

Lethality Table

The Lethality Table below is intended to help hunters select the most appropriate nontoxic shotshell load for the type of hunting they intend to do. It provides field-tested data collected and analyzed by Tom Roster and the Cooperative North American Shotgun Education Program. Montana was an active member of this program. The database is comprised only of birds taken with one shot at known ranges under normal hunting conditions. All birds were necropsied and X-rayed from two angles. Hunters can find information in the table on shot-size selection, maximum effective range for various pellets on different sized birds, and the pattern density needed to achieve a lethal load and cleanly kill a bird.

It takes a combination of penetration and pattern density to effectively harvest a bird. Testing by Tom Roster showed that pellets need to penetrate at least $\frac{2}{3}$ to $\frac{3}{4}$ of the way through a bird's body in order to result in a clean kill. The pellets need to strike a lethal area (heart, lungs, spinal column, brain). Also required is a pattern density that, when placed on the front half of a bird, will result in sufficient pellets striking those areas. Developing the shooting skills needed to consistently hit the targeted bird in the front half of the body is a responsibility of an ethical hunter.

Nontoxic shot is not required for webless migratory birds (sandhill crane, mourning dove and snipe) except on national wildlife refuges and waterfowl production areas. However, it is unlawful for anyone to use or possess a shotgun shell or ammunition loaded with or containing other than federally approved nontoxic shot while hunting, taking or attempting to take ducks, geese, swans or coots. If hunters have specific questions regarding this regulation, please inquire at the local refuge office.

TOM ROSTER'S 2016 NONTOXIC SHOT LETHALITY TABLE[©]

Proven Nontoxic Loads For Waterfowl, Doves, & Upland Game Birds¹ <i>Vel. Range Tested: 1,225 - 1,700 FPS</i>	Observed Hunters' Typical Shooting Range During Activity (Yards)	Most Effective Nontoxic Shot Size(s) For Birds Listed Under ACTIVITY At The Distances Listed In The Second Column	Minimum Load Weight (Ounces)	Minimum Pellet Hits Needed on Lethal Areas for Clean Kills	Minimum Pattern Count Needed at Any Distance for Clean Kills (# of Pellets in 30" Circle)	Most Effective Choke(s) at Distance (Given n Lead Shot Choke Designations)	NOTE: The pellets in the steel shot loads listed in this table were traditional, highly spherical ball-shaped pellets of ~ 7.86 g/cc density and 90-95 DPH hardness. The HEVI-Shot pellets were of 12.0 g/cc density and are harder than traditional steel pellets.
ACTIVITY							
Large Geese At Long Range Giant, Western, Atlantic and Interior Canadas	50-65 50-70	Steel BBB to T HEVI-Shot 2 to B	1-1/4 1-1/2	1-2 1-2	50-55 50-55	Improved Modified Improved Modified, Full	
Large Geese Over Decoys	35-50 35-50	Steel BB to BBB HEVI-Shot 2 to B	1-1/4 1-1/2	1-2 1-2	50-55 50-55	Improved Cylinder, Modified Improved Cylinder, Modified	
Medium/Small Geese Long Range Snow, White-fronted, Lesser Canadas	50-65 50-65	Steel BB to BBB HEVI-Shot 2	1-1/4 1-1/2	1-2 1-2	60-65 60-65	Improved Modified Improved Modified, Full	
Medium/Small Geese Over Decoys	35-50 35-50	Steel 2 to BB HEVI-Shot 4 to 2	1-1/8 1-1/4	1-2 1-2	60-65 60-65	Light Modified, Modified Improved Cylinder, Modified	
Large Ducks At Long Range Mallard, Black, Pintail, Goldeneye, Gadwall	45-65 45-65	Steel 2 to 1 HEVI-Shot 4	1-1/8 1-1/4	1-2 1-2	85-90 85-90	Improved Modified, Full Improved Modified, Full	
Large Ducks Over Decoys	20-45 20-45	Steel 6 to 2 HEVI-Shot 6 to 4	$\frac{3}{4}$ - 1 1-1/8	1-2 1-2	85-90 85-90	I.C. (20-35 Yds), Mod. (35-45 Yds) I.C. (20-35 Yds), Mod. (35-45 Yds)	
Medium Ducks Over Decoys Wigeon, Scaup, Shoveler	20-45 20-45	Steel 6 to 3 HEVI-Shot 6 to 4	1 1-1/8	1-2 1-2	115-120 115-120	I.C. (20-35 Yds), Mod. (35-45 Yds) I.C. (20-35 Yds), Mod. (35-45 Yds)	
Small Ducks Over Decoys Teal, Ruddy, Bufflehead	20-45 20-45	Steel 6 to 4 HEVI-Shot 6	1 1-1/8	1-2 1-2	135-145 135-145	Mod. (20-35 Yds), Full (35-45 Yds) Mod. (20-35 Yds), Full (35-45 Yds)	
Ring-Necked Pheasants	20-50 20-50	Steel 3 to 2 HEVI-Shot 6 to 4	1 1-1/8	2-3 2-3	90-95 90-95	I.C. (20-30 Yds), Mod. (30-50 Yds) I.C. (20-30 Yds), Mod. (30-50 Yds)	
Turkeys (Head and Neck Shots)	20-40	Steel 4; HEVI-Shot 6	1-1/4	3-4	210-230	Full or Extra Full	
Mourning Doves	20-45 20-45	Steel 8 to 7 HEVI-Shot 7 $\frac{1}{2}$	$\frac{5}{8}$ - $\frac{3}{4}$ $\frac{3}{4}$	1-2 1-2	200-210 200-210	IC-8's/LM-7's (20-30 Yds); Mod > 30 Yd I.C. (20-30 Yds); Light Mod (30-45 Yd)	
Northern Bobwhite Quail	20-30	Steel 8 to 7	$\frac{5}{8}$ - $\frac{3}{4}$	1-2	200-210	Imp. Cyl., Light Modified	
Swatter Load For Wounded Birds	20-30	Steel 7 to 6	1	1	175	Improved Modified, Full	

This table summarizes Tom Roster's analyses to date of the lethality data bases for certain of the 16 U.S. steel vs lead waterfowl & dove shooting tests published between 1968 & 2014 & one steel-only pheasant shooting test (1999) plus lethality data bases owned by ammunition companies for birds taken with nontoxic shotshell loads Roster tested for them & the CONSEP Org.

Note: Steel #BBB (.190") & HEVI-Shot #2 (.150") have exhibited the best all-around performance for taking geese; steel #3 (.140") & HEVI-Shot #4 (.130") the best all-around performance for taking ducks; steel #2 & HEVI-Shot #4 (.130") the best all-around performance for taking ring-necked pheasants; & steel 7's (.100") the best all-around performance for taking doves.

¹These findings are derived from testing 2 $\frac{3}{4}$ " 28 gauge; 3" 20 ga.; 2 $\frac{3}{4}$ ", 3" & 3 $\frac{1}{2}$ " 12 ga.; & 3 $\frac{1}{2}$ " 10 ga. steel loads; plus 2 $\frac{3}{4}$ " 28 ga.; 2 $\frac{3}{4}$ " & 3" 20 ga.; and 2 $\frac{3}{4}$ " & 3" 12 ga. HEVI-Shot loads.

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