A THREE-YEAR WATERFOWL KILL ON REELFOOT LAKE, TENNESSEE

CHARLES K. RAWLS, JR., Tennessee Game and Fish Commission

Proc. Annu. Conf. Southeast. Assoc. Game & Fish Comm. 8:147-165

Long the mecca of avid waterfowl hunters, Reelfoot Lake has continuously furnished top-ranking sport since its birth. Reelfoot is earthquake born, spawned of a series of tremors taking place from December 15, 1811 to the "hard shock" of February 7, 1812. Some geologists, who named this shock the "new Madrid Earthquake," say it was the most violent in the history of the nation, not excepting that of San Francisco. According to reports from pioneers in the then sparsely settled country, the Mississippi River ran backward, and through great fissures which opened in the earth, sulphurous fumes boiled upward to blacken the skies.

Soon it was discovered that in the extreme northwestern corner of Tennessee a new lake had been formed above the cypress swamps. Today, in low water periods, snaggy skeltons of the original cypress brakes stand revealed as 142-year-old indicators of pioneer Reelfoot country.

Early accounts of the extent of Reelfoot Lake vary considerably. At the present, with a spillway gage reading of 282.6 feet Mean Gulf Level, Reelfoot contains approximately 27,713 acres of swamp woods, marsh and open waters. Lying in a general North-South line, its length is about 11.5 miles from a point near Tiptonville, Tennessee, to just over the Tennessee-Kentucky border. Its width váries from 4.5 miles at the south end to less than 1.5 miles in the narrower portions. The greatest depth is around 20 feet, but most water areas average less than 6 feet.

In 1941 about one-third of the entire area was leased to the U. S. Fish and Wildlife Service on a 75-year basis. The Fish and Wildlife Service, from the acreage thus obtained, established Reelfoot National Wildlife Refuge. No hunting is permitted on the Refuge, and its existence is credited by old time guides, dating from market hunting days, for perpetuation of excellent waterfowl hunting in spite of annual hunter increase.

Of the 18,442 acres controlled by the Tennessee State Game and Fish Commission, there are roughly 3,000 acres of swamp woods, 9,200 acres of open water and the remainder, marsh. Waterfowl hunting without permit or fee is allowed on State controlled areas.

In the swamp woods, bayous, sloughs and potholes bisect and dot the vegetative canopy. Baldcypress *(Taxodium distichum)* dominates the wetter portions, while on slightly elevated ridges hackberry *(Celtis* spp.), sweetgum *(Liquidambar Styraciflua),* pecan and hickory *(Carya* spp.) ecize to prominence. Deciduous holly *(Ilex decidua)* is the chief understory tree; and twining freely from plant to plant is rattan vine *(Berchemia scandens),* pepper-vine *(Ampelopsis* spp.), and wild grape *(Vitis* spp.). All these species figure prominently in food habits of waterfowl migrating through the Reelfoot area. And because of the low, level terrain, of the swamp woods, a few inches rise in lake levels will inundate hundreds of acres of these prime feeding grounds.

Most waterfowl hunting in the woods is over decoys and from small permanent blinds erected by guides dependent on their skill for a living. The principal duck killed from these blinds is the common mallard *(Anas platyrhynchos platyrhynchos),* closely followed by the gadwall *(Anas strepera),* and the ring-necked duck *(Aythya collaris).*

In the marsh zone the dominant plant is giant cutgrass *(Zizaniopsis miliacea)* whose chief virtue, since it has little value as a duck food producer, exists in the natural blinds furnished by its dense growths to the waterfowl hunter. On exposed mud flats and feather edges in the broken marsh edge, buttonbush *(Cephalanthus occidentalis),* various smartweeds *(Polygonum* spp.), and chufa *(Cyperus* spp.) contribute to diet favored by waterfowl. Hunting here is from blinds covered with cane blended with giant cutgrass, or from duck boats forced among the 7-foot cutgrass blades. Decoys are the rule, though some hunters chance pass shooting. Mallard, gadwall, ring-necked ducks, and pintail *(Anas acuta tzitzihoa),* comprise most of the birds bagged, and now and then an occasional common Canada goose *(Branta canadensis).*

Open water blinds are sided platforms fashioned from weathered boards and placed among growing cypress trees. Sufficient room is provided beneath the blind for a duck boat with which to chase down cripples and retrieve downed game. Other blinds are camouflaged frameworks large enough to hide the boat from which the hunter shoots. Some acrobatic sportsmen crawl into natural hollow stumps and make their decoy spreads nearby. In addition to waterfowl species commonly taken from swamp woods and marsh blinds, diving ducks such as canvasback *(Aythya valisineria),* lesser scaup *(Aythya affinis),* and ruddy duck *(Erismatura jamaicensis rubida)* contribute to the hunter's bag. Food attraction in most open water locations is caused by great beds of pondweeds *(Pontamogeton pectinatus, pusillus* and *americanus),* coontail moss *(Ceratophyllum demersum),* fanwort *(Cabomda caroliniana),* Mulefoot *(Nuphar advena),* naiad *(Nadjas guadalupensis),* and the duck weeds *(Lemna minor, Spirodela polyrhizza,* and *Wolffia columbiana).* Before sinking beneath the water with the advent of cold weather, these food beds are often so think that a motor boat cannot be forced through them.

Other types of nearby waterfowl areas, to some extent, influence Reelfoot's web-footed populations. The Mississippi River is less than four miles distant and often in flood stage, before levees were erected, ran through the lake. Great sandbars and mud flats on the Mississippi sometimes support a profuse growth of panic grass *(Panicum dichotomiflorum* and *capillare)* and chufa. These foods, together with attractiveness of innumerable resting and loafing areas of open water, bars and mud flats, entice and hold Canada geese and ducks of many species for longer periods than they might otherwise remain.

When the Mississippi overflows its banks and spreads shallowly over agricultural fields between riverbanks and levees, mallards, gadwalls, and baldplates *(Mareca americana)* flock quickly to the mechanically picked corn fields. There they feed on corn *(Zea mays)* and various kinds of weed seeds found in the fields.

About 15 miles south and east of Reelfoot Lake are the Obion River bottoms, normally producers in quantity of pin oak *(Quercus palustris),* willow oak *(Quercus phellos)* and water oak *(Quercus nigra)* mast. Mallards are the principal bird bagged here, and wood ducks *(Aix sponsa)* are common.

When the waterfowl populations are great in the localities mentioned, individual flocks constantly trade from one place to another, affording the hunter adequate shooting opportunity. Water level is perhaps the number one factor which determines attractiveness of the Obion River bottoms and the Mississippi River. But when mast areas of the bottoms are dry, or when feeding spots on river bars and flats are far from the water's edge, Reelfoot Lake claims the greater portion of all stopping waterfowl migrants. On the rare occasions when Reelfoot freezes over, waterfowl forsake its sheltered waters for broad, open stretches of the Mississippi.

Food availability, naturally, is of importance with regard to population movements and distribution. There must be water covering the river bottom oak flats, the swamp woods of Reelfoot and mud bars of the Mississippi before potential food supplies are utilized to any great extent. But with the advent of mechnical corn pickers, it appears to matter little to the mallard, the prized duck target of the region, whether corn fields are wet or dry. It is only during the past two "dry" years that mallards have begun extensive feeding in non-flooded corn fields adjacent to Reelfoot. Now it is not unusual during the winter to observe thousands of birds in a small-acred field crow-hopping over one another in their eargerness to scoop up the spilled grain.

Gunning pressure, too, bears on waterfowl movement. When heavy concentrations of gunners move into favored hunting grounds, ducks and geese depart for less heavily hunted locales. Strong winds or congested boat traffic created waves which disturb resting Mississippi River waterfowl sometimes force these birds to seek quieter waters.

The peak waterfowl build-up generally occurs on Reelfoot Lake in November, just prior to the opening of the gunning season. Last year it was estimated at 150,000 birds of about 20 species. An estimated average of daily populations present on both State and Federal areas throughout the season has been placed at 30,000 birds. These figures include both coot and goose populations. Following the closure of hunting, numbers again build up and wintering birds are common until the middle of March.

Population numbers and species vary during the fall and winter months with some of the factors discussed above. The first migrants are the wood duck, many of which nest on Reelfoot, and the blue-winged teal *(Anas discors).* These are followed by most of the puddle ducks common to the region, while the divers, particularly the redhead *(Aythya americana)* and the American goldeneye *(Glaucionetta clangula americana)* make a late appearance. That odd-seasonal flights have sometimes taken place has been discovered through food habits studies of waterfowl killed here. Canvasbacks, taken in early December, were stuffed with a small snail *(Neritina reclivata)* found in fresh and brackish waters of the Florida and Gulf coasts. Lesser scaup examined in the same month had been feeding on snails *(Gyratoma sp.),* a genus prevalent in the Coosa River of Alabama. It would seem more logical at this time of year for these migrants to have been on a North-South flight rather than the reverse. No adverse weather condtions were indicated as being responsible.

Migrations of lesser extent take place daily. They are shown by mallards taken on Reelfoot with pin oak acorns litterally running out of their mouths. Observed coming into the lake from the south in flocks of hundreds, the likelihood of their having been feeding in flooded oak flats of the Obion River is strong. Grains, corn from nearby fields and rice *(Oryza sativa),* presumably from Arkansas and Missouri, have been found in incoming birds to the same degree.

In 1950, as a part of Federal Aid Project W-19-D, later W-22-R, a hunter bag check to determine waterfowl kill and associated data was initiated on Reelfoot Lake. Volunteer aid was solicited from camp and boat dock operators, guides and local sportsmen. Forms were furnished them on which to record various hunting data. At the end of the season when these forms were to have been collected, what few data were obtained were, for the most part, unsatisfactory. Many errors were apparent, forms were partially completed, or just plain "lost."

Prior to the opening of the 1951 - 52 season, it was decided to employ paid checkers. Seven such men were hired and assigned to work various portions of the lake. Each was employed from the neighborhood which he was to check because of his acquaintance with boat dock operators and guides of the locality. It was felt that natives could more easily obtain complete data (even illegal kill) since they had the confidence of the inhabitants.

Nearly all sportsmen hunting on Reelfoot arrive and depart at camps situated on the lake's perimeter. Owners of these camps were contacted, the purpose of bag checks explained, and assurance given that no information gained was to be used in law violation detection. Neither hunters' names nor license numbers were to be requested, and all information gathered was to be held in strictest confidence until the season's end. Too, a report of kill figures was to made available to each camp.

Camps from which most hunters departed numbered about 14. Hence, it was a fairly easy matter for checkers to determine the number of gunners using each camp each day. Some hunters were contacted as they returned to the camps, more often data were obtained at night from guides. Because of the inability of many hunters to identify bagged birds, guide information, on the whole, was considered more reliable. Naturally some hunters were missed, and this number was recorded on the checking form (Fig. 1). From knowing the number hunting the number missed, the percentage of known hunters checked was quickly figured. The information contained in the kill tables is based on these known hunters. For the three waterfowl gunning seasons under discussion, 1951 - 52, 1952 - 53, 1953 - 54, 95 percent, 88.5 percent, and 92.38 percent respectively, or an average of 91.96 percent of all known hunters was checked. A small number of gunners wading in from surrounding farmland, or hunting from private docks made up the greater portion of "unknown" hunters. Some illegal kills (over-the-bag-limit) were not reported, but it is felt that the information learned was most valuable and remarkably complete.

Kill tables and graphs are included in this paper which will be among those bound for subsequent distribution. For that reason and the fact that such tables should be studied at leisure, only the more important data will be pointed out at this time. During the November 22, 1951 - January 5, 1952 season (Table 1, Fig. 2), a total of 7,850 ducks of 17 species was checked on Reelfoot. Of this number, mallards comprised over 55 percent of the total, ring-necked ducks almost 20 percent, gadwall over 7 percent, and pintail nearly 4.5 percent. Canvasback, lesser scaup, green-winged teal *(Anas carolinensis)*, ruddy duck, shoveller *(Spatula clypeata)*, wood duck, baldplate, bufflehead *(Glaucionetta albeola)*, black duck *(Anas rubripes)*, readhead, American goldeneye, blue-winged teal and old squaw made up the remainder. These species constitute nearly all those ducks found on Reelfoot. A few greater scaup *(Aythya marila neartica)* have been reported, and one European baldplate *(Mareca penelope)* has been identified definitely. Taken on the nearby

Number Hunters Missed _____

FORM FAW-22-R-4-10-53

WATERFOWL KILL DATA 1953-54

Date	Where Killed (General Area)	Hours Hunted			Species	Sex	Total	Birds Lost	Other Birds Crippled	Bagged During Last Hour Before Sunset	Cripples Lost Last Hour Before Sunset	Coots or Geese
		From	To	Total								
	EXAMPLE				Mallard	m	1					
					Black Duck	f	1					
11/18	Grassy Bend	7	3	8	Baldpate	f	1	2	3	1	2	Geese-1
					Mallard	f	1					Coots-7

Place checked _____

Checker _____

Fig. 1. Waterfowl checking form.

Table 1. Waterfowl kill, Reelfoot Lake. Hunting season 1951 - 52, (Nov. 22 - Jan. 5).[a]

Species	Total	Males:Females	Species percent of total checked kill
Common Mallard	4,341	58:42	55.29
Ring-necked Duck	1,567	69:31	19.96
Gadwall	572	48:52	7.30
Pintail	351	67:33	4.47
Canvasback	208	72:28	2.64
Lesser Scaup	191	67:33	2.43
Green-winged Teal	151	63:37	1.93
Ruddy Duck	143	66:34	1.82
Shoveller	65	52:48	0.83
Wood Duck	59	73:27	0.75
Baldplate	57	68:32	0.73
Bufflehead	47	66:34	0.59
Black Duck	36	58:42	0.46
Redhead	32	56:44	0.41
American Goldeneye	28	68:32	0.36
Blue-winged Teal	1	0:100	0.01
Old Squaw	1	100:0	0.01
Total	7,850	61:39	99.99
Coot	3,623		
Common Canada Goose	18		
Merganser spp.	14		
Grand Total	11,505		

[a] Figures obtained from bag checks from 95 percent hunters known to have gunned Reelfoot. Calculations by slide rule.

Mississippi River, were to juvenile surf scoters *(Melanitta perspicillata)*. The male:female ratio of all ducks checked was skewed toward males, there being 61 males for each 39 females. During this same season, 3,623 coot *(Fulica americana)* were checked, 18 common Canada geese, and 14 mergansers of various species. Hunting statistics (Table 2) for the 1951 - 52 season disclose that 3,917 hunters averaged 7.3 hours for an average bag of 2.00 ducks, plus 0.758 birds lost and 1.08 cripples. Lost and cripple figures are always questionable, however. The hunter is forgetful, reluctant though shame to admit losing birds, or is not aware a bird has been hit when in reality it may fly for only a short distance before falling.

During the November 17, 1952 - January 10, 1953 gunning, water levels were much lower than during the preceding season. Little water was present in the Obion River pin oak flats, and on the Mississippi, few sand bars and mud flat feeding areas were sufficiently flooded to be attractive to waterfowl. As a result, Reelfoot Lake received the brunt of all West Tennessee hunters. At the season's closure 13,241 ducks had been checked (Table 2, Fig. 3). Mallards headed the list with a total of 58.45 percent. Next were ring-necks with 11.12 percent, gadwall with 10.67 percent and pintail with 5.44 percent. This was the same order of

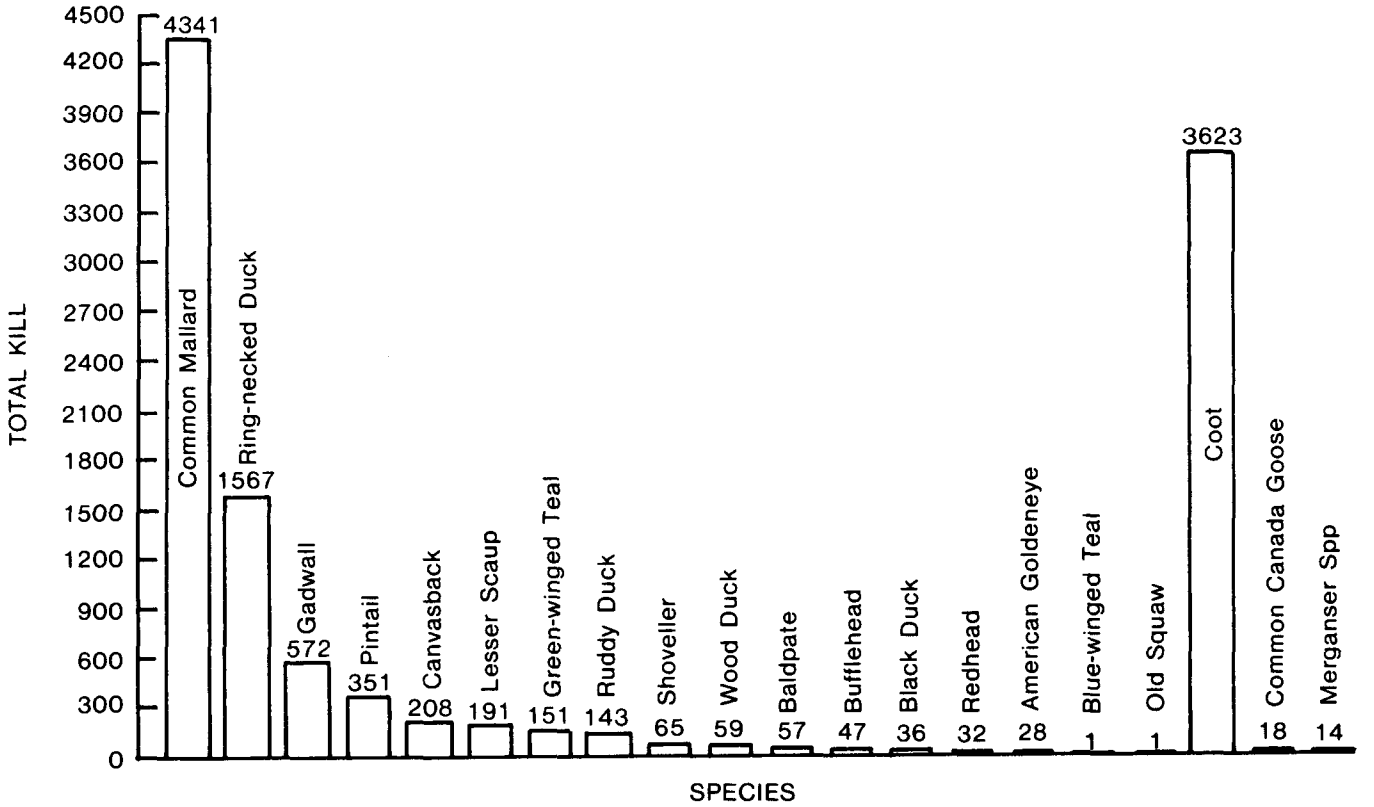

Fig. 2. Total waterfowl kill by species composition, Reelfoot Lake, hunting season 1951 - 52, (November 22 - January 5).

Table 2. A 3-year comparison of waterfowl hunting data (1951 - 52, 52 - 53, 53 - 54) on Reelfoot Lake. Slide rule calculations.

	1951 - 52	1952 - 53	1953 - 54	3-yr. Avg.
Days area checked	45	55	55	51.6
Individuals checked	3,917	6,149	7,681	5,915.7
Total blind hrs. reported	28,604	40,317	57,492	42,137.7
Avg. hrs. individual hunted	7.3	6.56	7.5	7.12
Total checked bag for area[a]	7,864	13,268	14,248	11,826.6
Avg. bag per hunter	2.00	2.16	1.86	2.02
Blind hrs. per duck bagged	3.65	3.04	4.03	3.57
Total lost birds reported[b]	2,971	3,518	3,988	3,492.3
Avg. lost birds per hunter	0.758	0.572	0.52	0.617
Blind hrs. per lost bird	9.75	11.45	14.35	11.85
Birds bagged per lost bird	2.65	3.78	3.59	3.34
Total cripples reported[c]	4,255	5,116	3,699	4,356.7
Avg. cripple per hunter	1.08	0.835	0.48	0.798
Blind hrs. per cripple	6.76	7.89	15.5	10.38
Birds bagged per cripple	1.85	2.59	3.86	2.76
Cripples per bird lost	1.43	1.46	0.92	1.27
Crippled plus lost birds per bird bagged	0.916	0.65	0.54	0.702
Birds killed last hr. before sunset			1,026	[d]
Percent of total bag			7.25	[d]
Birds crippled or lost last hr. before sunset			1,477	[d]
Percent of total cripple or lost birds			19.5	[d]

[a] Kill does not include coots or geese.
[b] Birds known downed, but not recovered.
[c] Birds known hit, but not downed.
[d] Sundown shooting permitted only during 1953 - 54 season.

species importance as was exhibited during the 1951 - 52 season. Thirteen species of other duck were also taken. Of each 100 ducks, 58 were males. Besides duck, 3,462 coot, 78 common Canada geese and 27 mergansers were checked. The final tally (Table 2) showed that 6,149 hunters averaged 6.56 hours to bag an average of 2.16 ducks, and lose an average of 0.572 birds plus 0.835 cripples each.

The November 17, 1953 - January 10, 1954 season was again a time of low water and again Reelfoot received hunting pressure usually alleviated by the river bottoms and mud flats. Of a total of 14,225 ducks checked (Table 4, Fig. 4), mallards retained first importance with 63.75 percent of all ducks killed. Of the other big four, gadwall furnished 10.35 percent, ringnecks 8.99 percent, and pintail 4.08 percent. The percentage left was spread among 13 other species. Males by 56:44 outranked females. The coot tally showed 2,838, common Canada geese 174, and mergansers 23. Relative to hunter success (Table 2) 7,681 gunners averaged 7.5 hours to take an average of 1.86 ducks per day plus 0.52 birds lost and 0.48 crippled.

Table 3. Waterfowl kill, Reelfoot Lake, hunting season 1952 - 53, (November 17 - January 10).[a]

Species	Total	Males:Females[b]	Species percent of listed total[b]
Common Mallard	7,740	57:43	58.45
Ring-necked Duck	1,473	69:31	11.12
Gadwall	1,411	45:55	10.67
Pintail	722	67:33	5.44
Green-winged Teal	482	62:38	3.64
Canvasback	329	67:33	2.48
Lesser Scaup	305	66:34	2.30
Baldpate	253	63:37	1.91
Ruddy Duck	139	61:39	1.05
Shoveller	108	52:48	0.82
Wood Duck	75	65:35	0.57
Black Duck	72	63:37	0.54
Redhead	48	60:40	0.36
Bufflehead	40	45:55	0.30
Blue-winged Teal	38	47:53	0.29
American Goldeneye	4	100:0	0.03
Old Squaw	2	0:100	0.01
Total	13,241	58:42	99.98
Coot	3,462		
Common Canada Goose	78		
Merganser spp.	27		
Grand Total	16,808		

[a] Figures obtained from bag checks of 88.5 percent hunters known to have gunned Reelfoot.

[b] Calculations by slide rule.

Reelfoot can truly be called a mallard, ring-necked, gadwall, pintail and coot lake. Each year the four named ducks were the top four birds bagged, and between them, accounted for about 86 percent of all ducks checked. Coot kill each year will average better than 3,000; mergansers can be considered incidental — usually taken by hunters who know no better.

One of the brighter spots in the waterfowl picture on Reelfoot Lake indeed throughout Tennessee, concerns the common Canada goose. Beginning in 1947 with five pinioned birds confined to a 90-acre rye grass *(Lolium* sp.) and fescue *(Festuca* sp.) pasture in the extreme northcentral lake area, the U. S. Fish and Wildlife Service initiated an attempt to build up and hold migrating goose flocks to the Reelfoot locality. Very few birds stopped at the "goose pen" that first year, but increasing in numbers each year, in November of 1953, there was an estimated peak population of 14,500 geese on the refuge. This peak occurred two to three days following the opening of the Illinois-Missouri waterfowl season. Checked goose kill on Reelfoot has reflected this increasing population — 18 in 1951 - 52, 78 in 1952 - 53, and 174 in 1953 - 54.

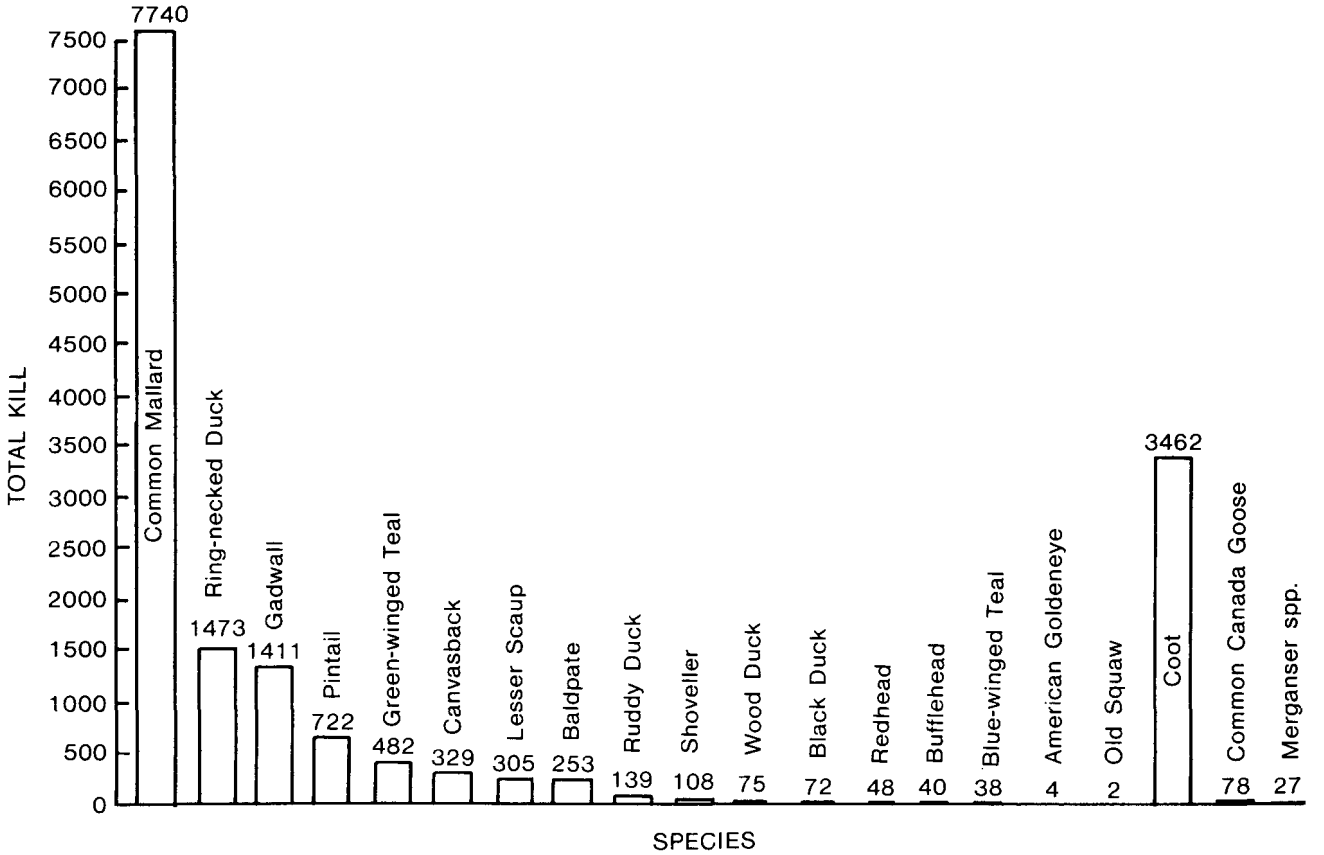

Fig. 3. Total waterfowl kill by species composition, Reelfoot Lake, hunting season 1952 - 53, (November 17 - January 10).

Table 4. Waterfowl kill, Reelfoot Lake. Hunting season 1953 - 54, (November 17 - January 10).[a]

Species	Total	Males:Females[b]	Species percent of listed total[b]
Common Mallard	9.084	55:45	63.75
Gadwall	1,473	47:53	10.35
Ring-necked Duck	1,280	66:34	8.99
Pintail	582	69:31	4.08
Lesser Scaup	471	63:37	3.31
Canvasback	383	60:40	2.69
Wood Duck	216	63:37	1.52
Ruddy Duck	175	54:46	1.23
Green-winged Teal	173	60:40	1.21
Blue-winged Teal	134	63:37	0.94
Shoveller	93	52:48	0.65
Baldpate	80	63:37	0.56
Black Duck	43	46:54	0.30
Redhead	17	53:47	0.12
Bufflehead	13	46:54	0.09
American Goldeneye	7	71:29	0.05
Greater Scaup	1	100:0	
Total	14,225	56:44	100.00
Coot	2,838		
Common Canada Goose	174		
Merganser spp.	23		
Grand Total	17,260		

[a] Figures obtained from bag checks of 92.38 percent hunters known to have gunned Reelfoot.

[b] Calculations by slide rule.

Shovellers, bufflehead, ring-neck and coot have exhibited a steady decline in bagged numbers; baldpate, black duck, green-winged teal, redhead and pintail were high in 1952 - 53, much lower in the other two years; mallard, lesser scaup, wood duck and blue-winged teal have contributed more to the hunter's limit with each succeeding season. Probably the 1953 - 54 increase in blue-wings and wood ducks can be traced to mild weather preceding and during late fall. Eighty percent of all blue-wings are taken during the first week of the season, and though some wood duck will be downed on nearly any given day, the majority of them, also, are first-of-the-season casualties. Increased mallard kill can possibly be traced to lack of water in favored river bottom flats. It is also recognized that population ups and downs for waterfowl species migrating in the Mississippi Flyway influence the Reelfoot picture.

In Table 5 and Fig. 5 are compiled results of the three-year check. A total of 35,316 ducks of 18 species was tallied, plus 9,923 coot, 270 common Canada geese and 64 mergansers. Geese and mergansers were not sexed because of the checker's inability to do so. Mergansers were not identified as to species for the same reason. There is also a possibility that greater scaup were at times identified as lesser scaup.

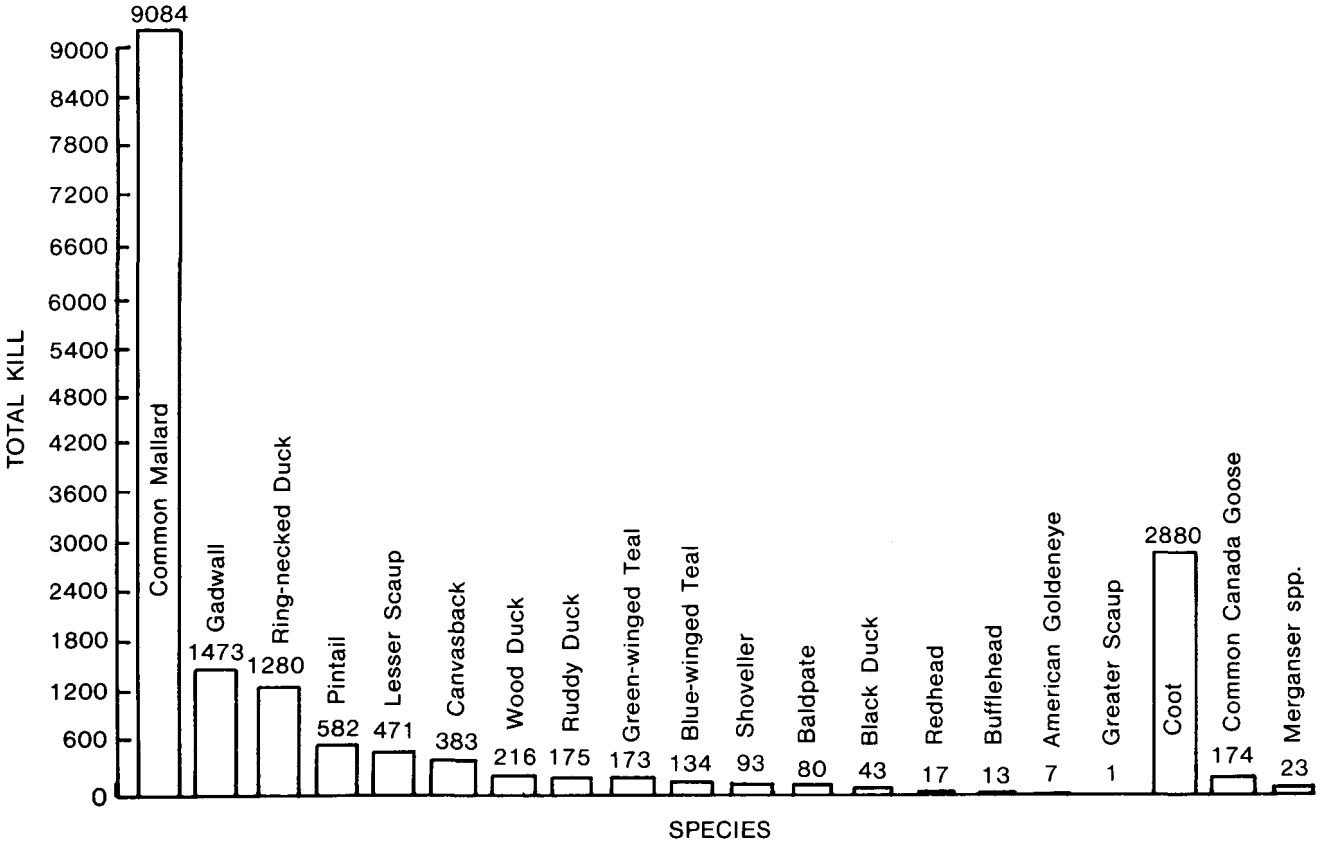

Fig. 4. Total waterfowl kill by species composition, Reelfoot Lake, hunting season 1953 - 54, (November 17 - January 10).

Table 5. Total of three years' waterfowl checks (1951 - 52, 52 - 53, 53 - 54) on Reelfoot Lake, representing the bag of an average of 91.96 of all known hunters.

Species	Total	Males:Females[a]	Species percent of listed total[a]
Common Mallard	21,165	57:43	59.93
Ring-necked Duck	4,320	67:33	12.23
Gadwall	3,456	47:53	9.79
Pintail	1,655	68:32	4.69
Lesser Scaup	967	65:35	2.74
Canvasback	920	66:34	2.61
Green-winged Teal	806	62:38	2.28
Ruddy Duck	457	60:40	1.29
Baldpate	390	65:35	1.10
Wood Duck	350	67:33	0.99
Shoveller	266	52:48	0.75
Blue-winged Teal	173	55:45	0.49
Black Duck	151	56:44	0.42
Bufflehead	100	52:48	0.28
Redhead	97	58:42	0.27
American Goldeneye	39	69:31	0.11
Old Squaw	3	33:67	0.01
Greater Scaup	1	100:00	Trace
Total	35,316	58:42	99.98
Coot	9,923		
Canada Goose	270		
Merganser spp.	64		
Grand Total	45,573		

[a] Calculations by slide rule.

As a three-year average (Table 2), 5,915.7 hunters hunted 7.12 hours to kill 2.02 ducks plus 0.617 birds lost and 0.798 crippled each day. During the 1953 - 54 season when sundown shooting was permitted, seven and one quarter percent of the total bag was taken during the last hour before sunset, and 19.5 percent of all crippled and lost birds occurred at this time. It is felt that all cripple and lost figures are conservative at best and probably reveal no more than two-thirds of the numbers they should. Other than sundown shooting, the nearly impenetrable cutgrass marsh of Reelfoot Lake is responsible for many lost and crippled birds; gunner error, too, is certainly a consideration.

With regard to hunting success it can be noted on Fig. 6, 7, and 8, that daily hunting success, as would be expected, is greatest during the first day or two of the season. On Reelfoot's opening day, 300 - 500 hunters can prepare to spend 1 to 2 blind hours for each duck bagged. Total opening day duck kills range from about 750 for 300 plus hunters to almost 1,500 for 500 hunters. As the season progresses, duck kill is roughly proportional to the number of hunters. Hunter success based on the number of blind hours required to kill a duck, which it is felt is a more accurate indicator of true hunting success than an average daily bag per

Fig. 5. Total 3-year waterfowl kill by species composition, Reelfoot Lake, 1951 - 1954.

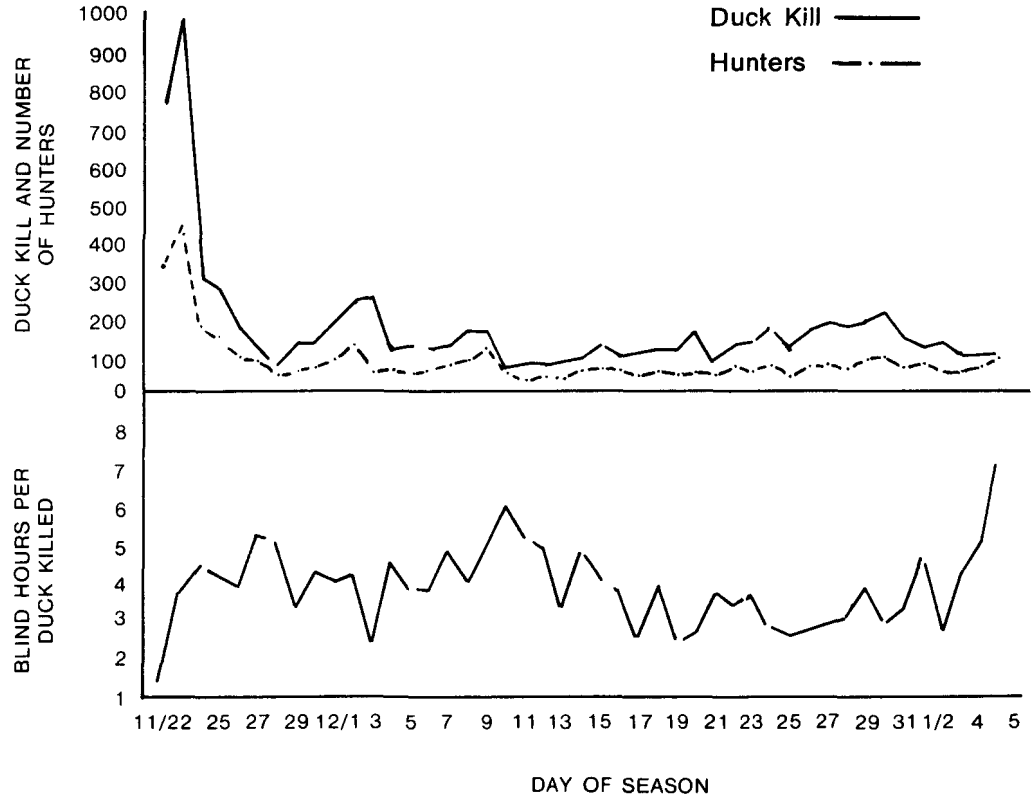

Fig. 6. Daily comparison of number of hunters with number of ducks killed, and hunter success based on daily average of actual blind hours per duck bagged, Reelfoot Lake, 1951 - 52, (November 22 - January 5).

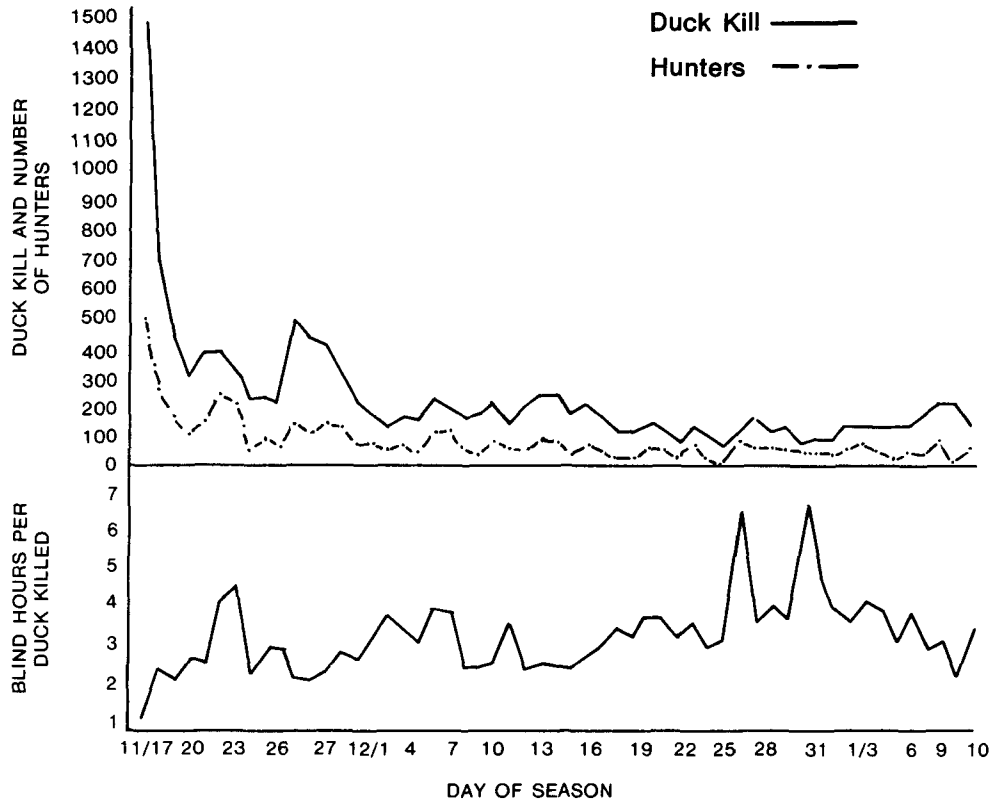

Fig. 7. Daily comparison of number of hunters with number of ducks killed, and hunter success based on daily average of actual blind hours per duck bagged, Reelfoot Lake, 1952 - 53, (November 17 - January 10).

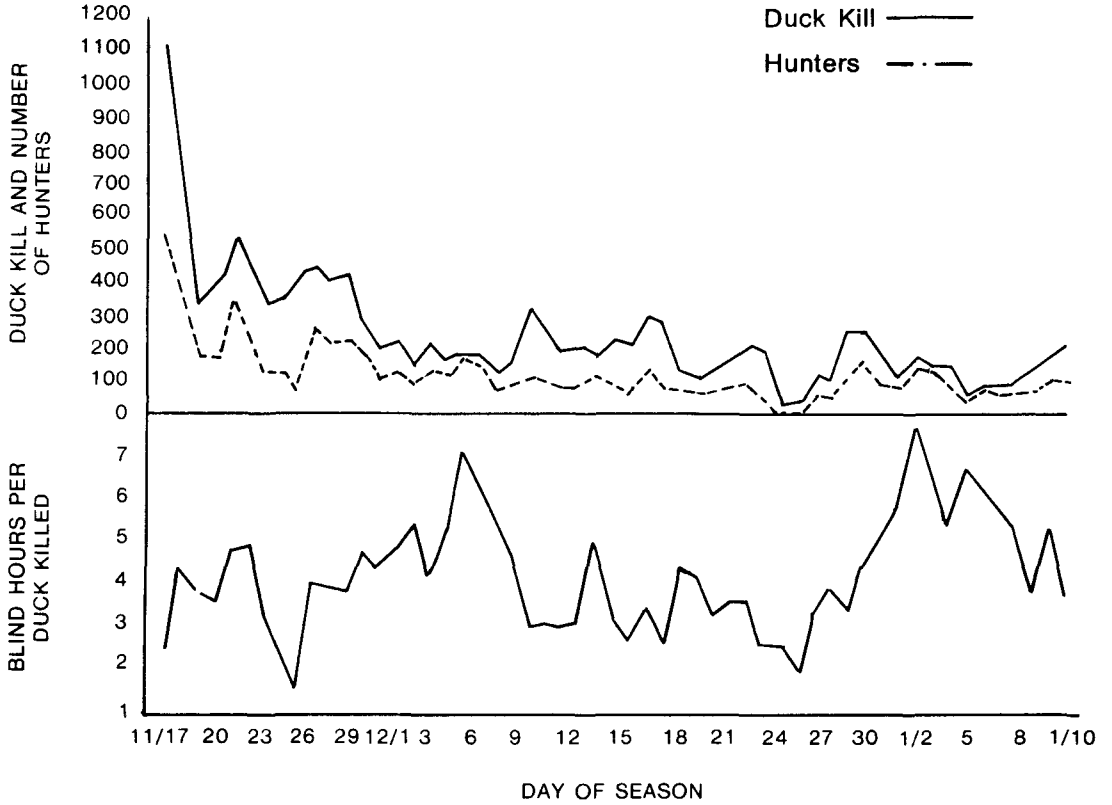

Fig. 8. Daily comparison of number of hunters with number of ducks killed, and hunter success based on daily average of actual blind hours per duck bagged, Reelfoot Lake, 1953 - 54, (November 17 - January 10).

hunter, reveals sharp peaks throughout the season. To a large degree, these peaks and depressions reflect influx and departure of migrating flights, icing conditions and water levels in nearby areas. After the first day's gunning, where hunter pressure is no greater than it is at Reelfoot, weather factors rather than hunter numbers seem to exert the greatest influence on hunter success.

But with all its brilliant past history as a sportsman's "must," Reelfoot faces a dismal future. Improper land-use practices on hillside farms along the loess bluff east of Reelfoot cause erosion with subsequent silt deposition in the lake mouths of Indian and Reelfoot Creeks, the main streams coming into Reelfoot. Gravel pits and drainage of submarginal low lands contribute their share of top spoil which finds it way into the lake. Indian Creek alone, the smaller of the two creeks with drainage area of about 5,517 acres annually adds an estimated 35-acre feet of silt to Reelfoot's problems. In low water years, ditches are cut through submarginal farm land normally inundated or too moist to farm. In years of normal rainfall, additional ditches are channeled to aid those already cut — the process seems endless and each ditch does its earthy part to hasten Reelfoot's demise.

As the lake basin fills, noxious vegetation such as giant cutgrass, cattail *(Typha* sp.), and willow *(Salix* sp.) encroach on the shallows, crowding out desirable waterfowl food, and preventing free water exchange from one lake to another. Resulting water stagnation with low oxygen content creates high fish kills, and prevents dissemination of desirable aquatic plant propagative portions. Perhaps if money were available, sufficient acreage around the lake could be purchased to ease the sedimentation problem, vegetative cover could restablished and erosion slowed. But as always, money is the big if.

Lack of water level control is another problem. The spillway at the south end of the lake is adequate, but the spillway ditch, Running Reelfoot Bayou, which after 20 miles empties into the Obion River and thence into the Mississippi, is overgrown with willow, shallowed with eroded and deposited top soil, and unmaintained for lack of funds or assigned authority. The Obion, too, is blocked by great drifts impeding stream passage. The Reelfoot National Wildlife Refuge manager is directed to maintain spillway levels at 282.6 M.G.L. minimum, but outflow is so slow in the Running Reelfoot Bayou that attempted control of lake levels is a near impossibility. If the spillway gates are opened to relieve heavy rainfall in the lake area, then agricultural interests below the spillway protest a rising water table, while farming interests above the spillway and around the lake are happy to see their water tables fall. They may be happy, but camp operators at the north end of the lake are dismal, they want high water levels for better fishing — and at the identical time that operators at the south end of the lake want low water levels for the same reason. And everybody but the farmer wants a high water level for duck hunting. On Reelfoot Lake, inherent human natures and conservation practices are as basically and irrevocably entertwined as they are elsewhere — perhaps more so.

SUMMARY

Reelfoot Lake, earthquake born in 1811 - 1812, consists of 27,713 acres of swamp woods, marsh and open waters in the north-western corner of Tennessee. Approximately one-third of this acreage is leased to the U. S. Fish and Wildlife Service and is operated as a non-human refuge. Waterfowl hunting is permitted on all Tennessee Game and Fish Commission controlled areas.

A great variety of natural duck foods abound in the swamp woods, marsh and open water areas. Excellent hunting is experienced in all three types. This hunting is influenced by existing water levels in the Obion River pin oak flats, the Mississippi River and adjacent agricultural fields. It is also affected by icing conditions, gunning pressure and river traffic.

The peak population of 150,000 waterfowl of about 20 species including coot and geese occurs in November. Odd season South-North migrations have been revealed through food habit studies. Though some wintering populations are present, the overall picture is definitely not static.

During the 1951 - 52, 1952 - 53, 1953 - 54 waterfowl seasons, seven natives were employed to gather waterfowl kill and associated data. An average of 91.96 percent of all known hunters was checked.

Annual kill and data tables and graphs abound as part of this report, but a three-year total reveals that on the annual average, 5,915.7 hunters spent 7.12 hours to kill 2.02 ducks, plus 0.617 birds lost and 1,798 crippled each day.

Hunting success and kills are greater the first day of the season. Weather, rather than gunning pressures, appears to bear the greatest influence on post-opening hunter success.

A total of 35,316 ducks of 18 species was tallied, plus 9,923 coot, 270 common Canada geese and 64 mergansers. Male: female ratios were skewed in favor of males by 58:42. This skewness is apparent in both pre- and post-season observations.

Mallard, ring-necked ducks, gadwall and pintail each year made up 86 percent of all ducks checked; coot kill each year was nearly 3,000.

Goose populations stopping on Reelfoot have increased since the beginning of a decoy flock of five pinioned birds on a 90-acre Refuge pasture area in 1947. Two to three days following the 1953 opening of waterfowl season in Missouri and Illinois, this population built to a peak of 14,500 birds. Checked goose kill on the lake — 18 in 1951 - 52, 78 in 1952 - 53, 174 in 1953 - 54 — has reflected this population increase.

Shovellers, ring-neck, bufflehead and coot have exhibited a steady decline in bagged numbers; baldpate, black duck, green-winged teal, redhead and pintail were high in 1952 - 53, much lower in the other two years; mallard, lesser scaup, wood duck and blue-winged teal have contributed more to the hunter's limit with each succeeding season.

Reelfoot's future is not bright. Sedimentation from hillside farms and gravel pits, and drainage of submarginal farm lands into the lake are creating a situation in which Reelfoot is being utilized for a settling basin.

Lack of water level control and conflict over any attempted level add to management problems. Agricultural and sporting interest not only disagree with each other, but among themselves.

CONCLUSION

Reelfoot from its birth has been and is a very important waterfowl area on the Mississippi Flyway. It will continue in this respect for some years to come, and though it is following the normal ecology of an eutrophic lake, its tomorrow is limited — catalyzed by man's disregard for tomorrow and his tenacious worship of the "dollar now" theory.