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MIGRATION OF THE RED-HEAD FROM THE
UTAH BREEDING GROUNDS

BY CECIL S. WILLIAMS

THERE are only a few areas in the United States where the Red-head (*Nyroca americana*) still breeds in appreciable numbers and of these remaining areas, the marshes and sloughs of northern Utah are among the most productive. The forces of civilization in this region have been retarded in their rate of encroachment upon the breeding habitat by the vast acreages of submarginal land; by the Federal and State Refuge Systems that have saved important parts of the breeding environment; and finally, by the early realization among the people that the marshes and the birds frequenting them are economic assets. As a consequence, the seed-stock of the Red-head is above the average and thousands of young birds are produced annually.

An idea of the productivity of Red-heads by the Utah breeding grounds was indicated by Williams and Marshall in 1938 [Journ. Wildlife Management, 2 (2): 29-48, Apr. 1938]. They recorded 343 Red-head nests on a selected sample area of 3,000 acres of available nesting vegetation on the Bear River Migratory Bird Refuge, a density of 0.11 nest per acre. The hatch was low at that time, but since then the mortality factors have been reduced in effectiveness and increased productivity on managed areas has been noted. There are reasons to expect further increases, but any appreciable amount over the breeding ground as a whole will be largely dependent upon more intensive management unless greater efforts are expended by conservation agencies, game clubs, wildlife federations, and individual conservationists in providing and maintaining more nesting environments.

Conditions on the breeding grounds, despite their importance, do not give the complete picture in the management of a species of waterfowl. The birds must migrate, winter, and migrate again, and adequate provisions for their requirements should be made on their travel routes. Thus from the standpoint of developing a broad management program for the birds of this particular breeding stock, it becomes essential to be informed of their migratory habits—the where, how, and when of their habits after they attain flight on the breeding grounds.

Resort has been made to the data from the banding of young Red-heads in order to obtain some of the needed information. A number of immature Red-heads have been banded on the Bear River Migratory Bird Refuge every year since its establishment in 1929, but significant numbers for the Bear River marsh area as a whole are available only for the years 1929, 1930, and 1931. Banding operations on the Bear River Refuge and on the Utah State Public Shooting Grounds, a portion of the breeding environment near Corrine, Utah, were carried on by Biological Survey personnel between July 14 and August 7 of these years. Banding was done while the young were still in the flightless stage.

RETURNS

The number of young birds banded during the periods under consideration totalled 2,332. Of this figure, 357 (15.3 per cent) bands were returned from birds shot by sportsmen in different sections of the continent. The distribution of returns, as evident in the accompanying map (Text-figure 1), shows the importance of the

Utah breeding grounds to the sportsmen elsewhere on the continent. Bands were returned from 18 states, 1 Canadian province, and 3 Mexican states.

The banding data are summarized in Table 1, and it is evident from the tabulations therein that the first shooting season is the most critical for the birds. At least 13.3 per cent of the banded population was taken during that period, as compared to averages of 1.6 per cent, 0.17 per cent, and 0.12 per cent for second, third, and fourth

TABLE 1

DATA OBTAINED FROM THE BANDING OF YOUNG REDHEADS ON THE NORTHERN UTAH BREEDING GROUNDS DURING 1929-31, INCLUSIVE

No. of birds banded & date	RETURN DATA ON BANDED BIRDS							
	Age of birds when collected							
		-1 yr.	-2 yr.	-3 yr.	-4 yr.	-5 yr.	-6 yr.	Totals
1005 in 1929	No. of returns	149	18	3	1	—	1	172
	% of returns*	14.8%	1.7%	0.2%	.09%	—	.09%	17.1%
	Rate of return†	(87%)	(10%)	(2%)	(.5%)	—	(.5%)	(100%)
916 in 1930	No. of returns	121	11	1	—	—	—	133
	% of returns*	13.2%	1.2%	0.1%	—	—	—	14.5%
	Rate of return†	(91%)	(8%)	(.7%)	—	—	—	(100%)
411 in 1931	No. of returns	41	9	—	2	—	—	52
	% of returns*	9.9%	2.1%	—	0.4%	—	—	12.6%
	Rate of return†	(79%)	(17%)	—	(4%)	—	—	(100%)
2332 TOTALS	No. of returns	311	38	4	3	—	1	357
	% of returns*	13.3%	1.6%	0.17%	0.12%	—	0.04%	15.3%
	Rate of return†	(87%)	(10.6%)	(1.1%)	(.8%)	—	(.2%)	

* Percentage of the total banded population returned at different ages.

† Percentage of all bands returned at the different ages. Example: of 172 bands returned from young birds banded in 1929, 87% were from birds less than one year old; 10% from birds less than two years of age, etc.

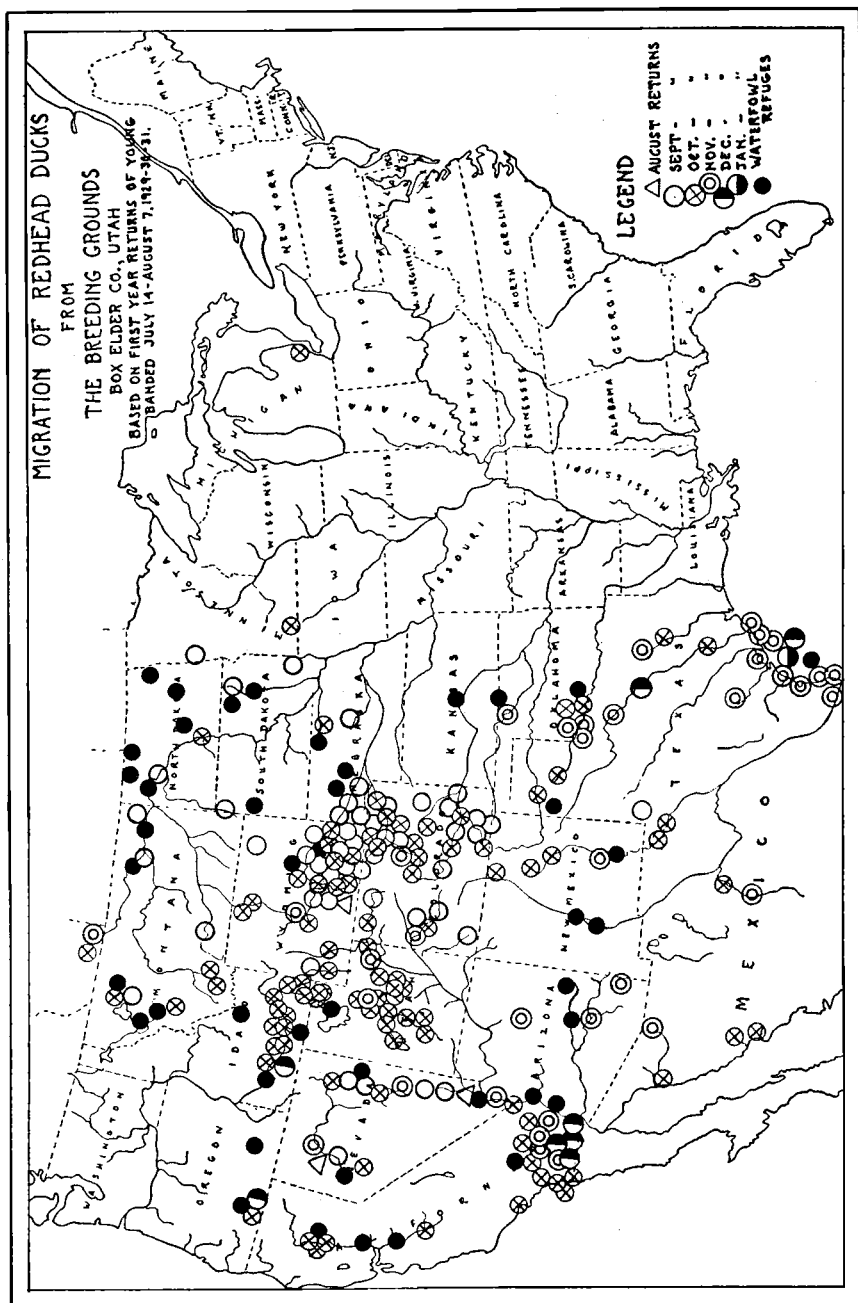
seasons following banding, respectively. The first season's return of bands represents an average of 87 per cent of all of the returns. In referring to the table, the figures, especially those pertaining to birds older than one year, should be interpreted with caution, as there are no data at hand to judge the average length of time bands remain on the ducks' legs, nor the population of banded birds remaining after various mortality factors have taken their toll. Unquestionably, banding returns lose much of their significance after the first year, but inasmuch as the percentages of banded birds taken while they were less than one year of age vary only 4.9 per cent over the three years of banding operations, the 13.3 per cent average kill

of the banded population may be taken as a basis for management until more accurate figures become available. This percentage applies to young birds produced each year, not to the adult population which may or may not be subjected to the same hunting pressure. However, no field observations have been recorded which would indicate that the hunting pressure differs appreciably between the two groups.

TIME OF FALL MIGRATION

Most young Red-heads of the region attain their powers of flight by mid-September. They are timid and secretive in habits on their breeding grounds, frequenting the dense bulrush marshes or the margins of open lakes. There is no tendency toward concentration after the birds can fly, and evidently departure is in small groups. The birds gradually filter out much in the same manner that they arrive in the spring, in sharp contrast to the migration of some of the other species, notably the Mallard, Green-winged Teal, and Pintail. In these, mass movement is commonplace, and an observer experiences little difficulty in knowing when they come or go. The Red-head, on the other hand, has much in common with the Ruddy Duck, a species which may be present in goodly numbers all during the nesting, brooding, and molting periods without giving much evidence of the fact.

Reference to the map (Text-figure I) will show that the filtering-out process begins soon after the birds become able to fly. The map also shows the months during which the birds may be expected at various points along their fall migration routes. Movement begins in August, as evidenced by the returns from Laramie, Wyoming; from Winnemucca and Las Vegas, Nevada; and from an unknown point in Mexico. The records are replete with returns from birds, flightless when banded in early August, taken during September in Colorado, Wyoming, South Dakota, North Dakota, Nebraska, Nevada, and Montana. Some of the birds are even on the wintering grounds during October. While the fall migration may start early, many young Red-heads remain on the breeding grounds until the latter part of October, as indicated by the large number of returns from Utah during that month. If any movement approaching mass migration does occur, it takes place during this period, for the November returns from Utah take a significant drop. In 1929 and 1930, a total of 104 October bands were returned from the State, as compared with only nine for November and two for December. The 1931 figures are not considered, as the shooting season of that year



TEXT-FIGURE 1.

was for October only. That the Red-heads mostly leave the breeding area by early November is also attested by records of hunting kill on the Bear River Refuge during the last two weeks of October, as compared with the kill of November 1-15 during the years 1938-40, inclusive:

<i>Year</i>	<i>Oct. 15-31</i>	<i>Nov. 1-15</i>
1938	394	44
1939	60	12
1940	215	30

The importance of these data to management of the Red-head, especially in Utah and adjacent states, is apparent; the kill can be controlled by regulating the time of open season. To give the Red-head of the Utah marshes the protection it deserves at this critical period, the hunting season should not begin before November 1, in Utah, Idaho, Colorado, and Wyoming. It is not meant to infer that hunting is the most important factor limiting the increase of the species, but merely to point to one management measure which would be certain to aid the Red-head population of this particular breeding ground.

MIGRATORY LANES AND WINTERING GROUNDS

The available evidence indicates a vagabond existence for the birds from the time they leave the breeding grounds until they concentrate on the wintering areas. The small groups apparently move leisurely from one favorable locality to another. If, however, only the returns from birds shot the first season after they were banded are plotted on a map (Text-figure 1), a pattern is formed which is useful in the management of the species. While the fact that a banded bird is taken in a particular locality does not give evidence of how it arrived there, a knowledge of the birds' habits, general physiography between points, combined with the return data from other banded birds, does permit filling in favorite routes. In this manner, the wintering grounds and the prominent travel routes to them have been worked out for the Utah Red-head.

Two principal wintering grounds are apparent—southern California and the lower coast of Texas. The place of wintering, however, seems to depend largely upon the character of the weather and the condition of food and cover at points along the route. The Imperial Valley, especially the Salton Sea, provides the attraction for the birds that winter in southern California; the wintering grounds of coastal Texas extend from around Corpus Christi south to Brownsville and Mexico and include such vast areas as the Laguna Madre. No returns of

Utah Red-heads are recorded from the excellent Sabine marshes of coastal Louisiana.

The routes by which the birds wander to the wintering grounds are several and differ in degree of pronouncement on the map not unlikely due to differences in the hunting pressure. The Texas coast seems to have several alternate highways leading to it. One follows the Bear River into Idaho and Wyoming; across Wyoming to the Pathfinder and Seminole Reservoirs and reservoirs near Laramie; the tributaries and reservoirs of the South Platte and Arkansas Rivers in Colorado; the Canadian and Pecos systems in New Mexico; and the Pecos, Red, Little Colorado, and Trinity systems in Texas. An alternate route uses the marshes south along the Wasatch Mountains, the Strawberry and Green rivers and reservoirs in Utah; the Yampa, Rio Grande, Gunnison, and Animas systems in western Colorado; to join the other route either in Colorado or New Mexico.

The most prominent travel route to southern California runs north into Idaho, and thence follows the Snake River probably to the Salmon and Bruneau tributaries and the Humboldt drainage in Nevada; thence southward through White Pine Valley, Ruby Lake, White River, and Pahranaagat Lakes in Nevada. Some of the birds evidently branch off from this route near Elko, Nevada, and move westward to the Winnemucca Lake and Carson Sink country of Nevada and the Sacramento and San Joaquin valleys of California.

A few returns are recorded from widely separated localities in states east and north of Idaho and Wyoming, but considering the distributions of returns, the hunting seasons, and the density of hunters in all of the states, there is only a remote possibility that an appreciable number of Utah Red-heads travel across country to the east coast.

The data indicate that the Red-head is largely dependent, during migration, on chains of closely spaced habitats. Lakes and reservoirs seem especially to be frequented by the birds. In this connection, the improvement in feeding and resting conditions in any such impoundments on or along the rivers serving as traffic lanes would unquestionably be of value.

The Federal Government and some State Governments have within recent years established refuges at known concentration points for waterfowl. Reference to the banding map on which circles represent the locations of Federal waterfowl refuges will indicate that while the widely scattered refuges are situated at strategic spots for the Utah Red-head, there is need for more managed areas along the travel lanes before they will be adequately cared for. An expansion of the fed-

eral system is desirable in order to fill the blank spaces which are apparent on the map. In Colorado, for instance, which is a key Red-head state, there should be at least three major refuges in different parts of the state: one along the South Platte in Weld or Morgan counties; a second, along the Arkansas in the Pueblo or La Junta regions; and a third, in the Grand Junction or Durango areas of western Colorado. It should be emphasized, however, that many other considerations influence the selection of a refuge site, one of the most important of which is the possible damage to agricultural production by bird concentrations. This is a serious consideration in Colorado.

The greatest value would accrue to the birds, however, from the saving and improving of numerous small habitats between existing major refuges. This holds true for other species, as well as for the Red-head. Such projects are not economically feasible for the Federal Government, but do offer desirable undertakings for both state and local agencies, game clubs, and other conservation-minded groups and individuals. It may be well to sound a warning that unless these small but productive areas are saved for the future and improved by such activities, the sportsmen on many areas in the West will sooner or later find that the expected flight of birds has passed them by and is concentrated on major refuges where the food and cover are attractive but where no hunting is permitted.

SUMMARY

Analyses of banding returns from 2,332 young Red-heads banded between July 14 and August 7, during the years 1929, 1930, and 1931, on breeding grounds in northern Utah show that:

1. The birds from this breeding area were taken in 18 states, 1 Canadian province, and 3 Mexican states.
2. The first season of hunting is the most critical for the birds, but a 13.3 per cent annual kill of young birds may be used as a basis for management.
3. The fall migration is a filtering-out process of small groups, beginning in August and accelerating near the last of October so that the birds are mostly gone from the breeding grounds by early November.
4. The kill can be reduced appreciably by opening the shooting season in Utah, Idaho, Wyoming, and Colorado not earlier than November 1, each year.
5. The principal wintering grounds are the Salton Sea region of southern California and the lower coast of Texas from Corpus Christi to Mexico.

6. There are favored travel routes to wintering grounds. These are indicated on a migration map, and the need for closely chained feeding and resting habitats along the principal river systems which the birds follow is emphasized.

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WILSON'S PLOVER IN ITS SUMMER HOME

BY IVAN R. TOMKINS

Plate 12

THIS paper is intended to give a tentative view of the life history of Wilson's Plover (*Pagolla w. wilsonia*), compiled from notes made during the past nineteen years. About two hundred visits have been made to the nesting areas during the spring and summer seasons, and many more in autumn and winter. The notes mention about one hundred and five nests, with casual references to many more. Unfortunately it has not been practicable to present more complete studies of particular family groups.

A few visits have been made to plover habitats in Duval County, Florida; Glynn County, Georgia; and Charleston County, South Carolina; but most of the time involved has been spent along the lower Savannah River, in that most interesting progression from cypress swamp through fresh, brackish, and salt marshes to the beaches bordering Callibogue Sound and the Atlantic Ocean.

MIGRATION

March 3, 1931, is my earliest spring record, but that was of only a single bird, and no noteworthy migration occurred that year until some time during the night of March 14-15, when numbers of the birds arrived. The first groups of migrants do not stay long but pass on to more northerly breeding grounds. One may find many birds, or none, at almost any time from the middle of March to the first of April, about which latter date our local birds arrive. The first large flocks of spring contain both sexes.

The peak of the nesting season is in May and June, although a few nests may be found as late as early July. The birds remain sparingly on their territories until late July. By August 1, there is a noticeable thinning of the numbers to be found on the beaches and mud flats, although they are still to be found until early September, and an occasional one may be seen until the middle of October. My