They actually possess a deep reverence for the birds they hunt. They contribute to waterfowl habitat management with their time and money. A total waterfowling experience includes watching the shifting clouds and the earned rewards of a well-trained retriever. It is reliving these hunts in our minds and re-igniting the ritual in a son or daughter that really stays with us.

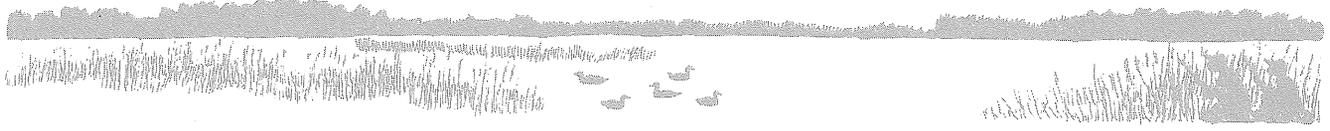
The responsible waterfowl hunter is seeking the genuine happiness he finds surrounded by cattails and open water with family or friends. To some hunters it no doubt means more than this — but certainly nothing less.



WATERFOWL QUIZ

Answers found on Page 27.

- | <u>T</u> | <u>F</u> | |
|----------|----------|---|
| ___ | ___ | 1. The two major parts of the duck call are the barrel and the keg. |
| ___ | ___ | 2. It is impossible to bag white-winged scoters in Minnesota. |
| ___ | ___ | 3. The least effective form of wetland management is water level manipulation. |
| ___ | ___ | 4. The two most common breeding ducks in Minnesota are the mallard and the teal. |
| ___ | ___ | 5. Refuges are unimportant in holding waterfowl throughout the hunting season. |
| ___ | ___ | 6. Nest boxes, properly constructed and maintained, can produce more ducks than natural cavities. |
| ___ | ___ | 7. Hens that nest in the same area each year are said to have a homing instinct. |
| ___ | ___ | 8. Minnesota is in the Central Flyway. |
| ___ | ___ | 9. Approximately one-third of all ducks bagged in Minnesota are mallards. |
| ___ | ___ | 10. Wigeon often swim with diving ducks to steal food. |
| ___ | ___ | 11. Wood ducks have always been one of our most plentiful ducks. |



- ___ ___ 12. Several puddle ducks have an all white speculum.
- ___ ___ 13. Green-winged teal are one of the swiftest ducks despite their small size.
- ___ ___ 14. As many as 50 percent of redhead hens lay their eggs in the nests of other ducks.
- ___ ___ 15. Goldeneyes do not nest until they are two years old.
- ___ ___ 16. The ringneck duck has a ring around its bill.
- ___ ___ 17. Greater scaup are as common to Minnesota as lesser scaup.
- ___ ___ 18. The lesser scaup ranks right behind mallards in the Minnesota harvest.
- ___ ___ 19. Goldeneyes nest over water on nests constructed of vegetation.
- ___ ___ 20. Old squaw ducks have been caught in underwater fish nets 240 feet below the surface.
- ___ ___ 21. According to Egyptian hieroglyphics, the sport of waterfowling is 3,000 years old.
- ___ ___ 22. The "Game Lake Designation Program" is one of Minnesota's most important waterfowl habitat efforts.
- ___ ___ 23. Redheads are most easily recognized by their wedge-shaped heads.
- ___ ___ 24. In most modern shotguns the choke constriction is found within 1½ inches of the muzzle.
- ___ ___ 25. Minnesota contributes little to the production of wild waterfowl.
- ___ ___ 26. Field hunting is rarely used to hunt geese in Minnesota.
- ___ ___ 27. Steel shot strings in a full choke gun are nearly identical to those of lead.
- ___ ___ 28. Puddle duck and diving duck decoys should be freely mixed in the same set to attract both types of ducks.
- ___ ___ 29. Except for size, the wings of a shoveler and blue-winged teal are nearly identical.
- ___ ___ 30. No. 4 lead and No. 2 steel are often the best shot sizes for hunting ducks.

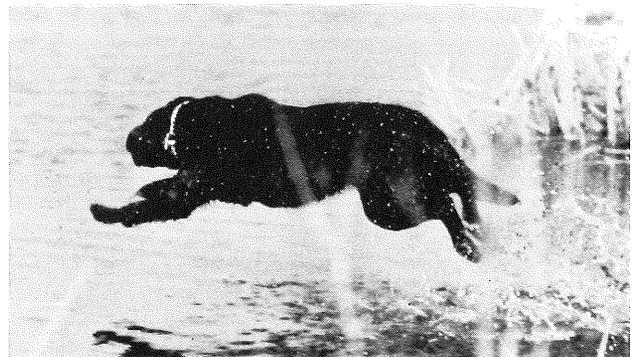
PREPARATION IS THE KEY

by Chuck Kartak, Park Supervisor,
Minnesota Valley State Trail and
Recreation Area,
and Craig Bihrlle, Editor,
Sauk Centre Herald

Waterfowl hunting can be as simple or as complicated as you want it to be. Those captured by the romance of waterfowling, however, generally find that their equipment needs far surpass other forms of hunting. More



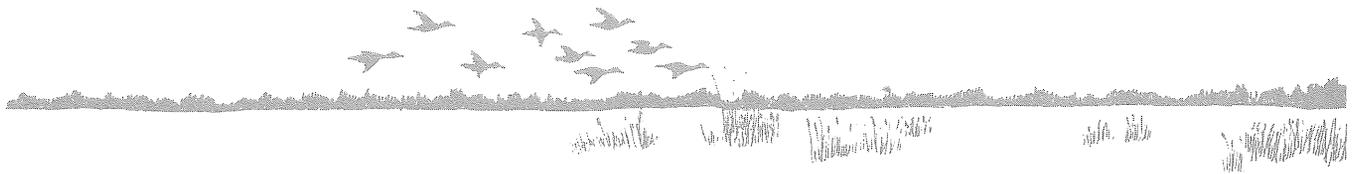
Trap and skeet shooting sharpen coordination and improve shooting basics, such as good follow-through. Duck tower, or similar clay target games, help familiarize the shooter with the variety of angles and distances encountered in waterfowling.



Proper conditioning and honing retrieving skills ensure that both the hunter and his canine partner will enjoy the up-coming season.

equipment means that more time and organization is needed for a successful trip.

Experienced waterfowlers find that preparation begins months in advance of opening day. Shotguns, for example, need to be patterned with a variety of loads under differing weather conditions, and sharpening gunning skills



should not be put off until a few days before the season.

By the same token, if you expect your gun dogs to perform during the extreme weather conditions of the Minnesota waterfowling season, they must be given advance attention. Maintaining their physical well-being through semi-annual check-ups and proper conditioning will pay dividends in the field. Time spent honing retrieving instincts and obedience training will ensure that you will enjoy this important hunting partner's company during the hunt (and vice versa).

Repair and painting of decoys, boats, and other equipment is best done during the "dog days" of summer when available time and weather conditions are less critical. Learning first hand that the week prior to the opener rarely provides ideal paint-drying conditions is not one of life's great pleasures.

Finding a place to go can also be done months in advance of hunting. Talking to conservation officers, wildlife agency personnel, sporting goods dealers, trappers, and local old timers can provide good information. Keeping your ears open at the local sportsmen's hangout pays off. As does joining area sportsmen's clubs and local chapters of the Minnesota Waterfowl Association and Ducks Unlimited.

With some general areas in mind, the use of maps and aerial photos can help pinpoint good locations and answer questions about land ownership and access. Maps of public hunting areas are available from both the U.S. Fish and Wildlife Service and the Department of Natural Resources. Highway maps, county maps, and county plat books are also very useful. Topographical maps and aerial photos will provide additional detail, even to the point of identifying likely flight patterns of birds.

There is no substitute for advanced scouting of likely areas. Remember to seek permission before scouting or hunting on private land. Contacts with landowners well in advance can avoid misunderstandings and disappointments as well as helping to pay dividends for years to

come (and don't forget the importance of post-season thank yous of appreciation).

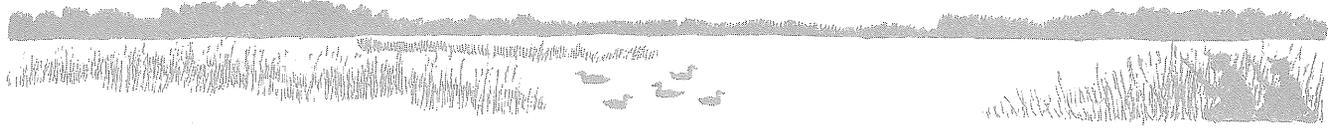
A few weeks before the season, go over a final checklist of equipment needs and necessary items. Don't wait until the last minute to purchase licenses for boat and trailer and hunting — **make sure you have both state and federal duck stamps signed and attached to your license.** Make sure the running lights on your trailer are working and that you are familiar with applicable hunting regulations.

Watch the weather reports prior to and throughout the hunting season. Weather patterns can have a tremendous impact on waterfowl movements. Cold fronts moving south are generally preceded by moving air masses that are often taken advantage of by migrating birds. If you remember that air masses in high pressure weather patterns move in a clockwise direction while those in low pressure patterns move counter-clockwise you will be able to predict the probable wind direction during the hunt. This can have a major influence on where you want to be and how you will set up. For example, an incoming high brings a northerly wind generally followed by a southerly one. Lines of barometric pressure on a weather map that are close together indicate strong winds, while a big high pressure system with lines wide apart means "bluebird" weather.

Be sure to notify someone where you plan to hunt and when you plan to return. Leave a note on the windshield of your car with more detailed information on your location once you arrive at the hunting area, with who to call in case of an emergency. It's also a good idea to have an extra set of dry clothes. These precautions can literally be life savers if you become lost or run into difficulty.

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 running around, or worse, forgetting something that will make your day on the marsh not only uncomfortable, but hazardous as well.





Waterfowl Hunting Checklist

- _____ Hunting license, state and federal stamps (signed)
- _____ Hunting regulations
- _____ Duck identification book
- _____ Watch
- _____ Shotgun, case, and shells
- _____ Rain gear
- _____ Waders, hip boots, or hunting boots
- _____ Binoculars
- _____ Camera and film
- _____ Waterproof hunting bucket (for storage)
- _____ Duck and goose calls
- _____ Compass and maps
- _____ Matches and candle
- _____ Flashlight with good batteries
- _____ Rubber gloves (for picking up decoys)
- _____ First aid supplies (band aids, and one large compress as a minimum)
- _____ Thermos with something warm to drink — no alcohol
- _____ Food and snacks
- _____ Camo covering (green, brown, or white)

For water hunting add:

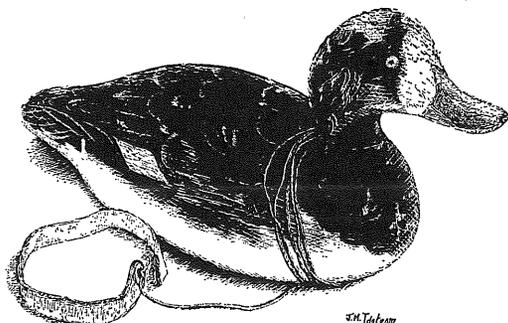
- _____ Boat
- _____ Oars and/or pushpole (extra oar)
- _____ Life jacket
- _____ Motor, gas, hoses and tank (extra shear pins)
- _____ Rope and anchor
- _____ Bailing scoop or bucket
- _____ Decoys with lines and anchors

For field shooting add:

- _____ Shovel
- _____ Canvas or plastic pad to lay on
- _____ Field decoys

Add your favorite hunting clothes:

- _____ Long johns
- _____ Hunting pants
- _____ Sweater, turtleneck, wool or chamois shirt
- _____ Hunting coat
- _____ Hat or cap with ear flaps
- _____ Gloves or mittens (bring extra)
- _____ Down vest
- _____ Extra socks



DECOY SETTING

by Chuck Kartak, Park Supervisor,
Minnesota Valley State Trail and
Recreation Area

Simply stated, decoying is the art of attracting waterfowl within the effective range of camera or gun by using counterfeit ducks or geese. It involves using additional resources to convince wildlife that it is safe to be attracted to the decoys for food, rest, or refuge. The best compliment you can get is having a flock land in your spread and swim around undisturbed by the fake blocks.

From a historical perspective, the oldest recorded use of decoys in the United States goes back more than a thousand years. Decoys made of woven bulrushes in 1000 A.D. were found in Lovelock Cave Nevada in 1924. Bits of cord were found on some of these decoys so we know they were used over water. Several decoys were in usable condition and clearly identifiable as canvasbacks!

The oldest cork decoy dates back to 1850 in Long Island. Wood and cork decoys were made by numerous individual local craftsmen. Commercially manufactured decoys appeared on the market in the 1880's. Three primary companies successful in the business were the Mason Decoy Factory and the Dodge Decoy Factory, both from Detroit, Michigan, and the C.W. Stevens Factory at Weedsport, New York. At the time, decoys sold for about 50 cents apiece.

Needless to say, these old decoys bring a pretty penny today. Waterfowl decoys achieved the status of "folk art" and many of the most ardent collectors are not even waterfowl enthusiasts. *The antique decoy market, however, has its share of fakes and would-be experts.* The aspiring collector would do well to purchase some of the excellent reference books available and spend time with knowledgeable collectors. Joining an organization such as the Minnesota Decoy Collectors would provide the opportunity to share with others of similar interests.

In the 1800s, a new item was introduced in decoying — the use of live ducks or geese as "tollers." The birds, whose wings were either clipped or kept on a special leash, were trained to swim around in front of the blind. Mated pairs were separated to encourage conversation. They cost \$3.50 per pair around the turn of the century. Some tollers were trained by the use of bait to fly from a cage to the blind area when their wild cousins were flying in the area. The nimrod who made an improper identification of a tame toller was quickly banished from the marsh. The use of live ducks and geese as decoys was outlawed in 1935.

Modern decoying, however, has its roots in the days of the market hunter. Up to 600 decoys made of wood or cork were often used with a sink box for open water diver gunning. These market gunning techniques, combined with the development of the semi-automatic shotgun proved to be one of the most destructive forces to the waterfowl resource.



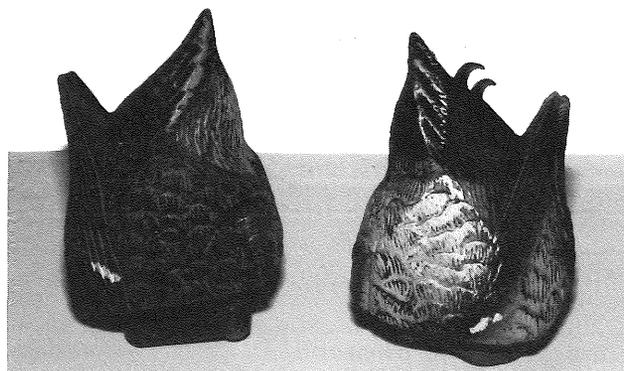
The payoff for successful decoy setting is getting the birds where you want them—feet down and in range.

Decoys in the proper location may be the single most important factor in increasing hunter success in the majority of waterfowling situations today. **The key to success is to place the decoys where the birds want to be!** While that may seem elementary, it demands advance scouting for best success. You must find out which areas the birds are using at various times of the day: Where do they rest? Where do they feed? Where do they take refuge? What are their flight patterns from one area to the next? Some experts become masters at thoroughly scouting a variety of wetlands before they ever consider actually hunting.

You must be flexible and go where the birds want to go. The most beautiful spread of decoys will not attract local ducks to an area that is of no value to them. Study the habits of the ducks and geese in your local area during the spring and early fall. Nearly every county has a variety of shallow game lakes with public accesses or wildlife areas that are open to public hunting. Focus in on those areas to learn about waterfowl, then seek out wetlands on private lands as the opportunity presents itself.

Once suitable hunting areas have been selected, there are some basic principles in decoying to follow. First, select decoys that will accomplish two basic needs: attract birds from a distance, and once attracted, give them the confidence to come within range of the blind. If possible, use decoys similar to the species that you are hunting. Although most puddle ducks will decoy to a mallard spread and most divers will decoy to a scaup or bluebill spread, the use of other species can add an extra measure of realism.

To provide initial attraction, you can use different techniques. You can use magnum decoys, a large quantity of decoys, showy decoys, or decoys that provide movement, such as kite-decoys. The improved drawing power of an equal number of magnum decoys over standard decoys is readily evident. Showy decoys like pintails, wigeon, goldeneyes, and bufflehead can also be used effectively for that critical early attraction. A large quantity of decoys is also obvious in providing greater attraction. Any movement that is favorable (a la kites) will also attract the attention of birds from a long way off. For example, a black flag waved in the air has proven effective in getting the attention of sea ducks on the coasts. A white flag or kite can work equally well on snow geese.



To add a degree of realism to your set use confidence decoys like feeding tip-ups.

To add a degree of realism to a spread, use confidence decoys like herons, geese (in some cases), gulls, coot, or feeding tip-ups. A mixture of species will also improve realism. Teal, wood ducks, pintails, and wigeon can be used with mallard decoys for early season puddle duck shooting. Divers such as canvasback, redhead, goldeneye, ring-neck, and bufflehead can be mixed with a spread of scaup.

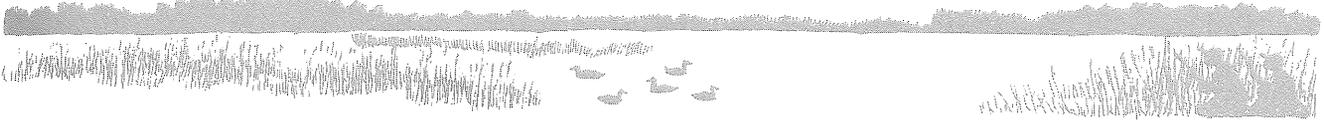
The number of decoys should reflect a natural situation. Don't cram four dozen decoys in a small pothole or marsh area. Often seven to 13 decoys will be more than adequate. On the other hand, 10 dozen decoys may be just right for big water diver hunting. In any case, leave an opening for the birds to land within range of the blind.

For early season hunting in Minnesota, use more hens than drakes in your spread. Both young waterfowl and adults will not have completed the transformation to full plumage. Later in the season add more drakes when many mature males will be migrating through the state. The exception is drake pintails which migrate ahead of the juveniles and hens.

Always set up your decoys to allow birds to land into the wind. Remember that their approach will be directly into, or quartering into, the wind toward the landing area. For example, a frontal wind will often cause the birds to swing directly over the blind. Typically, puddle ducks will land short of your decoys, while divers will tend to fly to the head of your setup. Again, leave an opening in your spread that will give the birds enough room to land.

Most importantly, decoys must be placed in such a way that when the shots present themselves, they will be within range. Needless to say, a great spread of blocks that brings the birds in to land but still out of range of the blind, isn't going to achieve your objective. Decoy layouts can be used to draw attention away from the blind and any inadvertent dog or hunter movement from you or your dog.

Some additional principles in decoying over water are as follows: Decoy lines should be about 1 1/2 times the depth of the water you are hunting. If possible, vary the head positions on your ducks. Decoys should be placed in loose groups of five to seven birds about three to six feet apart. Decoy anchors should be at least eight ounces. Single or small groups of ducks or geese will be easier to decoy than large flocks. In moderate to calm water try not to have all of your decoys facing the same way. Don't forget



For fast, easy handling of decoys use the Figure 8 wrap. Lines should be 1 1/2 times the depth of the water.

rubber gloves for retrieving blocks late in the season.

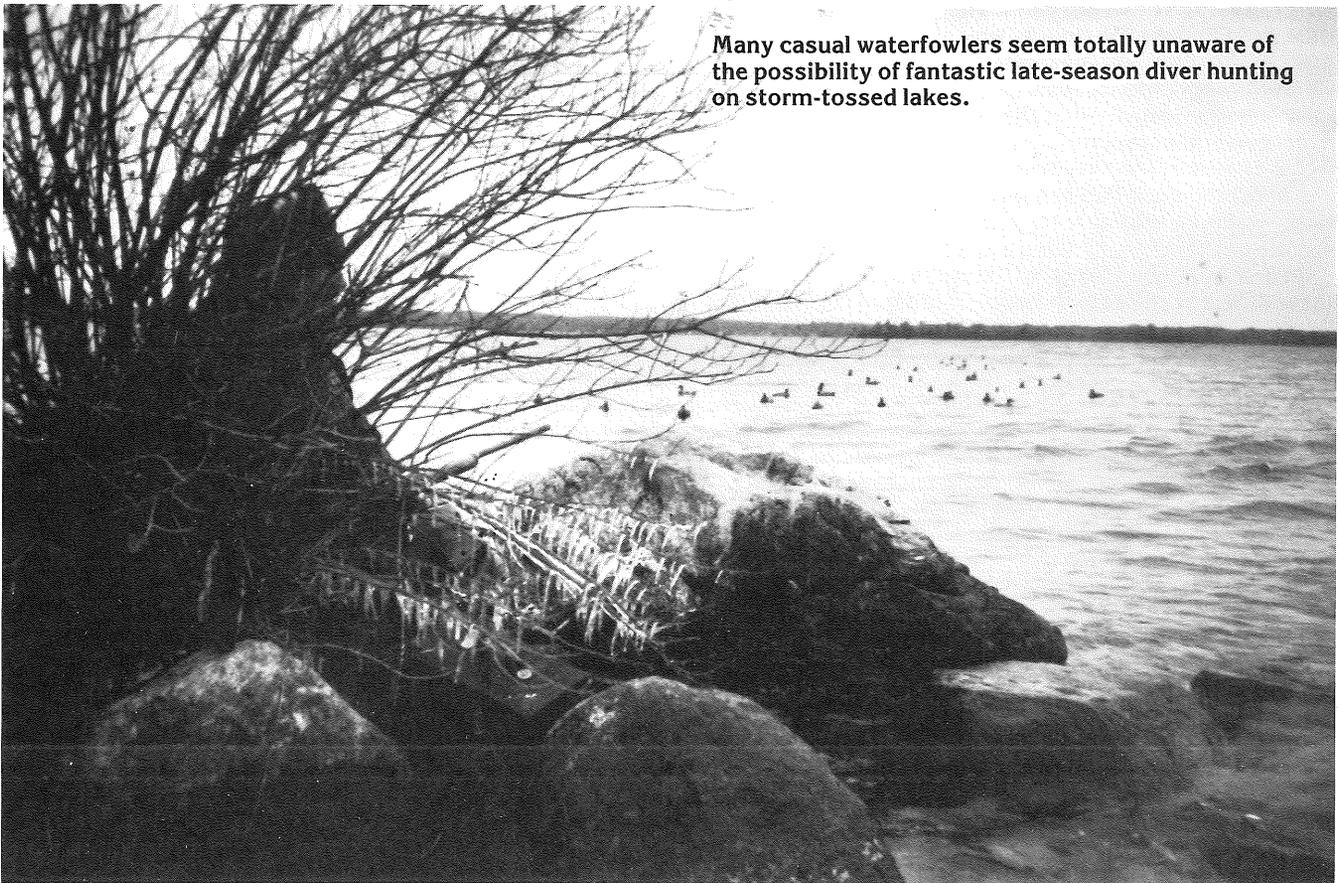
When field shooting, remember that ducks and geese will generally feed into the wind. Again, don't make the mistake of facing all of the decoys the same way. While hunting Canada geese generally requires only a few dozen decoys, you'll need as many as you can haul, carry or drag when hunting snow and blue geese. They are very gregarious birds and start staging in northern Canada. By the time they hit southern Canada and the U.S. flocks often number in the thousands.

Field decoys for geese should be spaced nine-12 feet apart in loose groups of five-seven. When wind conditions are right (10-15 mph), a kite can be used to attract geese from a distance. Don't make the mistake of keeping the kite stationary; its unnatural appearance may cause birds to flare.

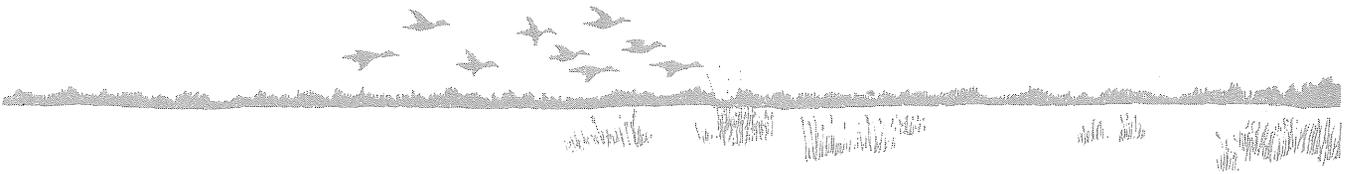
Field feeding birds generally avoid tree lines and brush piles, and almost always cross fence lines and roads at right angles. Geese typically approach the decoys by quartering into the wind and working to one side or the other of the set. Many hunters find it advantageous to use a shallow depression rather than a pit to provide maximum flexibility in adjusting to flight patterns.

The type of decoys to buy will primarily center on economics. Again, conform the decoys to the birds that you usually hunt. Consider magnum decoys if weight, room, and costs are not a factor. Purchase a durable decoy that will ride the water well and handle easily. Weighted keels will be a must for larger water and windy weather.

Remember, the key to successful decoying is placing your spread in the area that the birds want to use. Wallace Labisky in his 1950s book titled "Waterfowl Shooting" stated that the four most important aspects of waterfowling are: a thorough knowledge of the nature and habits of the birds being hunted, advance preparation and observation, decoys arranged in an effective pattern, patience and self control.



Many casual waterfowlers seem totally unaware of the possibility of fantastic late-season diver hunting on storm-tossed lakes.



TALKING THEIR LANGUAGE

by Chuck Kartak, Park Supv., Minnesota Valley State Trail and Rec. Area

Waterfowl are generally gregarious, constantly searching for members of their own kind. Puddle ducks and geese, in particular, rely on vocal communication to maintain contact with their brethren. Effective calling can add much to the success of your hunt by capitalizing on this behavior.

Duck and goose calls are a relatively recent addition to the sport of waterfowling. The invention of the modern duck call is generally credited to a Frenchman named Glodo who lived in America in the late 1800s. However, it wasn't until the use of live ducks and geese as decoys was outlawed in 1935 that calling really came into its own.

Calls are essentially musical instruments that can duplicate the unique tones of waterfowl vocabulary. The visible outer parts of a typical call are the barrel and the keg. The barrel funnels the air, while the keg fits into the barrel and holds the inner parts. The inner parts include the trough, which is the sound chamber; the reed, which vibrates to produce the sound; and the wedge, which holds the reed in place over the trough.

One of the keys to mastering the art of calling waterfowl is to purchase a call that can produce a wide range of tones, and is comfortable for you to use.

Go to a local sporting goods store that carries a number of different calls and try each of them. Although this

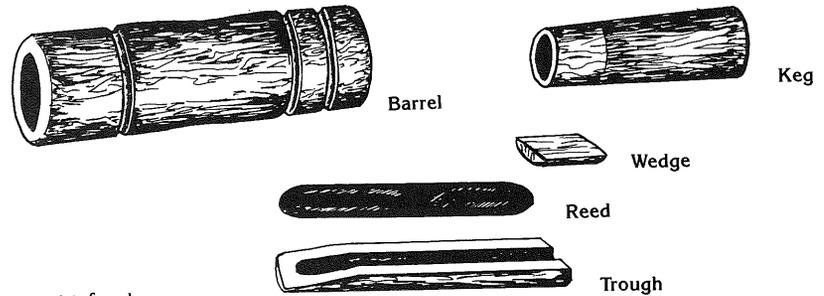


Good callers are made, not born. Successful calling adds an extra element to the sport of waterfowling.

can provide some embarrassing moments, particularly for the novice, it is the only practical method of finding a call that suits your individual requirements.

Purchase the best call you can afford and feel comfortable blowing. Because most calling is based on either the mallard or the Canada goose, these calls should be your first purchase.

The next step is to become familiar with the sounds of waterfowl under a variety of conditions. Calling records or cassettes cover the basic calls of waterfowl. Local refuges or parks provide the opportunity to listen to the birds under natural conditions. Paying close attention to local ex-

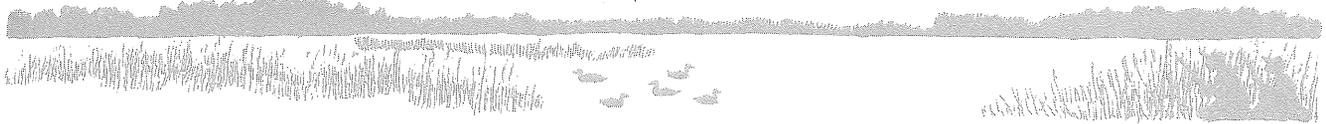


perts or attending calling contests will increase your knowledge of the variety of notes that can be produced with duck and goose calls.

To reproduce these seemingly mystical sounds yourself, begin by holding the call in one hand by encircling the base of the barrel with your thumb and index finger. This allows the rest of the hand to "cup" the keg of the call when needed. Next, force air up from the lower portion of your chest by "grunting" into the call. Don't blow into the call with puffs of air from your cheeks. Bring the air up by compressing your diaphragm in much the same manner as coughing.

Duck calling begins with the basic quack of the hen mallard. Nothing else you do in duck calling will have the importance of learning this single basic note. Grunt into the call while forming the word "wick." Your hand should cup the keg of the call as you begin the quack and then open as the note is completed. Used singly or in a series of three to five notes gradually tapering off, it is one of the most successful calls and forms the basis for several others.

The highball, or hail call, is a series of long loud quacks which are gradually shortened up to end with "wut, wut, wut." The highball is a long distance call to attract the attention of passing flocks.



The comeback call is similar to the highball except that it is quicker and more demanding. It is used after the ducks have made a pass and are going away.

Another important call is the feed call or chuckle. For many, it is one of the most difficult to master. The sound is produced by saying "ticka, ticka, ticka" rapidly into the call. Practice first by saying "tick, tick, tick" slowly, gradually speeding up as you begin to master it. Add the "a" and practice mixing in soft quacks. The chuckle imitates a flock contentedly feeding and resting on the water.

The calls of diving ducks, particularly redheads, scaup, and canvasbacks, can be imitated with a mallard call. Although not nearly as vocal as puddle ducks, the hens produce a soft quack while the drakes can be imitated by twirling your tongue to produce "prrr, prrr, prrr" into the call. Unlike the basic mallard calls, your hand should begin open and then close as the "prrr" is completed.

To complete your repertoire you should purchase pintail, wigeon, or wood duck "whistles" if these species frequent your hunting area.

Many people consider goose calling easier to learn than duck calling. The basic "ha-onk" of the Canada goose is achieved by blowing softly into the call, then rapidly increasing the volume to produce the dual note. Two to five evenly spaced "ha-onks" are equivalent to a "hail" call, attracting geese from a distance.

As a flock approaches the calling should be faster and more excited. Simple low grunts into the call simulate a contented flock feeding and resting.

The same basic technique is used in calling snow and blue geese except that the calls are much higher pitched, sounding almost like a single note as compared to the deep resonant dual note of the Canada.

In all calling, there are basic rules that will provide building blocks to success. **Remember that timing is much more important than the exact tones that are made. "Talk" to the birds instead of calling at them.** Watch their behavior and listen to their responses. Knowing when to call is as important as knowing how. If they appear spooky and silent, it may be best to set the call aside.

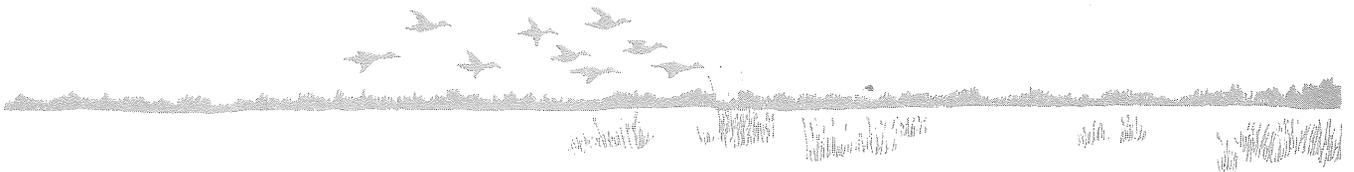
Under some conditions, the more people calling, the better. Less experienced hunting companions can be relatively safe in quacking or grunting softly while others produce the more difficult calls. However, no one should call when the birds are overhead and can pinpoint the source of sound. Any movement at this point can defeat the most expert calling efforts.

Bring a spare call. Calls should be periodically checked and cleaned throughout the season. Foreign material, lost parts, and freezing weather can render a call useless.

Finally, practice as much as possible in the off season. Good callers are made, not born; and they are not made overnight. A good way of critiquing your calling is to record it and play it back. Practice everywhere and anytime you can **except** while hunting. Opening day can sound like New Year's Eve when everyone decides to "tune" up their calling.

Nash Buckingham perhaps said it best: "A duck call in the hands of the unskilled is conservation's greatest asset."





WATERFOWL NEED MORE THAN JUST WATER

by Ray Norrgard, Minnesota Waterfowl Association

"If all that ducks needed was water, we wouldn't have enough space on our lakes to run a boat." This old saying is as valid today, perhaps more so, as it was when first spoken.

Minnesota is blessed with abundant water. We currently have 4.9 million acres of surface water including Minnesota's portion of Lake Superior — more than 10 percent of our total area. This water occupies 11,842 lakes 10 acres or more, 93,000 miles of rivers and streams, and an estimated 1.4 million acres of emergent wetlands.

This is, indeed, a lot of water, but to benefit waterfowl, it has to be the right type, occurring in the right place, and at the right time. In addition, some ducks such as mallards, teal, and other dabblers require dense upland cover for nesting in the spring and early summer.

Prime waterfowl habitat is really a combination of nesting cover and a variety of wetland types. These wetlands vary from acre sized temporary basins, which may exist for only a few weeks each year, to large permanent waterfowl lakes thousands of acres in size. But they share the common characteristics that all wildlife need to survive: food and cover.

Let's take an in-depth look at the primary components of the habitat required for waterfowl.

Breeding Areas

The small wetlands that play a vital role in the breeding ecology of Minnesota's waterfowl deserve as much attention from waterfowlers as the larger, more renowned, waterfowl lakes used by ducks and geese in the fall.



Small wetlands play a vital role for waterfowl production; yet they are the hardest hit by drainage.

When our resident waterfowl return in the spring to breed, they are attracted to small wetlands. These shallow, often temporary basins are the first to warm up after snow melt and provide abundant food in the form of insects and other invertebrates. This food source is rich in the protein required by hens to produce viable clutches.

The smaller wetlands also provide seclusion for breeding pairs at a time when their demands for privacy are the strongest. Even diving ducks such as canvasbacks and redheads, normally associated with large, open marshes, key in on small wetlands to breed and produce young.

Although many small wetlands have dried up by mid-summer, their important role in the breeding ecology of Minnesota's waterfowl is unmistakable. Minnesota's small wetlands have also been the hardest hit by drainage and filling. We have lost more than 85 percent of our original wetland acreage, most of it consisting of these important breeding areas. Even though Minnesota has the strongest wetland protection in the nation, we continue to lose these wetlands at a rate of about 5 percent per year.

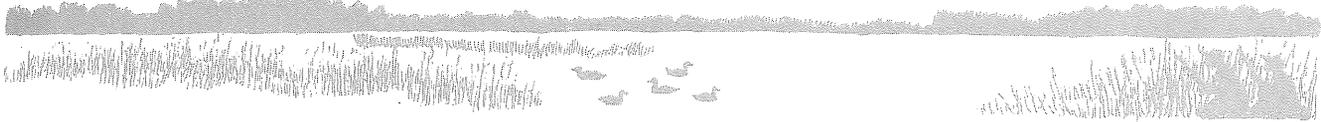
On the brighter side, there are increasing numbers of landowners who recognize the benefits of these small basins and are restoring previously drained wetlands or creating new ones. With the assistance of organizations like the Minnesota Waterfowl Association, blended with technical and cost-share provisions of the Department of Natural Resources Wildlife Habitat Improvement Program on private lands (WHIP), landowners are being helped to provide areas for breeding ducks and geese.

Nesting Areas

As waterfowl pairs complete breeding, the hens search out secure nesting cover for laying their eggs. The type of habitat used depends on the species. Canada geese, for example, typically use muskrat houses or other structures on small wetlands with a good mix of open water and emergent cover.

These high quality basins are also used by over-water nesting ducks like canvasbacks, redheads, and ruddy ducks. Building their nests of residual emergent vegetation, they are susceptible to late spring and early summer flooding. The Ring-necked duck, another Minnesota diver, more commonly nests on the sedge mat surrounding shallow woodland lakes of north-central Minnesota.

A number of Minnesota waterfowl nest in tree cavities and readily accept properly constructed artificial nest boxes. Wood ducks are familiar to most Minnesotans, but goldeneyes and hooded mergansers are also common cavity nesters in the northern portion of the state. Although artificial nest boxes can make a tremendous difference in the productivity of these birds, care must be



taken to insure that these boxes are as predator resistant as possible. In addition, nest boxes should be checked annually and properly maintained.

Puddle ducks, such as mallards and teal, require dense stands of grasses and leafy vegetation on upland areas for nesting cover. High quality nesting cover for these birds means residual vegetation not flattened by winter snows. New growth at least 8-inch high in combination with residual cover not flattened by winter snow will provide 100 percent effective coverage. Blocks of cover 40 acres or more in size are desirable. Strips of cover along roadsides, fence rows, and wetland margins also provide nesting opportunities, but are usually more susceptible to predation. Naturally, any upland nesting cover will be more productive when there are adjacent wetlands suitable for brooding.

One of the most important programs for maintaining both wetlands and nesting cover on private lands is the Federal Water Bank Program. This program provides qualified landowners with a 10 year contract that includes annual payments as an alternative to converting wetlands into cropland. Landowners must enroll at least one upland acre for each wetland acre (with the option of enrolling up to four upland acres for each wetland acre). Minnesota has 35 eligible counties and approximately 85,000 acres under contract. Nationally, more than 5,000 contracts and nearly 573,000 acres of prime waterfowl habitat are covered under the Federal Water Bank Program.

(Right) Small marshes can provide ideal production for wood ducks with the addition of properly designated nest boxes.

Migration Habitat

Minnesota has approximately 2,000 shallow lakes that historically provided some of the finest waterfowl habitat in the world. These lakes vary in size from less than 100 acres to 10,000 acres and contribute an important share of our remaining wetland resources.

Besides providing important migration habitat in both spring and fall, these permanent wetlands also serve as brood areas and molting areas for adult birds. These marshes become particularly important during periods of drought when other basins have extremely low water levels or none at all.

Unfortunately, the tremendous loss of wetlands in Minnesota has had its impact on the waterfowl lakes that remain. Water once stored by small wetlands now drains off the land, increasing the flow of run-off and nutrients into



Waterfowl need a combination of shallow water with emergent cover and adjacent upland nesting cover.



these larger lakes. Excessive water depths, reduced water clarity, and the actions of rough fish have eliminated the important marsh vegetation from these traditional waterfowl concentration areas.

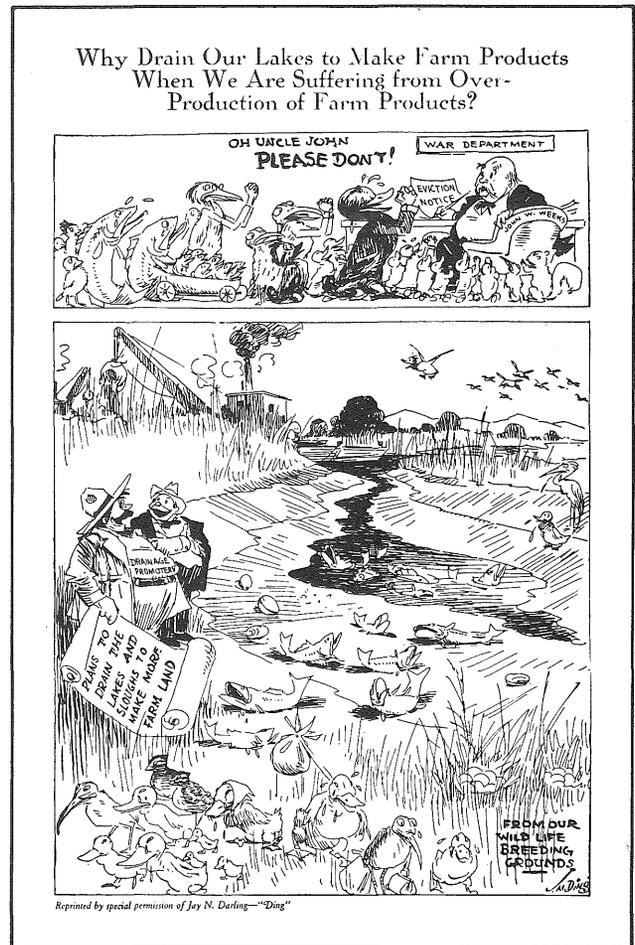
Led by the Minnesota Waterfowl Association, sportsmen were instrumental in the passage of the Game Lake Designation Program in 1969. Potential inclusions in the program are studied by professionals to determine the feasibility of proper management. Good candidates go through a process that includes the development of a management plan presented for approval at a public hearing. Designation must include plans for public access and where necessary, the DNR control of the outlet. Lakes designated under this program can be managed for primary benefits to waterfowl and other wildlife.

Manipulating water levels is the best tool available for managing these lakes for a proper mix of aquatic plants. This manipulation may, at times, include temporarily removing all the water to compact and rejuvenate bottom soils to encourage good vegetative growth.

By 1984, 21 Minnesota lakes were designated for waterfowl management — more than 38,000 acres of prime habitat. But the continued growth of this program depends on support by concerned citizens.

Minnesota is both an important harvest and production state. One-fourth to one-third of the ducks harvested in our state were produced here (half of our mallard harvest originates in the U.S, principally the Dakotas). The habitat base that has supported our waterfowling tradition requires our continued dedication and support. Our heritage and future deserves no less.

(Right) Times may have changed since this 1930's cartoon by Ding Darling, but the issue remains the same: HABITAT IS THE KEY!



HOW TO IDENTIFY DUCKS

By Dick Anderson, Advanced Hunter Education Coordinator

October Morning Light appears in the east, the Indian summer sun will soon rise behind heavy clouds rolling in from the north—a cold wind nips your nose, your eyes water, the birds are coming, and you have no way to identify them.

All you learned from studying color charts and bird identification books seem like a waste—the ducks are only black silhouettes.

If state and federal regulations continue to allow us to hunt waterfowl one-half hour before sunrise, we must take it upon ourselves to identify ducks with techniques other than color charts.

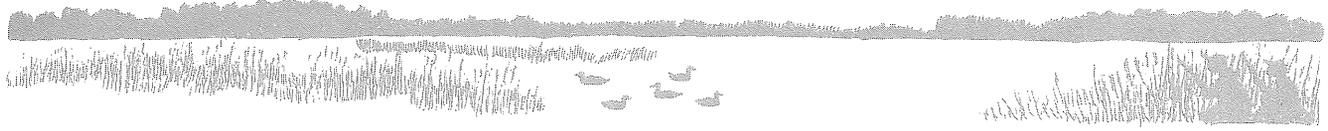
Duck identification doesn't have to be a mystery—once you know what to look for it's not that tough. Hunters who know how to identify their targets get far more enjoyment from their hunt. They also have a better quality hunt and

are able to fill their bag with the largest or best eating birds.

The modern way to study ornithology, the study of birds, is simple. You can become an amateur naturalist and not even leave your easy chair!

Most hunters don't have time to study biological descriptions or spend week after week in duck blinds. They want to read clues in plain English that help identify varied waterfowl species in flight and under poor light conditions. In-hand identification is great, but it may be "too little, too late."

The main pitfall for most hunters is believing that there are too many species of waterfowl, and that learning to identify them is an impossible job. There are 41 species of waterfowl that are native to North America. Perhaps no more than 10 species are common to the area you hunt



and of that number maybe only two or three have special regulations designed to protect the breeding population. Special attention must be given to hen mallards, wood ducks, redheads, canvasbacks and hooded mergansers.

Waterfowlers should also be able to identify geese, swans, cormorants, and our state bird, the loon.

The art of identifying approaching waterfowl is knowing their habits and general characteristics, and asking yourself these questions in order:

1. Are they divers or puddlers?
2. Are they big or small?
3. Are they black or white?
4. Shoot or don't shoot!

1.) Are They Divers or Puddlers?

A.) **Migration Timetables** — Timetables for identification can only be used in the general terms. True, you don't have to worry about goldeneyes frequenting your hunting area in early October when there may be a good number of teal available, but at the same time low numbers of other species such as redheads, bluebills, or canvasback will be in Minnesota.

B.) **Areas Frequented By Birds** — If you hunt deep lakes and marshes your main concern should be with divers such as redheads, canvasbacks, and mergansers. But if you hunt shallow wetland basins, you will be interested in puddlers, especially wood ducks and mallard hens. You can bag all other puddlers in numbers totaling your legal possession limit, but **always** be on the lookout for canvasback and redheads.

C.) **Flock Formation of Divers** — When in flight divers generally look very disorganized. Flock formation may appear vertical rather than horizontal.

D.) **Flock Formation of Puddlers** — When in flight puddlers appear more regimented than divers, and may appear to have a leader.

2.) Are They Large or Small?

A.) **Relative Size** — Are the ducks large or small? Determining size pays off — you'll be able to start narrowing down the selection as the ducks get closer.



B.) **Body Contours of Divers** — When divers approach, their bodies appear round and large in relationship to their wings. The wings of a diver are shorter than a puddler's so in comparison divers have a faster wingbeat and shorter stroke than puddlers.

C.) **Body Contours of Puddlers** — When puddlers approach, their bodies appear oval-shaped and small in relationship to their wings. A puddler's wings are longer than those of the diver. Compared to a diver, puddlers have slower wingbeats and longer, deeper strokes.

D.) **Manner of Takeoffs and Landing** — See illustrations below.

3.) Are They Black or White?

A.) **General Color Patterns** — Because Minnesota waterfowlers hunt in the poor light conditions of early morning, the ducks appear as silhouettes. The hunter must look for color patterns which have **Lots of white or Little or no white.**

4.) Shoot or Don't Shoot!

A.) **Puddlers** — when a flock appears in the distance you should immediately ask yourself, "Are they divers or puddlers?"

Puddlers, when in flight, appear more regimented than divers, and they may appear to have a leader. Once identified as puddlers, ask yourself are the ducks big or are they small? Next, are they showing a lot of white, or little or no white? Now for the decision whether or not to shoot. We are concerned with only two puddlers — the mallard and the wood duck — because of the special regulations on their taking. Both are large ducks with little or no white.

At the present time bagging either species is not in violation of federal or state regulations but in order to protect breeding numbers bag limits have been set.

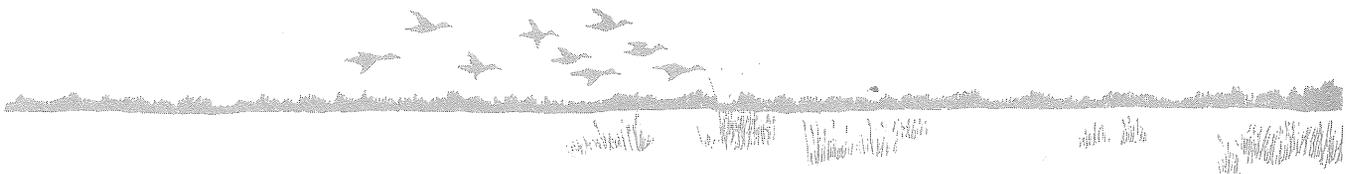
There should be no excuse for not identifying wood ducks even under poor light conditions. It is the only duck to fly with its head held high, bobbing its head during flight.

The mallard is well known by most waterfowlers and in poor light the white bars on either side of the violet-blue speculum are easy to see.

The mallard is the most prized and sought after duck in Minnesota. Many hunters are becoming very selective and shoot all drakes so that they can have a larger bag and spend more time afield.

B.) **Divers** — If you hunt deep lakes and marshes your main concern should be with divers such as redheads, canvasbacks and mergansers. When a flock appears in the distance, divers may appear very disoriented and resemble a swarm of bees. Some, however, appear quite regimented.

There is no one absolute distinguishing flock formation of ducks. From my experience, flock behavior and individual behavior provide more clues as to their identity than any particular formation. Furthermore, most of your shooting experience will involve singles, doubles or triples rather than whole flocks. Many of the large flocks you see, such as mallards and woodies, are out of shooting range.



Once you have identified them as divers, ask yourself are they large or small? If they are large are they showing a lot of white, or little or no white? In a moment you must make the decision whether or not to shoot. If the divers show little or no white, concern yourself with identifying only two birds — the hen canvasback and redheads.

The female canvasback will appear very dull in color and dark under poor light conditions. Other prominent characteristics to look for are the head and neck. The neck on the canvasback is longer and stouter than any other diving duck, and the wedge-shaped head also stands out.

Redheads will also appear quite dark under poor light conditions. When they get close, the circular powder-puff shape of their head is quite distinctive. Redheads, similar to canvasbacks, have special regulations designed to protect and build their breeding populations. Many times it is good to go from the familiar to the unfamiliar. For instance, one way to view a redhead is by calling it a gray-brown mallard.

Now let's look at a large bird showing a great deal of white. The species to be concerned with here is the drake canvasback — another species with protective regulations. The white back and belly, and inner-white half of the wings combine in flight to form the greatest expanse of white exhibited by any duck. In close, the wedge-shaped head becomes a very distinctive characteristic.

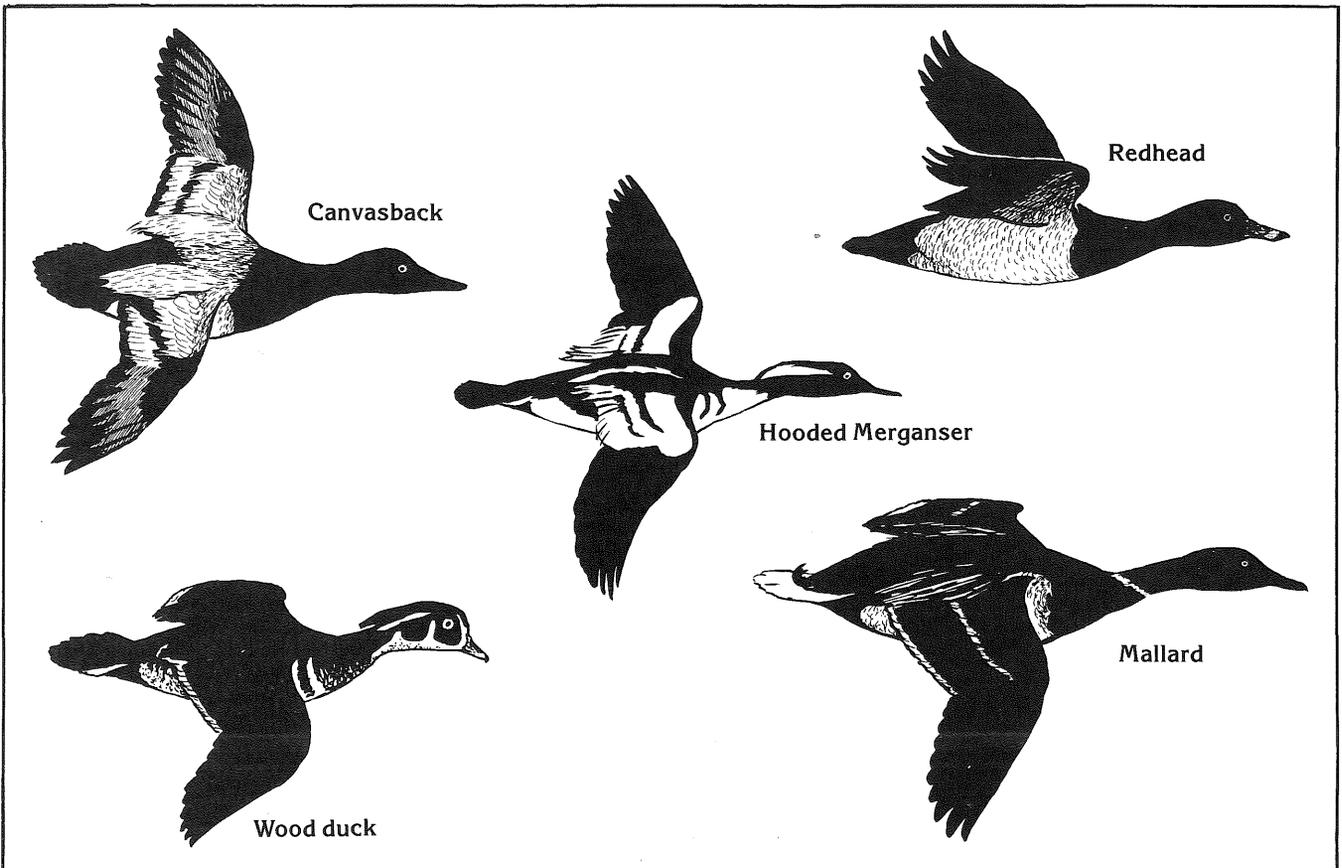
The last diver we must be concerned with will be a small bird displaying a lot of white. This bird is the hooded merganser ("Saw Bill" or "Fish Duck").

Hooded mergansers are protected by state and federal regulations so be sure to consult your waterfowl regulations. They are wary and retiring ducks, usually found in singles, pairs and in flocks of five to 10.

The best clue to identifying a hooded merganser is its head. Mergansers hold their heads slightly below the plane of their bodies. Look for the backward slant of the crest which makes the head appear longer, and the elongated, serrated bill. Use caution when they're present.

In addition to the items previously mentioned — **voice, wing sounds and behavior just after landing** can give you additional clues. For instance, the hooded merganser, which you might expect about mid-October, will usually fly low and directly into your decoys. They immediately pool together and exhibit very nervous behavior scooting about and looking like they might want to leave in a hurry.

By all means get your hands on several duck identification books. Improving your recognition skills is a lifetime endeavor. The better you become, the less frustrated you will be. But remember, it takes more than I.D. books to create ethical hunters. An ethical hunter works hard at I.D. skills and maintains a sportsman's image by not firing at those species that are either protected or scarce.





THE RULES OF THE HUNT

by Ray Norrgard, Minnesota Waterfowl Association

Hunting regulations have been developed to limit the fall harvest to a level that will provide for future breeding populations of waterfowl. These regulations must be readjusted at times to compensate for the impact of weather and the availability of waterfowl breeding habitat.

The annual development of waterfowl hunting regulations is a more complex process than for any other game species in Minnesota due to the international scope of the resource and the number of agencies involved. The first step in their development is to establish, as accurately as possible, the current status of waterfowl populations.

The U.S. Fish and Wildlife Service, with the assistance of the Canadian Wildlife Service and several states (including Minnesota), conducts surveys of waterfowl populations each spring and summer along established transects using airplanes and ground crews. The spring survey indicates the number of breeding pairs while the summer survey indicates breeding success through the production of broods. In addition, nearly all states contribute to a mid-winter census. Analysis of waterfowl band returns and hunter surveys also play an important role in establishing the previous year's harvest.

These findings are presented at a population status meeting and later reviewed by the technical committees of the four flyway councils — Atlantic, Mississippi, Central, and Pacific. Minnesota is a member of the Mississippi Flyway Council. Each state and provincial agency is a voting member. After receiving the recommendations from

their technical committees, each council develops official recommendations.

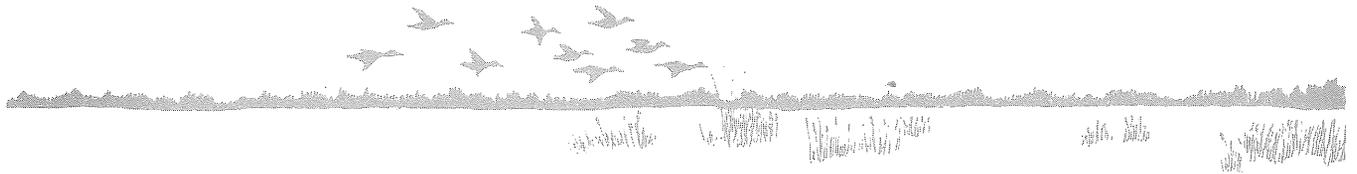
Two delegates from each flyway then present their council's recommendations to the Director of the U.S. Fish and Wildlife Service at an annual meeting of the Waterfowl Advisory Committee. Each delegate also serves as a member of the National Waterfowl Council which collectively represents the views of the four flyways. At a mid-August meeting, the views of major national conservation organizations are also considered.

With this input of views, the Director of the U.S. Fish and Wildlife Service and his staff develop regulations that provide the framework for the states. These regulations are reviewed by the Secretary of Interior. When approved, these proposals are published in the Federal Register. When published, groups and individuals not previously involved in the process can express their views on the federal framework.

Open seasons occur for waterfowl from early September until February — nearly half a year! The Minnesota waterfowl hunting season opens at noon on the Saturday closest to October 1. Early seasons are necessary to provide hunting opportunities in the far north before freeze up, while late seasons meet the needs of southern areas

(Below) Properly designed harvest regulations, as well as wildlife management techniques, made possible the comeback of Canada goose populations.





which may not have substantial numbers of waterfowl until late fall and winter. Some waterfowl species have already begun their spring migration to the breeding grounds before the last season closes.

The final seasons and bag limits are selected by states within the guidelines set forth by the USFWS. The individual states can set stricter regulations than the federal government if they feel that conditions warrant it.

Generally, the federal framework and local regulations are set by taking into account the individual population status and characteristics of different waterfowl species. Due to population levels and behavioral traits, some species may have special restrictions on daily bag limits and open hunting areas.

Besides bag limits and length of season, waterfowlers should be familiar with a number of other regulations that apply in Minnesota.

STEEL SHOT ZONES: Lead shot for waterfowl hunting is not permitted within the boundaries of state wildlife management areas, federal waterfowl production areas, or national wildlife refuges that are open to waterfowl hunting. In addition, there are several areas, such as some important migration lakes, that are also restricted to non-toxic shot. All steel shot zones are listed in the DNR waterfowl regulations published annually.

Why steel shot? Lead shot has long been recognized as the silent killer of over 2 million waterfowl each year (approximately twice the number harvested by Minnesota hunters). Lead ingested while feeding is ground by the gizzard and absorbed into the blood stream causing poisoning. Birds affected, but not killed outright, are more susceptible to disease and predation, as well as having markedly lower reproduction.

4 O'CLOCK CLOSURE: Beginning in 1973, Minnesota waterfowl hunters were required to end hunting by 4 p.m. each day. This closure is still in effect statewide, but only for the first three weeks of the season. Although initially quite controversial, this regulation has had a very positive effect on the population of breeding hens, especially mallards, in Minnesota.

To understand the importance of this regulation, we must first recognize that Minnesota is an important waterfowl production state, as well as a high harvest area. Unique regulations are needed in Minnesota to protect breeding hens.

Successful hens often do not bring off a brood until their second or even third nesting attempt during the year. Because of this late nesting effort, mallard hens, in particular, are late going into their annual summer molt and many are barely able to fly by the time our waterfowl season traditionally opens.

Old-timers referred to these birds as "marsh hens" because they were often encountered separate from organized flocks and seemed dependent on small marshes and the heavily vegetated areas of larger water bodies. 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 the other ducks. Since the inception of this regulation, our breeding hens have increased approximately 25 percent.

REFUGES: Refuges also play an important role in protecting Minnesota's resident breeding hens, while at the same time providing undisturbed rest areas that keep migrating waterfowl in our state longer. By providing these attractive areas, migrating flocks stay in the state longer and allow additional harvest opportunities for waterfowl hunters.

There are a number of refuge types that Minnesota waterfowl hunters should be familiar with:

National Wildlife Refuges: Federally owned and managed, national wildlife refuges often include several categories of lands in terms of hunter use. These range from sanctuaries where no trespassing is allowed to areas where hunting is allowed except for waterfowl. Waterfowl hunting is allowed on portions of some national refuges, but be sure to check the waterfowl synopsis and refuge headquarters for details.

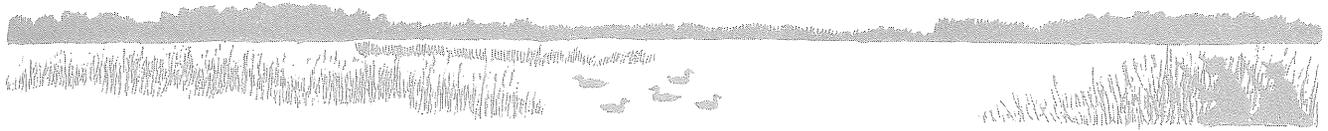
State Duck Refuges: Portions of wildlife management areas and waterfowl production areas (state and federally owned, respectively) may be posted as "State Duck Refuge." The posted areas are closed to all trespassing from September 1 through the end of the waterfowl season.

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 the necessary permission before trespassing.

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.



Wildlife Management Areas are open to public hunting unless otherwise posted.



FEEDING AND RESTING AREAS: Areas posted as "Feeding and Resting Area" are open to waterfowl hunting but do not allow the use of motors. By reducing the disturbance of resting flocks, these areas provide some of the same benefits that refuges provide for migrating waterfowl.

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. Although it can be applied to any water area, state law currently prohibits more than 13 lakes being so designated.



Public support by concerned sportsmen is a necessary part of the Game Lake Designation Program.

DESIGNATED GAME LAKES: Lakes designated for wildlife management through the "Game Lake Designation Program" are open to waterfowl hunting unless otherwise posted. The only waterfowl hunting regulation that comes with designation is prohibition of the use of airboats.

Lakes are designated through a public hearing process and allow the DNR to manage the lake primarily for waterfowl habitat. Control of the outlet and the establishment of a public access are necessary for this management. Other regulations concerning steel shot, refuges, and feeding and resting areas may apply to designated lakes but are established under a separate process. These lakes are listed in the waterfowl synopsis.

NO OPEN WATER HUNTING: Waterfowl hunting in open water where there is not enough natural cover to provide at least partial concealment for hunters is not allowed in Minnesota. What constitutes "partial concealment" is not always clear in areas of sparse cover or when jump shooting from a boat; so whenever there is a question, be sure to check with the Conservation Officer in the area you plan to hunt.

This regulation again provides some security for resting flocks of waterfowl.

This listing is intended to clarify some of the major waterfowl hunting regulations that are not included in the federal framework. It certainly is not an exhaustive list of the laws we hunt under. Be sure each year to carefully review the synopsis of waterfowl hunting regulations published by the DNR. Because of the need for federal involvement, the synopsis is not usually available until September of each year. If any regulations appear unclear, take the time to contact a DNR conservation officer or the DNR Enforcement Division, 500 Lafayette Road, St. Paul. Information Officer — 612-296-4771.

Dabbling ducks typically land short of the decoys
Diving ducks typically follow a lead and fly to the head of the spread

Early season — use more hens than drakes

Calling will add realism to your decoying

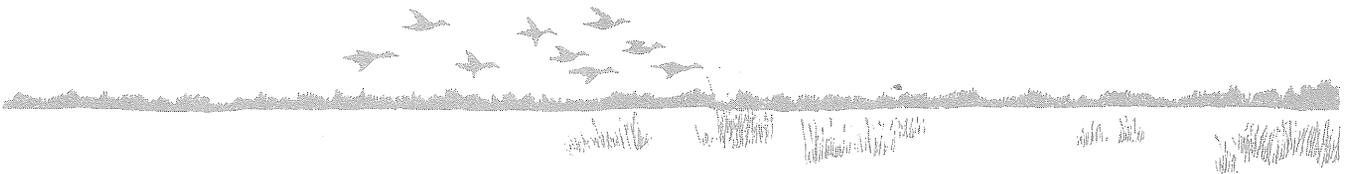
Offer the birds an inviting opening to land within range

You should keep puddle ducks and diving ducks separate

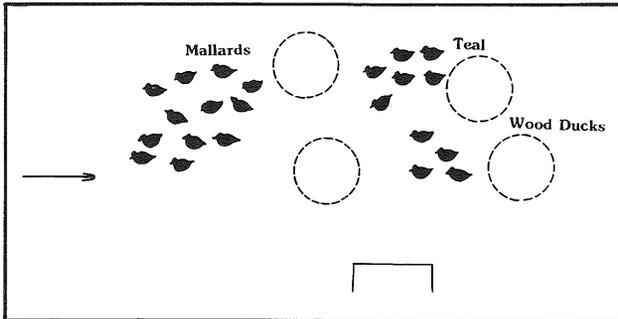
In setting out your decoys, allow birds to land into the wind

Nasty, windy weather is a duck hunters best friend

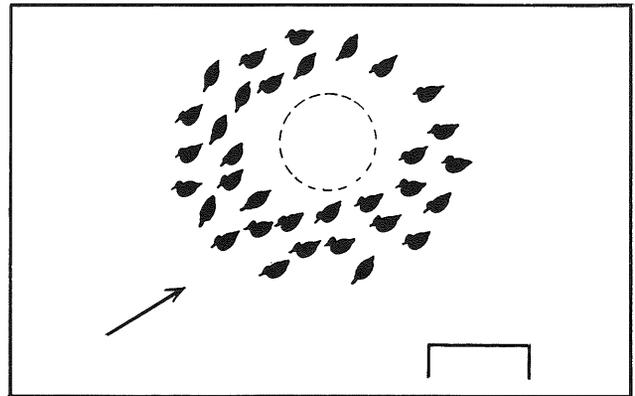
Go where the birds are, know their feeding/nesting habits and flight patterns.



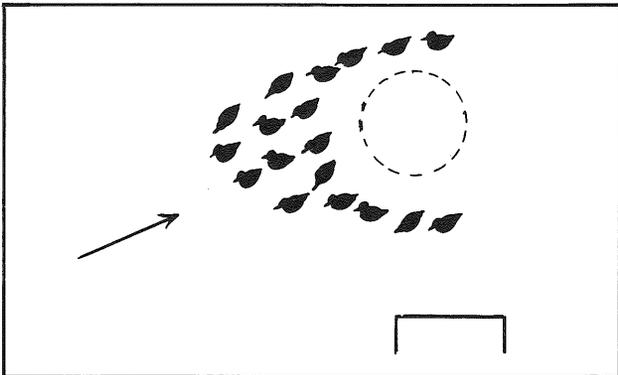
DECOY SETUPS FOR VARYING HABITAT AND HUNTING CONDITIONS



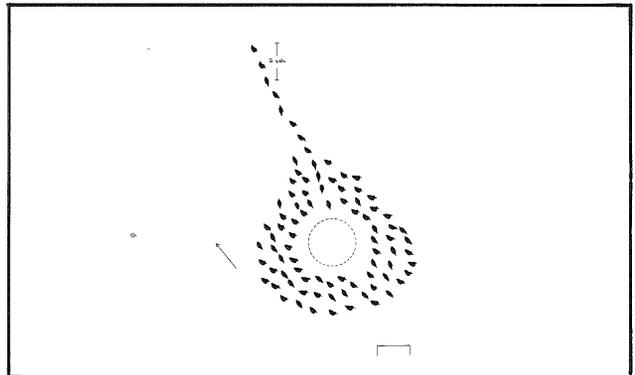
Setup 1: This decoy set is to be used in a marsh or small game lake situation. The set is designed to attract early season puddle ducks such as mallards, wood ducks and teal. The set includes size variations in decoys for added realism in the spread. Use about one dozen mallards, four to six wood ducks, and four to six teal.



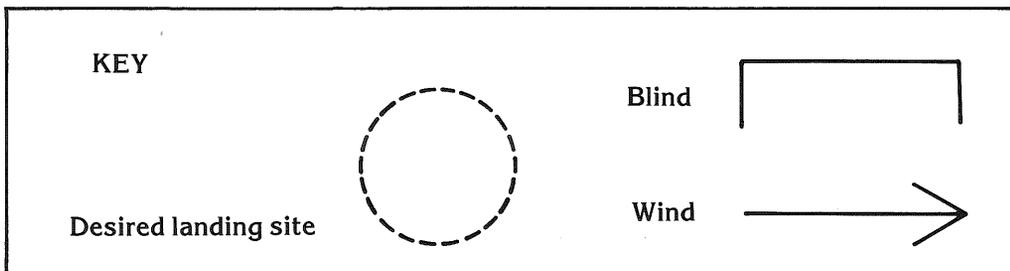
Setup 3: This set is useful in larger, open-water areas with moderate winds. Use one to two dozen mallard or other puddle duck species. The set tries to replicate a small group of migrants in a resting state.

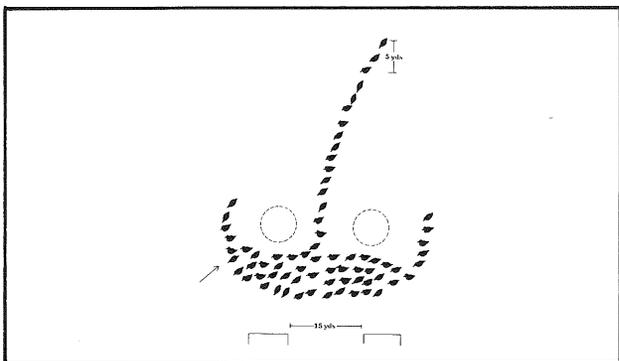
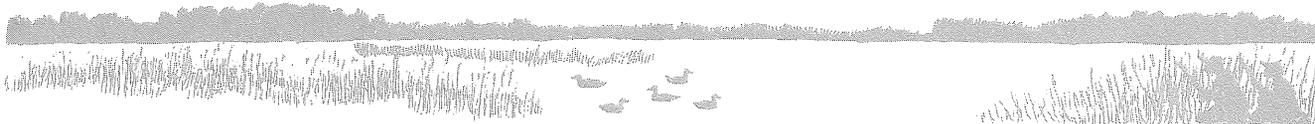


Setup 2: This decoy set is appropriate for a pothole situation. Depending on the size of the basin, one to three dozen mallard decoys can be used to attract puddle ducks. This set is well-suited for an area where puddle ducks need a ready source of water after feeding in a picked grain field.

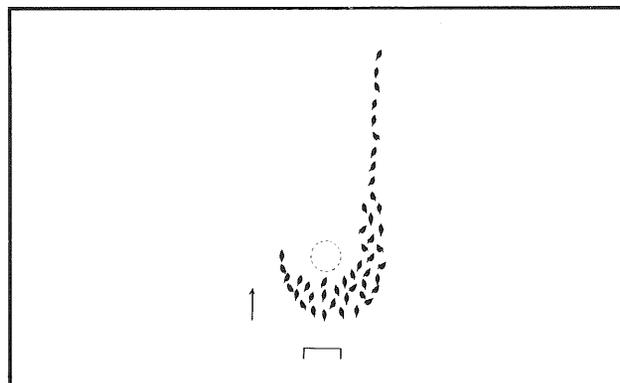


Setup 4: This is a traditional set for attracting diving ducks. A minimum of three dozen decoys and maximum of 10 dozen decoys can be used. The majority of the decoys can be scaup or ringnecks with some goldeneyes or buffleheads making up part of the leader string.

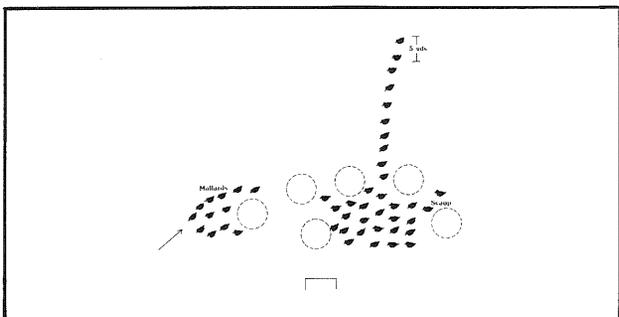




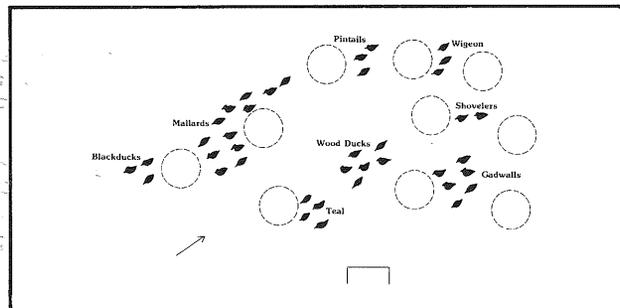
Setup 5: This is another classic set for attracting diving ducks when two boats are hunting over the same spread. A combination of four to eight dozen scaup, canvasback, redhead or ringneck decoys works best. Group individual species together throughout the spread.



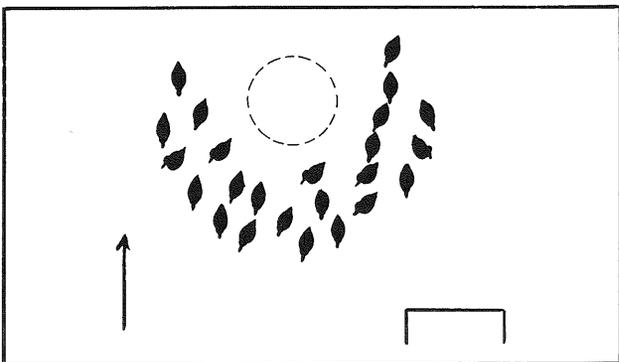
Setup 8: This is a classic diver set for a larger marsh or lake. Use three to six dozen diver decoys to make the fishhook. Scaup or ringnecks should make up the majority of the spread. The bulk of the decoys should be within 40 yards of the blind with the leader extending 60 to 300 yards out into the lake.



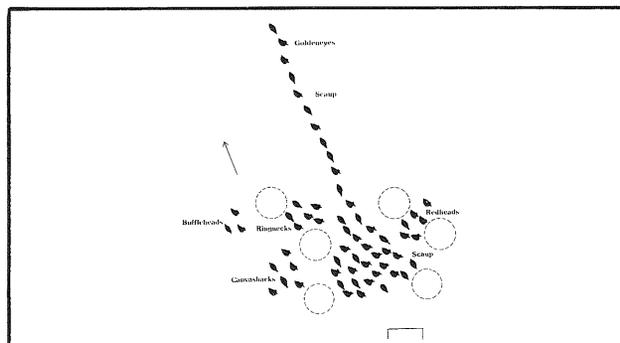
Setup 6: This is a combination set for hunting both divers and puddle ducks. Bunch the puddle ducks together slightly upwind of the blind, and include about one dozen mallard decoys. The diver setup can consist of three to five dozen scaup decoys and should have a leader string extending further out into the lake. The mallard and scaup decoys will attract all species of puddle and diver ducks.



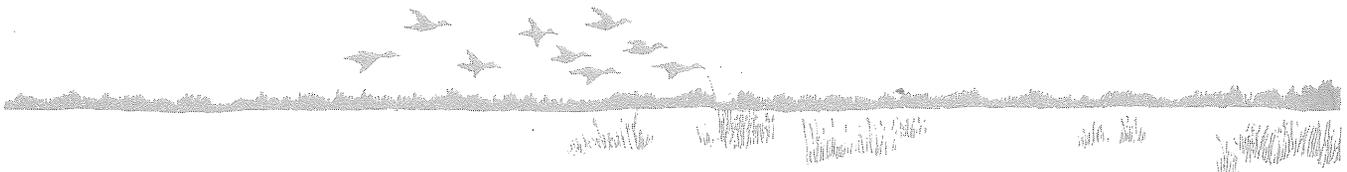
Setup 9: Use this puddle duck setup when other setups fail to bring in the ducks. Use up to four dozen puddle ducks with as many different types of decoys that you own or can borrow. This setup provides a variety of shapes, sizes and colors that just might be the ticket for fooling local birds the second or third week of the season.



Setup 7: This is a puddle duck set using one to two dozen mallard, wood duck, teal or wigeon decoys. Add tip-ups to simulate an active feeding situation. The set is effective in a shallow marsh situation.



Setup 10: This diving duck setup is appropriate on a large lake or marsh. Use a variety of diver duck species of different shapes, sizes and colors to fool late-season divers. Goldeneyes or buffleheads are put at the tail of the spread because their white bodies show up great distances and can produce that initial attraction.



HYPOTHERMIA: WHEN THE BODY'S FURNACE FAILS

by Warren Downs, Science Writer University of Wisc. Sea Grant Institute

Reprinted with permission of *The Minnesota Volunteer*

In 1912, the ocean liner *Titanic* sank, ripped open by an iceberg, in the North Atlantic. Rescue came in less than two hours for those in lifeboats. But for nearly 1,500 people who were forced to jump into the water, it was too late. Though still afloat, most had died not from drowning but from the cold.

Fortunately, the tragedy of a shipwreck in the North Atlantic is rare. But hypothermia — when the body's furnace gives out and internal temperatures begin to slide — is more common than might be expected, even in summer.

"Actually, suffering from severe cold seems like a remote possibility, because our technological society tends to isolate and shield us from our larger natural environment," says Robert Pozos, a Sea Grant hypothermia specialist at the University of Minnesota-Duluth Medical School located on the shores of cold Lake Superior.

But people are particularly vulnerable to hypothermia when immersed in cold water, says Pozos. The Great Lakes pose a special danger as well as do many inland lakes and streams in northern states.

Because of its high conductivity, water has 23 times the cooling power of air. In 50° F. water, survival is less than three hours. In 32° F. water, a person loses use of his hands in 10-20 minutes and can die in 45-60 minutes.

Inner Heat Loss. Most critical is the heat loss in the body's internal organs. The heart and brain of a person in cold water begins to cool in 15 minutes. As the body core cools down from its normal 98.6° F., shivering subsides and muscles become rigid. When the body reaches 85° F., unconsciousness, heart irregularity, then heart failure can follow. At less than 80° F., coma and death becomes certain.

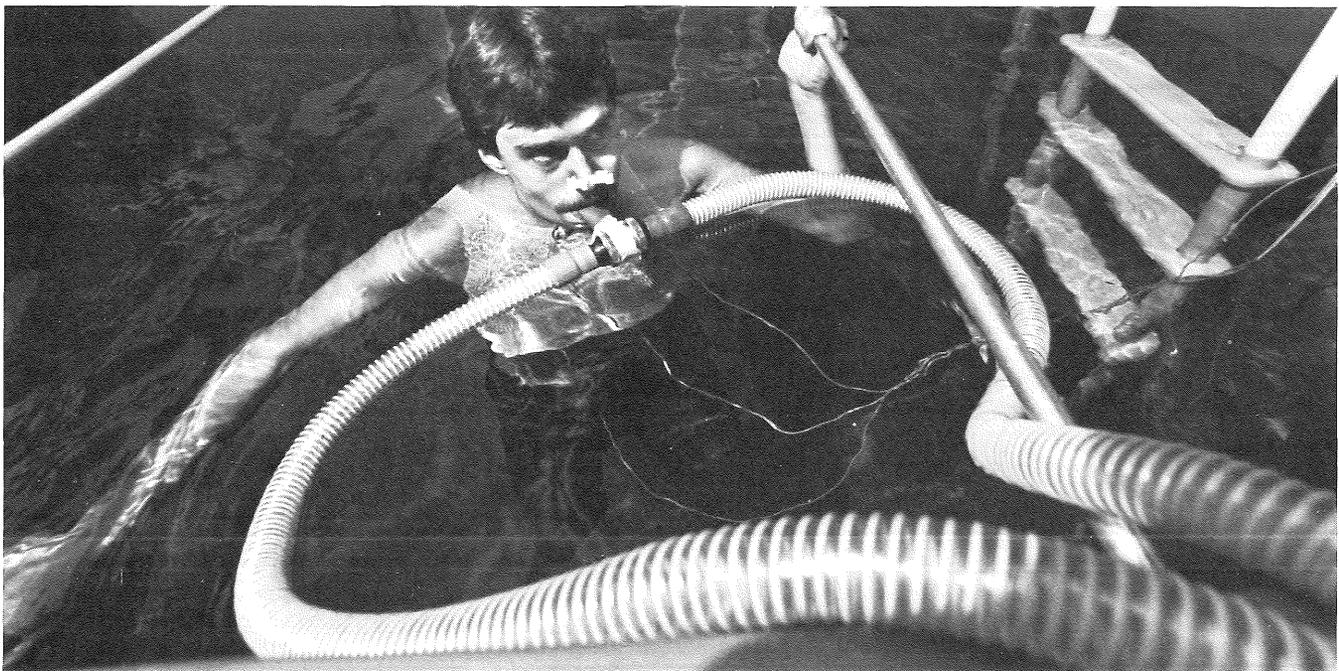
"Hypothermia can develop quickly," says Pozos, "but sometimes it develops so gradually the victim doesn't realize what's happening until it's nearly too late."

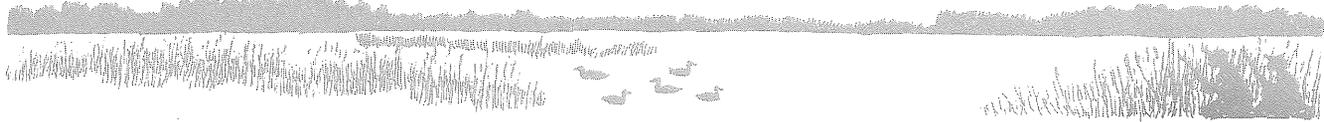
Prompt action is required for a person in any stage of hypothermia, but doctors point out that the body's own natural defenses must be kept in mind.

"The brain is capable of making seemingly ruthless, sacrificial decisions," states Pozos.

As the body cools, the brain begins to constrict the blood vessels and stop the blood flow to arms and legs. This helps conserve heat for the body's vital internal organs.

(Below and right) At the University of Minnesota-Duluth Medical School, volunteers take tests to measure their response to immersion in water which is almost the temperature of Lake Superior.





For that reason, warming the entire body surface — in a hot tub, for example — could be a mistake. Warming the entire body quickly dilates blood vessels in the arms, legs, and surface tissue. This expansion of the vessels sends still-cold surface blood back to the core and further lowers the temperature of internal organs. The result: a temporary but dangerous “rewarming shock” to the system.

A guiding principle in serious cases of hypothermia is to supply most heat internally. Why? Because survival depends on keeping the heart, lungs, and brain warm. The skin and extremities can be warmed later and more indirectly.

Several Treatments. Depending on the degree of hypothermia and circumstances surrounding the accident, doctors recommend several treatment procedures. Ideally, rescuers should have inhalators that send warm, humidified oxygen to the lungs, warming its blood vessels and the heart nearby.

“The equipment is portable, inexpensive, and easy to use,” says Pozos. “So the technique may soon become standard procedure for field rescue teams.”

Another method is to place heated pads around the victim’s head, neck, rib cage, and groin — areas where heat is more directly transferred to the body core. A third method is to place the victim — if conscious — in a warm



Proper waterfowling gear should include a PFD (Personal Flotation Device).



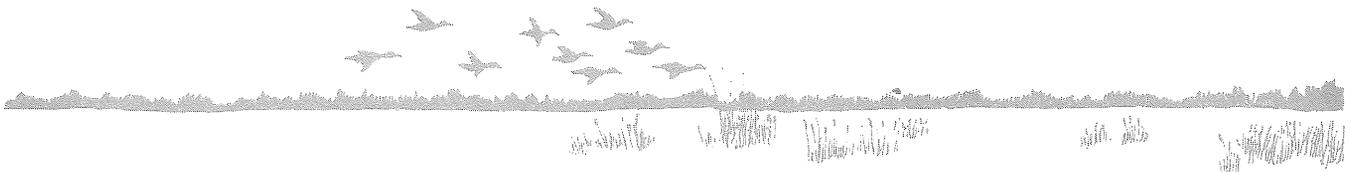
tub, but reduce the risk of rewarming shock by leaving his arms and legs out of the water.

If inhalators and tubs are not at hand, the victim can be rolled in blankets or a sleeping bag. One or two rescuers can also crawl inside to share their body heat. At the same time, mouth-to-mouth breathing will supply moist, warm air to the victim’s lungs.

Also, Pozos adds, the victim’s determination to live is sometimes decisive.

“The incredible powers of the mind, through the expression of the will to live, can greatly influence heat production and heat loss,” he states. “Individual psychology is an important ingredient in survival.”

For more information, refer to
PLANNING THE HUNT.



BASIC BALLISTICS FOR WATERFOWLERS

by Ray Norrgard, Minnesota Waterfowl Association

The shotgun is a unique firearm because its successful use generally depends on multiple hits. Although no one will challenge the fact that gamebirds can be killed with a single "lucky" pellet in a vital organ; sportsmen must be concerned about the crippling losses that occur when shooters rely on luck rather than developing consistent harvest skills.

A consistent clean kill demands at least four body "hits" on ducks and five on geese. Achieving these multiple hits depends on adequate pattern density at the range that the shot is taken. The smaller the target, the denser the pattern required. Regardless of the range, this pattern density must be combined with shot pellets that have enough energy to penetrate the vital organs of gamebirds.

Shot charges spread and the pattern becomes thinner as the range is extended. The shot charge not only becomes wider, but longer as well. This phenomenon, known as shot stringing, can be visualized as a cloud of shot moving through the air with portions of the "cloud" relatively dense compared to the rest. The characteristics of the shot string differ with selected loads and chokes. Generally, the rounder the pellets (fewer deformed pellets), the shorter and tighter the shot string. The length of the shot string becomes more important as the range is extended.

Patterning to check densities is as important to the shotgunner as "sighting in" is to the rifleman. Patterning can be as simple or as complicated as the shooter wants to make it. Waterfowlers can make a simple, but effective evaluation following a few guidelines:

- Select an area that will provide a safe backstop. Set up patterning paper (no special requirements except size — at least 45 inches square will save on frustration), and mark an aiming point near the center of the paper. Using the gun/load combination selected, measure the distance that the load will typically be used at while hunting. It makes little sense to test a long range goose load at 40 yards or a potential decoy load at 60 yards.

- Wear a good set of shooting glasses and adequate ear

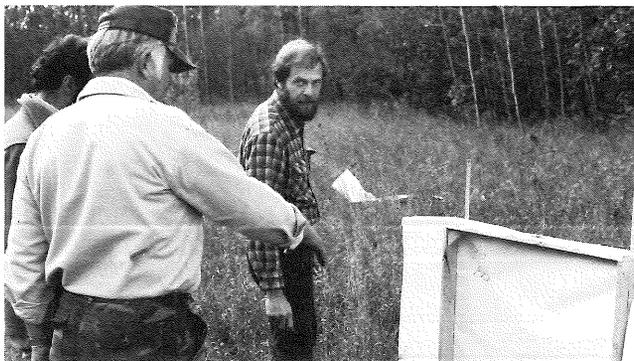


Table I — PATTERN DENSITY FOR CONSISTENT CLEAN KILLS*

Type of Waterfowl	Required Pattern Count (30" circle)
Medium ducks (Lesser scaup)	148
Large ducks (Mallard)	88
Small Geese (Snow)	50
Large Geese	35

*Based on Tom Roster's formula for critical target area, assuming four pellet hits on ducks and five pellet hits on geese with sufficient retained energy for adequate penetration. Patterns should have an even dispersion of pellets.

protection. Shoot at least three test patterns (five is better, 10 is even more accurate) and average the results.

- To evaluate the patterns, start by outlining a 30-inch circle with the densest part of the pattern centered in the circle. Record the number of hits within the circle. The density required to consistently achieve adequate patterns for various sized waterfowl is given in Table I. Although only a guideline, these examples provide a realistic starting place for choke/load evaluations.

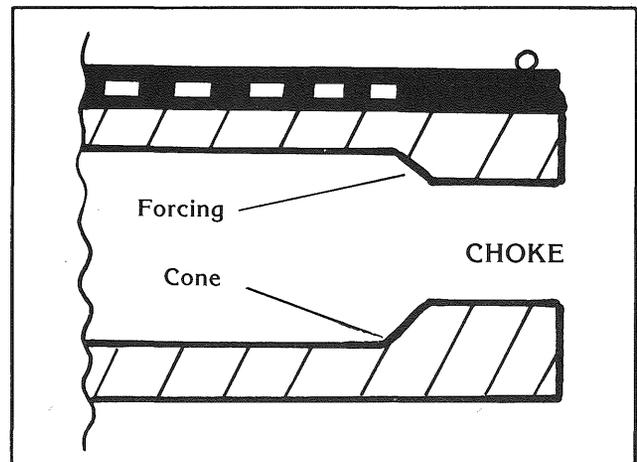
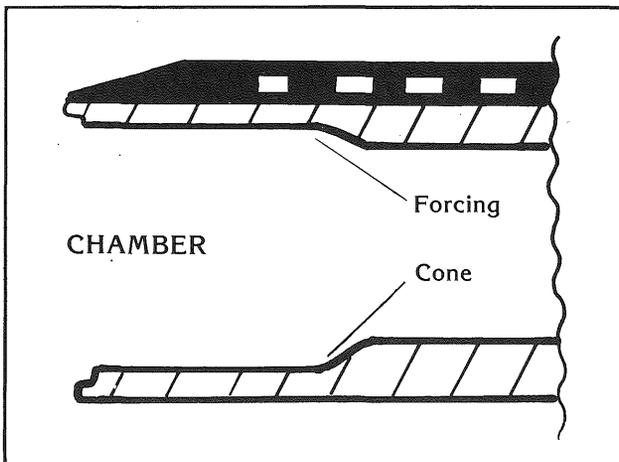
- The evenness of the pattern should also be considered in evaluating a particular hunting load. The extremely dense centers and thin margins often found with very tight patterning loads can lead to "fringing" birds with the outside edge of the pattern, and increasing crippling, unless they are perfectly centered. The evenness can be simply "eye-balled," or assessed in more detail by scribing a 21-inch circle inside of the 30-inch circle, and then quartering the entire pattern creating eight equal areas for comparison. It is important to record the weather conditions when the patterns were shot. Air density, wind, and temperature can affect shotshell performance.

The primary enemy of dense and even patterns is deformation of the shot pellets. The hardness of the pellets, their size, the constrictions within the barrel, and the velocity of the load can all play a role in pellet deformation. Let's look at these factors one at a time.

Lead pellets vary in hardness depending on the alloys mixed with the lead. In general, waterfowl hunters will find that the harder the pellets the more expensive the load, whether factory made or hand loaded. While many extra hard pellets are copper or nickel plated, it is primarily the antimony content that determines the hardness of lead pellets.

The ultimate in pellet hardness for shotgunners is steel shot (required for waterfowl hunting in many areas). Actu-

Figure 1



ally formed from soft iron wire, steel shot exhibits no visible deformation even when examined as spent pellets after discharge. Full choke patterns with steel typically have dense centers and short shot strings.

The size of the pellet in the shotgun load can also be a factor in pellet deformation, especially with soft shot. Large pellets have more difficulty moving through constrictions in the chamber and choke forcing cones of the barrel. Loads with larger shot sizes contain fewer pellets and losses to deformation can be critical to performance.

Constrictions within the shotgun barrel have a definite impact on patterns. Constriction in the choke (generally limited to the last 1½ inches of the barrel) is necessary to provide effective patterns. However, the amount of constriction and the angle of the forcing cone (Figure 1) can also be factors in disrupting patterns when shot is excessively deformed while passing through the choke. More and more shotgunners are finding open chokes and gradual forcing cones are meeting their needs more effectively than the traditional full chokes used in the past.

A second area of constriction in a typical shotgun barrel occurs where the chamber enters the rest of the barrel. The constriction is necessary for the undershot wad to effectively seal the expanding powder gases to create the pressure that provides pellet velocity. Recent work, however, has shown that less constriction is required with modern plastic shot cups than with the older felt wads. Back boring barrels to a larger diameter is becoming more common to improve patterns without sacrificing velocity. Again, a gradual forcing cone in this area is conducive to better patterns, even in standard barrels.

As another example, the smaller the shotgun gauge the more difficult it becomes to reduce pellet deformation. Given the same shot charge, say 1¼ oz. of No. 4 lead, the tighter constriction of a 20 gauge barrel will typically result in poorer patterns than the same load fired through a 12 gauge.

Shot pellets receive some protection from deformation with the plastic shot cups found in most modern shot shells. Combined with an under shot wad, generally attached to the base of the shot cup, pellets are cushioned during the initial thrust of firing and protected from friction along the inside of the barrel. Granulated plastic filler

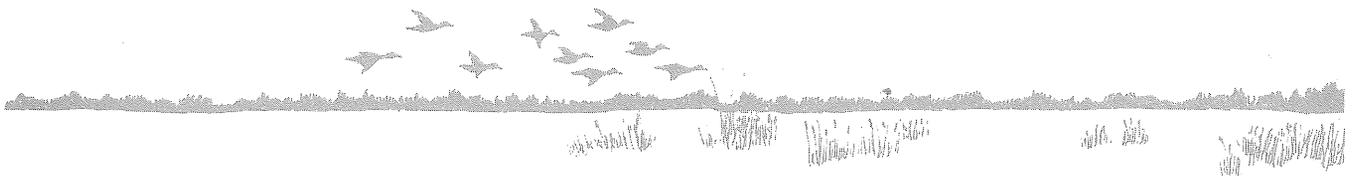
can be added to cushion the pellets from each other during compression in the forcing cones. In the case of steel shot, the extra tough shotcup is designed to protect the interior of the barrel from contact with the shot. A cushioning wad is unnecessary since steel shot is hard enough to withstand the otherwise damaging effect of acceleration.

Velocity and the size of the pellet are important contributors to the effectiveness of hunting loads. Dense patterns alone will not provide consistent kills if the pellets do not have sufficient energy to adequately penetrate the body of the bird. Table II provides a guideline for various sized pellets in hunting loads for ducks. No. 2 lead and No. 1 steel should be considered minimum for geese with strong consideration given to BB in both lead and steel for large Canadas. Handloaders, in particular, should be aware that while increased velocity adds energy to individual pellets, it can also disrupt patterns by increasing pellet deformation. Only by patterning can shooters evaluate the impact of increased velocity on down range patterns.

The dilemma faced by waterfowlers is finding the balance between pellet energy and adequate patterns. The larger the pellet, for example, the greater the energy but the fewer the pellets in the pattern. The right combination depends on the size of the bird and the distance of the shot. While there is no perfect solution, conscientious waterfowlers will work towards finding the best gun/load combinations for their needs.

Table II — SUGGESTED SHOT SIZE SELECTION — DUCKS

Range/Yards	30	40	50
#7½ lead	██████████		
#6 steel			
#6 lead	████████████████████		
#4 steel			
#4 lead	██		
#2 steel			



BAG WATERFOWL WITH LEAD OR STEEL

by Bob Brister, Outdoor Writer and Ballistics Expert, Houston, Texas

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“How far do you lead a duck or goose? What are the differences in forward allowance between steel shot and lead shot loads?”

A widely publicized field test in Louisiana is being reported by some publications as indicating steel loads cripple 41 percent more ducks than lead loads. (See “North American Hunter,” Nov./Dec., 1982).

That is not what happened. I have that test data, and digging out the facts rather than relying on the news releases shows that shooters get 4.84 cripples per 100 shots with steel and 4.16 cripples per 100 shots with lead. That is not 41 percent, nor even a statistically significant difference.

It is significant in that one of the principal reasons for steel shot tests is to estimate the total number of cripples, or kills, that could be expected to have an effect upon the waterfowl population. And if that 41 percent figure is construed to mean 41 percent more cripples, period, it could be a very dangerous one in the hands of anti-hunters.

What the 41 percent actually meant is that of all ducks believed by observers to have been hit by the hunters, 41 percent more were crippled than with lead loads. Since fewer birds were hit at all with steel shot, the actual crippling number was essentially the same with lead or steel. You have to hit them to cripple them.

The obvious question is why did those steel pellets that did hit cripple 41 percent more?

I believe the answer is the same one that prompted Winchester's computerized Nilo Lethality Model to predict that a super tight buffered magnum load of lead, in the hands of a poor shooter, would bag less than half the ducks of an ordinary high brass duck load because the latter has a bigger pattern.

It has to do with the shooter's aim error.

Those test shooters in Louisiana had to be “fringing” a lot of ducks on the edge of the pattern. They were demonstrably poor shots (bagging only 15 ducks per 100 shots with lead and 10.6 per 100 with steel) and to compound their problems they were shooting mostly full and modified choked guns at an average distance of 30 yards.

Certainly they had to be hitting ducks at the edge of the pattern with both the lead and the steel, but the particular lead load used (No. 5 high velocity) throws a larger pattern with more pellets near the edge of the pattern than the super tight patterning steel load. Thus a duck hit by the edge of that particular lead pattern had a greater chance of being hit with enough pellets to kill rather than cripple.

But that was a factor of the shooting and the patterning of these two loads, not the shot material. Had the tightest patterning buffered lead magnum load been substituted

for the steel, it too might have crippled more “fringed” birds because like the steel it has a very tight clump of pellets in the middle, small spread, and ragged pattern edge up close.

Either load used in that test, lead or steel, will kill a duck every time at 30 yards if the bird is centered in the pattern. Interestingly enough, at long range where steel shot is believed to cripple through lack of penetration, the lead loads in Louisiana crippled more than the steel.

I certainly do not see this test as indicating the average hunter will cripple significantly more birds with steel shot, because I believe the average guy is a better shot than those test shooters seemed to be. Shooters that hit 15 ducks out of 100 shots just don't tell me much about what a load can do, yet there has never been a major field test of steel shot, to my knowledge, in which the shooters were experienced with it.

If you're still worried about steel's “killing power” and think that was the problem rather than the shooters' hitting, be advised that when the shooter could take aim and center his pattern (finishing off birds on the water), there was no difference in kills with lead or steel.

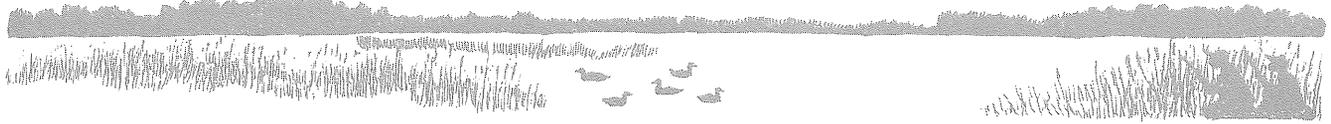
All of this is tiring to read, and certainly to research, but it's important for shooters, conservationists, and/or preservationists to understand. Steel shot are the only non-toxic substitute available should some lawsuit be filed under the Endangered Species Act to halt lead shot use. That could happen. And if conservationists believe that 41 percent more waterfowl are going to be crippled with steel, the chance of such a suit is increased. Also increased would be the chance of an end to waterfowl hunting.

The fact is that in the Louisiana test, as in all the others, the total number of cripples was virtually the same with lead or steel. And that is what matters most to the waterfowl resource.

What matters most to the hunter is bagging some ducks, and that boils down to hitting them solidly.

Contrary to general belief, the biggest problem hitting with steel is at close range. That's because the pattern is so small, the shot string so short, and because the loads leave the gun faster than any lead load. That can mean less forward allowance up close, particularly with a tightly choked gun. And it could have had an effect on the good shots (I'm sure there must have been some) in the Louisiana tests because hunters did not know if they were shooting lead or steel in the unmarked cartridge cases and they probably used the same forward allowances they were accustomed to with slower lead loads.

I'm convinced the average shooter will kill ducks much better over decoys (and maybe anywhere else) with an im-



proved cylinder barrel if he is shooting either steel shot or the premium quality, plastic buffered lead shot magnums. Guide Gene Campbell, whose blind near Anahuac probably produced as many ducks last year as any in Texas, has had plenty of experience shooting steel shot by now and he used nothing but improved cylinder and No.2 steel on big ducks.

I've been testing steel since 1972 and mostly use an over-under bored improved cylinder and modified. For pass shooting, cylinder and modified with No.2 Federal steel $\frac{3}{4}$ -inch magnums or 3-inch Remington or Federal 2s. On geese I use mostly 3-inch BBs or 1s. For pass shooting, modified is a good steel shot barrel in the hands of an expert. I'm not suggesting you throw away your full-choke barrel, in fact, it can come in very handy in extreme range pass shooting and particularly on geese. But I'm just honestly warning that shooting steel shot with it at close range is not easy.

It's a big help to go to a skeet range and shoot a few crossing targets with steel loads. When you see how far you can break a tiny target with No.4 steel you'll begin to get the idea of what short shot strings can do. If you use

your full choke, you may not hit many until you reduce your lead a little but, with improved cylinder, I find little adjustment necessary. Improved cylinder lengthens the shot string.

In researching my book, *Shotgunning, The Art And The Science*, I fired hundreds of shots with lead and steel at a 16-foot long target towed behind a vehicle at the flight speeds of crossing ducks and geese. Using data on where the loads struck behind point of aim, with gun swinging at target speed, the required forward allowance at various ranges was computed into "bird lengths" to make it easier for shooters to envision where the gun must be pointed for the load to intercept the bird.

Those allowances must have helped somebody, judging from my mail and the fact that the book is now in its seventh printing, but remember they are based on the actual forward allowance needed if you sustain the swing and really point him out at target speed. If you use the easier system of starting behind the bird and swinging right past his head, you can get by with roughly one-third to one-half as "daylight" out front of the bird.

A crossing pintail between 20 and 30 yards requires about one bird length for the swing-through (and keep swinging) shooter and about two bird lengths ahead for the sustained lead shooter. That's with lead shot. With steel you can cut the allowances almost in half. If you are a very fast-swing, English style shooter you may need to see virtually no allowance at all up close. I can't say because I don't shoot that way; I see some forward allowance on every shot except the ones so close I could all but hit them with the barrel. For average speed lead loads, and a sustained forward allowance, the computer says you need two pintail lengths at 30 yards, 2.2 at 35, 2.7 at 40, 3 at 45, 3.6 at 50, 4 at 55, and 4.7 at 60 yards. Remember, you can cut all these by one-third to one-half if you are a fast swing-through shooter.

With steel shot out to 30 cut those leads in half, from there on out to 45 you can shoot steel with the same forward allowance as lead. Beyond 45 yards steel requires a slight increase in forward allowance that should become progressively greater as the range lengthens. I lead a 60-yard goose with BB or No. 1 steel shot (the best I've found for geese) about the same as I'd lead a 65-yard shot with a lead magnum.

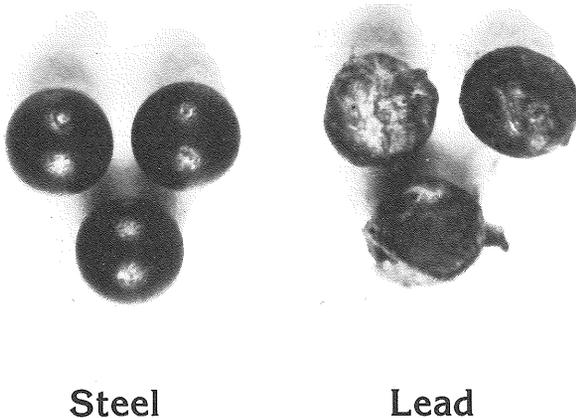
Geese appear to be moving slower (to the eye) and are usually farther away where long allowances are required. The same allowances will work for blue geese, specklebellies, and lesser Canada geese (just as the same allowances for pintails will work with mallards, gadwall, wigeon and other so-called "big ducks"). They are close enough to the same size that a few inches won't matter in a shotgun pattern. Also nobody can judge 2.2 duck lengths; use some reason and try to get the feeling of giving him just a little more than two lengths and keep swinging.

For snow geese and lead loads the computer says to allow two "goose lengths" at 35 yards (cut that about in half with steel) and $2\frac{1}{2}$ lengths at 40 yards, roughly three at 45 yards, roughly $3\frac{1}{2}$ at 50, 3.7 at 55, and 4.3 at 60 yards.

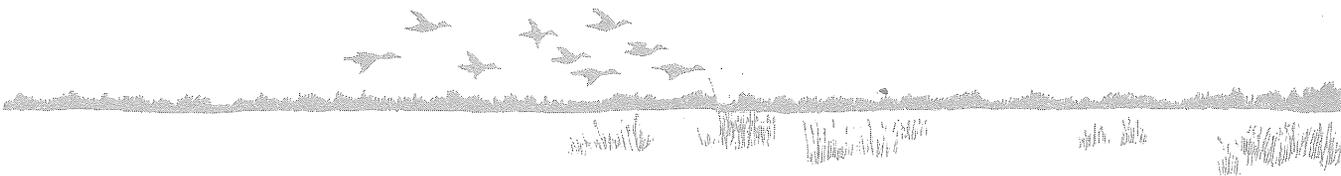
Nowhere here have I said steel shot will kill as far as the best magnum lead loads. It won't. But any load, lead or steel, will kill farther than most of us know where to point it.



Pellets on the left are unfired steel pellets. On the right are unfired lead pellets. The steel pellets are more truly spherical in shape.

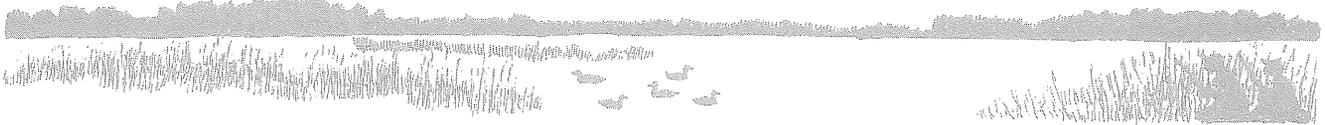


The pellets in this picture were recovered from the muscle tissue of bagged birds. Much of the deformation of the lead pellets (upper group) took place before the pellets struck the target, while the steel pellets remained spherical when fired and upon impact with the target. This pellet deformation accounts for part of the differences in patterning and shot string when comparing lead and steel loads — Photos and Necropsy by Tom Roster.



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Other Publications:

Cold Water Drowning, A New Lease on Life.

(MICHU-SG-77-104) Available from: Michigan Sea Grant Program, Publications Office, 2200 Bonisteel Blvd., Ann Arbor, MI 48109.

Cold Water Survival. Available from: The Canadian Red Cross Society, 95 Wellesley St. E., Toronto, Ontario, Canada M4Y 1H6.

Danzl, Daniel F. MD. *Emergency Accidental Hypothermia.* (PSD: AF 361, Jan. 81) Available from: Smith, Kline & French, Division of Smith, Kline Corp., Philadelphia, PA.

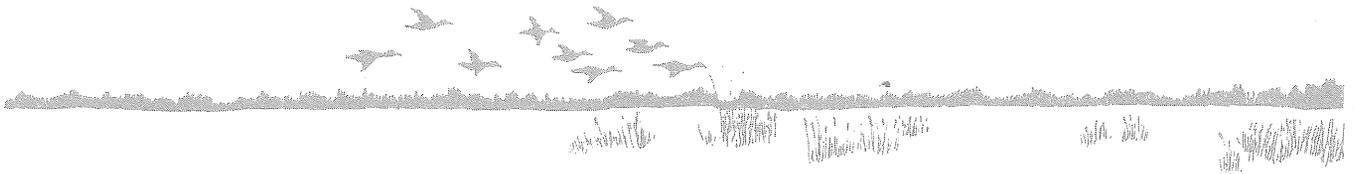
More information on waterfowl identification and habitat is available by writing for the following material:

“Landowner Choices For Wetland Enhancement”, and “Landowner Choices For Wetland Preservation”. Department of Natural Resources, Section of Wildlife, DNR Bldg., Box 7, 500 Lafayette Road, St. Paul, MN 55146. Free.

“Ducks at a Distance”. Department of the Interior, U.S. Fish and Wildlife Service. Stock No. 024-010-00442-8. U.S. Government Printing Office, Washington, D.C. 20402. Nominal charge.

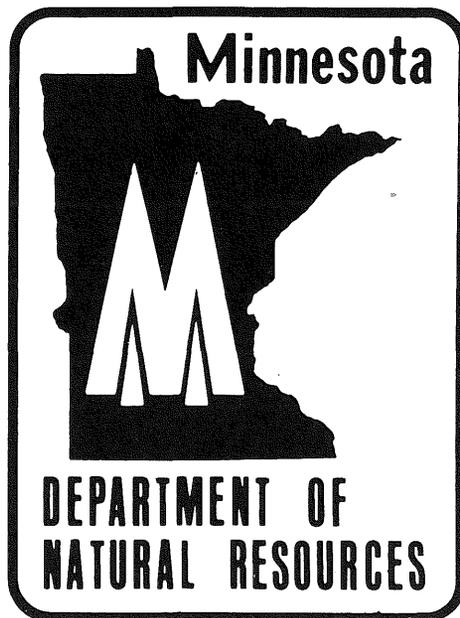
WATERFOWL QUIZ ANSWERS

- | | |
|---|---|
| 1. True | 15. True |
| 2. False — White-winged scoters occasionally migrate through Minnesota, a few are harvested each year. | 16. True |
| 3. False — It is the most effective form of management. Managing water levels is used to promote the growth of both submergent and emergent vegetation favorable to waterfowl. | 17. False — Greater scaup are much less common in Minnesota since their primary migration route is toward the Atlantic Ocean. |
| 4. True | 18. False — The wood duck and ringneck generally rank right behind mallards. |
| 5. False — Refuges provide the rest and security needed for migrating waterfowl. | 19. False — Goldeneye are cavity nesters like wood ducks. |
| 6. True | 20. True |
| 7. True | 21. True |
| 8. False — Minnesota is in the Mississippi Flyway. | 22. True |
| 9. True | 23. False — It is canvasbacks that have the wedge-shaped heads. |
| 10. True | 24. True |
| 11. False — In the early part of this century many observers feared wood ducks were on their way to extinction, with a tremendous effort put into wood duck box placement the population is on the upswing. | 25. False — Minnesota is one of the top waterfowl producing states in the lower 48. |
| 12. False — Most have a brightly colored iridescent speculum. | 26. False |
| 13. True | 27. False — Steel shot strings are generally one-half to five-eighths as long as lead shot strings in full choke guns. |
| 14. True | 28. False — They can be used on the same set but should be separated. |
| | 29. True |
| | 30. True |



CREDITS: This booklet was compiled by the Minnesota Waterfowl Association for the Advanced Hunter Education Program. Material was contributed by Chuck Kartak, Ray Norrgard, Warren Downs, Bob Brister, Chuck Vukonich, Dave Weiss and Craig Bihrlle.

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