

MAINE COOPERATIVE WILDLIFE RESEARCH UNIT

University of Maine

Orono, Maine

QUARTERLY REPORT

January-March, 1962

Cooperating Agencies

Maine Department of Inland Fisheries and Game
Wildlife Management Institute
University of Maine
U. S. Bureau of Sport Fisheries and Wildlife

Unit Personnel

Leader - Howard L. Mendall
Assistant Leader - Malcolm W. Coulter
University Representative - Albert D. Nutting
Faculty Collaborators - Horace F. Quick
 David C. O'Meara
 Chester F. Banasiak
Graduate Assistants - Benjamin W. Day, Jr.
 Henry W. Houseman
 Russell R. Hyer
Graduate Student - Hugh Haswell
Secretary - Maxine L. Horne

NOT FOR PUBLICATION

The quarterly reports are usually statements of progress. The data presented often are incomplete and the conclusions reached may not be final. Consequently, permission to publish any of the information contained herein is withheld pending authorization from the Research Unit.

MAINE COOPERATIVE WILDLIFE RESEARCH UNIT

Quarterly Report

January-March, 1962

RESEARCH PROJECTS

WATERFOWL RESEARCH

(a) Waterfowl Distribution and Management

Objectives: To obtain data on the abundance, distribution, and migration of waterfowl species in Maine; and to conduct research that will assist in the management of the important breeding species, especially the black duck and the ring-necked duck.

Assignment: Howard L. Mendall, Leader

Inactive during the quarter.

Plans for next quarter: To initiate the season's field studies in April.

(b) Renesting and Homing Study

Objectives: To study renesting behavior and the degree of migrational homing exhibited by waterfowl, primarily the black duck, mallard and the ring-necked duck.

Assignment: Malcolm W. Coulter, Assistant Leader
(Vermont phase conducted jointly with William Miller, former Waterfowl Project Leader, Vermont Fish and Game Service)

Inactive during the quarter.

Plans for next quarter: To begin the spring field work in April.

(c) Waterfowl Hunter Bag Checks

Objectives: To determine hunter success, crippling loss, and species, sex and age composition of the kill.

Assignment: Howard L. Mendall, Leader

Inactive during the quarter.

Plans for next quarter: Inactive.

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WOODCOCK RESEARCH

Woodcock Population Studies

Objectives: To conduct an annual census and to obtain related ecological data on the Unit's permanent census routes in Maine.

Assignment: Howard L. Mendall, Leader

Inactive during the quarter.

Plans for next quarter: The spring field studies will begin in early April. Graduate Assistant Houseman will be in charge of the Greenbush banding work carried out for the past two seasons by former Graduate Assistant Frederick Payne.

ECOLOGY OF COASTAL HABITAT

Classification of Coastal Marshes and Mud Flats

Objectives: To devise a practical system for classifying coastal habitats possessing the following prerequisites:

1. It should be sufficiently descriptive so that any field biologist can apply it.
2. It should reflect the ecological differences between the various habitats.

Assignment: Russell R. Hyer, Graduate Assistant

Emphasis was placed during this quarter on the review of pertinent literature and a revision of the project outline. A preliminary draft of the outline, including the selection of a group of study areas, was accepted. For the initiation of study, the following areas have been selected because of the knowledge available on the use by waterfowl, the variation in their individual environments, and their accessibility: Kilkenny Cove, Raccoon Cove, Hog Bay, Jordan River, Bagaduce River (all in Hancock County); the Weskeag River marsh (Knox County); plus Sears Island and the Penobscot Estuary from South Orrington to Sandy Point in Waldo and Hancock counties. All of these areas, except the Weskeag River, were visited during this quarter and preliminary field work begun. The study will be extended to include a few areas in southwestern Maine as the preliminary field procedures are established. Consultations with State and University personnel, particularly Howard L. Mendall, Malcolm W. Coulter, and Howard E. Spencer, were very useful during this preliminary planning.

Plans for next quarter: To begin intensive field study on the coast. On April 13, a consultation will be held in Boston with Mr. Francis Schmidt and other members of the Technical Services Division of the Bureau of Sport Fisheries and Wildlife.

BIG GAME RESEARCHWinter Behavior of the White-tailed Deer

- Objectives: (1) To determine environmental differences in two deer yards of contrasting cover types but with similar climatic conditions.
- (2) To determine variations in deer behavior within the two yards and to relate these to environmental factors.

Assignment: Benjamin W. Day, Jr., Graduate Assistant

During the period January through March, 33 trips were made to the study yards. A total of 64 man days of advisory, graduate, and undergraduate assistance was utilized for gathering data. These consisted of recordings of temperature and snow accumulation; measurements, the depth to which deer sank in snow while traveling, single track to trail ratios, feeding and bedding activity; also information on mortality, predator sign, and other ecological factors. Temperature records were obtained for each area by the use of a recording thermograph and several maximum-minimum thermometers.

Within the mountainous hardwood yard (T5R9), John Willette, a local resident, recorded daily temperature fluctuations and snowfall using a maximum-minimum thermometer and a yard stick. Similar information was gathered in the yard typical of a spruce-fir situation through the cooperation of several woodsmen.

With the exception of 2-3 day periods following the few storms that occurred, the movement of deer was not restricted to any great extent throughout the winter. Partly responsible for this was a substantial layer of crust that was in evidence nearly everywhere and tended to become increasingly strong as the winter progressed. During periods of the deepest snow accumulation (February 20-March 20) this crust was seldom more than 18 inches below the top of the snow in the mixed growth and generally less in the softwoods.

The total length of time that deer in the Springfield study area were limited in their access to the fields and orchards was no longer than 6 weeks. At the yard in T5R9, dependence on the heavier cover next to the river was limited to only the last 3 weeks of February. Immediately following this period, travel throughout the more lightly sheltered portions of the yard again became evident.

Only once (first three days of February) were the deer closely restricted in their movements. Extreme temperatures rather than snowfall appeared to be the climatic factor responsible for this reduction in movement. During this period, daily minimum temperatures were -26° , -42° , -21° F., and -26° , -40° , -18° F., for T5R9 and Springfield respectively. A thaw immediately followed this cold snap and the deer became as dispersed as they had been during early January.

One entire dead deer and parts of four more were found on the study areas. Three of the remains were determined to be fawn (1 buck, 2 unidentified as to sex), by hind leg measurements and molar succession. One was a yearling buck and the last was unidentified as to sex and age. The fawn buck was

most likely a pre-winter fatality as judged by the stage of molar succession and pelage. The cause of death of the yearling buck was suspected, by Fish and Game Biologist, Myron Smart, to be the result of winter bobcat predation.

Plans for the next quarter: To make follow up trips to both study yards for purposes of preparing final cover type maps, food surveys, noting summer deer activities, etc.

COOPERATION, EDUCATION WORK AND MISCELLANEOUS ACTIVITIES

Coulter and Mendall continued to furnish technical aid to the state Department of Inland Fisheries and Game.

Assistance was given the general public in arranging for autopsies, identifying specimens, and in furnishing technical information.

Coulter assisted in conducting the wildlife seminar. Mendall was moderator of the waterfowl program at the January meeting. Also participating in this were Edward J. Baker, U. S. Game Management Agent and Robert Johnson, Director of Research and Planning for the State Department of Inland Fisheries and Game.

Mendall and Coulter attended the Annual Unit meetings and North American Wildlife Conference in Denver, Colorado. Coulter was re-elected as regional representative of the Wildlife Society for the northeast region. Enroute to Denver Mendall visited the Missouri Unit and spoke at a combined meeting of wildlife student organizations at the University of Missouri. He described the waterfowl research program being conducted in Maine.

Mendall participated in the 3-day regional conference of Fish and Wildlife Service employees held in Boston, Massachusetts.

PUBLICATIONS

Coulter and Mendall edited a revised draft of a condensation of the thesis of former Graduate Assistant Hartman. This is to be submitted for publication in the near future.

Mendall prepared a paper for presentation at the waterfowl session of the Northeastern Fish and Wildlife Conference to be held in Monticello, New York in May.

Respectfully submitted,

Howard L. Mendall

Howard L. Mendall, Leader
Maine Cooperative Wildlife
Research Unit

May 21, 1962

MAINE COOPERATIVE WILDLIFE RESEARCH UNIT

University of Maine

Orono, Maine

April-June, 1962

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RESEARCH PROJECTS

WATERFOWL RESEARCH

(a) Waterfowl Distribution and Management

Objectives: To obtain data on the abundance, distribution, and migration of waterfowl species in Maine; and to conduct research that will assist in the management of the important breeding species, especially the black duck and the ring-necked duck.

Assignment: Howard L. Mendall, Leader

The regular season's field studies were conducted throughout the quarter. The annual report on this subject has been submitted. Although this covers slightly more than the current quarter (as of July 25), it is reproduced at this time in the interest of continuity. It is as follows:

This report summarizes the results, to date, of the 1962 waterfowl breeding ground studies in northern, eastern and central Maine. During the investigations the writer was assisted by other members of the Unit staff and also, on certain phases of the study, by the following: game warden Lawrence Caron and biologists J. William Peppard and Henry Carson of the Maine Department of Inland Fisheries and Game; biologist Eldon Clark of the Moosehorn National Wildlife Refuge; and John M. Dudley of Calais, Maine.

This is the 24th consecutive year of these studies. Techniques were the same as in recent years. Coverage was similar to that of 1961 except that an additional week in July was available for obtaining brood data.

Weather and General Breeding Conditions

Unusually mild weather in late March and the first half of April resulted in early ice-clearing on waterways throughout central and eastern Maine. This was followed by three weeks of cold, wet weather. Plant phenology was at first advanced from average, then retarded. The latter trend has continued throughout the remainder of the spring and summer. A long, dry period, with below average temperatures, prevailed from the second week of May until the last week of June. Thereafter, precipitation has been above normal but with a continuation of unseasonably low temperatures.

The seasonal chronology had an appreciable effect, mostly beneficial, on waterfowl. Early migration of black ducks, goldeneyes and wood ducks was heavy and rapid, followed by a "dribble" of late arrivals over an extended period. First arrivals of teal and ring-necked ducks were earlier than usual, but migration peaks were slightly behind their average schedule. Nesting chronology of the early breeding species was in two distinct peaks, showing a direct effect of the extremes in the weather pattern. The prolonged drought (by northeastern standards) resulted in unusually stable water levels and permitted very high nesting success for our principal duck, the black duck.

Breeding Populations

Initial breeding populations are determined from 13 study areas that, over a period of years, have proven quite reliable indicators for northern, eastern and central Maine, especially for the State's two most numerous species - the black duck and the ring-necked duck. Data for other species have less value. The two teals and the goldeneye ordinarily do not occur on the study areas in sufficient numbers to permit more than a general estimate as to annual trends.

The overall breeding population was noticeably improved over that of 1961, although there were several important species variations. The black duck showed a 17 per cent increase. This is the largest annual change recorded since 1948. For the past 10 years the species has exhibited a nearly static level with only minor year to year changes. Since population estimates were based on nearly 150 pairs of black ducks, this year's figure is considered significant. This seems especially true since the increase, although most noticeable on the eastern Maine study areas, occurred in northern and central Maine as well. Breeding black ducks are at their highest level in more than two decades, even exceeding the figure for 1953. Although this is based only on measurements from individual study areas, it is supported by the concensus of biologists and wardens throughout Maine.

An interesting situation is seen in the blue-winged teal. This is a secondary species in Maine, but 1962 marked the second consecutive year when a substantial increase was apparent. Although black ducks and ring-necked ducks predominate on the Unit study areas, blue-wings closely followed wood ducks in numbers of breeding ducks. For Maine as a whole, it is probable that the species was more numerous as a breeder this year than at any time since ornithological records have been kept.

Wood ducks and green-winged teal also appeared to be increased at the start of the nesting season. The goldeneye did not show an appreciable change from 1961 although the study areas are not located in optimum habitat of that species.

In striking contrast to the favorable status of most ducks, the ring-neck showed a 34 per cent decrease. This is the largest annual change yet recorded for the species. It is now at its lowest population level on the study areas since 1947.

Breeding pair counts or estimates are summarized as follows:

<u>Species</u>	<u>Status in 1962</u>
(Measured on census areas)	
Wood Duck	20% increase
Black Duck	17% increase
Ring-necked Duck	34% decrease
(Estimated)	
Blue-winged Teal	Substantial increase
Green-winged Teal	Slight increase
Common Goldeneye	No change

Nesting Success

A total of 35 nests was available to supplement more voluminous, but indirect, data relative to nesting success. This is a smaller sample than usual, due primarily to the decreased population of ring-necks. These nests were divided as follows: ring-necked duck - 18; black duck - 15; blue-winged teal - 1; green-winged teal - 1. As of July 25, all but two of these had been re-checked with a combined hatching success of 67 per cent. The figure was 53 per cent for the ring-necked duck, which is much below the long-term average. For the black duck a record high of 79 per cent success was noted. Although these data are based on a small sample, they are substantiated by brood studies which showed similar trends when considering "breeding pair - brood" ratios. On three study areas, for example, 30 pairs of black ducks had produced a minimum of 24 broods up to mid-July.

All known nest losses were attributed to predation or desertion. The mink, crow and raven were predators most often identified as causing losses. For the first time in many years, there was no evidence of nest loss by flood. Contrary to conditions in many waterfowl breeding areas, a dry spring in the northeast is associated with high nesting success.

The Brood Season

Major hatching periods for both black ducks and ring-necks have been at near average dates when considered for the entire season. However, in both species there were two distinct peaks - one earlier and one slightly later than usual. This is in accord with the contrasting seasonal chronology as already described. The blue-winged teal showed only one peak, occurring about a week earlier than average.

A noteworthy point is that the initial hatching peak of the black duck was very compact (during the last 10 days of May) and was more extensive than usual. This would give further support to the belief that the species enjoyed much better than average early season production. In fact, all species except the ring-necked duck, evidently had a very high proportion of successful early nests. Many young black ducks and teal are already at the flying stage.

Rearing conditions have not been quite as satisfactory as a year ago. Plant phenology has been retarded. This resulted in thinner cover on some study areas and, in connection with below average temperatures, may have had an adverse effect on the abundance of insect food available to the ducklings. It may have been only coincidence, but more than the usual number of young black ducks were observed feeding on land. Water levels had dropped below optimum on many marshes by mid-June. However, extensive rainfall occurred in late June and throughout the first three weeks of July. At present, rearing conditions are very good and, with a replenished water table, are expected to remain satisfactory for the balance of the season.

A total of 89 broods where complete counts were made are tabulated by age classes in Table 1. Average size of Class I young (downy stage) is slightly higher than the 7.5 figure of 1961. The size of Class III broods (two-thirds grown to flying age), however, is slightly lower than a year ago (6.5 in 1961 for all species combined). Although the sample for this age group is low, it may reflect slightly less favorable rearing conditions

of early summer. In 1961 a minimum of successful breeders reared large-sized broods. Since water levels at present are the best of the summer, it is expected that the ultimate seasonal averages for Class III will show only a slight decrease from a year ago. Furthermore, the present figure for the black duck is still higher than the long-term average.

Conclusions

1. Considering all species there were more ducks on Maine study areas at the start of the 1962 season than in 1961.

2. A large increase in the black duck was recorded and the species is at its highest population level in more than 20 years on Unit study areas, exceeding the previous high point of 1953.

3. A noticeable increase of blue-winged teal was observed for the second consecutive year. From all available evidence this duck is now more numerous as a breeding species in Maine than at any time since ornithological records have been kept.

4. In contrast to other species, the ring-necked duck showed a serious population decline. It dropped 34 per cent on the study areas in comparison with last year.

5. Nesting success was much better than average for early nesters. This is attributed directly to the dry spring. Black duck success was the highest recorded in 24 years. For the ring-neck, however, success was considerably below the long-term average.

6. Rearing conditions were not as satisfactory as last year during early summer, but are now considered to be excellent.

7. Based on all available data, overall waterfowl production in northern, eastern and central Maine is very substantially increased over that of 1961. The sole exception is in the case of the ring-necked duck. A combination of a serious population decline and lower than average nesting success is occasion for concern for this species. For other ducks, and especially the important black duck, excellent production is indicated. In view of the pessimistic report on conditions in Maine a year ago, it is gratifying to record such a marked change in 1962.

Plans for next quarter: To conclude the season's studies.

Table 1

Average Brood Sizes by Age Classes
 (Complete counts only, as of July 25, 1962)

Species	Total Broods	Class I		Class II		Class III	
		Broods	Av. Size	Broods	Av. Size	Broods	Av. Size
Black Duck	49	26	7.7	12	6.7	11	5.8
Ring-necked Duck	22	9	7.7	11	8.2	2	5.5
Blue-winged Teal	9	6	7.3	1	7.0	2	7.0
Hooded Merganser	4	2	9.5	2	8.0	--	--
Wood Duck	3	1	6.0	1	7.0	1	6.0
Common Goldeneye	1	--	--	1	6.0	--	--
Common Merganser	1	--	--	1	6.0	--	--
Totals	89	44	7.7	29	7.3	16	5.9

(b) Renesting and Homing Study

Objectives: To study renesting behavior and the degree of migrational homing exhibited by waterfowl, primarily the black duck, mallard and the ring-necked duck.

Assignment: Malcolm W. Coulter, Assistant Leader
(Vermont phase conducted jointly with William Miller, former Waterfowl Project Leader, Vermont Fish and Game Service)

The renesting and homing studies were conducted for the sixth consecutive year. Part of this work is carried out in Lake Champlain in cooperation with the Vermont Fish and Game Service. A very high degree of migrational homing was noted this spring among black ducks and mallards. Approximately half of all hens nest-trapped had been previously banded at the same or nearby nest sites during previous years. A complete seasonal summary will be given in the next quarterly report.

Plans for next quarter: To conclude the season's field work.

(c) Waterfowl Hunter Bag Checks

Objectives: To determine hunter success, crippling loss, and species, sex and age composition of the kill.

Assignment: Howard L. Mendall, Leader

Inactive during the quarter.

Plans for next quarter: Inactive.

WOODCOCK RESEARCHWoodcock Population Studies

Objectives: To conduct annual census and to obtain related ecological data on the Unit's permanent census routes in Maine.

Assignment: Howard L. Mendall, Leader

Woodcock censuses on areas in eastern Maine were conducted by Unit personnel. A very slight increase from 1961 was recorded. Although too small to be of significance it nevertheless indicates the status of the breeding populations as a continuation of the high trend of a year ago. Excellent nesting conditions prevailed and an early hatch was recorded. Many birds had reached the flying stage by the last of May.

In cooperation with the woodcock-pesticide investigations of the Patuxent Wildlife Research Center a trapping and banding study was conducted at the Greenbush study area in the Penobscot Valley. This is the third year that an attempt has been made to trap the resident male population. A total

of 17 birds were caught this spring, 9 adults and 8 yearlings. Three of the adults were returns from birds banded in 1961. Work on the Greenbush area was under the supervision of Graduate Assistant Houseman, assisted by Sergeant David Bell of the University Military Department. As was the case in the two previous years, a great deal of student interest was shown in this project. Much of the necessary manpower was provided by both graduate and undergraduate wildlife and forestry majors.

Plans for next quarter: Inactive.

ECOLOGY OF COASTAL HABITAT

Classification of Coastal Marshes and Mud Flats

Objectives: To devise a classification scheme for waterfowl habitat which occurs in the intertidal zone of the Maine coast. The classification scheme should possess the following prerequisites:

1. It should be sufficiently descriptive so that any field biologist can apply it.
2. It should reflect the ecological differences between the various habitats.

Assignment: Russell R. Hyer, Graduate Assistant

For the initiation of this study, areas were chosen which represented several environmental types along the Maine coast. These were: Kilkenny Cove, Raccoon Cove, Hog Bay, Jordan River, and Bagaduce River, all in Hancock County; Sears Island, Marsh Stream, and the Penobscot Estuary from South Orrington to Sandy Point, in Waldo and Hancock counties; also Weskeag Marsh in Knox County. They were selected because of environmental variations, plus accessibility for study and known waterfowl usage. However, field investigation to date has shown that some additional areas should be added to fill gaps in the range of common habitat types. Such additions needed are a sandy flat, a rock and gravel flat not in an estuary, and an additional marsh type.

Emphasis during this quarter has been placed on field reconnaissance and primary classification of mud flats. No work as yet has been carried out in the marsh areas. Using field maps made from copies of U. S. Coast and Geodetic Survey charts, both biological and physical characteristics of each area were recorded as follows:

1. Major plant communities. These were recorded in scale and position with reference to major constituents. On all mud flat areas, the amount of vegetation was sparse and consisted of a small number of species.
2. Bare ground conditions. General conditions as clay, silt, sand, gravel, or rock were outlined. Due to the wide variation in bare ground conditions even within a small area, only the overall appearance for large sections of any study area were noted.

3. Tides and periods of submergence. The width of the intertidal zone was determined by ground measurement at the minimum and maximum readings on a graduated tide stake. This stake was placed with its zero point at the low water line on a day when, according to the Tide Tables of the Coast and Geodetic Survey, the lowest stage of the tide was to be near mean low water. At each six-inch rise of the tide, the position of the water line on the shore was recorded. From these data, the period of submergence slope of any portion of the area could be calculated. This procedure was carried out at only four areas and will be discontinued. While slope and period of submergence play a definite role in the distribution and abundance of invertebrates and vegetation, as well as in the length of dabbling duck feeding time, it is not felt as precise a measurement is required for this study. A suitable measure can be gained from an ocular estimate coupled with distribution data on vegetation and invertebrates.
4. Other physical features. Boulders, piers, and numerous other objects have been mapped. This was done for purposes of orientation and the possible relationship of these features to concentration areas for waterfowl and/or invertebrate organisms.

The importance of several other factors has become evident during the field investigation. The various combinations of plant species, soil types, and rocks support distinctive populations of invertebrates as regards species and relative abundance. For this reason, sweepings of the vegetation and water, together with soil samples, will be examined for a determination of invertebrate organisms. This will involve a more intensive study of invertebrates and the niche they occupy in the total environment.

In some areas, it has been noted that the surface of the soil is but a thin layer which conceals a soil beneath it of a different type. For this reason, borings will be made to determine the composition of this subsoil layer. Also, many of the mud flats appear very similar, but they vary considerably in their ability to support weight. This is probably due to a change in soil composition and the related water-capacity. In an effort to measure this qualitatively, a device that will apply a uniform pressure per unit area will be placed on the mud surface and the depth to which it sinks recorded for the various flats.

In addition, measurements of the salinity and temperature of the water are to be taken at all areas. It is felt that these data will be of particular significance in the estuaries and protected coves having numerous freshwater inlets.

Plans for next quarter: To complete as many as possible of the field investigations described, and to begin the formulation of the classification scheme.

BIG GAME RESEARCHWinter Behavior of the White-tailed Deer

- Objectives: (1) To determine environmental differences in two deer yards of contrasting cover types but with similar climatic conditions.
- (2) To determine variations in deer behavior within the two yards and to relate these to environmental factors.

Assignment: Benjamin W. Day, Jr., Graduate Assistant

Inactive except for a brief trip to each study area to obtain spring data needed in type mapping.

Plans for next quarter: Inactive.

MISCELLANEOUS STUDIES

Two short-term, seasonal studies were conducted during the quarter:

(a) The Weskeag Marsh, a tidal marsh in Knox County, is high on the priority list of State acquisition areas. Accordingly a biological reconnaissance is currently being conducted by Graduate Assistant Day. Objectives are to conduct a general survey of the plants and invertebrates, and to type-map the marsh prior to any habitat changes through management; also to obtain data on present waterfowl usage. An undergraduate wildlife student, John Moulton, has been employed to work with Day during the summer.

(b) A special study was carried out during April and May by Mendall relative to color-marking of black ducks immediately prior to nesting. This was conducted in cooperation with the Moosehorn National Wildlife Refuge, where a spring banding program permitted a good series of birds for marking. The objective was to determine the feasibility of such an investigation on a more intensive basis. Information on several basic aspects of pair formation and duration of the pair bond, now little known in the black duck, can best be determined by observation of marked birds. The problem was not, of course, to mark the birds but whether subsequent observations would be meaningful when dealing with relatively thin populations in a forested region. It was concluded that such a study is feasible but would necessitate full-time efforts throughout the nesting season, preferably by a two-man team.

COOPERATION, EDUCATION WORK AND MISCELLANEOUS ACTIVITIES

Coulter and Mendall continued to furnish technical aid to the state Department of Inland Fisheries and Game.

Assistance was given the general public in arranging for autopsies, identifying specimens, and in furnishing technical information.

Assistant Leader Coulter organized and presided at a 3/4 day wildlife program as part of the University of Maine's annual Farm and Home Week activities. A capacity attendance prevailed at two of the four wildlife sessions of the program.

Mendall attended part of the sessions of the Northeastern Wildlife Conference in May at Monticello, New York. He presented a paper at the "excess-drake" panel of the waterfowl program.

PUBLICATIONS

Gibbs, Richard M.

1962. Juvenile mortality in the common goldeneye, Bucephala clangulata americana, in Maine. Me. Field Nat., 18(5):67-68.

Mendall, Howard L.

1962. The role of unpaired drakes on northeastern waterfowl breeding areas. Proc. Northeast Fish & Wildlife Conf., 1962, 5 pp. (Mimeo.).

PERSONNEL CHANGES

Several personnel changes related to the Unit occurred during the summer or are shortly to take place:

Dr. Horace Quick resigned in July, effective September 1.

Dr. Sanford Schemnitz has been appointed for half-time teaching and half-time research to be effective January 1. Dr. Schemnitz is currently teaching and conducting research at the Pennsylvania State University. He is familiar with the Maine program, having temporarily replaced Dr. Quick when the latter was in Africa on Fulbright studies.

Assistant Leader Coulter will be on leave of absence from September 1 to June 30. He will be working toward a PhD at Syracuse University.

William Robinson, a former Graduate Assistant, has been appointed to replace Coulter temporarily, effective January 1. Robinson worked on the white-tailed deer while obtaining a Master's degree at the Unit. Since then he has been studying for a PhD at the University of Toronto.

From the foregoing, it is apparent that both the wildlife teaching program of the School of Forestry and the work of the Unit will be on a curtailed basis from September through December. Some undergraduate fall courses will not be offered until spring although one essential course will be given by other staff members and by guest lecturers.

Respectfully submitted,



Howard L. Mendall, Leader
Maine Cooperative Wildlife
Research Unit

August 31, 1962

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University of Maine

Orono, Maine

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(a) Waterfowl Distribution and Management

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Assignment: Howard L. Mendall, Leader

A seasonal summary was presented in the last quarterly report. This included data up to the latter part of July. Subsequent field checks confirmed most of the conclusions already given. Ample precipitation in late summer, however, materially improved brood rearing conditions and also resulted in excellent water levels for post-breeding concentrations of birds. September populations of waterfowl were very satisfactory in nearly all parts of Maine.

Plans for next quarter: Limited data on populations and migration will be obtained in connection with field work under sub-project c.

(b) Renesting and Homing Study

Objectives: To study renesting behavior and the degree of migrational homing exhibited by waterfowl, primarily the black duck, mallard and the ring-necked duck.

Assignment: Malcolm W. Coulter, Assistant Leader
(Vermont phase conducted jointly with William Miller, former Waterfowl Project Leader, Vermont Fish and Game Service)

This report constitutes a seasonal summary, from April through July, of work carried out on this sub-project.

Intensive field studies were conducted on one area in Maine and at four groups of islands in Lake Champlain, Vermont. The joint work in Vermont was greatly aided by the loan of a boat, motor, trailer and other equipment by U. S. Game Management Agent Owen Seelye stationed in Milton, Vermont. Seelye, together with Vermont personnel and several students, assisted with the field work in Vermont. Students also helped with the field studies in Maine.

Since the project is now in an advanced stage of completion, less emphasis was placed upon the renesting phase of study. Thus, only a few nests of marked birds were collected to simulate natural predation. Those taken were in situations where natural predation was in progress or appeared certain. Forty-two nests (29 black duck, 10 mallard, 1 ring-necked duck) were located

and 25 hens (16 black duck, 8 mallard, 1 ring-necked duck) were trapped, banded, color-marked and released at their nests. Most of these hens continued to incubate their clutches. Trapping the birds permitted us to determine how many previously banded birds had returned to nest. Birds previously banded included those nest-trapped in former years, those hand-reared and released at the study areas, or wild-reared birds banded near the study areas.

Fourteen (58 per cent) of the 25 hens trapped were birds for which we had some previous history. Eight nested on the study areas during past years. Of these, three had returned for their fifth year; three others returned for the fourth season.

Four hens were birds that were hand-reared and released during previous summers near the study areas. Another was a wild-reared bird, web-tagged at the nest a few hours after it hatched in 1961.

The pattern of recovery of banded birds is similar to that for the earlier years of this study. Homing by hand-reared birds released at the study area is very low. Return to the nesting covers by adult hens is much higher, but varies considerably; in general, known adult hens have made up approximately 30 per cent of the nesting population. This season about 32 per cent of our females were known previous nesters, but more than 50 per cent of all nesting hens had some previous known association with the study areas.

Predation by birds continued at a high level at some areas and greatly hampered study. At the Kennebec River, for example, crows destroyed 7 of 14 nests including a re-nest by a color-marked hen. It is certain that other nests were destroyed about which we have incomplete knowledge. Shells of ducks eggs were found at several places and at times when they likely did not come from known nests. The possibility of controlling this local population of crows immediately prior to the 1963 nesting season should be considered.

A simplified mechanism designed to spring the nest trap at a pre-determined time was developed. It consists of an alarm clock, damper switch and a piece of rubber surgical tubing. The alarm clock may be set to release the surgical tubing at a pre-determined hour. Contraction of the stretched rubber tubing provides the power to purse the nest trap (net). This device was used successfully in 5 trials to trap wary hens.

This is the 7th consecutive year of study in Maine and the 6th in Vermont. A total of approximately 325 nests have been studied and hens from about 200 nests trapped and color-marked. It is anticipated that field work for 1963 will be on a similar scale to that for this year and that a final report will be prepared during the summer of 1963.

Plans for next quarter: Inactive.

(c) Waterfowl Hunter Bag Checks

Objectives: To determine hunter success, crippling loss, and species, sex and age composition of the kill.

Assignment: Howard L. Mendall, Leader

Inactive during the quarter.

Plans for next quarter: Regular hunter field bag checks will be conducted in cooperation with the State Game Division. In addition Unit personnel will participate in a pilot study of "spy blind" observations. This has been requested by the Migratory Bird Population Station of the U. S. Bureau of Sport Fisheries and Wildlife.

WOODCOCK RESEARCHWoodcock Population Studies

Objectives: To conduct annual census and to obtain related ecological data on the Unit's permanent census routes in Maine.

Assignment: Howard L. Mendall, Leader

Inactive during the quarter.

Plans for next quarter: Inactive.

ECOLOGY OF COASTAL HABITATClassification of Coastal Marshes and Mud Flats

Objectives: To devise a classification scheme for waterfowl habitat which occurs in the intertidal zone of the Maine coast. The classification scheme should possess the following prerequisites:

1. It should be sufficiently descriptive so that any field biologist can apply it.
2. It should reflect the ecological differences between the various habitats.

Assignment: Russell R. Hyer, Graduate Assistant

The data gathered on the study areas during the past spring and summer have been organized into a trial classification scheme. This is based upon a summary of the field data and relates only to the major types. As the field testing of this scheme is completed, each type will probably be divided into subtypes.

A brief description of the types is as follows:

Type I - Coastal Clay Flat - This is relatively uncommon on the areas studied. The clay is variable in color from light to dark gray and in consistency from firm to sticky. It normally occurs as a pure type with rocks and boulders as the only soil variations. Vegetation is usually absent. Animal species that are characteristic are the common periwinkle (Littorina littorea), the mud snail (Nassa obsoleta), and the soft-shelled clam (Mya arenaria).

Type II - Coastal Silt Flat - This is probably the most common major type of the coastal flats and beaches. However, it seldom occurs as a pure type being mixed in various combinations with other soil types. For this reason, a series of subtypes will be necessary.

The color of the silt may vary from gray to almost black with an occasional brown-gray. The greatest variation, however, is in soil consistency. It can be classified according to its ability to support the weight of a standing person (145-185 pounds) as follows:

- Very firm - person sinks not more than 2 inches.
- Firm - person sinks 2 to 6 inches.
- Medium - person sinks 6 to 10 inches.
- Soft - person sinks 10 to 18 inches.
- Very soft - person sinks 18 or more inches.

Vegetation on a Type II flat is generally sparse; although, dense growths of eelgrass (Zostera maritima), widgeon grass (Ruppia maritima) or rockweed (Fucus sp. and Ascophyllum sp.), may occur. Other common plant species are sea blite (Suaeda maritima), glasswort (Salicornia sp.), salt-meadow cordgrass (Spartina patens) and smooth cordgrass (Spartina alterniflora).

Clams (Mya arenaria and Macoma balthica) and clamworms (Nereis sp.) are the most common animal species on these flats. The number of invertebrate species is not great, but the number of individuals is considerable. Other characteristic species are the bamboo worm (Clymenella torquata), the sand shrimp (Cargo septemspinus), the common periwinkle (Littorina littorea), and the mud snail (Nassa obsoleta).

Type III - Coastal Sand Beach - This is a comparatively unimportant type on the areas studied. The soil itself is relatively pure; although it sometimes occurs mixed with silt, gravel, or rock. The vegetation is sparse with only the rockweeds, sea blite, and the glassworts occurring with any regularity. A species of amphipod (Orchestia sp.) is the only animal species commonly found; although the dog whelk (Nassa bivittata) is quite often recorded.

Type IV - Coastal Gravel Beach - This type, like the material which comprises its soil, is highly variable. The gravel commonly occurs in a layer ranging from one to many inches deep covering a different soil type. The soil is even more sparse than on Type II with only the rockweeds occurring commonly. The animal life is represented by the amphipod (Orchestia sp.), the blue mussel (Mytilus edulis), the common periwinkle, and the dog whelk.

Type V - Coastal Rock Beach - Except for the larger size of the soil particles, this type is similar to Type IV. The rockweeds are the characteristic vegetation, but even these are often absent. A variety of invertebrate animals are present; however, only four genera are required to characterize the type - the starfish (Asterias sp.), the limpets (Acmaea sp. and Fissurella

sp.) and the mussel (Mytilus edulis).

Type VI - Coastal Cobble Beach (and) Type VII - Coastal Boulder Beach - These two types vary from Type V only in size of soil particles, but their physical characteristics are so distinct they are included as separate types.

Type VIII - Estuarine Clay Flats - Only one small area of this type was studied. No vegetation could be found. The soft-shelled clam, the little Macoma clam, and a polychaete (Scolelepides viridus) were the animals represented.

Type IX - Estuarine Silt Flats - Just as Type II is the most common major coastal type, Type IX is the most common estuarine type. The color of the flats vary from light gray to almost black. The ability of the silt to support weight is highly variable and can be classified as outlined under the description of Type II. Widgeon grass, the rockweeds, and the cordgrasses (Spartina spp.) may occur on these sparsely-vegetated types. The invertebrate species that commonly occur are a polychaete (Scolelepides viridus), two amphipods (Gammarus sp. and Orchestia sp.), sand shrimp, little Macoma clam, and the soft-shelled clam.

Type X - Estuarine Sand Flat - This type is similar to Type III; however, the dog whelk is not found.

Type XI - Estuarine Gravel Flat - The only variation of this type from Type IV is the absence of the dog whelk and the addition of the sand shrimp and another amphipod (Gammarus sp.).

Type XII - Estuarine Rock Flat - The combined abundance of the common periwinkle and the blue mussel are characteristic of this type. This, combined with the absence of the starfish and limpets, is the only variation between Type XII and Type V.

Types XIII and XXIX - Coastal and Estuarine Marshes - It is felt that the type names of the major marsh types are all the description required for the present testing. Almost all of these major types will be divided into subtypes and these will require a more detailed description.

Plans for next quarter: To complete the primary testing, revision, and re-testing of the preliminary classification scheme, and to initiate aerial photograph work.

BIG GAME RESEARCH

Winter Behavior of the White-tailed Deer

- Objectives: (1) To determine environmental differences in two deer yards of contrasting cover types but with similar climatic conditions.
- (2) To determine variations in deer behavior within the two yards and to relate these to environmental factors.

Assignment: Benjamin W. Day, Jr., Graduate Assistant

Two trips to the study areas were made to obtain summer data on vegetation and to take photographs.

Plans for next quarter: Field work will be resumed on an intensive basis during the quarter.

MISCELLANEOUS STUDIES

As pointed out in the last quarterly report, a short-term biological reconnaissance has been carried out during the spring and summer on the Weskeag Marsh. This area, essentially tidal, is in Knox County and is proposed for acquisition as a State Game Management Area. Work was conducted by Graduate Assistant Day, assisted by an undergraduate wildlife student, John Moulton.

Data will be analysed during the winter. A summary of Day's progress report is as follows:

Objective: To conduct an ecological survey of the Weskeag River Marsh in Thomaston, South Thomaston, Rockland, and Owl's Head.

The scope of the study will include the following:

1. A vegetative study of the Weskeag marshes that can be duplicated in the future to reveal changes brought about by management practices.
2. Composition, size, and seasons of waterfowl concentrations, as well as information on nesting and brood rearing.
3. Additional information on tidal fluctuations, salinity, pH, invertebrates, soils and wildlife utilization.

From July 9 to August 25, 1962, an intensive field study was made on the Weskeag River marshes. The area under study involves about 300 acres of marsh, varying from a shallow marine marsh to a small fresh water marsh and 50 acres of tidal flats. Three-fourths of the area is under tidal influence.

A 2 1/2 mile staked line, approximately parallel to the winding channel served as a baseline for all sampling included in the survey. Forty-one transect lines at right angles to this base line, at five chain intervals, served as guides for gathering vegetative data and compiling a type map. Along the traverse lines a six foot wide strip was evaluated by ocular estimate as to vegetative composition. The classification system used was that described in the Wildlife Management Series #7, Wetland Habitat Mapping, Division of Wildlife Refuges, U. S. Fish and Wildlife Service, March 15, 1946. While information was being obtained from the traverse line, a type map was also being constructed on graph paper by mapping in the types 2 1/2 chains on either side of each line.

The marine portion of the marsh is readily subdivided into three major vegetative zones. The first of these consists of a narrow band of smooth cordgrass (Spartina alterniflora) that grows along the main and side channels, ditches, and tidal pools. The second zone covers over 70 per cent of the tidal marsh and includes large pure stands of salt meadow cordgrass (Spartina

patens) and smaller pure stands of black rush (Juncus gerardi). Vegetation in zone three, to the upland edge of the marsh, varies greatly as different soil types, freshwater runoff, and different bordering land uses are encountered. Principal marine species of this zone are Baltic rush (J. balticus), salt marsh sedge (Carex paleacea) and bayonet-grass (Scirpus paludosus). Some of the common fresh water or brackish forms are soft-stem bulrush (Scirpus validus) and narrow- and broad-leaved cattail (Typha angustifolia, and T. latifolia).

The fresh water portions of the study area involve about 25 per cent of the total marsh acreage and are not as easily separated into vegetative zones as was the tidal marsh. Principally responsible for this is the lack of a definite channel, a very irregular marsh bottom and the fact that several soil types underly the area. Common plants, or genera, are narrow- and broad-leaved cattail, soft-stem bulrush, bluejoint grass (Calamagrostis canadensis), smartweed (Polygonum spp.), pondweeds (Potamogeton spp.), burreed (Sparganium spp.), arrowhead (Sagittaria latifolia), and several sedges (Carex and Scirpus spp.).

Several spring trips revealed that 80 Canada geese, 100 black ducks, 60 blue-winged teal and 250 green-winged teal comprised the bulk of earlier waterfowl concentrations. By the end of April these birds had largely departed leaving several breeding pairs each of black ducks and blue-winged teal. Several days of nest hunting in late May and early June produced one black duck nest and five broods (1 blue-winged teal, 4 black duck). During the summer approximately six broods of blacks and one pair of blue-winged teal (in addition to the teal brood) were repeatedly observed.

In early August, 18 black ducks, new to the area, were seen on several occasions, feeding or resting. Following a flood tide, during the third week of August, at least 35 "new" black ducks were present as well as 28 "new" blue-winged teal.

Plans for next quarter: To make at least one field trip prior to, and three trips during, the waterfowl season to complete miscellaneous field work, take photographs, and observe composition and size of waterfowl concentrations; also to obtain information relative to the amount of hunting carried on.

COOPERATION, EDUCATION WORK AND MISCELLANEOUS ACTIVITIES

The summer meeting of the Unit Coordinating Committee was held in Orono August 28. In attendance from the Department of Inland Fisheries and Game were Commissioner Roland Cobb; Director of Research and Planning, Robert Johnson; Game Division Chief, Kenneth Hodgdon. The Unit was represented by Messrs. Nutting, Coulter and Mendall. At the morning session Graduate Assistants Day and Hyer summarized progress on their respective thesis studies.

A special meeting of the Unit Coordinating Committee was held in Augusta on September 25. The purpose was to discuss various aspects of contract research. Messrs. Nutting and Mendall attended from the Unit; Messrs. Cobb, Johnson and Hodgdon of the Department of Inland Fisheries and Game; and Francis Schuler of the Federal Aid Branch of the Boston Regional Office, Bureau of Sport Fisheries and Wildlife.

Unit personnel continued to furnish technical aid to the State Department of Inland Fisheries and Game and to the general public.

Mendall participated in several group meetings during the quarter. These included the annual meeting of the Maine Waterfowl Council in Augusta on August 20, a meeting of the Knox County Fish and Game Association in Union on August 23, and a meeting of the State Game Division in Augusta on September 20. He also attended several meetings and conferences in Orono relating to pesticides, the rabies outbreak in western Maine, and curricula program planning. He participated in the joint Federal-State-University conference pertaining to the new Cooperative Fisheries Unit to be activated this fall. On September 28 and 29 he conferred in Fredericton, New Brunswick with officials of the University of New Brunswick and the Provincial Fish and Wildlife Branch.

PERSONNEL CHANGES

A new graduate student, Frank Ricker, reported to the Unit in mid-September. He is a graduate of Bates College in 1961, majoring in biology. Following graduation he taught school for a year in Androscoggin County.

Assistant Leader Coulter temporarily concluded Unit duties August 31 and will be on leave of absence until June 30, 1963. He is studying toward a PhD at Syracuse University.

Respectfully submitted,



Howard L. Mendall, Leader
Maine Cooperative Wildlife
Research Unit

October 16, 1962

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MAINE COOPERATIVE WILDLIFE RESEARCH UNIT

University of Maine

Orono, Maine

QUARTERLY REPORT

October-December, 1962

Cooperating Agencies

Maine Department of Inland Fisheries and Game
Wildlife Management Institute
University of Maine
U. S. Bureau of Sport Fisheries and Wildlife

Unit Personnel

Leader - Howard L. Mendall
Assistant Leader - William L. Robinson
Malcolm W. Coulter (on leave of
absence, September 1-June 30)
University Representative - Albert D. Nutting
Faculty Collaborators - Sanford D. Schemnitz
David C. O'Meara
Chester F. Banasiak
Graduate Assistants - Benjamin W. Day, Jr.
Russell R. Hyer
Graduate Students - Henry W. Houseman
Frank W. Ricker
Secretary - Maxine L. Horne

NOT FOR PUBLICATION

The quarterly reports are usually statements of progress. The data presented often are incomplete and the conclusions reached may not be final. Consequently, permission to publish any of the information contained herein is withheld pending authorization from the Research Unit.

MAINE COOPERATIVE WILDLIFE RESEARCH UNIT ;

Quarterly Report

October-December, 1962

RESEARCH PROJECTS

WATERFOWL RESEARCH

(a) Waterfowl Distribution and Experimental Management

Objectives: To obtain data on the abundance, distribution, and migration of waterfowl species in Maine; and to conduct research that will assist in the management of the important breeding species, especially the black duck and the ring-necked duck.

Assignment: Howard L. Mendall, Leader

Inactive during quarter except for obtaining limited data on populations and migrations, as summarized under sub-project c.

Plans for next quarter: Inactive.

(b) Renesting and Homing Study

Objectives: To study renesting behavior and the degree of migrational homing exhibited by waterfowl, primarily the black duck, mallard and the ring-necked duck.

Assignment: Malcolm W. Coulter, Assistant Leader
(Vermont phase conducted jointly with William Miller, former Waterfowl Project Leader, Vermont Fish and Game Service)

Inactive during the quarter.

Plans for next quarter: Inactive.

(c) Waterfowl Hunter Bag Checks

Objectives: To determine hunter success, crippling loss, and species, sex and age composition of the kill.

Assignment: Howard L. Mendall, Leader

For the 15th consecutive year personnel of the Maine Cooperative Wildlife Research Unit and the State Game Division cooperated in a field bag check study of waterfowl hunters. Game Division personnel were under the direction of Howard Spencer, Jr., waterfowl project leader. Data obtained are used to supplement information from federal and state postal surveys. Coverage and man-days of effort were similar to 1961. Fewer data were obtained this fall, however, because of an apparent decrease in the number of hunters afield.

A split season, evenly divided, was in effect on ducks with open dates of October 12-November 3 and November 17-December 8, with a bag limit of two birds. A 60-day straight season on geese ran from October 12 to December 11. Special regulations applied to sea ducks (eiders, old squaws, scoters) but this study does not include that phase of off-shore hunting.

A total of 832 hunter contacts was made and 896 birds were examined. This represents nearly 30 per cent fewer hunters checked by the field men than in 1961, in spite of approximately the same coverage. During the first two days of the season about the same number of hunters were contacted as on the same areas a year ago. Thereafter, a noticeable scarcity of gunners was reported by wardens and biologists. This was especially evident in the usual concentration areas such as Merrymeeting Bay, Casco Bay, Frenchman's Bay, and the Sebasticook drainage. On the closing day of the season, even with favorable hunting weather, biologists checked the fewest number of gunners in 15 years.

It is believed that lessened shooting pressure occurred in one of two ways: (1) an actual decrease in the number of hunters, or (2) a lower average number of trips per hunter. Preliminary tabulations of duck stamp sales indicate a similar number as in 1961. Thus, it may be that the second alternative is correct. In either event it is probable that the total waterfowl kill was considerably reduced in 1962. As a point of interest in this connection the 1961 stamp sale was more than 30 per cent lower than in 1960.

Fall Populations

Populations of most species were present in excellent numbers throughout the entire fall. Opening day concentrations were larger than in 1961, a direct reflection of the unusually successful breeding season of Maine and New Brunswick. Flight birds of November and early December likewise appeared to exceed the numbers of 1961. Flights of Canada geese began earlier in October than usual and continued throughout November.

Of particular importance to the relatively few hunters afield, the timing of the major flights through the State, and the coastal build-up, occurred during open season. Often, in a split season this is not the case. This fall extensive migrations at inland waterways were noted during late October and early November, and again the third week of November. Both migration peaks came while the season was open.

Although favorable waterfowl populations were present from October to the December closing, weather factors were both a help and a hindrance. Hunting effort was curtailed temporarily in some parts of the state by unseasonably heavy snowfall and a sudden freeze the last of October; also by severe coastal icing in eastern Maine late in November. The latter was alleviated after a few days, however, and favorable conditions prevailed until the end of the season. Exceptionally heavy precipitation during October resulted in excellent hunting in many small ponds and marshes that ordinarily have few ducks during the fall. At the same time, high water prevailed on some of the favorite shooting locations of the Kennebec and Penobscot drainages, causing early departure of many birds.

Hunting Success

Average hunter success, based on bag check data, was 1.9 birds per man-day. This was a slight improvement over the 1.8 average in 1961. In both seasons the bag limit was two ducks. (*)

The percentage of parties checked that bagged their limit was calculated as one means to determine the effect of the bag limit. A party was considered to be any group of hunters shooting together. For example, if a party of two hunters had four ducks, or if three hunters bagged 6 birds, these were considered limit bags. Many parties consisted of only one hunter. Of 411 parties checked, 113 or 27 per cent had limit bags. Thus it would appear that the bag limit directly limited the shooting of about one-fourth of the parties. Of course, a few of these limits may represent kills made in the last minutes of the hunt and further shooting would have been impossible, anyhow. A few limit bags may have been those of hunters that might have continued shooting illegally above the limit. But, all in all, the percentage of parties with limit kills may be a fair indication of the direct effect of the bag limit on the kill.

Indirect effects of the two bird limit are assessed less readily. It is difficult to estimate the number of potential hunters that did not buy a duck stamp because of the low bag limit. In addition, the bag limit may have influenced the average number of times gunners did get out, as previously mentioned.

Crippling Loss

Crippling loss (birds "downed" but not retrieved) was 29 per cent. This represented an increase over the 27 per cent reported for the 1961 season and is not far below the record high of 31 per cent recorded in 1960. This is a serious waste of birds, and one which is preventable to a large extent.

Bag Composition

The kill by species of birds examined is given in Table 1. The percentage of black ducks, which comprise nearly half of the total bag, has remained about the same in the past three seasons. The green-winged teal continued to drop slightly, as in 1961, but at 16 per cent was still well above the long-term average for this species. The goldeneye maintained its third place position where it has been in the past three seasons. Wood ducks showed a moderate increase in the bag from a year ago and reached an all-time high of more than eight per cent.

Ring-necked ducks made up 4 per cent of the bag, a relatively high proportion for this species. They were especially prevalent in the Sebasticook area. The percentage of blue-winged teal continued to drop and reached an all-time low of only 1 per cent of the bag. Recent declines in this species may be associated in part with western drought conditions, since banding data show that some blue-wings shot in Maine are hatched on the western prairies. Also, the late date of the season opening in recent years is undoubtedly an important factor in the decline in the bag of this early migrant.

(*) Hunting was recorded by half-day time units. If a man hunted any part of either morning or afternoon it was counted as a half man-day. If he hunted any of both morning and afternoon it was listed as one man-day.

Table 1
 1962 Waterfowl Bag Checks
 Species Composition (Exclusive of Sea Ducks)

Species	No. of Birds Checked	Per cent	Per cent Change from 1961
Black Duck	421	47.0	+0.1
Green-winged Teal	145	16.3	-2.1
Goldeneye	113	12.6	+0.3
Wood Duck	75	8.4	+3.3
Ring-necked Duck	36	4.0	+1.3
Mallard	23	2.6	+1.2
Hooded Merganser	19	2.1	+0.9
American Coot	15	1.7	-0.3
Mergansers (Common & Red-breasted)	14	1.6	+1.0
Blue-winged Teal	10	1.1	-2.3
Pintail	4	0.4	-1.6
Bufflehead	4	0.4	-1.0
Lesser Scaup	4	0.4	No change
Canada Goose	4	0.4	+0.1
Greater Scaup	2	0.2	-0.2
American Widgeon	1	0.1	-0.1
Ruddy Duck	1	0.1	+0.1
Barrow's Goldeneye	1	0.1	+0.1
Miscellaneous (unidentified)*	4	0.4	
	896	99.9	

*Includes birds plucked and dressed when examined.

Fifteen American coots (mud hen or crowbill) were recorded in hunters' bags. Although this represents a drop from the high reached in 1961, this bird continued for the second consecutive year to be present in unusual numbers for this region.

Scaup (both greater and lesser) were harvested in extremely small numbers, in spite of the "bonus" allowance in the bag limit and good populations in late season. In fact, only 2 parties checked by the field men had benefitted by the special scaup limit.

The very low proportion of buffleheads taken is an indication, as pointed out in previous reports, of the good numbers of black ducks and goldeneyes available to late season coastal gunners.

Age and Sex Ratios

The proportion of young birds in the kill generally reflects the success of the previous breeding season. Among northeastern ducks a ratio of two young to each adult shot is considered to be indicative of a healthy population. It must be cautioned here that, because of differences in migration patterns between young and adult birds, figures from one state may disagree with those from its neighboring states. To obtain an accurate picture of age ratios, therefore, figures from various parts of the flyway must be considered. In Maine, out of 657 examined birds, the kill contained 1.6 immature birds for each adult. Among 306 black ducks examined this ratio was 1.7:1. Both these figures indicated a decline from last year when the respective ratios were 2.1:1 and 2.2:1. At Merrymeeting Bay on opening weekend, however, when local birds constitute the major portion of the kill, the ratio based upon 100 examined black ducks was 2.4 young to 1 adult. Local production of black ducks was good in 1962.

Sex Ratios

Sex ratios in the kill may indicate different migration patterns between males and females, hunter selection of one sex over another, or, when considered over a broad geographical area, the actual proportion of males to females in the waterfowl population. In Maine among black ducks shot in 1962, there were 122 males taken for every 100 females. This figure is slightly above the long-term average of 116:100, but is down from the 131:100 ratio obtained in the 1961 season. Previous studies in this state have indicated that during the latter part of the fall male black ducks are more abundant than females. Thus late season kill would result in an increased proportion of drakes. This explanation appeared to apply to the high ratio of drakes in both the 1961 and 1962 kill. By contrast, on opening weekend, October 12 and 13, 1962, 79 male and 78 female black ducks were checked in the bag.

Summary and Conclusions

1. Waterfowl populations during the entire fall were considered noticeably higher than those of 1961.

2. A total of 832 hunters were checked and 896 ducks were examined during the field studies.

3. After the opening two days, hunting pressure appeared to be even lower than was the case in 1961. It is believed that the total kill was reduced from a year ago even though individual hunter success was slightly higher.

4. Crippling loss continued to be alarmingly high and was the third highest in 15 years of bag checking in Maine.

5. The black duck, green-winged teal, and goldeneye continued to predominate in the bag. These three species combined made up about three-fourths of the total ducks checked.

6. Age ratios showed a reduction in the proportion of immature birds taken by the hunters.

7. Sex ratios indicated a higher than average incidence of drakes in the bag although the figure was slightly lower than in 1961.

Plans for next quarter: Inactive.

WOODCOCK RESEARCH

Woodcock Population Studies

Objectives: To conduct annual census and to obtain related ecological data on the Unit's permanent census routes in Maine.

Assignment: Howard L. Mendall, Leader

Inactive during the quarter.

Plans for next quarter: Inactive.

ECOLOGY OF COASTAL HABITAT

Classification of Coastal Marshes and Mud Flats

Objectives: To devise a classification scheme for waterfowl habitat which occurs in the intertidal zone of the Maine coast. The classification scheme should possess the following prerequisites:

1. Ecological differences between the various habitats must be reflected.
2. The terms of description must be sufficiently clear and distinct so that field biologists with limited experience in coastal habitats may use the scheme.

Assignment: Russell R. Hyer, Graduate Assistant

The data gathered on the study areas during the past spring and summer were organized into a trial classification scheme. This scheme was

presented in part in the Unit Quarterly Report for the period July-September, 1962.

Copies of this trial classification were sent to ten field biologists for testing. By the end of the quarter, responses had been obtained from eight of these biologists. Many of their comments and suggestions have been considered and will be incorporated into the revised classification.

Most of the biologists have reported that the classification of the unvegetated intertidal areas (mud flats and beaches) seems to be adequate. A few difficulties were encountered, however, primarily in definition of certain terms and criteria. Possibly the most common misunderstanding was in regard to the word "habitat." Testers were uncertain as to size limits and exactly what was to be considered a habitat. For the purposes of this work a habitat is considered to be an area of any arbitrarily selected size between the extremes of spring tides. Other terms and criteria not readily understood will be defined in the revised classification.

More difficulty was encountered by the biologists in classifying vegetated areas than flats and beaches. The trial classification scheme for estuarine marshes apparently required too much detailed study for rapid field application. Attempts are being made to combine certain similar marsh types into broader categories.

An attempt was made to distinguish major classification types, particularly flats and beaches, through use of available aerial photographs. This work was handicapped by lack of appropriate low tide photographs of the study areas. Based on limited study, however, it appears that classification of major types through aerial photography is possible, and further work in this area is recommended.

Plans for next quarter: Completion of testing, revision of the classification scheme, and initiation of thesis writing.

BIG GAME RESEARCH

Winter Behavior of the White-tailed Deer

- Objectives:
- (1) To determine environmental differences in two deer yards of contrasting cover types but with similar climatic conditions.
 - (2) To determine variations in deer behavior within the two yards and to relate these to environmental factors.

Assignment: Benjamin W. Day, Jr., Graduate Assistant

Field research on this project was resumed during the latter part of November. This is the final season for this two-year study. Since work was being conducted on an intensive basis at the end of the quarter, no progress report will be made at this time. It will be of interest to point out, however, that exceptionally heavy snowfall accompanied the well-publicized blizzard of December 30-31. This restricted deer movements within yarding areas much more abruptly than is the case ordinarily.

Plans for next quarter: To continue detailed studies throughout the quarter, and to initiate the thesis write-up.

COOPERATION, EDUCATION WORK AND MISCELLANEOUS ACTIVITIES

Unit personnel continued to furnish technical assistance to the State Department of Inland Fisheries and Game and to the general public.

Mendall, Hyer, and Day assisted in handling several laboratories or gave demonstration lectures in the undergraduate course in Game Management. In view of the staff vacancy it was necessary for the School of Forestry to conduct this course largely on a guest-lecture basis prior to Dr. Schemnitz's arrival in late December.

PUBLICATIONS

Robinson, William L.

1962. Social dominance and physical condition among penned white-tailed deer fawns. J. Mammal., 43(4):462-469.

Mendall devoted much time during the quarter to manuscript work on the forthcoming cooperative book Waterfowl Tomorrow. He has been assigned as co-author of one of the chapters dealing with behavior.

PERSONNEL CHANGES

Two personnel changes of importance to the Unit program were effective at the end of the quarter:

(1) William L. Robinson became Assistant Leader to fill the vacancy caused by Malcolm Coulter's leave of absence. This is effective until June 30. Robinson is a former Unit Graduate Assistant. He has recently completed work for his PhD degree at the University of Toronto.

(2) Dr. Sanford D. Schemnitz has been appointed as Assistant Professor of Wildlife Management for half-time teaching and half-time research. He holds a PhD degree from Oklahoma State University and recently has taught and conducted research at Pennsylvania State University.

Respectfully submitted,



Howard L. Mendall, Leader
Maine Cooperative Wildlife
Research Unit

March 20, 1963