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Kenneth M. Reynolds

Iowa Conservation Commission

Richard A. Bishop

Iowa Conservation Commission

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Iowa's 1975 Waterfowl Bag Check Program

KENNETH M. REYNOLDS¹ and RICHARD A. BISHOP

Iowa Conservation Commission, Clear Lake, Iowa, 50428

A waterfowl bag check program was initiated in 1975 to estimate duck harvest, hunting pressure, hunter success and species composition of the harvest on 24 waterfowl areas. Sample design was such that it was easily repeatable and would permit detection of changes in harvest parameters. Analysis of management practices in light of these changes would then be possible. Estimated harvest for the 24 areas was 32,591 birds while estimated hunter trips totaled 46,131. Big Marsh, Eagle Lake, Otter Creek Marsh, Hawkeye Wildlife Area, Rush Lake (Palo Alto County), Riverton Wildlife Area, Green Island, New Albin Access, and Sweet Marsh accounted for 84.8% of the harvest and 81.4% of hunter trips. Harvest and hunting pressure was highest on weekends with the greatest intensity occurring on season openings. Species composition of checks showed the mallard (*Anas platyrhynchos*) was number one in the bag (28.6%) followed by blue-winged teal (*Anas discors*, 22.7%), green-winged teal (*Anas carolinensis*, 21.2%) and wood ducks (*Aix sponsa*, 14.1%). The importance of each species in the bag varied greatly between areas.

INDEX DESCRIPTORS: Waterfowl harvest, Hunter Success, Wildlife Harvest Survey.

The collection of bag check data is a basic survey method which provides wildlife biologists with information concerning various aspects of the harvest of wildlife species. When collected in a standardized manner, data can be utilized to monitor yearly trends in harvest and recreational demand. Management practices can then be evaluated with regard to these fluctuations.

Prior to 1975, Iowa Conservation Commission personnel conducted periodic waterfowl bag checks on state-owned hunting areas throughout the state. Surveys were concomitant with regular duties and as other hunting seasons opened, less time was spent collecting waterfowl data. The difference in effort expended over the season and between areas made it impossible to estimate harvest parameters or make meaningful comparisons between areas.

It was determined that a more structured program was needed in order to more accurately determine harvest levels, hunting pressure, and species composition of the kill. Therefore, in 1975 a standardized bag check program was developed to estimate the following: (1) total harvest of ducks on the major waterfowl hunting areas in the state, (2) hunting pressure on each of the selected areas, (3) species composition of the harvest and (4) hunter success.

METHODS

Bag checks were conducted on 24 waterfowl hunting areas distributed throughout Iowa's four wildlife management districts. Since hunting pressure is not evenly distributed over an entire day or season, time of day and days of the season were stratified in order to obtain more accurate estimates. Each sample day was divided into three periods. Period 1 ran from ½ hour before sunrise to 10:00 a.m., period 2 from 10:00 a.m. to 3:00 p.m., and period 3 from 3:00 p.m. until dark. The season was stratified into eight divisions. The number of bag checks made by time period and season division appear in Table 1.

Vehicle counts were made in the area parking lots during each sample time period. The number of different vehicles that used the area during each time period was calculated by recording vehicle license numbers. These data were utilized to estimate total number of hunters.

Persons conducting the survey were asked to collect as many bag checks as possible during designated time periods. Information was recorded as to the number of hunters per party, total hours hunted, number of birds retrieved, species bagged and sex of species bagged. To avoid duplication of parties, each group was asked if their hunting was completed.

Calculations

(a) Estimated harvest:

$$\text{estimated harvest} = \frac{\text{no. of different cars (parties) observed}}{\text{no. of complete parties}} \times \frac{\text{total ducks for complete parties}}{\text{no. of complete parties}} \times \text{no. of days in season division}$$

(b) Mean bag per hunter:

$$\text{mean bag per hunter} = \frac{\text{total ducks for parties with completed hunts}}{\text{no. of hunters for complete parties}}$$

Table 1. Number of bag checks made by time period and season division

	First split (October 4-11, 1975)		
	Time period		
	1	2	3
	½ hour before sunrise to 10:00 a.m.	10:00 a.m. to 3:00 p.m.	3:00 p.m. until dark
Season division			
I opening day	1	1	1
II second day	1	1	1
III remainder of season	1	1	1
Second split (October 25-November 30, 1975)			
IV opening day	1	1	1
V second day	1	1	1
VI weekday during remainder of split	2	2	2
VII weekend during remainder of split (include November 27-28)	2	2	2
VIII "peak flight" day	1	1	1

¹Present address: Atterbury Fish and Wildlife Area, Edinburg, Indiana, 46124.

(c) Percent species composition of harvest:

RESULTS

$$\text{percent species composition} = \frac{\text{no. of individuals of a species bagged}}{\text{total ducks bagged}}$$

Harvest

Total estimated duck harvest for the 24 areas surveyed was 32,591 ducks (Table 2). This is somewhat under estimated because complete data were available from only 21 locations. Nine of the areas checked accounted for the majority of the harvest of 84.8% of the total. The locations were Big Marsh, Eagle Lake, Otter Creek Marsh, Hawkeye Wildlife Area, Rush Lake (Palo Alto County), Riverton Wildlife Area, Green Island Wildlife Area, New Albin Access and Sweet Marsh. These are state areas all intensively managed for waterfowl and traditionally attract large numbers of migrants each year. In addition, refuges associated with several areas function to hold birds in the area thus providing more recreational opportunity for sportsmen.

(d) Estimated total hunter trips per season division:

$$\text{estimated total hunter trips} = \frac{\text{no. of different cars (parties) observed}}{\text{no. of hunters complete parties}} \times \frac{\text{no. of complete parties}}{\text{no. of complete parties}} \times \text{no. of days in season division}$$

Table 2. Estimated duck harvest, hunter trips and mean bag per hunter for waterfowl hunting areas in Iowa, 1975

Area	County	Estimated Harvest	Estimated Hunter Trips	Mean Bag Per Hunter
Big Marsh	Butler	6,548.50	7,800.13	0.88
Riverton	Fremont	4,642.83*	5,041.04*	1.36
Sweet Marsh	Bremer	4,002.43	9,958.74	0.66
Green Island	Jackson	3,014.12*	4,123.34*	0.85
Eagle Lake	Hancock	2,754.05	2,305.50	1.68
Otter Creek	Tama	2,702.03	4,589.29	0.54
New Albin Access	Allamakee	1,538.29	1,807.05	1.28
Rush Lake	Palo Alto	1,289.32	1,192.42	1.02
Hawkeye Wildlife Area	Johnson	1,133.90	2,646.99	0.45
Louisville Bend	Monona	878.49	2,473.40	0.35
Lansing Bottoms	Allamakee	612.39*	371.17*	1.54
Rathbun (North County Line)	Lucas	546.16	432.67	0.97
Red Rock	Marion	438.65	645.09	0.55
Hottes Lake	Dickinson	392.01	269.42	0.63
South Twin Lake	Calhoun	315.88	481.98	0.95
Goose Lake	Greene	279.84	517.24	0.70
Cheever Lake	Emmet	250.26	400.28	0.84
Rathbun-Atwell	Appanoose	247.50	302.76	0.88
Rush Lake	Osceola	245.18	479.63	0.63
Elk Creek	Worth	232.05	340.69	0.75
East Slough	Emmet	187.17	165.17	1.65
Rathbun (South County Line)	Appanoose	180.41	197.17	0.92
Brown's Slough	Lucas	85.63	220.97	0.37
Dan Green Slough	Clay	73.50	88.50	0.94
Totals		32,590.59	46,130.64	0.90

*Incomplete data.

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Table 3. Species composition by percent of bag checks conducted on 24 waterfowl hunting areas in Iowa, 1975

Area	Mallard Male	Mallard Female	Wood Duck	GWT	BWT
Big Marsh	32.03	12.96	4.20	12.32	26.82
Eagle Lake	18.97	9.14	3.19	33.66	25.76
Cheever Lake	9.09	5.05	28.28	13.13	36.36
Louisville Bend	21.51	14.72	4.90	35.47	5.66
Hottes Lake	12.04	5.76	21.47	19.37	19.89
Rush Lake (Osceola Co.)	15.29	14.65	9.55	17.83	14.01
East Slough	7.69	4.61	3.85	36.15	39.23
Otter Creek	33.13	16.25	8.75	12.50	13.13
Coralville	26.79	15.48	2.98	19.05	15.48
Rush Lake (Palo Alto Co.)	25.00	16.23	13.16	10.09	14.91
Red Rock	10.77	6.15	33.85	21.54	15.38
Riverton	8.60	7.11	8.98	34.04	33.29
Brown's Slough	17.65	5.88	17.65	0.00	11.76
Rathbun (North County Line)	34.31	10.22	25.55	10.95	2.19
Rathbun (South County Line)	20.00	20.00	13.33	10.00	0.00
Rathbun (Atwell)	48.57	11.43	20.00	0.00	0.00
Green Island	11.47	14.73	36.39	20.65	9.84
New Albin Access	22.49	13.40	20.33	14.35	17.22
Goose Lake	15.00	8.00	1.00	26.00	25.00
Elk Creek	13.33	12.22	27.78	22.22	21.11
Lansing Bottoms	8.77	8.19	43.08	10.53	6.43
Dan Green Slough	5.26	5.26	31.58	15.79	21.05
South Twin Lake	12.77	12.06	21.28	26.24	19.15
Sweet Marsh	7.94	9.15	13.00	22.74	36.94
Total	17.87	10.76	14.14	21.17	22.67

Total harvest on the 24 areas surveyed represented 10.6% of the state total (308,243) as estimated from the U.S. Fish and Wildlife Harvest Survey (Sorensen et al. 1977). It is obvious therefore, that substantial duck hunting opportunity is available on many other areas, both public and private.

The majority of the harvest (52.9%) occurred on weekends with the two opening weekends accounting for 36.9% of the season harvest. Harvest rate appeared greatest on opening weekends averaging 3,008 birds per day while the remaining weekends averaged 433 birds per day. An average of 740 birds per day were harvested on weekdays. Opening weekends of the hunting season traditionally bring out the greatest number of hunters. If weather conditions and migration chronology are favorable, the result is generally a higher harvest rate.

Hunting pressure and success

Estimated hunter trips for the 24 areas totaled 46,131 for the season (Table 2). As with estimated harvest, this total is conservative since complete information was not available. The nine areas which dominated the harvest, also accounted for a large percentage (81.4%) of all hunter trips. Hunting pressure was greatest on the two opening weekends with an average of 3,038 trips per day. Weekdays during the entire season averaged only 739 trips per day.

Analysis of harvest and hunting pressure by area showed a highly

significant positive correlation ($r = .748, P < 0.01$). This relationship likely reflects hunter awareness of waterfowl concentrations and hunting success. To a lesser degree, it probably reflects the fact that given an adequate supply of ducks, harvest may be increased by putting more hunters on an area. However, for each area there is a threshold beyond which additional hunting pressure would reduce the harvest due to hunter competition leading to excessive harassment of birds.

The average hunter (all areas combined) bagged 0.90 birds per hunter (Table 2). This agrees rather closely with hunter success calculated from data collected in 1973 (0.80 birds per hunter) and 1974 (0.98 birds per hunter). The degree of comparability between these figures is uncertain because sampling methods in 1975 differed from previous years. The 1975 data showed considerable variability by area, ranging from 0.35 to 1.68 birds per man. An analysis of harvest and hunter success showed virtually no relationship ($r = 0.03, P > 0.05$) between the variables. Examination of data in Table 2 shows many high and low harvest areas with similar success rates. Factors such as marsh conditions, hunting pressure, availability of ducks and good hunting spots contribute to this variability.

Species composition of the harvest

The majority of the harvest (86.7%) was comprised of mallards (28.6%), blue-winged teal (22.7%), green-winged teal (21.2%) and

wood ducks (14.1%) (Table 3). Federal wing survey data for 1975 (Sorenson et al. 1977) showed the species composition for Iowa's duck harvest was 38.9% mallard, 17.5% wood ducks, 15.1% blue-winged teal and 11.9% green-winged teal equaling 85.4 percent of the total harvest. The shift in rank of wood ducks and blue-winged teal possibly reflects the lack of bag check data from interior river areas where a substantial number of wood ducks are found.

DISCUSSION

Data from the 1975 bag check program indicates that the majority of the duck harvest on state-owned areas comes from the larger more intensively managed marshes. Refuges associated with many of these areas increase the local harvest by holding birds in the vicinity of the hunting area. Hunting pressure as well as harvest rates were greatest on weekends with most activity occurring on season openings. Hunter's appeared to be knowledgeable of state areas where large numbers of ducks are present since a significant correlation was found between harvest and hunting pressure. Hunting success varied greatly between areas and quality waterfowl hunting was not restricted to the high harvest areas. Mallards ranked first in the hunter's bag followed by

blue-winged teal, green-winged teal and wood ducks.

The bag check program, as presented in this report, provides a standardized method by which various parameters of the waterfowl harvest can be evaluated on an area basis. Conducted periodically, data obtained can be utilized to monitor trends in the harvest, migration patterns, and recreational demand. These data then become very useful for evaluating various waterfowl management strategies.

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