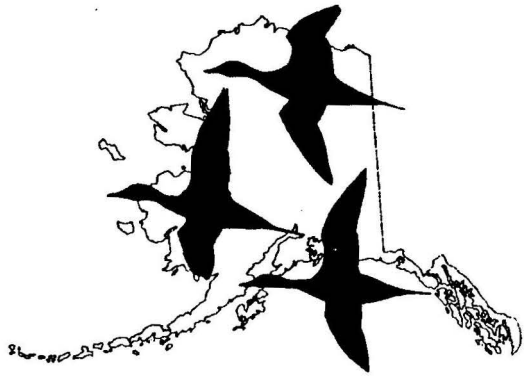
SHOOT STEEL SHOT

THE SOLUTION TO LEAD POISONING IN WATERFOWL



STEEL HAPPENS - 1991 - A NEW TRADITION IN WATERFOWL HUNTING BEGINS IN ALASKA

Nontoxic (steel) shot is a proven alternative to lead shot. Nontoxic (steel) shot will be the only ammunition allowed for waterfowl hunting beginning **September 1, 1991.** Nationwide, including ALL of Alaska, it will be illegal to hunt waterfowl with lead shot. Throughout many parts of the country steel shot is already required for waterfowl hunting and several states have already completely converted to its use. Until the fall of 1991, it will be legal to use lead shot for waterfowling in Alaska. However, we encourage you to switch to steel before then.

The Alaska Department of Fish and Game supports the conversion to steel (nontoxic) shot for waterfowl hunting. We believe this progressive change is in the best interests of our waterfowl resource. By learning how to effectively use steel shot, you can further promote waterfowl conservation. Continuing to deposit lead, a known poison, in the environment, when a suitable alternative exists, constitutes poor management of our wildlife resources.

MAKE THE SWITCH NOW

There has been much written and said about the merits of steel shot. Unfortunately, much of it inaccurately portrays steel shot as a poor choice for waterfowl hunting. We hope this pamphlet will answer some of your questions about steel shot. You should find this information useful in switching from lead to steel. We encourage you to get the facts, develop the skills to shoot steel well, and continue to do your part to insure the future of waterfowl and waterfowl hunting.

THE PROBLEM

Waterfowl hunters deposit several million pounds of lead in the environment each year. Waterfowl ingest this lead while feeding, and an estimated 1.5 to 3 million suffer from lead poisoning and die annually as a result. This is as much as 30 times the total waterfowl harvest in Alaska. Bald eagles also die from lead poisoning. Eagles die from eating unretrieved waterfowl that have lead pellets in their flesh. This loss of wildlife can be avoided by using non-toxic steel shot.

IS THERE A LEAD POISONING PROBLEM IN ALASKA?

The Alaska Department of Fish and Game conducted a study in upper Cook Inlet in 1985 and 1986. Thanks to the cooperation of local duck hunters, we collected livers and gizzards from 574 mallards and pintails in Redoubt Bay, the Susitna Flats, and the Palmer Hay Flats. Ingested lead pellets were detected in the gizzards of 27 percent of mallards and 17 percent of pintails. Twenty-six percent of all birds collected on opening day contained ingested lead shot. This indicates that shot deposited in previous years is available to spring migrants, nesting females, and young birds raised on these hunting areas. Additionally, a high percentage of birds had elevated lead levels in their livers, indicating poor health or developing sickness.

DO ALL THESE BIRDS DIE FROM LEAD POISONING?

We do not know the answer to that question. There are many factors that determine whether a bird will die from ingesting lead shot. There is evidence that even one or two ingested lead pellets can have sublethal effects. Unlike disease die-offs, lead poisoning afflicts individual birds, generally in winter. These birds seek seclusion and are quickly removed by predators. Consequently, hunters seldom find evidence of lead poisoning mortality in the field.

SHOOTING STEEL SHOT

Because steel shot has a shorter and smaller diameter shot cloud, more precise gun pointing is required to shoot it well. Proper choke and load selection can help offset this problem. Thus shooting steel shot may require a slight modification in your shooting. Whether you shoot lead or steel, the secret to successful hunting is KNOWLEDGE and PRACTICE. Knowledge of your gun, knowledge of your ammunition, knowledge of your prey, and practice are the keys to success.

THE FACTS

Shot pellet sizes (#2, #4, #6, BB, etc) are standardized, so a #5 steel pellet is the same size (diameter) as a #5 lead pellet. There are however, two major differences between steel and lead shot pellets. Steel shot is **LIGHTER** and **HARDER** than lead shot. Understanding how these differences affect performance are keys to the successful use of steel shot.

SHOT SIZE CHART (NOT ACTUAL SIZE)

STEEL SHOT SIZES	6	4	3	2	1	BB	T	F
SHOT DIAMETER (in.)	.11	.13	.14	.15	.16	.18	.20	.22
STEEL PELLETS PER OUNCE	315	192	158	125	103	72	52	40
LEAD PELLETS PER OUNCE	225	135	---	87	---	50	---	---

STEEL IS LIGHTER

Steel is less dense than lead. As a result, steel pellets weigh about one-third less than lead pellets of the same size. This means that when shooting the same size steel and lead shot, steel will have less energy. A common belief among hunters is that if they shoot a certain lead load they should shoot the same weight equivalent steel shot charge. If using the same shot size, this would mean more pellets in the shot charge of steel and less room in the loaded shell. Also, because of steel's lighter weight, retained energy of the pellets would be less than the lead load.

USE A LARGER SHOT SIZE

To compensate for weight differences between lead and steel, a rule of thumb is to use two sizes larger steel shot than when using lead (see "Improve Your Shooting" for exceptions to this rule). Remember, the important points are to have enough pellets in the shot charge to adequately cover the target at a given distance and to have enough retained energy at that range to penetrate to the vital organs of the bird.

STEEL IS HARDER

The annealed (softened) iron used in "steel shot" shells is about 3 times harder than lead pellets. Because of its hardness, steel does not deform during firing or travel through the barrel. It leaves the barrel as a nearly round ball. Lead pellets are by contrast typically deformed during this same process. A charge of shot travelling through the air (a shot cloud) can be envisioned as a cone lying on its side with the tip of the cone in front. As a result of pellet deformation, lead shot clouds spread out longer and wider than a steel shot cloud of the same size pellets. This also means that at any given distance lead loads generally have a less dense shot pattern.

USE A MORE OPEN CHOKE

To compensate for steel shot's tighter patterns use more open chokes. Try using improved cylinder and/or modified chokes, especially when shooting at distances less than 50 yards. Even with more open chokes steel shot clouds will be shorter and tighter than many lead loads. As a result of the smooth, round surface of steel shot, pellets do not gather a feather ball upon striking the bird like lead shot, and penetration is better.

STEEL SHOT SIZE AND CHOKE RECOMMENDATIONS FOR WATERFOWL*

Birds and Range	Recommended Steel Shot	Recommended Choke
Teal, all distances	6, 5	Imp. Cyl., Mod, Full
Ducks, under 40 yards	6, 5, 4**, 3	Improved Cylinder
Ducks, 30 to 50 yards	4**, 3, 2	Imp. Cyl., Modified
Large ducks, over 50 yds.***	2, 1	Mod., Imp. Mod., Full
Small Canada, brant, snow and white-fronted geese, under 50 yards	BB, BBB	Imp. Cyl., Mod.
Large Canada geese, all geese over 50 yards.***	BBB, T	Modified, Imp. Mod.

* These recommendations based on testing as of January 1989. Testing is ongoing and recommendations are subject to change.

** Of all steel shot sizes currently tested, steel 4s exhibit the highest rate of crippling. Therefore, whenever environments present adverse retrievalbility conditions, such as heavily vegetated marshes, flooded timber, and ice, duck hunters should avoid using steel 4s.

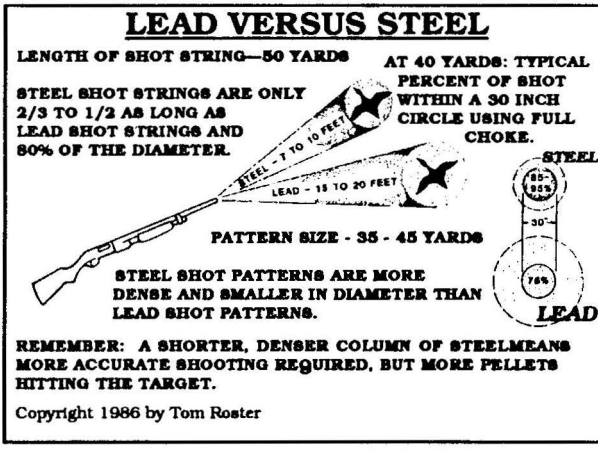
*** Steel 2s and 1s are not lethal on ducks beyond 65 yards; steel BBs ae not lethal on geese beyond 65 yards.

Recent field tests with #F steel indicate very poor patterning performance. Currently, we do not recommend #F steel.

IMPROVE YOUR SHOOTING

There are two important steps to improve your shooting performance.

Pattern your shotgun - Shotguns pattern differently when shooting steel, lead or buffered lead loads. They also may perform differently when shooting different size pellets. You should experiment and pattern your shotguns at various distances with different size shot to find the best pattern densities, regardless of the type of shell you are using. At the same time you will determine which choke/shot combination gives you the best patterns. The key is to pattern your gun to find out what load works best.



Learn your unique sight picture - Practice shooting your shotgun and learn the proper air space in front of your target. Learning the proper air space is the key to consistently hitting the target. Because steel comes out of the muzzle faster and slows down quicker, your individual sight picture will be different than when shooting lead. With practice you will learn to identify the proper sight picture.

CONCERNS ABOUT USING STEEL SHOT

Many of the concerns about steel shot are largely the result of misinformation. Many hunters have heard or read that steel shot causes barrel damage, is ineffective and increases crippling, is expensive, and can't be reloaded.

GUN BARREL DAMAGE

Most modern shotguns do not have any problems when firing steel shot shotshells. In the past, there have been two types of problems: bore erosion and choke expansion. Bore erosion resulted from the scratching of the barrel by the steel pellets as they traveled through the barrel. This was a problem with the early loads manufactured in the mid-to-late 1970's. The ammunition available now is vastly improved. Not only has performance greatly improved, but the new shotshells have a tougher, thicker plastic shot cup that fully encloses the shot charge and prevents it from coming in contact with the barrel. Bore erosion is no longer a problem.

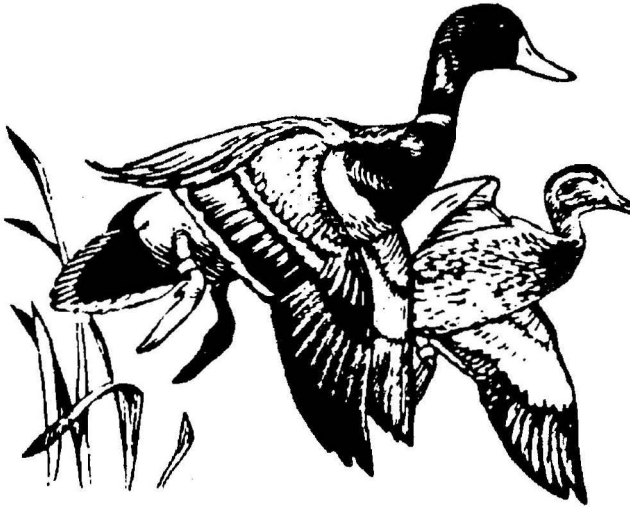
Choke expansion occurs in some guns. It is a slight ring bulge at the choke constriction. It is caused by the relative incompressability of steel and some magnum buffered lead loads. Choke expansion is only a cosmetic change and does not affect gun performance or lifespan. On some double barreled shotguns ring bulge can result in barrel separation. Choke expansion is most likely to occur in older,full choke shotguns that have softer steel and thinner barrel walls.

Steel shot ammunition should not be used in older American double-barreled guns, such as L.C. Smith's and Parker's, and some modern imported double barrel guns. **IF YOU ARE NOT SURE IF STEEL OR MAGNUM LEAD LOADS WILL DAMAGE YOUR BARREL CONTACT THE MANUFACTURER.**

SCREW-IN CHOKES The use of steel shot in sizes larger than #6 may cause some brands of screw-in-chokes to stick in the barrel. This is generally a problem with full choke constrictions, but the larger shot sizes (#1 or larger) may cause some modified chokes to stick. Consult the manufacturer before using steel shot with a screw-in-choke.

CRIPPLING LOSSES

The increased muzzle velocity of steel loads, combined with proper shot size selection, provide enough downrange energy to efficiently kill waterfowl. Hunters should experiment with various loads and preferred shot sizes to determine those loads that are best suited for their type of hunting. A number of field studies have been conducted to compare the effectiveness of lead versus steel shot under actual field conditions. Only one of 14 tests found that steel crippled more birds than lead. One test



showed lead crippling more than steel, while the other 12 tests showed no significant difference between the two.

Crippling can be minimized by patterning, proper load selection, and practicing with your shotgun on clay birds.

COST OF STEEL AMMUNITION

Steel shot ammunition generally will cost more than most lead shot ammunition because of the higher manufacturing costs. Currently, the price of factory loaded steel ammunition is comparable to many of the buffered lead and magnum lead loads available. Local prices are mainly a result of the supply of steel shot ammunition and dealer marketing, but the average hunter buys relatively few shotshells each season and may not be affected significantly.

RELOADING

Steel shot can be reloaded. Reloading your own steel shot shells can save one-third to one-half the cost of purchasing factory shells. Four companies now market steel shot reloading components. However, only those reloading components that have been tested for barrel damage by independent ballistics laboratories are recommended for use. It is extremely important that reloaders use the components listed and follow directions precisely due to the higher chamber pressures associated with steel loads.

WITH STEEL SHOT
REMEMBER

* When shooting at distances less than 50 yards, use a more open choked shotgun--an improved cylinder or modified.

* Use a larger size shot--3's instead of 5's, BB's instead of 2's; 6's for close-in shots, for equivalent lead shot energy.

* Pattern your shotgun--determine which load is best in your gun.

* Learn leads by shooting at clay birds--practice! Then practice some more!

MORE INFORMATION

For more information, including the dates and locations of steel shot seminars, contact the Alaska Department of Fish and Game Hunter Education Program in the Division of Wildlife Conservation at the following number: 800-478-SHOT.

DO YOUR PART!

As a concerned waterfowl hunter, you can make a contribution to the conservation of waterfowl resources by learning the facts about steel shot and developing the skills to shoot it effectively. You will also be able to leave your favorite waterfowling spot knowing that, hit or miss, you have not left behind a toxic substance that can keep on killing ducks and geese for months and even years to come. You will be doing your part to help perpetuate waterfowl hunting.

Alaska Department of Fish and Game
P.O. Box 3-2000
Juneau, Alaska 99802

SEE YOUR LOCAL DEALER ABOUT PURCHASING STEEL SHOT:

REVISION DATE 8/21/89