3140

Illinois Natural History Survey A Division of the Department of Energy and Natural Resources ENR

River Research Laboratory, Box 599, Havana, Illinois 62644, (309) 543-3950

Steel Shot

July 14, 1988

Dear Mississippi Flyway Technical Section Representative:

The Environmental Issues Committee has been requested to review available material on No. F steel shot and the need for additional research and to provide a summary plus recommendations for Technical Section consideration at the summer meeting. Although emphasis is to be placed on the issue of shot sizes used for waterfowl hunting, the Flyway Council did not necessarily want us to limit our report to No. F steel shot.

Enclosed is a copy of our report to be given on 28 July. We wanted you to receive this report for your familiarization before the meeting. The Environmental Issues Committee interacted with the Chairman of the Research Committee, Dr. Vernon Wright, during the preparation of this report.

Please note on page 8 that we have requested the state representatives to discuss and vote their belief on at what level (national, flyway, or state) restrictions on shot size should occur.

We have included background and supplemental information in the table, figures, and appendix of the report. The Flyway Council went on record in 1958 supporting quality hunting and management of waterfowl (Appendix 1).

There was little available information to draw upon for preparing this report. The Committee hopes that the report is suitable for discussion and formulating proper decisions by the Tech Section, Council, and perhaps other agencies.

Recommendations by the committtee are included in the report. These recommendations can be amended after discussion in the general session. Vern Wright will present the discussion and recommendations at the meeting.

Sincerely yours,

Stephen P. Havera

Stephen P. Havera
Chairman,
Environmental Issues Committee

SPH:kr

Environmental Issues Committee Report Concerning Steel No. F Shot

28 July 1988

There has been discussion as to whether No. F steel shot should be permitted to be used as a commercial product for the taking of waterfowl because of concerns about excessive crippling, unethical hunter behavior (skybusting), and hunter safety. The Mississippi Flyway Council requested in March 1988, that the Flyway Technical Section review relevant available information on the issue of No. F steel shot and provide a summary plus recommendations at the July 1988 meeting.

The Planning Committee of the Mississippi Flyway Council prepared a report entitled "Waterfowl Management and Quality Hunting" in 1958. The report dealt with qualitative management of waterfowl, including intangibles such as ethics, esthetics, culture, traditions, and sportsmanship. The report "Waterfowl Management and Quality Hunting" was adopted by the Mississippi Flyway Council as a supplement to the "Guide to Mississippi Flyway Waterfowl Management" during the executive session of the Council meeting, August 3, 1961. Selected pages from the "Waterfowl Management and Quality Hunting" report are included in Appendix 1. Essentially, the Flyway Council adopted a position that quality, including esthetics, is important to waterfowl management and hunting.

With the conversion to the use of nontoxic shot for the taking of waterfowl, nontoxic shotgun shells have been developed with a variety of new components. One of the shells placed on the market in 1986 was a 3-inch 12-gauge load of No. F (0.220-inch diameter) steel shot for goose hunting. A typical 3-inch, 12-gauge 1 1/4 oz. F steel shot load contains 48 pellets. In a letter dated 19 February 1988, Winchester Division/Olin Corporation questioned whether large steel shot (No. F)

and the recently-announced 3 1/2-inch, 12-gauge shotgun shell should be legal for sport hunting of waterfowl in the Mississippi Flyway (C.E. Becker, Mississippi Flyway Council Technical Section Minutes, 19 February 1988, Appendix F).

In this analysis, we examine the history of Federal restrictions on firearms and ammunition for waterfowl hunting, assess the current situation in states in the Mississippi Flyway with regard to shot size, present the research findings of studies conducted on No. F steel shot, and propose recommendations for future shotgun shell restrictions.

History of Federal Restrictions

The first nationwide restrictions on firearms and ammunition, which prohibited the use of big bore punt and swivel guns for the taking of migratory game birds, was established on 31 July 1918. According to a memorandum dated 25 January 1968 (to William D. Snow, U.S. Game Management Agent, Augusta, Maine, and from Charles H. Lawrence, Chief, Division of Management and Enforcement), "The Federal regulation established in 1918 pursuant to the provisions of the Migratory Bird Treaty Act provided, 'Migratory game birds...may be taken during the open season with a gun only, not larger than 10-gauge, fired from the shoulder...' Subsequently, the gun regulation was amended to confine the taking of migratory birds to a shotgun incapable of holding more than three shells in the magazine and chamber combined." Because of the destruction they wrought when fired into rafted waterfowl, at least 6 states preceded the Federal regulations in outlawing the big bore punt guns. The 3-shell restriction went into effect in 1935, the same year the use of live decoys and bait for the taking of migratory birds was completely banned (U.S. Dept. Inter., Fish and Wildlife Service. 1975. Final environmental statement for the issuance of annual regulations permitting the sport hunting of migratory birds).

In 1974, Federal regulations were proposed to require the use of nontoxic (steel) shot instead of lead shot in shotgun shells used for hunting waterfowl as a means of reducing losses due to lead poisoning (U.S. Dept. Inter., Fish and Wildlife Service. 1975). Nontoxic shot will be required for all waterfowl hunting in the United States beginning with the 1991-1992 season (U.S. Dept. Inter., Fish and Wildlife Service. 1986. Final supplemental environmental impact statement: use of lead shot for hunting migratory birds in the United States).

To our knowledge, nationwide restrictions have never been promulgated for the length or capacity of shotgun shells; amount, size, or shape of shot; or other physical properties of ammunition. Color coding of shotgun shells (e.g., red or green for 12-gauge, yellow for 20-gauge) was voluntary on the part of the industry. We are also unaware of any restrictions on firearms and/or ammunition, either past or present, that were established at the flyway level.

In summary, Federal regulations currently restrict firearms and ammunition used for waterfowl hunting nationwide in the United States to: (1) shoulder-mounted shotguns (2) with maximum 3-shell capacity and (3) shells not larger in diameter than 10-gauge (4) loaded with nontoxic (steel) shot.

Current State Restrictions

A poll of the 14 states in the Mississippi Flyway revealed that 5 currently have state-wide restrictions on the maximum size of steel shot used for waterfowl hunting (Table 1). Of these, 1 state permits a maximum of No. BBB, 3 states permit a maximum of No. T, and 1 state permits a maximum of No. F. Two additional states restrict the size of shot on some areas. When and where lead shot is (was) legal, the same 5 states restrict the maximum size to No. BB. The only other state restrictions on ammunition involves limitations on the number of shells in

possession on specific areas; 7 states have such restrictions (Table 1).

Research Findings of No. F Steel Shot

To date, there have been two research studies completed on No. F steel shot regarding its effectiveness for taking Canada geese (Mississippi Flyway Council Technical Section Minutes, February 1988, Appendix F). One study was completed by the Illinois Department of Conservation (IDOC) and the other study was done by a consultant for the Cooperative Lead Poisoning Control Information Program (CLPCIP). The IDOC study compared the effectiveness, hunter preference, and safety of Winchester sizes BBB (0.190-inch diameter), Winchester T (0.200-inch), and Federal F (0.220-inch) steel shot in 3-inch, 12-gauge shells for hunting Canada geese during the 1986 waterfowl season. A total of 373 No. BBB, 362 No. T, and 417 No. F steel shot shells were fired by 29 hunters who spent 268 days afield and bagged 326 Canada geese. On the basis of data reported by hunters, the 3 test shells performed similarly with respect to geese hit (40.3-45.0 per 100 shells), geese knocked down (30.7-35.1), geese bagged (25.4-31.1), and geese lost as cripples (13.9-14.9). IDOC concluded that steel shot sizes BBB, T, and F shot in the 3-inch, 12-gauge shells tested were about equal in effectiveness for hunting Canada geese in Illinois. The consensus of opinion among the hunters who shot these different loads at geese was that Nos. BBB and T shot shells were more effective than the No. F, the No. F posed a potential hunter safety problem, and the No. F could encourage "skybusting" and degrade hunting quality. IDOC recommended from this study that the size No. T steel shot and No. BB lead shot limitations for shotgun shells should remain in Illinois.

The CLPCIP study tested the exterior and terminal ballistic performance of a generic 3-inch, 12-gauge 1 1/4 oz. load of No. F steel shot provided by Winchester during the 1986-1987 and 1987-1988 waterfowl seasons. These shells were used to

harvest three large races of Canada geese. Terminal ballistics testing data analysis was confined to examination of x-rays and necropsies of 78 one-shot kill Canada geese collected and field records concerning the fate of the total of 133 Canada geese struck with the load. All testing was performed by one expert gunner. Data available thus far on this study are from a preliminary CLPCIP report. Data and findings from the final report of this study may further our knowledge of No. F steel shot.

The CLPCIP study found that the No. F load tested exhibited the poorest bagging performance and highest crippling loss of any steel shot load and steel pellet size (No. 2, No. 1, No. BB, No. BBB, and No. T) tested to date for taking Canada geese. The maximum effective range for this No. F shot shell was found to be approximately 35 to 40 yards. The overall crippling loss of 41.4% was also the highest crippling rate of any steel shot load tested by the CLPCIP. The study cited the rapid falloff beyond 35-40 yards in bagging success and the rapid increase in wounding losses demonstrated by the No. F steel test load was significantly correlated with pattern density. Primarily modified and improved cylinder chokes were used in the study.

CLPCIP concluded that the tested load of No. F steel was inefficient for harvesting Canada geese and caused an exceptionally high crippling rate at ranges over 35-40 yards. CLPCIP has previously demonstrated that steel shot sizes of Nos. BB, BBB, and T in 3-inch, 12-gauge loads proved lethal and efficient for harvesting large races of Canada geese out to 60, 65, and 70 yards, respectively.

Testing by the Winchester Division/Olin Corporation found that No. F steel launched with a nominal velocity of 1350 fps retained 16.0, 5.3, and 1.4 ft/lbs of per-pellet energy at 50, 100, and 200 yards, respectively, and all were higher than

No. T steel or No. BB lead (C.E. Becker, Mississippi Flyway Council Technical Section Minutes February 1988, Appendix F). The retained energy was enough to penetrate ballistics gelatin to 2.94 and to 1.23 inches at 50 and 100 yards, respectively. Winchester expressed concern for the potential for injury to persons in hunting situations where blinds are less than 150 yards apart and the possibility of damage to vehicles or structures within 150 to 200 yards of a shooting site. Winchester also cautioned about potential for barrel damage to shotguns with integral chokes or screw-in choke systems. However, testing of No. F shot by Federal Cartridge Co. has resulted in no problem with barrel damage (Bill Stevens, Mississippi Flyway Council Technical Section Minutes, February 1988, Page 20).

To date, only the 3-inch, 12-gauge No. F shot shells have been tested, and those have only been field tested on harvesting Canada geese. No data is available for No. F shot in the 3 1/2-inch 10-gauge shells or for the new 3 1/2-inch 12-gauge shells. Nor is data available for the No. F, 3-inch, 12-gauge shell for harvesting other species of geese such as snow and white-fronted geese (Tom Roster, Mississippi Flyway Council Technical Section Minutes, February 1988, Appendix F).

Recommendations

Shell length. Although Federal regulations established the maximum diameter (10-gauge) for shotgun shells for waterfowl hunting nationwide 70 years ago, the subject of shell length has never been addressed. Length obviously functions hand-in-hand with diameter in determining the amount of shot and powder contained in shells. Over the years, the 10-gauge restriction has been circumvented, in part, by increasing the length of shells. In 1912, before restrictions were implemented, the 8-gauge shell contained 1 3/4 ounces of lead shot (Fig. 1). Most shotgun shells available in 1923 contained a maximum of 1 1/4 ounces of lead shot (Figs. 2

and 3). In 1933, most shells still contained a maximum of 1 1/4 ounces of lead shot and their length did not exceed 2 3/4 inches (Fig 4). By comparison, today's 3-inch, 12-gauge shells contain a maximum of 1 7/8 ounces of lead (1 3/8 ounces of steel) shot and 3 1/2-inch, 10-gauge shells contain a maximum of 2 1/4 ounces of lead (1 3/4 ounces of steel) shot--more that the 1 3/4 ounces of lead shot in 8-gauge shells that were outlawed. When loaded with 1 1/4 ounces of steel No. BBB or No. T shot, the 3-inch, 12-gauge shell is effective in harvesting Canada geese up to 65-70 yards (T. Roster, Mississippi Flyway Council Technical Section Minutes, February 1988, Appendix F).

If shell diameter is to continue to be restricted nationwide by Federal regulations, length should also be restricted nationwide by Federal regulations. Thus, we recommend petitioning the U.S. Fish and Wildlife Service to formulate Federal regulations that govern the length of shotgun shells used for waterfowl hunting throughout the United States.

Although we make no specific recommendations as to the maximum allowable length of shotgun shells, we point out that 3 1/2-inch, 10-gauge shells have been manufactured and marketed by all 3 ammunition companies for many years. Also, we consider it impractical to establish maximum lengths that differ from gauge to gauge. In other words, the same maximum allowable length should apply to all shotgun shells regardless of diameter.

Shape of Shot. Although shot used for waterfowl hunting in the United States has traditionally been spherical in shape, there is no legal deterrent to the development of other configurations. Given the nature of free enterprise, methodologies for making shotgun shells loaded with mini-darts or other shapes of shot with potential effective ranges exceeding 100 yards are certain to be

perfected. By virtue of neglect, we are encouraging the development of such methodologies. Thus, we recommend petitioning the U.S. Fish and Wildlife Service to formulate Federal regulations that govern the shape of shot in shotgun shells used for waterfowl hunting throughout the United States. At the very least, highly elongated, dart-like shot should be banned.

Size of Shot. The central issue here is whether restrictions on the size of shot in shotgun shells used for waterfowl hunting should be promulgated at the national level, at the flyway level, or remain at the discretion of the individual states. In this regard, we believe the Technical Section should submit to the democratic process whereby the state representatives properly discuss the issue and vote their convictions as to what level (national, flyway, or state) restrictions on shot size should occur. A concensus will constitute the recommendation made to the Council.

As for the specific matter of effectiveness or ineffectiveness of No. F steel shot for hunting waterfowl, it is the Environmental Issues and Research Committees' opinion that the available data are insufficient to make a decision. Thus, additional field testing is warranted.

We offer the following recommendations:

1. No. F steel shot in 3-inch, 12-gauge loads should be field tested, including a design to measure crippling rates, on other species of geese, such as snow geese and white-fronted geese;

2. Various 3-inch, 12-gauge No. F steel shot shells and loads made by different manufacturers should be tested ballistically to determine if the various shell components used by the manufacturers may have an effect on the performance of No. F steel shot for harvesting various species of geese; and

3. A shotgun shell with the capacity to hold at least 64 No. F steel shot,

which is equivalent to the number of No. T steel shot in the 3-inch, 12-gauge shells found effective for hunting Canada geese (CLPCIP, IDOC studies) should be field tested. The new 3 1/2-inch, 12-gauge shell appears well suited for this purpose.

The Cooperative Lead Poisoning Control Information Program (CLPCIP) seems the logical instrument for coordinating the further testing of No. F steel shot. We anticipate that after additional information is available on various No. F steel shot loads, a reasonable decision can be made with regards to its effectiveness and safety, as well as its needs.

MISSISSIPPI FLYWAY COUNCIL

Recommendation No. _____

Subject

Possible Federal regulations affecting shotgun shell length, shot shape, and shot size.

Recommendation

(1) Petition the U.S. Fish and Wildlife Service to formulate federal regulations governing the maximum length of shotgun shells used for waterfowl hunting throughout the United States.

(2) Petition the U.S. Fish and Wildlife Service to formulate Federal regulations governing the shape of shot in shotgun shells used for waterfowl hunting throughout the United States.

(3) Endorse the additional ballistical and field testing of No. F steel shot loads.

Justification

Little research on the effectiveness of No. F steel loads for harvesting waterfowl has been conducted. Additional information is needed to determine whether No. F steel loads are effective in harvesting Canada and other species of geese, delineating potential damage to gun barrels, and determining if hunter safety is satisfactory. Given the restriction on the gauge of shotgun shells allowable for sport hunting of waterfowl in the United States, other issues complement the shot size topic, such as possible Federal regulations on the shape of shot and the maximum allowable length of shotgun shells.

Action:

Approved by Technical Section _____ Date

Approved by Council _____ Date

Table 1. Restrictions on the size of shot and the number of shotgun shells used for waterfowl hunting in the 14 states in the Mississippi Flyway.

State	Maximum Shot Size (statewide)		Number of Shotgun Shells (selected areas)
	Steel	Lead[a]	
Alabama	T (0.200)[b]	BB (0.180)	nr[c]
Arkansas	T	BB	25 - some duck areas
Illinois	T	BB	10 - some goose areas
Indiana	nr	nr	8 - some goose areas
Iowa	nr[d]	nr	nr
Kentucky	F (0.22)	BB	10 - some goose areas
Louisiana	nr	nr	nr
Michigan	nr[e]	nr	nr
Minnesota	nr	nr	6 - some goose areas
Mississippi	nr	nr	25 - some duck areas
Missouri	nr	nr	10 - some goose areas
Ohio	nr	nr	nr
Tennessee	nr	nr	nr
Wisconsin	BBB(0.190)	BB	nr

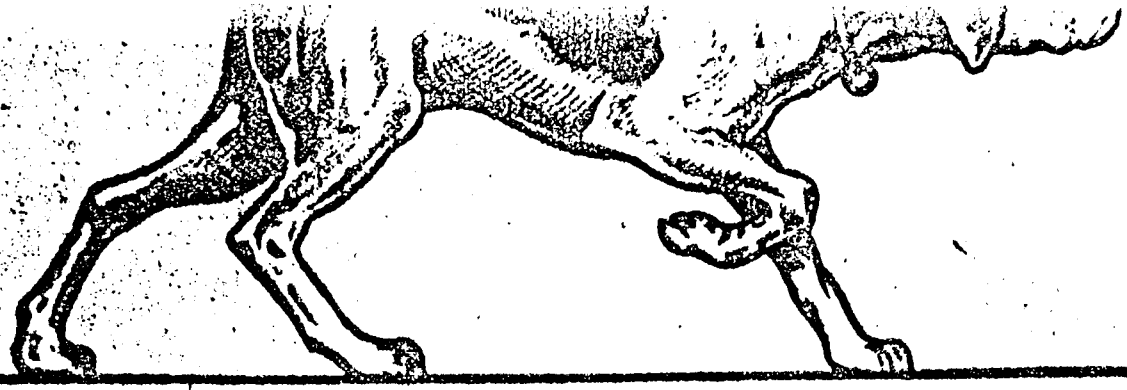
[a]When and where legal.

[b]Diameter in inches.

[c]No restriction.

[d]No T on selected areas.

[e]No. BBB on selected areas.



a hundred
$9.20
a case of
500

THE LONG BRASS CUP PROTECTS THE SHELLS, KEEPS OUT MOISTURE AND MAKES THEM BETTER, STRONGER, SAFER

PRICES

Pointer Smokeless Shells
12-GAUGE.
Loaded With Drop Shot.

Catalog No.	Grains of Smokeless Powder equal to	Oz. of shot	Size of Drop Shot	Price, per Box of 25 Shells	Price, per 100 Shells	Price, per Case of 500 Shells	Price, per 1,000 Shells
6H2214 6H2216 6H2218	3 Drams	1	No. 4 No. 6 No. 8	47c	$1.88	$ 9.20	$18.40
6H2222 6H2224 6H2225 6H2226 6H2227 6H2228	3 Drams	1⅛	No. 3 No. 4 No. 5 No. 6 No. 7 No. 8	50c	2.00	9.80	19.60
6H2234 6H2236	3¼ Drams	1⅛	No. 4 No. 6	52c	2.08	10.20	20.40

Always give catalog number and state size of shot load wanted.

WHEN PURCHASING IN FULL CASE LOTS, YOU EFFECT A SAVING IN PRICE, AS WELL AS IN FREIGHT CHARGES.

10-GAUGE POINTER SMOKELESS SHELLS.

Catalog No.	Grains of Smokeless Powder equal to	Oz. of shot	Size of Drop Shot	Price, per Box of 25 Shells	Price, per 100 Shells	Price, per Case of 500 Shells	Price, per 1,000 Shells
6H2248 6H2246	3¼ Drams	1⅛	No. 6 No. 8	56c	$2.24	$11.00	$22.00
6H2252 6H2254 6H2256	3½ Drams	1¼	No. 3 No. 4 No. 6	60c	2.40	11.80	23.60

Always give catalog number and state size of shot load wanted.

Pointer Smokeless Shells
12-GAUGE.
Loaded With Chilled Shot.

Catalog No.	Grains Smokeless Powder equal to	Oz. of shot	Size of Chilled Shot	Price, per Box of 25 Shells	Price, per 100 Shells	Price, per Case of 500 Shells	Price, per 1,000 Shells
6H2274 6H2276 6H2277 6H2278	3 Drams	1⅛	No. 4 No. 6 No. 7½ No. 8	54c	$2.16	$10.60	$21.20
6H2284 6H2286	3¼ Drams	1⅛	No. 4 No. 6	55c	2.20	10.90	21.80
6H2287 Trap Load	3⅛ Drams	1¼	No. 7½	57c	2.28	11.20	22.40

Always give catalog number and state size of shot load wanted.

16-GAUGE POINTER SMOKELESS SHELLS.

Catalog No.	Grains of Smokeless Powder equal to	Oz. of shot	Size of Drop Shot	Price, per Box of 25 Shells	Price, per 100 Shells	Price, per Case of 500 Shells	Price, per 1,000 Shells
6H2264 6H2266 6H2268	2½ Drams	1	No. 4 No. 6 No. 8	50c	$2.00	$9.80	$19.60

8-GAUGE HAND LOADED WITH SMOKELESS POWDER.

Catalog No.	Grains Smokeless Powder equal to	Oz. of shot	Size of Drop Shot	Price, per Box of 25 Shells	Price, per 100 Shells	Price, per Case of 500 Shells	Price, per 1,000 Shells
6H2280	5½ Drams	1¼	BB	$1.37	$5.48	$25.55	$51.10

Always give catalog number and state size of shot load wanted.

RGES ON A CASE OF 500 SHELLS, the various central points in the East, Middle West and North. By taking the town nearest to where you only determine what the charges would be on a case of s. You will note that after adding the freight charges ou will still effect a great saving as against what you here.

GUARANTEE: Pointer Shells are guaranteed against misfire and hangfir and to have penetration and pattern equal to any she made regardless of name or price. If you purchase a case of the Pointer Shell and after trying a box of 25, for any reason find them unsatisfactory, return th remaining 475 shells to us at our expense, and we will return you the price yo paid for the 500 shells, together with the freight charges.

Figure 1. Shotgun shells listed in Sears catalog in 1912. This was one of the last years Sears listed the 8-gauge shotgun shell.

How fast do game birds fly?

KIND OF BIRD	FEET PER SECOND AVERAGE FLIGHT
Plover	50-80
Jack Snipe	65
Ruffed Grouse	75
Quail	75
Mallard	75
Black Duck	75
Prairie Chicken	75
Dove	85
Blue Bill	110-140
Wild Goose	110-125
Red Head	120
Canvasback	145

IN TESTS of millions of loads, du Pont Powder averages 4% greater velocity (greater effective range); 6% better pattern (more even spread of shot), and 10% less breech pressure (greater margin of safety).

E. I. DU PONT DE NEMOURS & CO., Inc.
Sporting Powders Division
Wilmington, Delaware

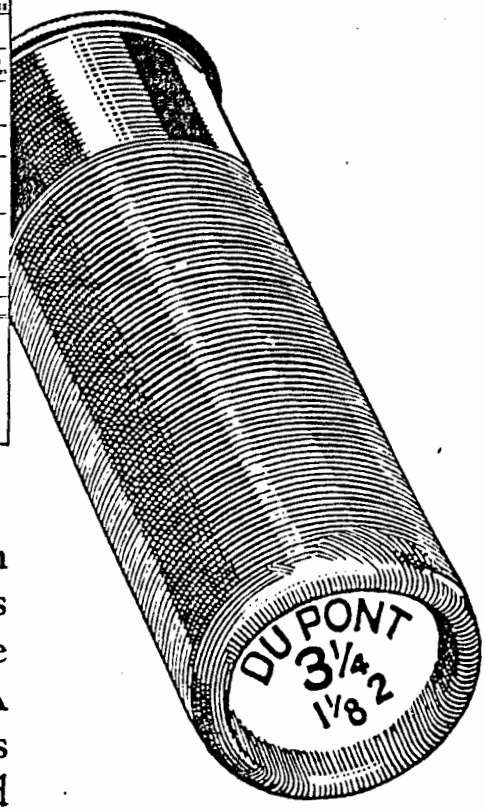
STANDARD LOADS of DU PONT SHOTGUN POWDERS

Kind of Game	DUPONT (Bulk) SMOKELESS 12 GAUGE DRAMS	12 GAUGE OZ SHOT	16 GAUGE DRAMS	16 GAUGE OZ SHOT	20 GAUGE DRAMS	20 GAUGE OZ SHOT	SHOT SIZES ALL GAUGES
Turkey Geese	3¼	1-⅛	2¾	1	2½	⅞	* 2 & 4
Brant Large Ducks	3¼	1-⅛	2¾	1	2½	⅞	4 or light 6 over decoys
Medium Ducks Grouse Prairie Chicken	3¼	1-⅛	2½	1	2¼	⅞	6
Squirrels Rabbits	3	1 1-⅛	2½	1	2¼	⅞	6
Small Ducks Pheasants Pigeons Doves	3¼	1-⅛	2½	1	2¼	⅞	7½
Quail Snipe Woodcock Shore Birds	3	1 " 1-⅛	2½	1	2¼	⅞	8
Reed & Rail Birds	3	1	2½	1	2¼	⅞	10
Trapshooting	3	1¼	2½	1	2¼	⅞	7½

BALLISTITE (Dense) SMOKELESS
If BALLISTITE (*Dense*) Powder is desired order by grains. A comparison follows of *Bulk* and *Dense* Loads:

DRAMS	GRAINS	DRAMS	GRAINS
3½ equivalent to	28	2½ equivalent to	20
3¼ "	26	2¼ "	18
3 "	24	2 "	16
2¾ "	22	1¾ "	14

* In 12-Gauge loads only. Use No. 2 Shot.



MEASURING the flight of birds is not an exact science but most authorities agree that a wild goose will average a rate of from 110 to 125 feet per second. A 12-gauge shell loaded with 3¼ drams du Pont Powder, 1⅛ ounces No. 2 chilled shot, gives an average velocity of 736 feet per second at 40 yards.

SHOOT DU PONT POWDERS

DU PONT

Figure 2. Shotgun shells advertised in Field and Stream manazine in 1923.

Pointer Smokeless Shells

(Unmailable) 12-GAUGE. Loaded With Drop Shot.

Catalog No.	Grains of Smokeless Powder equal to	Oz. of Shot	Size of Drop Shot	Per Box of 25 Shells	Per 100 Shells	Per Case of 500 Shells of One Load Only	Per 1,000 Shells
6N238¼ 6N239¼ 6N240¼ 6N241¼	3 Drams	1	No. 4 No. 6 No. 8 No. 10	$0.86	$3.37	$16.60	$33.20
6N242¼ 6N243¼ 6N244¼ 6N245¼ 6N246¼ 6N247¼	3 Drams	1⅛	No. 2 No. 4 No. 5 No. 6 No. 7 No. 8	.91	3.55	17.50	35.00
6N290¼ 6N248¼ 6N249¼	3¼ Drams	1⅛	No. 2 No. 4 No. 6	.93	3.63	17.90	35.80
6N293¼	3¼ Drams	1¼	BB	1.05	4.13	20.40	40.80

10-Gauge Pointer Smokeless Shells. Loaded With Drop Shot.

Catalog No.	Grains of Smokeless Powder equal to	Oz. of Shot	Size of Drop Shot	Per Box of 25 Shells	Per 100 Shells	Per Case of 500 Shells of One Load Only	Per 1,000 Shells
6N253¼ 6N254¼	3½ Drams	1⅛	No. 6 No. 8	$0.97	$3.80	$18.75	$37.50
6N255¼ 6N256¼ 6N257¼	3½ Drams	1¼	No. 2 No. 4 No. 6	1.00	3.91	19.30	38.60

28-Gauge Pointer Smokeless Shells. Loaded With Drop Shot.

Catalog No.	Grains of Smokeless Powder equal to	Oz. of Shot	Size of Shot	Per Box of 25 Shells	Per 100 Shells	Per Case of 500 Shells of One Load Only	Per 1,000 Shells
6N259¼ 6N260¼ 6N261¼	1¼ Drams	⅝	6 8 10	88c	$3.43	$16.95	$33.90

Always give catalog number and state size of shot load wanted.

Compare Our Prices With Others

Shipping Weight.

Box of 25 Shells	5 lbs.
Box of 50 Shells	7½ lbs.
Box of 100 Shells	14 lbs.
Box of 500 Shells	65 lbs.

The long brass cup protects the shells, keeps out moisture and makes them better, stronger and safer.

Guaranteed high quality in velocity, pattern and penetration.

All Pointer Shells are loaded with a high grade smokeless bulk powder of a hard, clean grain. Primed with a powerful nitro primer set in a gas-tight battery cup. Instantaneous ignition. Loaded by automatic machinery, guaranteeing uniformity. Pointer shells are the ideal shells to use in magazine, double or single guns for trap or field use. Sold exclusively by us.

If you want to determine the freight charges on a case of 500 shells weighing 65 pounds, to various central points, refer to the list of cities shown below. By taking the city nearest to where you live, you can approximately determine what the charges would be on a case of shells shipped to your town.

Case prices on full cases (500) of one load only. We do not furnish other loads than those specified.

410-Caliber Smokeless Shells.

Catalog No.	Grains of Smokeless Powder equal to	Oz. of Shot	Size of Ch'l'd Shot No.	Per Box of 25 Shells	Per 100 Shells	Per Case of 500 Shells of One Load Only
6N277½ 6N278¼	⅝ Dram	⅓	6 7½	67c	$2.51	$12.30

Always give catalog number and state size of shot load wanted.

(Unmailable) 12-GAUGE. Loaded With Chilled Shot.

Catalog No.	Grains of Smokeless Powder equal to	Oz. of Shot	Size of Chilled Shot	Per Box of 25 Shells	Per 100 Shells	Per Case of 500 Shells of One Load Only	Per 1,000 Shells
6N264¼ 6N265¼ 6N263¼	3 Drams	1⅛	No. 4 No. 6 No. 7½	$0.96	$3.77	$18.60	$37.20
6N267¼ 6N268¼ 6N269¼	3¼ Drams	1⅛	No. 4 No. 5 No. 6	.98	3.84	18.95	37.90
6N270¼ Trap Load	3¼ Drams	1¼	No. 7½	1.01	3.98	19.65	39.30
6N279¼	3 Drams	1¼	No. 7½	.99	3.91	19.30	38.60

16-Gauge Pointer Smokeless Shells. Loaded With Drop Shot.

Catalog No.	Grains of Smokeless Powder equal to	Oz. of Shot	Size of Drop Shot	Per Box of 25 Shells	Per 100 Shells	Per Case of 500 Shells of One Load Only	Per 1,000 Shells
6N271¼ 6N272¼ 6N273¼	2½ Drams	1	No. 4 No. 6 No. 8	86c	$3.34	$16.45	$32.90

20-Gauge Pointer Smokeless Shells. Loaded With Drop Shot.

Catalog No.	Grains of Smokeless Powder equal to	Oz. of Shot	Size of Drop Shot	Per Box of 25 Shells	Per 100 Shells	Per Case of 500 Shells of One Load Only	Per 1,000 Shells
6N274¼ 6N275¼ 6N276¼	2¼ Drams	⅞	No. 4 No. 6 No. 8	85c	$3.30	$16.25	$32.50

Shells Cannot Be Shipped by Parcel Post.

A good way is to buy in case lots and have them come to you by freight. You then effect a great saving in carrying charges.

See approximate freight charges at bottom of page for case lots.

Loaded Black Powder Shotgun Shells

An excellent grade. Very popular with many shooters.

Buy by the case. You save in cost price and freight charges.

We guarantee every black powder shell against misfire, hang-fire or blowback. We use a special black powder of a hard grain. It burns rapidly and leaves very little residue. Case prices on full cases (500) of one load only. A case of 500 shells weighs approximately as follows: 12-gauge, 65 lbs.; 10-gauge, 75 lbs.; 16-gauge, 53 lbs.; 20-gauge, 48 lbs.

Shells Cannot Be Shipped by Parcel Post.

(Unmailable) 12-Gauge (Black Powder Shells)

Catalog No.	Drams of Powder	Ounces of Shot	Size of Drop Shot	Per Box of 25 Shells	Per 100 Shells	Per Case of 500 Shells	Per 1,000 Shells
6N215¼ 6N216¼	3	1	6 8	73c	$2.90	$14.35	$28.70
6N226¼ 6N217¼ 6N218¼	3	1⅛	2 4 6	74c	2.94	14.45	28.90
6N219¼ 6N220¼ 6N221¼	3¼	1⅛	4 5 6	75c	2.98	14.65	29.30
6N222¼ 6N223¼	3½	1⅛	4 6	76c	3.02	14.85	29.70
6N224¼	3½	1⅛	BB	81c	3.22	15.85	31.70
6N225¼	3½	1	4 Buck	80c	3.18	15.65	31.30

(Unmailable) 10-Gauge (Black Powder Shells)

Catalog No.	Drams of Powder	Ounces of Shot	Size of Drop Shot	Per Box of 25 Shells	Per 100 Shells	Per Case of 500 Shells	Per 1,000 Shells
6N227½ 6N228¼ 6N229¼	4½	1¼	2 4 6	91c	$3.60	$17.75	$35.50
6N233¼	4½	1¼	BB	94c	3.75	18.50	37.00

16-Gauge (Black Powder Shells).

Catalog No.	Drams of Powder	Ounces of Shot	Size of Drop Shot	Per Box of 25 Shells	Per 100 Shells	Per Case of 500 Shells	Per 1,000 Shells
6N234¼ 6N235¼	2¾	1	4 6	74c	$2.94	$14.45	$28.90

20-Gauge (Black Powder Shells).

Catalog No.	Drams of Powder	Ounces of Shot	Size of Drop Shot	Per Box of 25 Shells	Per 100 Shells	Per Case of 500 Shells	Per 1,000 Shells
6N236¼ 6N237¼	2½	⅞	6 8	70c	$2.78	$13.65	$27.30

Mallard Smokeless Shells

12-Gauge Only. A case of 500 weighs about 65 pounds.

A good grade smokeless powder shell. These shells are loaded with a good grade bulk smokeless powder, quick, clean and powerful. Mallard shells are guaranteed to be uniform and have a low breech pressure. They are primed with a powerful No. 3 primer and will be found highly satisfactory for all kinds of game shooting. Sold in 12-gauge only. Buy them by the case and effect a saving in freight charges. A case weighs about 65 pounds. Note the list below giving freight rates to various points.

Shells Are Unmailable.

Catalog No.	Drams of Powder	Oz. of Shot	Size of Shot	Per Box of 25 Shells	Per 100 Shells	Per Case of 500 Shells	Per 1,000 Shells
6N280¼ 6N281¼ 6N282¼	3	1	4 6 8	$0.82	$3.26	$16.05	$32.10
6N283¼ 6N284¼	3	1⅛	4 6	.85	3.38	16.60	33.20
6N285¼ 6N286¼	3¼	1⅛	4 6	.86	3.42	16.95	33.90
6N287¼	3	1⅛	6 Chilled	.90	3.58	17.70	35.40
6N288¼	3	1⅛	7½ Chilled	.90	3.58	17.70	35.40

FREIGHT CHARGES ON A CASE OF 500 SHELLS.

From Chicago to—		From Chicago to—		From Chicago to—	
Denver, Colo.	$2.21	Detroit, Mich.	$0.67	Memphis, Tenn.	$1.47
Indianapolis, Ind.	.61	Minneapolis, Minn.	.76	Fargo, N. Dak.	1.50
Dubuque, Iowa	.59	Helena, Mont.	3.40	Milwaukee, Wis.	.50
New Orleans, La.	1.98	Kansas City, Mo.	.99	Springfield, Ill.	.61

From Phila'phia to—		From Phila'phia to—		From Phila'phia to—		From Phila'phia to—		From Phila'phia to—	
Hartford, Conn.	$0.50	Bangor, Me.	$0.88	Atlantic City, N. J.	$0.50	Chambersburg, Pa.	$0.57	Providence, R. I.	$0.61
Georgetown, Del.	.52	Houlton, Me.	1.59	Trenton, N. J.	.50	Harrisburg, Pa.	.30	Newport, Vt.	.79
Atlanta, Ga.	1.89	Baltimore, Md.	.50	Albany, N. Y.	.57	Easton, Pa.	.50	Montpelier, Vt.	.79
Portland, Me.	.70	Boston, Mass.	.61	Pittsburgh, Pa.	.70	Towanda, Pa.	.57		
		Concord, N. H.	.61						

A case of 500 12-gauge shells weighs approximately 65 pounds.

Figure 3. Shotgun shells listed in Sears catalog in 1923.

HIGHEST QUALITY AMMUNITION Non-Corrosiv PRIMERS

...YOU CAN'T BUY BETTER... NO MATTER WHAT YOU PAY!

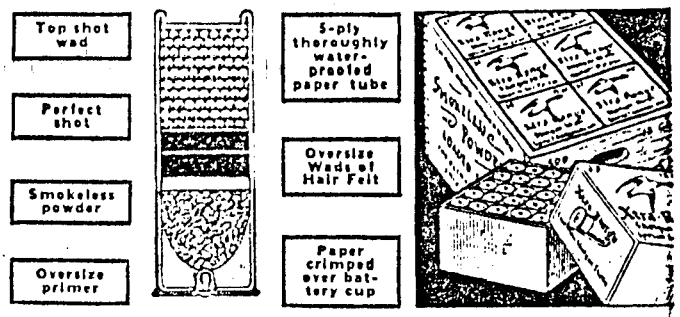
Buying many millions of shells annually and selling them direct to you from the manufacturer enables us to offer you the highest grade ammunition at great savings. Our ammunition is manufactured and quality guaranteed by one of the largest factories in America.

WE GUARANTEE that our manufacturer makes our Sport Loads in exactly the same way as their own nationally advertised brands, which sell at much higher prices. Ammunition Is Not Mailable. Not Prepaid.

Firearms and Ammunition Not Sold To Minors

SHIPPING WEIGHTS

12, 16, 20-Ga.			410-Gauge		
Shells	Boxes	Lbs.	Shells	Boxes	
25	1	4	25	1	2 lbs.
100	4	14	100	4	5 lbs.
500	20	65	500	20	20 lbs.



• SHOT GUN SHELLS •

MALLARD Sport Loads—Smokeless Powder

Ammunition Not Mailable. Shipped by Freight or Express.

25 12-Gauge Shells 59c In Case Lots

For All Around Shooting

Mallard Sport Loads give uniform patterns, penetration and velocity. Oversize non-corrosive primer. Instantaneous ignition. Popular with hunters, gun clubs, and skeet clubs. Not Prepaid. Not Mailable.

12-Gauge Shells 2½ Inches Long After Fired
Loaded with Drop (Soft) Shot

Kind of Game	Drams Powder	Oz. of Shot	Size Shot	Catalog No.	Box 25	Case 500
Pheasants and Quail	3	1	4 6 8	6 DM 420 6 DM 421 6 DM 422	62c	$11.80
Early ducks, rabbits, pheasants	3	1⅛	4 6 8	6 DM 423 6 DM 424 6 DM 444	65c	$12.40
Early ducks, rabbits, pheasants	3¼	1⅛	2 4 5 6	6 DM 425 6 DM 426 6 DM 427 6 DM 428	65c	12.40
Loaded with Chilled Shot						
Rabbits, pheasants or quail	3	1⅛	6 ch.	6 DM 429	69c	$13.00
Early ducks	3¼	1⅛	4 ch 5 ch 6 ch	6 DM 431 6 DM 432 6 DM 433	69c	13.00
Trap Load	3	1¼	7½ ch.	6 DM 430	65c	12.40
12-Gauge Open Loads 2¾ Inches Long After Fired						
Pheasants and Quail	3	1⅛	6 ch 7½ ch	6 DM 448 6 DM 449	69c	$13.00
16-Gauge 2⅝ Inches Long After Fired						
Early ducks, rabbits, pheasants	2¾	1	4 6 8	6 DM 436 6 DM 437 6 DM 438	62c	$11.80
Early ducks, rabbits, pheasants	2¾	1	5 ch.	6 DM 439	65c	12.40
20-Gauge 2½ Inches Long After Fired						
Rabbits, pheasants or quail	2¼	⅞	4 6 8	6 DM 440 6 DM 441 6 DM 442	62c	$11.80
Early ducks	2¼	⅞	5 ch.	6 DM 443	65c	12.40

XTRA-RANGE Sport Loads—Smokeless Powder

See Shipp Weights on Sh gun Shells ab

25 12-Gauge Shells 82c In Case Lots

Increase Killing Range by 10 Yards

—High brass cup adds to strength and safety and keeps shell moistureproof.
—Progressive burning powder.
—Instantaneous ignition. —Non-corrosive primer.
—Powder used in 12-gauge Sport Loads produces velocity equivalent to 3¾ drams of regular smokeless powder.
—Other gauges in proportion.

Each batch of powder is carefully tested for velocity and strength. Loading machines are scientifically adjusted to load shells with the exact quantity of powder, precisely the correct kind and amount of wadding, and correct weight of spherical and sized shot. Shells are waterproofed inside and out. Not Mailable. Not Prepaid.

Maximum Load Progressive Burning Powder

12-Gauge Shells 2¾ Inches Long After Fired. High Brass Base

Kind of Game	Oz. Shot	Size Chilled Shot	Catalog No.	Box 25 Shells	Case 500 Shells
Large duck, Turkey, Geese, Brant	1¼	2C 4C 5C	6 DM 475 6 DM 476 6 DM 477	85c	$16.40
Ducks and Pheasants	1¼	6C 7½C	6 DM 478 6 DM 479	85c	16.40
Geese	1¼	BB Drop	6 DM 480	85c	16.40
Deer, Moose, Wolves and Large Game	Single Round Ball or Pumkin Ball-Drop Shot		6 DM 490	85c	16.40
16-Gauge Shells 2⅝ Inches Long After Fired. High Brass Base					
Large duck, Turkey, Geese, Brant	1⅛	4C 6C 7½C	6 DM 481 6 DM 482 6 DM 483	79c	$15.20
20-Gauge Shells 2¾ Inches Long After Fired High Brass Base					
Large Duck, Turkey, Geese, Brant	1	4C 6C 7½C	6 DM 484 6 DM 485 6 DM 486	79c	$15.20
410-Gauge Shells 2½ Inches Long After Fired					
Squirrels, Rabbits, etc.	⅜	5C 6C 7½C	6 DM 489 6 DM 487 6 DM 488	52c	$9.80

• RIFLE CARTRIDGES •

50 22-Cal. Shorts 11½c In 500 Lots

STA-KLEAN Rim Fire Cartridges

Regular Kopper Koted Cartridges

—Helps prevent rust in barrel.
—Non-corrosive primer. —Loaded with the finest smokeless powder. —Kopper Koted bullets.
—Accuracy of cartridge improved.

Loaded with high grade smokeless powder. Not Prepaid. Shpg. wts.: 50 cartridges, 2 lbs.; 100 cartridges, 2 lbs.; 500 cartridges, 4 to 6 lbs.

Caliber	Cat. No.	For 50	For 100	For 500
22 BB Caps	6 DM 315	....	25c	$1.15
22 Short	6 DM 316	13c	25c	1.15
22 Long	6 DM 317	19c	37c	1.75
22 Long Rifle	6 DM 318	24c	47c	2.25
22 Long Rifle Hollow Point	6 DM 328	28c	55c	2.65
22 W. R. F.	6 DM 319	38c	75c	3.65
22 Long R. F. Shot, Size No. 12	6 DM 329	37c	73c	3.55

Xtra-Range High Speed Cartridges

—Greater killing power. —Non-corrosive primer.
—Greater accuracy. —Cadmium plated bullets.
—Longer range with greater velocity and flatter trajectory.

Due to increased pressure and velocity of these cartridges, they should be used only in a high grade rifle in first class condition, certified by the gun manufacturer to be suitably constructed to withstand such increased pressure and velocity. These cartridges for rifles only. Shpg. wts.: 50 cartridges, 2 lbs.; 100 cartridges, 2 lbs.; 500 cartridges, 4 to 6 lbs. Not Prepaid.

Caliber	Cat. No.	For 50	For 100	For 500
22 Short	6 DM 300	13c	25c	$1.15
22 Long	6 DM 301	19c	37c	1.75
22 Long Rifle	6 DM 302	24c	47c	2.25
22 Long Rifle Hollow Point	6 DM 303	28c	55c	2.65
22 W. R. F.	6 DM 304	38c	75c	3.65

PRO-TEX-BOR Center Fire Smokeless Cartridges

20 30-30 Cal. 89c

—Made with Kopper Koted Bullets.
—Loaded with finest smokeless powder and with positive non-corrosive primers. Prevents lead fouling in the barrel, and increases efficiency of your rifle.

Every improvement known is used to maintain absolute precision in the manufacture of these cartridges. Cannot be sent by Parcel Post. Not Prepaid.

Center Fire Smokeless Rifle Cartridges

Kind of Bullet	Caliber	Catalog No.	For 50	For 100	Bullet Wt.	Shpg. Wt. Per 100
M.P.	.25-20 for Repeating Rifles	6 DM 360	$1.19	$2.34	86 grs.	4 lbs.
S.P.	.25-20 for Repeating Rifles	6 DM 361	1.19	2.34	86 grs.	4 lbs.
M.P.	.32-20 Same as 32 W. C. F.	6 DM 365	1.19	2.34	115 grs.	4 lbs.
S.P.	.32-20 Same as 32 W. C. F.	6 DM 366	1.19	2.34	115 grs.	4 lbs.
S.P.	.351 Winchester S. L.	6 DM 373	2.20	4.36	180 grs.	4 lbs.

Center Fire Cartridges for High Power Sporting Rifles

			For 20	For 40		Shpg. wt. for 40
S.P.	.22 Hi-Power for Savage Rifles	6 DM 376	$0.98	$1.92	70 grs.	3 lbs.
Expdg.	.25-35 for Winchester Rifles	6 DM 378	.85	1.66	117 grs.	3 lbs.
Expdg.	.250-3000 for Savage Rifles	6 DM 399	1.08	2.14	100 grs.	3 lbs.
M.P.	.30-30 Same as 30 W. C. F.	6 DM 379	.89	1.74	170 grs.	3 lbs.
Expdg.	.30-30 Same as 30 W. C. F.	6 DM 380	.89	1.74	150 grs.	3 lbs.
Expdg.	.300 Savage Repeating Rifles	6 DM 398	1.22	2.40	150 grs.	3 lbs.
S.P.	.303 Savage Repeating Rifles	6 DM 382	.98	1.92	190 grs.	3 lbs.
Expdg.	.30 U. S. Army or .30-40 Krag	6 DM 383	1.29	2.54	180 grs.	3 lbs.
S.P.	.32-40 for Repeating Rifles	6 DM 385	.83	1.62	165 grs.	4 lbs.
Expdg.	.32 Winchester Special	6 DM 387	.98	1.92	165 grs.	4 lbs.
S.P.	.38-55 for Repeating Rifles	6 DM 389	1.04	2.04	255 grs.	4 lbs.
S.P.	.45-70-405 Caliber	6 DM 346	1.08	2.14	405 grs.	4 lbs.

Rimless High Power Smokeless Cartridges

			For 20	For 40		
S.P.	.30 Remington Rimless	6 DM 393	$0.89	$1.74	170 grs.	3 lbs.
S.P.	.32 Remington Rimless	6 DM 395	.98	1.92	170 grs.	4 lbs.
Expdg.	.35 Remington Rimless	6 DM 397	1.08	2.12	200 grs.	4 lbs.
Expdg.	.30 Govt'06 Boat Tail	6 DM 392	1.42	2.80	180 grs.	4 lbs.

Figure 4. Shotgun shells listed in Sears catalog in 1933.

Appendix 1.
(Selected pages only.)

waterfowl management and quality hunting

A GUIDE TO MISSISSIPPI FLYWAY WATERFOWL MANAGEMENT

MANAGEMENT PLAN COMMITTEE

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Cyril Kabat
Wisconsin Conservation Department, Madison

Parker Smith
Tennessee Fish and Game Commission, Nashville

George B. Saunders
Bureau of Sport Fisheries and Wildlife, Atlanta

J. Donald Smith
Bureau of Sport Fisheries and Wildlife, Minneapolis

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Illinois Department of Conservation, Springfield

James W. Kimball
Minnesota Department of Conservation, St. Paul

Albert Hyder
Tennessee Fish and Game Commission, Nashville

MISSISSIPPI FLYWAY COUNCIL

1958

ACKNOWLEDGEMENTS

This guide is the work of many people -- too many to single out individual contributors. In fact, we know of no other venture in the field of wildlife management to date which has involved so many different agencies and staff members. At one stage in its preparation, the committee working on the Guide sent out a questionnaire to determine what service each agency might be able and willing to contribute toward the final product. The response then and at all other stages of the Guide's development demonstrated clearly that this has been a group effort of the highest order.

Two agencies perhaps deserve special bouquets: the Bureau of Sport Fisheries and Wildlife and the Wisconsin Conservation Department. The Bureau's Flyway Representative was permitted to devote a great deal of his time to this project and was authorized to call in the Assistant Supervisor of Game Management in each Regional Office for assistance whenever it was needed. The Wisconsin Conservation Department made the necessary arrangements for final publication and distribution of the Guide, also contributed art work and editoral guidance as well as strong support from the beginning.

Other participating states were: Minnesota, Michigan, Ohio, Indiana, Illinois, Iowa, Missouri, Kentucky, Tennessee, Arkansas, Louisiana, Mississippi, and Alabama. Other contributing agencies were: Wildlife Management Institute, Illinois Natural History Survey and Welder Wildlife Foundation.

Contributing Canadian agencies were: Canadian Wildlife Service, Game Branches of Ontario, Manitoba, and Saskatchewan and Ducks Unlimited (Canada).

Acknowledgement is also given to the University of Wisconsin Extension Division for its duplicating services, and to Jens von Sivers of Madison, Wisconsin, for the illustrations.

Edited by

Clarence A. Schoenfeld
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Ruth L. Hine
Wisconsin Conservation Department

PREFACE

The function of the Mississippi Flyway's Planning Committee is to look for shortcomings in the Flyway's waterfowl management program, as evidenced by comparing the aims given in the Management Guide with the actual accomplishments to date. Last year's annual report by this Committee concluded with a section captioned "Looking Ahead". Ten facets of management which will require the concerted efforts of the Council during the present decade were listed.

Upon reviewing this list, the Planning Committee was especially concerned about the significance of the concept of qualitative management, and selected this as the subject of its annual report.

The full report including a policy and standards, was adopted by the Mississippi Flyway Council as a supplement to the Guide to Mississippi Flyway Waterfowl Management during the executive session of the Council meeting in St. Louis, Mo., August 3, 1961.

The contents of this report may be quoted, if proper acknowledgment is given to the Mississippi Flyway Council.

The Planning Committee
Arthur S. Hawkins, Chairman
William G. Leitch
Thomas R. Evans
Richard K. Yancey
Fran C. Gillett, Ex-officio
Allan T. Studholme, Ex-officio

Edited by Ruth L. Hine

"A Guide to Mississippi Flyway Waterfowl Management"
Part II: Projects and Programs

THE PROBLEM

One of the facets of waterfowl management is so fundamental, so badly neglected, and so urgent that it deserves full attention. It has been called the qualitative aspect of management or qualitative management. Although the word "quality" falls far short of describing the subject at hand, the problems of management do fall conveniently into two broad groupings: those which are related to quality as opposed to those related to quantity. The quantitative aspect of management involves numbers of birds, acres of land, and dollar costs; in other words, the tangible values. In contrast, qualitative management is concerned with the intangibles: ethics, esthetics, culture, traditions, and sportsmanship. This report deals primarily with these intangibles.

We commenced this study with a thorough review of Aldo Leopold's writings because no one else before or since has given these intangibles comparable consideration. We found his writings so refreshing and to the point that pertinent statements have been extracted and placed in an appendix to this report for your information (Appendix A).

GENERAL CONCLUSIONS AND RECOMMENDATIONS

The following general conclusions and recommendations are given here for quick reference and so that you may better weigh the analysis which follows:

We conclude that:

1. The function of management is to preserve not only the resource itself, but also its full recreational attributes.

2. The intangible values of the resource which may equal or exceed the tangible values presently are largely ignored both in management planning and in arriving at a monetary figure for comparison with purely economic considerations. This results in a wastage of potential benefits to people, and places the wildlife resource at an unfair disadvantage in all cost-benefit comparisons.

3. It is unrealistic to expect a resource (including both birds and their habitat), which is becoming less abundant and which in many areas is already over-utilized, to supply unlimited recreational demands.

4. It is realistic to enact management measures which will hold the recreational use of this resource within the capability of the resource to supply a satisfying brand of recreation, but such control must be exercised within the traditional and legislative framework which deeds this resource to all the people.

5. It is democratic to apply any necessary controls without discrimination, but it is undemocratic to so manage the resource that its recreational attributes become diluted beyond the point where discriminating people can obtain enjoyment and satisfaction. Therefore, provision should be made for discriminating people as well as for those whose tastes are less well developed.

6. Qualitative values are reduced or destroyed by over-crowding on an area, unnecessary or excessive regimentation, introducing unnatural objects to the landscape, removing the element of uncertainty and suspense, making things too easy for the hunter, and unsportsmanlike conduct.

7. Qualitative values are enhanced by reasonable solitude, attractive natural surroundings, suspense and excitement, rugged exercise, a chance for using skill and obtaining a trophy, birds that behave naturally, and an atmosphere full of outdoor flavor and sporting traditions.

8. Management's present ability to promote quality and cope with its problems lags far behind its technical skills toward managing the birds and their habitat.

9. Qualitative considerations should become an integral part of management plans and operations on all public hunting areas and to the extent possible on all types of areas.

We recommend that:

1. The Council take positive action in behalf of qualitative management by:

   a. Recognizing that quality control on most public hunting areas needs improvement.

   b. Adopting a policy and a code of standards to serve as a guide to improving the quality of hunting and other public use on all publicly-owned areas.

   c. Determining what readjustments in present procedures for licensing hunters, financing programs, and managing areas would be required to strike a balance between supply and demand, thereby permitting adoption of agreed upon standards of quality.

   d. Promoting a long-range educational program designed to increase public appreciation of the many values that this resource offers.

2. The Planning Committee be charged with the responsibility of reporting annually on the progress of qualitative management in this Flyway.

POLICY ON QUALITATIVE MANAGEMENT

It is Council policy to recognize that (a) the waterfowl resource has both tangible and intangible values; (b) the intangible values, which include the esthetic, educational, cultural, and traditional aspects of wildfowl and wildfowl hunting, the therapeutic attributes, the opportunity for vigorous exercise, and the chance to practice a wide variety of skills, unquestionably outweigh the monetary values; (c) these values are enhanced by preserving natural conditions and reduced by introducing artificial conditions; (d) these values are enhanced by good sportsmanship and a reasonably successful hunt and reduced by poor sportsmanship and continuous poor success; (e) these values are enhanced by reasonable control of hunting pressure and reduced by lack of control wherever hunting pressure is high; and (f) these values are enhanced by good all-around management which considers the discriminating person and reduced by management designed only to meet the current demands of the indiscriminating public.

Further, it is Council policy to promote and adopt such measures as will give greater recognition to quality in (a) the evaluation of projects under the Coordination Act; (b) the over-all management of waterfowl; and (c) the management of waterfowl on publicly-owned areas.

CONSIDERATIONS REGARDING QUALITY

Most people will agree that the sport of wildfowling isn't what it used to be in the "good old days" but few have stopped to consider why this is so or what, if anything, can be done about it. We propose to make a start toward such a diagnosis by considering some of the elements which have a bearing on quality.

Definition of Quality

It might be well to begin this discussion by defining the word "quality" as herein used. Webster's definition of quality includes the following descriptive terms: class, kind, grade, distinctive trait, power, capacity, virtue, excellence of character and attributes. A quality product is one that contains fine workmanship; one that combines with great skill the raw materials from which the product is constructed.

Waterfowl managers concoct a product known as "wildfowling", which is the sport of hunting wildfowl with a shotgun. The two raw materials used are the bird and its habitat. These two ingredients of wildfowling can be so combined as to provide men with a great deal of pleasure, or used to the detriment of both the resource and the recreation provided by it. The end

product of management's efforts may be a desirable place to pursue the time-honored sport of wildfowling, or a phony substitute which provides a form of outdoor recreation bearing only superficial resemblance to the traditional sport.

While the exact specifications for quality are nebulous, the general framework within which it exists is clear-cut. Quality hunting requires appropriate surroundings, reasonable solitude, rugged exercise, suspense, excitement, and a chance to pit the skill of the hunter against the innate cunning of the prey. A quality hunt is one to be remembered with great satisfaction whether or not a full legal bag is obtained.

Difficulties in maintaining satisfactory quality standards are not confined to the sport of hunting. Sport fishing interests are similarly challenged, as evidenced by an article entitled, "I Got The Limit" which appeared in Vol. 5, No. 3, of the Washington State Game Bulletin. In it, an important question about quantity is asked and the answer is given in terms of quality:

> "How far can we go? When our State's population doubles, which it will surely do some day, will we halve our legal limit again? There are only so many lakes and streams in the State and these waters can support only so many fish, regardless of the number of hatcheries or amount of money spent on producing more fish... Since it is impossible to keep pace with the fishing pressure as it now exists, and creel limits alone are not the answer, it should be obvious that we must revive the basic principles of angling, and fish for pleasure instead of meat. Sport fishing today is not a means of providing a family larder -- it's recreational, by any yardstick used, and all that remains is to adapt ourselves to that fact.
>
> "Let's think in different terms. Let's think and talk about fishing for its own sake... Let's teach our youth that going fishing doesn't mean getting the most fish, but is instead a pastime of fraternizing with Mother Nature. Let's just let the age old thrill of angling for sheer pleasure be our creed."

We do not want to imply that a successful hunting and fishing trip and quality are unrelated. Opportunity for success cannot be consistently lacking if reasonable standards of quality are to be maintained. The point is that small bags of game taken under sporting conditions can provide the sportsman with greater satisfaction than a bag limit taken under unsporting conditions. This is one of the basic principles of <u>qualitative management</u> discussed later.

<u>Quality vs. Quantity</u>

We undertook this study realizing there is a tendency among many practical-minded wildlife officials to write off quality control in modern waterfowl management as a lost cause. Both administrators and waterfowl managers are constantly harassed by such problems as how to provide more

targets for increasing numbers of hunters, despite a steady decline in production and harvest areas. These problems of quantity are not only real but also greatly intensified by outside pressures from people who both like to hunt and to tell the Conservation Department how its affairs should be run. Consequently, qualitative problems usually are relegated to the low spot on the totem pole until they become so serious as to attract widespread attention. At that point drastic stop-gap action is often necessary.

Frequently, problems of quality and quantity are interwoven and must be attacked simultaneously. Two of the most publicized incidents in the annals of wildlife conservation occurred in this Flyway and will serve to illustrate how quality-linked problems may reach scandal proportions.

What may have been "absolute zero" in degraded quality was reached shortly before live decoys and baiting were banned. During the twenties, a new way was found to make a fast "buck" at the expense of the duck. Somebody discovered that in some areas, notably the Illinois Valley, live decoys, corn, and tar-paper-lined scoop-outs filled with water formed the makings of a commercial duck club, sometimes miles from the nearest marsh. Around these heavily baited field pens, blinds were built and filled with hunters often guaranteed their limits. At a given signal from the operator, the hunters emptied their pump guns (no restriction on number of shells) into the flock of mallards. Potting on the water was commonplace. The shoot having ended, the hunter picked up his birds and departed usually with the 15 - 25 ducks permitted at that time. At their peak, 250 field pens were tallied from a plane in one Illinois County and a small part of another. This situation was halted by mass public indignation and legislation to back it up.

Within the memory of most of us a previously almost unknown spot on the map known as Horseshoe Lake, Illinois, suddenly became infamous far and wide as the slaughter pen for Canada geese. This situation finally resulted in a complete closure of Canada goose hunting in this Flyway for one year and a drastic revolution in Canada goose management which is still in progress. That the problem is not completely resolved was apparent to the public as well as game managers as recently as last fall when people started calling Horicon Marsh, Wisconsin, "another Horseshoe Lake," with reference to the situation prevailing in southern Illinois during the early forties rather than the present situation there.

From these experiences of former and even recent years, we should have learned this lesson: that management which forgets quality, sooner or later must face a day of reckoning. It is far better to balance quantitative and qualitative considerations as we proceed.

Supply vs. Demand

There is no way in sight to substantially increase the supply of most kinds of waterfowl; therefore, it seems obvious that if reasonably high quality is to be maintained, the demand somehow must be controlled. Demand eventually tends to control itself through the law of diminishing returns, or can be controlled deliberately through the application of well-planned control measures.

There are a number of examples on public hunting areas of deliberately controlled hunting pressure throughout the Flyway. Mostly, however, the law of diminishing returns is allowed to operate in a most unsatisfactory and inefficient manner. This is true because of the strange human psychology (discussed later) which governs whether people do or do not hunt.

The alternative to allowing hunting pressure to seek its own level is to decide how many hunters can be accommodated by the resource at given places and to discourage participation beyond the saturation point. We realize this approach is criticized as undemocratic even though it is considered entirely proper to quit selling tickets when all the seats in the stadium or baseball park are taken. We recognize also that over-regimentation can spoil the fun of hunting just as surely as can over-crowding and unsportsmanlike conduct. Nevertheless, we believe that limiting participation is a far better way to protect the many values of this sport than by letting demand increase until the recreation loses its attractiveness. It might be well at this point to review our legal obligations and moral responsibilities as they relate to this matter.

Legal and Moral Responsibility

Some professional wildlife workers seem uncertain when the chips are down, whether to place their allegiance with the resource, the public as a whole, hunters only, or with various pressure groups. There should be no cause for this dilemma. For both moral and legal reasons, the resource itself must come first. Section 2 of the Migratory Bird Treaty Act states "unless and except as permitted by regulations made as herein provided, it shall be unlawful at any time, by any means, or in any manner, to pursue, hunt, take, capture, kill... any migratory bird... included in the terms of the Conventions..." Section 3 empowers the Secretary "to determine when, to what extent, if at all, and by what means it is compatible with the terms of the Conventions to allow hunting..." In short, hunting is a privilege to be enjoyed only when the level of the population is such as to declare a dividend in the form of a harvest season. Both wildlife managers and hunters are inclined to take this privilege for granted but they should not. It is to everybody's interest to not only preserve the resource but also to maintain it at a sufficiently high level to permit a bountiful annual harvest.

In view of the fact that hunters contribute more toward waterfowl management than any other group, should they not be entitled to "write their own ticket?" All United States wildfowlers buy a duck stamp as well as a small game license. Saskatchewan hunters all contribute automatically to the depredations fund, much of which goes to reimburse farmers for mallard damage to crops. Minnesota hunters all contribute a dollar each year toward buying wetlands as a fixed part of their license fee. Louisiana hunters all contribute to Ducks Unlimited through their hunting license fee. Other hunters donate large amounts to Ducks Unlimited or the Wildlife Management Institute or toward the maintenance of an important chunk of duck habitat which they hunt. Aren't these people entitled to special privileges?

Public Law 1024 (Fish and Wildlife Act of 1956) says emphatically "No" by stating: "this Act shall be administered with due regard to the inherent right of every citizen and resident of the United States...for his own pleasure, enjoyment, and betterment, and with the intent of maintaining and increasing the public opportunity for recreational use of our fish and wildlife resources."

It boils down to this: the official agencies charged with the management of the resource are responsible to the entire citizenry rather than any select group. This means that a democratic approach must be used, avoiding favoritism and discrimination, if anything is done deliberately to control the number of hunters. We do not interpret this to mean, however, that the number of participants in this recreation should be permitted to increase to the point that standards fall apart and the recreation itself is placed in jeopardy.

Satisfying the Masses

Qualitative values of hunting are threatened wherever the demand for hunting is high and places to hunt are limited. This is an axiom brought about as follows: Public hunting grounds in heavily populated areas are patronized to such an extent that hunter success approaches the zero point and unsportsmanlike conduct prevails among the hunters. The only way to improve the situation is through varying degrees of regimentation. Under such conditions, hunters with strong feelings toward the finer aspects of the sport (i.e., the sportsmen) have three choices: (1) accept the low standards provided, (2) look for greener pastures elsewhere, or (3) hang up their guns. Soon the crowded place is monopolized by a throng of novice hunters who have never known anything better. At first the area manager is amazed that his clientele seems satisfied with the poor conditions which exist and finally he is convinced that this is democracy in action -- the people have spoken so that's the way it must be. There is another possible interpretation, more logical in our view, which is illustrated by a recent experience in the television industry.

In 1959 the television industry passed through a stage of evolution which finally ended in a major scandal. The basic reason: it had bowed to what seemed to be the wishes of the masses. Arthur Schlesinger, Jr., Harvard Professor of History, Pulitzer prize-winner, and one of President Kennedy's chief advisors, wrote an evaluation which bears strongly on the problem we are here considering. He stated: "The giving-the-public-what-it-wants argument fails to answer the deeper question of how public wants came into being. In television, as in other areas of our society, wants are induced to a considerable degree by what is available; 'supply creates demand.' Giving-the-public-what-it-wants is an alibi. Mr. Seldes (University of Penn.) rightly calls it 'pernicious nonsense, since the public cannot know how much better it might be served.'...One must wonder about the social wisdom of letting so miraculous and compelling a medium degenerate into electric vaudeville...The fact that trash wins out in the

But, on the other hand, we feel a strong responsibility to prevent the sport of wildfowling, which in its own small way symbolizes America's f dom, from degenerating to just another pastime completely devoid of its traditional attributes.

The Code

Every situation is somewhat different in terms of hunting pressure space, the supply of birds, and what can be done to promote quality but there are several basic principles which should be considered.

1. Wildfowling is essentially a contest between a wary bird and a skillful hunter in an appropriate setting. The sporting element is weakened by so managing the quarry that it has no choice but to become a target for the hunter no matter how unskillful he may be.

2. The hunter exhibits his skill in various ways. He may be able to fashion life-like decoys or so arrange them in the marsh as to deceive even gun-shy birds. He may know the best place for a blin under various wind conditions or he may "talk" duck language so skillfully on a call that he brings birds to him from great distances. The coup is a nifty shot which produces a clean kill. Quality is reduced when a hunter is prevented from exercising these and other traditional skills.

3. The third basic element is the setting. A duck marsh is just the pure and simple. To the extent that a marsh is defiled by signs other unnatural objects, the hunter is being shortchanged in his experience.

4. Sportsmanship is an indispensable aspect of waterfowl hunting. Fighting for a place to hunt, sky-busting to beat your neighbor, and arguing over downed birds have no place on a duck marsh. Management has definite ways of encouraging or discouraging sportsmanship.

5. Knowing the birds enhances the sport and provides entertainment both hunters and non-hunters. It adds quality to the sport and impetus to species management when a hunter has the knowledge a control to abstain from shooting a protected species or to kill drake rather than a hen.

Super-imposed on these basic principles is the fact that the s birds is limited by production habitat, which is being progressive at the same time the potential for more hunters is rapidly increas some point this recreation becomes uninviting to all except the mo because of poor success and over-crowding. Management wants to pr from happening. To do so will require some method of limiting hun the method has to be democratic because the whole tradition of hun America is based on democracy at its best. This element must be p at all cost.

This is where ethics on the part of the managing agency enters the picture. These agencies are often in a position to grant special favors such as reserving choice hunting spots for selected individuals or otherwise cheating the general public. It is the Council's strong conviction that favoritism is completely out-of-place in the management of this resource and that violators of this principle should be censured. Instead, the policy must be fair treatment to all segments of the hunter population.

In brief then, this is the situation: the objective of management is to preserve both a sport and a tradition. This sport has certain elements which make it entirely different from other sports, even including the superficially similar sport of shooting semi-wild ducks released from a tower and trained to fly over the gunner. The basic difference is that the wild bird can draw on its own resourcefulness to avoid being shot, whereas the hunter has to draw on his skill to be successful. Management should recognize and encourage this relationship rather than try to weaken or destroy it.

Hunting is more than simply killing game. Attractive and appropriate surroundings are important. Many people like to hunt waterfowl because they find the type of habitat utilized by these birds fascinating. Management should give more thought toward preserving or establishing the proper setting.

A third consideration is the end result -- the trophy. A wild and tame mallard may resemble each other very closely but any hunter will tell you that there is no comparison in the satisfaction derived in bagging these counterparts. The wild bird is and should be regarded as a trophy of the hunt. The tame bird is simply a live target. Our job is to manage <u>wild</u> birds.

Variety is another important feature of wildfowling. It is not uncommon to find four or five species of birds in a legal daily bag, all challenging the hunter's ability to identify them. Management should capitalize on this distinction.

No virtue becomes a hunter more than sportsmanship in its finest sense and management should help foster this idea. Sportsmanship includes restraint from shooting species or sexes which need added protection, hence the sportsman must learn how to recognize these birds. This is another area where management can help.

In short we, the waterfowl resource administrators and managers, should not fear the word "quality." It simply means that we recognize the capability of management to enhance or detract from the recreational value of the waterfowl resource. We want to know how to make this form of recreation better and in the following section have set down some guidelines for doing so. This then is our code.

where hunters can average two or more ducks each is automatically of high quality over-all. As already pointed out, an area must meet other standards as well as that of reasonable success.

Goose hunting success must be rated differently. It is not part of the goose hunting tradition to expect success on every trip afield. On the contrary, the degree of success on most managed public goose hunting areas is far higher than that which satisfied old-time goose hunters. Since a goose is, or at least should be, considered a trophy bird, an average success rate of one per three or four hunter-days should be adequate. A hunter who bags one or two geese per season in the proper atmosphere for goose hunting should feel amply repaid for his efforts. Success much higher than this may actually detract from quality by making goose hunting too easy, thereby weakening trophy-value and creating dissatisfaction with any degree of success short of the limit.

3. Rules and Regulations

A sport such as hunting demands as much freedom of action and initiative by the participants as possible. Ideally, the hunter should have the freedom to go and come as he pleases, build his blind where conditions of that particular day dictate and discover his own way to have fun within the framework of a few simple rules. As demands on space increase, however, this becomes less and less possible. Time after time free-for-all hunting has become a free-for-all brawl on public hunting areas. Even this may be fun for a certain class of hunter, but unless we wish to abandon the whole idea of quality, the rights and pleasures of more discriminating hunters must be protected -- by rules and regulations.

Local problems are too varied to set specific standards. As a guideline, however, whatever system provides the hunter with the best chance for reasonable solitude and success under existing conditions is probably best for that area. Some specific suggestions on how this problem is being handled at present in various parts of the Flyway are given in Appendix B. Some special types of regulations are considered below.

(a) Boats: One of the easiest ways to regulate quality is through boat regulations. Nothing can be more annoying to a hunter trying to turn a flock of wary ducks than the intrusion of a motor boat. Even duck boats can be disturbing if there is considerable traffic near your blind. On some managed areas the boat disturbance problem is handled by "taxi" service to and from the blind. This method may be efficient but it also destroys an important element of the sport. It is not recommended for that reason.

Restricting traffic to designated boat lanes is another approach. So that hunters cannot possibly go astray, lanes are often marked with conspicuous signs. This may be necessary in many cases but signs are foreign to a duck marsh and should be held to a minimum.

Outlawing the use of outboard motors is an effective means of making a small marsh seem bigger and of establishing quality zones based on effort. Those satisfied with crowded conditions can pull into the first empty blind, while those willing to work for the privilege of reduced competition will explore the far reaches of the marsh.

Manitoba has gone one step farther and excluded boats entirely from certain marshes. Manitoba, in fact, has been a leader in the manipulation of boating regulations to preserve the tranquility of a marsh during the breeding season as well as during the hunting season. (See Appendix B).

We recommended a careful review of the boating regulations on all public hunting areas with a view toward modifying them in the interests of improving quality.

(b) Guns and shells: In the questionnaire, "sky-busting" was singled out as the greatest nuisance on public hunting grounds. This can take the fun and skill out of the sport for everybody, hence steps must be taken to remedy the problem. Furthermore, the growing tonnage of lead accumulating in our marshes is a major cause of mortality in waterfowl. Even more important are the crippling losses due to careless and inaccurate shooting. Management to date has lacked imagination and aggressiveness in combating these major problems which are directly traceable to guns, shells, and of course the hunter. Studies have shown that the difference between killing and crippling a duck largely boils down to "delivering a lethal number of pellets" to the bird and is not simply a question of the kind of equipment used. Bellrose found that at 60 yards, unless a duck is hit by at least five No. 4's it is more likely to become a crippling loss than a bird in the bag.

What can be done about this extremely important situation? Obvious answers are these: (1) Reduce long-range shooting by whatever means are necessary. This may mean causing a hunter to lose the privilege of hunting in an area if he is observed in the act of sky-busting (deliberately shooting time after time at extreme range or out-of-range birds). Certainly an aggressive I & E program is the least that can be done to help. Various "props" may be used to advantage such as life-sized silhouettes placed at various distances. (2) Reduce the amount of lead fired at waterfowl. The most effective approach would be the complete replacement of lead shot by some non-toxic material. This in itself would not reduce the number of shots fired, however. One way to accomplish the latter, would be to limit the number of shells used per hunter-day. (At least two Flyway states, Ohio and Indiana, are experimenting with this approach). The pros and cons should be considered of reducing the total holding capacity of guns from the

present three shells to only two shells. Encouragement of decoy shooting through blind spacing will in itself reduce the sky-busting problem. Whatever is required to get the job done, sky-busting must be reduced significantly not only in the interests of improving quality but also in the interests of maintaining a harvestable supply of birds.

(c) Dogs: No one will deny that under most conditions a good retriever will save cripples. Uncontrolled dogs, however, can become a nuisance and for this reason have been outlawed on some public hunting areas. Besides saving cripples a good retriever adds greatly to the pleasure of hunting and is a definite contribution to quality. The use of dogs should be encouraged on most public hunting areas with the proviso that a hunter who cannot control his dog may lose his hunting privileges on the area.

(d) Other special regulations: On many managed areas there are places where, because of heavy cover or various obstacles, an abnormally high proportion of birds shot cannot be recovered. Some parts of an area may have bottom conditions on which lead pellets tend to accumulate later to be consumed by ducks which become poisoned and die. A small portion of a managed area may be frequented by species needing special protection. Wastage of these kinds directly competes with quality as well as quantity and such areas should be zoned against hunting as part of the management plan for the area.

4. Hunter behavior, sportsmanship, and training

Courtesy in the duck marsh, like manners in the home or office, is the result of environment and not heredity. Hunter behavior reflects to a large degree his past experiences. What kind of experience has he had on the managed marsh? Perhaps his only association has been with the sky-buster element. If so, he is almost certainly a sky-buster himself. There is an opportunity on managed areas to encourage good sportsmanship by eliminating the conditions which breed poor sportsmanship. Novice hunters can be taught some of the behaviorism which can make or break quality hunting. It is up to the managing agency to provide the right climate for proper duck-marsh etiquette.

Waterfowl identification is an important phase of the training program. How can a hunter be a good sportsman if he shoots at species that are protected? Is he not a better sportsman if he passes up hens in favor of drakes when there is a scarcity of the former and a surplus of the latter? There is an opportunity on every public hunting ground to teach hunters something about duck identification and its significance in the management program. This same opportunity extends to all the I & E outlets. Identification and indoctrination on species' status and general conditions are prerequisites to any successful species management program, a program which this Council is now featuring in its I & E work and which most managers agree is of top priority.

this elemental man-earth relation with gadgets and middlemen that awareness of it is growing dim" (c) "any experience that stimulates this extension of ethics is culturally valuable" (He was referring to land-butchering as being unethical and grounds for social ostracism.) (d) "any that has the opposite effect is culturally damaging. For example, we have many bad hunters with good guns. Such a hunter shoots a wood duck, and then tramples the bejeweled carcass into the mud, lest he fall foul of the law. Such an experience is not only devoid of cultural value, it is actually damaging to all concerned. It does physical damage to the wood duck, and moral damage to the hunter, and to all fellow hunters who condone him. No sane person could find anything but minus value in such 'sport'."

Leopold asks this pertinent question: "Is culture fed by our present forms of outdoor recreation?" Do we foster "a distinctly American tradition of self-reliance, hardihood, woodcraft, and marksmanship?"

Usually, we build our case for preserving hunting around a framework of economic values. Concerning this justification, Leopold wrote as follows: "the traffic in gadgets adds up to astronomical sums, which are soberly published as representing the economic values of wildlife. But what of cultural values?"

He described a typical duck hunt on a public marsh thusly: "the decoys work, despite the caller; a flock circles in. It must be shot before it circles twice, for the marsh bristles with other sportsmen, similarly accoutred, who might shoot first. He opens up at 70 yards, for his poly-choke is set for infinity, and the ads have told him that Super-Z shells, and plenty of them, have a long reach. The flock flares. A couple of cripples scale off to die elsewhere. Is this sportsman absorbing cultural value? Or is he just feeding minks?"

Many feel that the rapid decline in sporting quality dates back to the end of World War II but long before the war ended Leopold wrote, "not all sports have degenerated to the same extent as duck hunting."

Who is to blame for this situation? "Wildlife administrators are too busy producing something to shoot at to worry much about the cultural value of shooting. Nor has it dawned on the American sportsman that outdoor recreations are essentially primitive, atavistic; that their value is a contrast value; that excessive mechanization destroys contrast by moving the factory to the woods or to the marsh" and "the sportsman has no leaders to tell him what is wrong."

Providing a where and when to go service to hunters is another way to destroy intangible values, in Leopold's opinion. "Knowledge of the whereabouts of good hunting and fishing is a very personal form of property. To hand it to all and sundry as free public 'service' seems to me distinctly another matter, tending to depersonalize one of the essentially personal elements in hunting skill."

and predilections, rather than by his purse. The bulk of all land relations hinges on investments of time,... forethought, skill, and faith rather than on investments of case."

"Cease being intimidated by the argument that a right action is impossible because it does not yield maximum profits, or that a wrong action is to be condoned because it pays."

As a final telling blow to the strictly materialistic viewpoint, Leopold wrote: "In measuring the value of recreation, we are so obsessed with the numbers who now participate that we have forgotten all about the intensity or quality of their experience. This obsession is especially prevalent in the land-owning bureaus, which justify their mounting costs and expanding domain by their mounting public patronage..."

"No man is wise enough to say at just what point the loss in quality of recreation outweighs the gain in quantity, but any man with half an eye can see on which side the scale the official leadership should throw its weight... From now in it is quality, not quantity, which needs the attention of far-seeing administrators..."

Aldo Leopold asks all of us this parting direct question: "...has not our employer, the public, a right to demand some degree of skill and resourcefulness in preserving the quality... despite mass use?" What is our answer?

Sources of quotations used:

Leopold, Aldo

1931. GAME METHODS THE AMERICAN WAY.
American Game, March-April, 1931.

1933. THE CONSERVATION ETHIC
Journ. of Forestry Vol. XXXI No. 6, Oct. 1933.

1934. CONSERVATION ECONOMICS.
Journ. of Forestry Vol. XXXII No. 5, May, 1934.

1938. CONSERVATION ESTHETIC.
Bird Lore, March-April, 1938.

1941. WILDERNESS AS A LAND LABORATORY.
The Living Wilderness, July 1941.

1942. WILDERNESS VALUES.
The Living Wilderness, March 1942.

1942. LAND-USE AND DEMOCRACY.
Audubon Magazine, September-October 1942.

1943. WILDLIFE IN AMERICAN CULTURE.
Journ. of Wildlife Mgt., Vol. 7, No. 1, Jan. 1943.