

MAINE COOPERATIVE WILDLIFE RESEARCH UNIT

Quarterly Report

January-March, 1957

RESEARCH PROJECTS

FUR ANIMAL RESEARCH

Ecology of the Fisher

Objectives: To obtain data on the distribution, habitat preferences and winter food habits of the fisher.

Assignment: Malcolm W. Coulter, Assistant Leader

Twenty-one unskinned fisher were examined during the quarter. Fifteen of these were animals taken accidentally or illegally and were submitted to the Unit laboratory through the cooperation of the Warden Division of the Department of Inland Fisheries and Game. Several regional biologists of the Game Division assisted in sending these to the Unit. Six fisher were collected, under a special permit, from wilderness areas during late March and early April. The late season specimens are of special interest and value in further studying the pattern of reproduction in fisher.

Records established from actual specimens gave further evidence of a continued increase in range of fisher within the State. Several field trips together with reports from other field workers have aided in following the spread of the animals into previously unoccupied sections. One of the most interesting aspects of the tremendous expansion of range during the past 7 or 8 years has been the establishment of the animals in many kinds of habitat other than maturing coniferous cover. Some of these types of habitat are probably not optimum to the fisher and may have been occupied because of population pressure in other areas. However, the fact that the animals continue to thrive in several different kinds of cover, including reverting farmlands, cut over areas and also hardwood forests, suggests that they are very adaptable. In the past most people have felt that the fisher required rather mature coniferous forests for survival.

On the areas visited this winter there appeared to be no decrease in fisher numbers. At one area where frequent observation was made by Graduate Assistants Olson and Robinson, together with several undergraduate students, a very noticeable increase of fisher was found. This study area is in a section that consists of a small, wooded stream valley bordered by ridges with abandoned farms and scattered small marginal farms. On the latter agricultural practices, except for poultry, are largely on a part time basis. During the winter of 1955-1956 the stream valley was heavily cut for pulp wood. Fisher virtually abandoned the area at that time. However, during this past winter, sign was so abundant that at times it was impossible to follow an individual fisher track because of the maze of fisher tracks in the area, and, in addition to kills found, the analysis of several scats added to our knowledge of fisher activities in this particular habitat.

During the quarter some progress was also made in studying the backlog of food habits material. Graduate Assistants Olson and Robinson examined several specimens. Since this phase of the study is incomplete a more detailed report of stomach and scat analysis will be given in a later report.

Plans for next quarter: Continue laboratory study of food habits material.

HABITAT RESEARCH

The Use of Aerial Photographs for Detailed Study of Marsh Vegetation in Merrymeeting Bay

- Objectives: 1. To determine the value of various kinds of aerial photographs in studying marsh vegetation.
2. To analyze the vegetative associations in Merrymeeting Bay from aerial photographs.

Assignment: David P. Olson, Graduate Assistant

Olson continued a review of the literature and study of techniques. Several conferences were held with Dr. Harold Young of the Forestry Department, Mr. Stoeckeler of the Technology Experiment Station and Mr. Wood of the Sewall Company, Old Town, Maine, as well as with other specialists.

Preliminary plans were made to have several types of aerial photographs taken of the same area. These photos will be studied to determine which kinds are most useful in studying marsh vegetation.

Plans for next quarter: Begin study of vegetation on area and work with photos available.

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

Considerable time was devoted to preparation of a manuscript on the ring-necked duck, based upon the Unit's long term studies on this species.

Plans for next quarter: Conduct spring breeding pair counts and nesting studies.

(b) Renesting and Homing Study

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

Assignment: Malcolm W. Coulter, Assistant Leader

Inactive except for planning details of the spring work and arranging to have nest traps constructed.

Plans for next quarter: Detailed field work including search for nests, trapping and marking of hens and search for renests will be conducted during the quarter.

(c) Waterfowl Banding

Objectives: To study the movements and migration routes of waterfowl in Maine.

Assignment: Malcolm W. Coulter, Assistant Leader

Considerable time was devoted to tabulation of band returns from the Penobscot River Station and to some exploratory work to determine the value of the data for use in calculating survival. It has become readily apparent that because of the intensive bag checks conducted in Maine, as well as in some states south of Maine, the rate of band return is distorted in many instances. It appears questionable whether these data may be suitable for calculating survival but further exploration may suggest ways to correct at least some of the variables involved.

Plans for next quarter: Plans will be made for summer banding activities. These will emphasize the banding of diving ducks. ~~Some~~ banding will be done during the spring in connection with the renesting study.

(d) 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

Data gathered during the past fall in cooperation with the waterfowl project of the Department of Inland Fisheries and Game were analyzed.

Fall Populations

As was pointed out in the last quarterly report, fall flights of both ducks and geese were disappointing to the gunners. Considering the State as a whole, there was no period during the hunting season when birds were as numerous as in 1955. This is believed due both to decreased production on the breeding grounds and to unusual migration patterns. In a few sections of the central and eastern Maine coast larger than average concentrations built up during November, but over most of the coastal belt a decided decrease was noted.

During mid- and late December an apparent influx of black ducks, goldeneyes and scaup occurred but the hunting season had ended by that time.

Hunting Success

The 1956 hunting season in Maine extended from October 5 to December 13. During the bag check studies, State and Unit personnel contacted 2,981 hunters and examined 3,511 waterfowl of 22 species. Average hunting success was substantially lower than in 1955. As is usually the case Merrymeeting Bay enjoyed the highest hunting success, although gunning there was poor after the opening week. Goose shooting in the Bay was very unsatisfactory this year.

Statistically the season was not as poor as had been anticipated prior to tabulation of the data. There was actually better hunting than in 1950; in that year average hunter success was the lowest since the bag check studies were initiated.

Crippling Loss

Data compiled on crippling loss showed this mortality to constitute 22.5 per cent. This means roughly, that for every 100 ducks bagged, an additional 23 were shot but not retrieved. This is somewhat lower than a year ago. It follows the usual trend noted previously, i.e., the poorer the gunning the more effort hunters make to retrieve the birds that are knocked down.

Bag Composition

The kill by species of the birds examined is shown in table 1.

Table 1 - Kill by Species - 1956
(Exclusive of Sea Ducks)

Species	No. Birds Checked	Per Cent
Black Duck	1,512	43.1
Green-winged Teal	403	11.5
Blue-winged Teal	303	8.6
American Goldeneye	266	7.6
Wood Duck	263	7.5
Bufflehead	189	5.4
Ring-necked Duck	133	3.8
Mergansers (3 species)	102	2.9
Greater Scaup	69	2.0
Baldpate	37	1.1
Ruddy	34	0.9
Pintail	31	0.9
Mallard	28	0.8
Canada Goose	21	0.6
Lesser Scaup	13	0.4
Redhead	8	0.2
Canvasback	3	0.1
Barrow's Goldeneye	3	0.1
American Coot (Crowbill)	6	0.1
Shoveller	1	---
Unidentified*	86	2.4
Total	3,511	100.0

*Chiefly birds plucked and dressed when examined.

A noticeable decline of the black duck in the bag occurred this past year. Although still occupying first place by a wide margin, the species dropped from 54 per cent in 1955 to 43 per cent in 1956. A favorite of late season coastal gunners, the goldeneye, likewise was taken in a smaller proportion in 1956, dropping from second to fourth place.

Substantial increases in the kill were recorded for the green-winged teal and the wood duck. The former rose from fourth place to second, with a percentage change of 6.8 to 11.5. The wood duck, which had declined to only 4.5 per cent in 1955 was up to about its usual proportion in 1956 at 7.5 per cent.

The greater scaup and the ring-necked duck were the only other species that showed any appreciable increase in the past season's bag. With the latter, undoubtedly this was due to the fact that they remained later on the breeding grounds. Ring-necks were a minor species in the State as a whole but constituted 23 per cent of the October bag in northern and eastern Maine.

Apart from the decreases recorded for the black duck and goldeneye, the most noticeable decline in 1956 occurred in the mallard. This is always a minor species in Maine although the recent trend has been toward a gradual increase. This year, however, only about half as many mallards were checked as in 1955.

Sex and Age Ratios

Slightly over 60 per cent of the birds examined were sexed and aged. These data are given in table 2.

Table 2 - Sex and Age Ratios - 1956

Species	Adult Male	Adult Female	Immature Male	Immature Female	Total	Ad.-Im. Ratio	Sex Ratio (Per Cent) Male-Female
Black Duck	174	151	352	278	955	1:1.9	55:45
Green-winged Teal	67	62	127	92	348	1:1.7	56:44
Blue-winged Teal	18	46	68	112	244	1:2.8	35:65
American Goldeneye	55	37	33	33	158	1:0.7	56:44
Wood Duck	48	22	57	48	175	1:1.5	60:40
Ring-necked Duck	2	13	51	46	112	1:6.5	47:53
Bufflehead	18	10	6	10	44	1:0.6	55:45
All other species(15)	37	36	77	60	210	1:1.9	54:46
Grand Totals (22 species)	419	377	771	679	2246	1:1.8	53:47

Biologically a more desirable adult:immature ratio was observed in this season's kill in comparison with that of a year ago. A substantially higher proportion of young birds was taken in all species except the goldeneye and bufflehead.

Sex ratios were not greatly removed from a 50:50 basis except in the blue-winged teal. A much higher proportion of female blue-wings was killed.

Conclusions

1. The 1956 waterfowl hunting season was considerably poorer than that of the previous year.

2. Principal declines in the bag occurred in the black duck, American goldeneye and mallard.

3. The green-winged teal, wood duck, greater scaup and ring-necked duck were shot in greater proportions.

4. Lowered hunting success of 1956 is believed due to decreased populations and unusual migration patterns.

5. Sex and age ratios in the bag composition were more favorable, from a biological standpoint, than a year ago.

Plans for next quarter: Inactive.

WOODCOCK RESEARCH

Woodcock Census Studies

Objectives: To conduct an annual census on the Unit's permanent census routes in Maine; and to correlate census results of cooperators in the northeastern states.

Assignment: Howard L. Mendall, Leader

Plans were made for conducting the census in Maine and for coordinating the censuses in New England and New York.

Plans for next quarter: The usual spring census will be taken. Mendall will again serve as regional coordinator for the census studies in New England and New York.

UPLAND GAME BIRD RESEARCH

Ruffed Grouse Cover Requirements and Populations

Objectives: To determine preferred winter cover types and population densities.

Assignment: Howard L. Mendall, Leader

Most of the contemplated work on this project had to be curtailed

because of unexpected duties in connection with the Atlantic Flyway Council, and the proposed expansion of State and Federal waterfowl programs.

One field trip of 3 day's duration was made during January. Grouse populations on north-central Maine study areas appeared to be substantially higher than for several winters. The birds were well dispersed but were utilizing open mixed-growth covers in upland more than in recent seasons.

Reports of increased grouse populations this winter were obtained over wide sections of Maine. State biologists, wardens and sportsmen, as well as Unit personnel working on the fisher project, almost unanimously considered grouse more abundant than a year ago.

Plans for next quarter: Inactive.

BIG GAME RESEARCH

Moose Studies in Norway

Objectives: To study the productivity and management of moose on a private forest of 80,000 acres in Romerike, Norway.

Assignment: Arne Krafft, Graduate Student

Krafft continued to work on his thesis as time from other duties permitted.

Plans for next quarter: Continue work with thesis.

White-tailed Deer

Objectives: To measure the effects of a deficiency of winter cover on penned fawn deer.

Assignment: William L. Robinson, Graduate Assistant

This problem is being conducted under an assistantship provided by the P-R Division of the Department of Inland Fisheries and Game. It constitutes one segment of an overall P-R project concerning deer yard management on privately owned lands.

Robinson reported for duty on February 1 and has devoted his time to formal class work, to planning and to a review of the literature pertaining to this project. Since more intensive work on the study will begin later, a more detailed description of procedures and progress will be made in the next several quarterly reports.

To date much planning has been accomplished and it appears that many of the details of alteration of winter shelter in existing deer pens, construction of a new pen, source of supply of fawn deer, availability of instruments to keep weather records, student assistance in handling deer, and other aspects are fairly well established.

Plans for next quarter: Make final arrangements for the field investigations.

COOPERATION AND EDUCATIONAL WORK

Coulter and Mendall continued to furnish technical assistance to the State Pittman-Robertson program. Several meetings and conferences were held during the quarter.

Assistance was also given the general public in furnishing technical information about many conservation subjects, arranging for autopsies and identifying specimens and in furnishing speakers for various groups.

The Unit Staff also assisted several undergraduates in obtaining summer employment in conservation. In addition several undergraduates participated in some of the winter field trips.

Coulter and Mendall attended the conference of the Northeastern Section of the Wildlife Society during January in New Haven. Mendall served as discussion leader of the waterfowl panel. Following this meeting Mendall attended the Atlantic Flyway Council meetings in Baltimore as a member of the sub-committee on research. Another similar meeting was attended following the National Wildlife Conference in Washington, D. C.

Ashman, Coulter and Mendall attended the Cooperative Unit meetings in Washington in March and the National Wildlife Conference there immediately after the Unit meetings. Quick also attended the National Conference.

PERSONNEL

Quick returned from his leave of absence in Scandinavia and resumed his teaching duties at the beginning of the spring semester.

William L. Robinson, B. S. in Fisheries and Wildlife, Michigan State College, 1954, joined the staff as a Graduate Assistant February 1. Robinson, recently discharged from the Armed Forces, has had previous experience with the Park Division, the Game Division and the Field Administration Division of the Michigan Department of Conservation. Robinson was selected to work under a new assistantship provided by the Maine Department of Inland Fisheries and Game and has been assigned the deer project described above.

PUBLICATIONS

Coulter, Malcolm W.

1956. Aging and Sexing Waterfowl. Guide to Waterfowl Banding, U. S. Fish and Wildlife Service. (11 page illustrated article under Section C, Special Techniques.)

1957. Predation by Snapping Turtles upon Aquatic Birds in Maine Marshes. Jour. Wildl. Mgt., 21(1):17-21.

Mendall, Howard L.

1957. Woodcock Census Studies in Northeastern United States - 1956.
Special Scientific Report: Wildlife No. 34, U. S. Fish and
Wildlife Service, pp. 19-30.

Respectfully submitted,

Howard L. Mendall (H)

Howard L. Mendall, Leader
Maine Cooperative Wildlife
Research Unit

University of Maine
Orono, Maine.
April 19, 1957

MAINE COOPERATIVE WILDLIFE RESEARCH UNIT

Quarterly Report

April-June, 1957

RESEARCH PROJECTS

FUR ANIMAL RESEARCH

Ecology of the Fisher

Objectives: To obtain data on the distribution, habitat preferences and winter food habits of the fisher.

Assignment: Malcolm W. Coulter, Assistant Leader

Field work for the season was terminated during mid-April. Six specimens were collected under special permit in remote sections of the State for the reproductive phase of the study. Continued progress was accomplished in examining material on hand.

Plans for next quarter: Inactive.

HABITAT RESEARCH

The Use of Aerial Photographs for Detailed Study of Marsh
Vegetation in Merrymeeting Bay

- Objectives: 1. To determine the value of various kinds of aerial photographs in studying marsh vegetation.
2. To analyze the vegetative associations in Merrymeeting Bay from aerial photographs.

Assignment: David P. Olson, Graduate Assistant

Plans were made for the summer photography. It has been decided to take the pictures in Ektachrome, Ektacolor, Aercon and Panchromatic Super XX at scales of 1:5,000, 1:12,000 and 1:20,000 with an 8.25 inch focal length camera.

Preliminary trips to Merrymeeting Bay were made to select the study plots and to begin the plant surveys. Also, considerable progress was made in the interpretation of the photographs already on hand.

Plans for next quarter: Continue the photo-interpretation, conduct the vegetative survey and make final arrangements for the new photography which is to be taken in August.

(NOTE: This project is to be much more extensive than originally planned. A special grant from the Wildlife Management Institute has been received to help defray the costs of the new aerial photography; this is in addition to the Institute's regular contribution to the Unit.)

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 Unit census and production studies were carried out. Mendall was assisted throughout by the Unit staff. During the nesting studies additional help was given by John M. Dudley of Calais, by State Warden Lawrence Caron, by State Regional Biologists Blanchard, Carson and Peppard, and by Arnold Davis of the Moosehorn Refuge.

In the interests of better continuity, the following summary covers a period slightly beyond that of the current quarter (through mid-July):

This was the 19th consecutive year of these investigations. Coverage and techniques were essentially the same as in previous years. No changes were made in the study areas used a year ago so data for 1956 and 1957 are directly comparable.

As in past years the studies consist of 3 phases: (1) a count of pairs and territorial males prior to and during the early part of the breeding season; (2) a sample nesting study to determine nesting conditions and success; (3) brood counts commencing with the beginning of the hatching period.

Breeding Populations

Resident waterfowl on the Maine study areas as a whole were more numerous than a year ago. All species showed slight to moderate increases with the exception of the green-winged teal. The increase in black ducks, although slight, was gratifying in view of three consecutive years of population declines noted for this species. The apparent increase in the American goldeneye is the first recorded in many years.

The two species of teal and the goldeneye do not occur on the study areas in sufficient numbers to permit accurate measurements; thus, statements relative to them are based upon estimates.

The status of the initial population of the six species of breeding game ducks is as follows:

The Brood Season

A total of 70 aged broods of five species was available for compilation as of mid-July. This is an appreciably larger sample than at the corresponding time a year ago.

Brood averages ran close to those of 1956 for a comparable period. Although relatively few had been recorded in the important Class III size up to July 15, it is likely that the final tabulated figures will be very similar to 1956. This will be slightly higher than the long-term average. Satisfactory rearing conditions were noted on a majority of the marshes this year in spite of a general deficiency of precipitation; most exceptions occurred in the coastal belt.

Conclusions

Pending tabulation of the complete season's data (to be given in the next quarterly report) it may be concluded that:

1. Waterfowl populations at the start of the 1957 breeding season were higher than those of a year ago. All species except the green-winged teal showed an increase.
2. The nesting season was advanced by over a week from that of last year.
3. Nesting success for both the black duck and the ring-necked duck was similar to that of 1956, which is somewhat below the long-term average.
4. Better than average rearing conditions for broods existed during the first half of the summer, with the figures obtained to date being similar to those of last year.
5. Considering increased breeding stock, lower than average nesting success, but slightly better than usual rearing success, it may be expected that ultimate waterfowl production in northern, eastern and central Maine will be slightly increased from that of 1956.

Plans for next quarter: Complete the season's study and prepare final tabulations on production.

(b) Renesting and Homing Study

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

Assignment: Malcolm W. Coulter, Assistant Leader

Throughout the quarter much of Coulter's time was devoted to this project. As stated in a previous report, the Vermont portion of the study is being conducted jointly with William Miller of the Vermont Fish and Game Service.

Techniques developed and tested during preliminary studies in 1955 and 1956 were applied with reasonably good success. As of the close of the quarter, 8 additional cases of reneesting among marked black ducks and 2 instances of reneesting in ring-necked ducks were observed and studied.

The scope of this project has been increased to take advantage of an unusual situation on the islands in Lake Champlain, Vermont. On some of these, black ducks nest in densities exceeding one nest per acre. It was felt that because of the abundance of nests in restricted covers, it might be possible to gather a larger series of data with correspondingly less expenditure of time and money than on the study areas in Maine alone. The work in Vermont this season was of an exploratory nature, but the encouraging findings indicate worthwhile potential results. It also appears that broadening the study to include two distinct habitat types should add to the overall value of this work. The Vermont department and Miller have been generous in their provision of field equipment, manpower and also facilities for hatching and rearing ducklings.

Several persons assisted with the field and laboratory work in Maine. Graduate Assistant Robinson devoted many hours of study on the Goose River area. He was helped at times by Graduate Assistant Olson. Olson also tended the incubator on Campus and assisted in starting the rearing program for ducklings. Professor Robert J. Smyth, Head, Poultry Department, University of Maine arranged for use of an incubator and other facilities.

Since the field studies for the season will not be completed until mid-summer a more detailed report of results will be made in the next quarterly report. At present 32 hens have been nest-trapped, marked, banded and released. The eggs from these nests were collected and transported to incubators for hatching. Ducklings reared will be banded and released primarily at the areas from which the eggs were collected.

Of the 32 females trapped, 10 have reneested to date. Included in these figures are 17 hens that were marked on the Vermont study areas; 7 of the latter have been found reneesting.

Plans for next quarter: Complete season's field studies. Begin preparation of a manuscript describing a new nest trap, devised during the present investigation.

(c) Waterfowl Banding

Objectives: To study the movements and migration routes of waterfowl in Maine.

Assignment: Malcolm W. Coulter, Assistant Leader

Largely inactive, except for planning details for summer banding program. A few birds were banded during the quarter in connection with the reneesting study.

Plans for next quarter: Begin operation of summer banding stations.

(d) 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 quarter.

Plans for next quarter: Inactive

WOODCOCK RESEARCH

Woodcock Census Studies

Objectives: To conduct an annual census on the Unit's permanent census routes in Maine; and to correlate census results of cooperators in the northeastern states.

Assignment: Howard L. Mendall, Leader

The regular spring woodcock studies were conducted in cooperation with the State Game Division personnel. In addition, Mendall served as regional coordinator of all census studies in the New England States and New York. A complete report for the season was submitted under date of June 4 so only a brief text summary is repeated at this time:

The census results indicated that after 2 years of general declines, a substantial increase in woodcock populations have occurred throughout most of the region in 1957. All states showed an increase this year with the exception of Massachusetts and New York. In New York the decrease was so slight as to have no statistical significance; thus only Massachusetts shows an appreciable reduction in resident population this year. In correspondence with Dr. William G. Sheldon of the Massachusetts Cooperative Wildlife Research Unit, he attributes the 1957 decline to lower than average brood success a year ago.

It was in the three most northern states of Maine, New Hampshire and Vermont, that this year's increase was most outstanding. In Maine, the increase noted may be attributed, in part at least, to the excellent breeding season of a year ago; also to the fact that the kill last fall of resident woodcock appeared to be somewhat lower than usual because of the peculiar migration patterns. The situation in eastern Maine is particularly gratifying because populations have declined there for several years.

UPLAND GAME BIRD RESEARCH

Ruffed Grouse Cover Requirements and Populations

Objectives: To determine preferred winter cover types and population densities.

Assignment: Howard L. Mendall, Leader

Inactive during quarter.

Plans for next quarter: Inactive.

BIG GAME RESEARCH

Moose Studies in Norway

Objectives: To study the productivity and management of moose on a private forest of 80,000 acres in Romerike, Norway.

Assignment: Arne Krafft, Graduate Student

Because of the pressure of official duties Krafft was unable to complete his thesis this spring as originally planned.

Plans for next quarter: Continue work on thesis write-up.

White-tailed Deer

Objectives: To measure the effects of a deficiency of winter cover on penned fawn deer.

Assignment: William L. Robinson, Graduate Assistant

Robinson devoted much time to planning the details of this project. Preliminary work was also carried out in remodeling the pens on the University forest where the captive deer are to be held.

Plans for next quarter: Complete the remodeling of the pens and the construction of a new one; make all arrangement for initiating the study this fall.

COOPERATION AND EDUCATIONAL WORK

Coulter and Mendall continued to furnish technical assistance when requested to the State Pittman-Robertson program. Several meetings and conferences were held, particularly in connection with Robinson's study as well as a new P-R assistantship which is to be effective September 1; this will deal with deer nutrition studies.

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

PERSONNEL

Professor Robert Ashman retired in June as Head of the Forestry Department. During his long service, his interest in Unit activities did much to further the program here. It was with deep regret that the Unit staff said farewell, but all extend best wishes for many years of happy retirement.

However, we are very fortunate in that Professor Gregory Baker, a member of the Forestry Staff since 1935, has been named as Acting Head of the Department. He will serve as University representative on the Unit Coordinating Committee.

PUBLICATIONS

Coulter, Malcolm W.

1957. Food of Wood Ducks in Maine. Jour. Wildl. Mgt., 21:235-236.

Mendall devoted as much time as could be spared from other duties to work on the manuscript of the Unit publication on the ring-necked duck. This is based on 18 years of research. By the end of the quarter, the preliminary draft was well toward completion.

Respectfully submitted,

Howard L. Mendall

Howard L. Mendall, Leader
Maine Cooperative Wildlife
Research Unit

University of Maine
Orono, Maine
September 19, 1957

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MAINE COOPERATIVE WILDLIFE RESEARCH UNIT

University of Maine

Orono, Maine

QUARTERLY REPORT

July-September, 1957

Cooperating Agencies

Maine Department of Inland Fisheries and Game
Wildlife Management Institute
University of Maine
United States Fish and Wildlife Service

Unit Personnel

Leader - Howard L. Mendall
Assistant Leader - Malcolm W. Coulter
University Representative - Gregory Baker
Faculty Collaborators - Horace F. Quick
 David C. O'Meara
Graduate Assistants - David P. Olson
 William L. Robinson
 Philip U. Alkon
Graduate Student - Arne Krafft
Clerk - 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

July-September, 1957

RESEARCH PROJECTS

FUR ANIMAL RESEARCH

Ecology of the Fisher

Objectives: To obtain data on the distribution, habitat preferences and winter food habits of the fisher.

Assignment: Malcolm W. Coulter, Assistant Leader

Inactive during quarter except for some laboratory work with food habits material.

Plans for next quarter: Field work on one study area will be initiated if snow cover occurs during the quarter.

HABITAT RESEARCH

The Use of Aerial Photographs for Detailed Study of Marsh
Vegetation in Merrymeeting Bay

- Objectives: 1. To determine the value of various kinds of aerial photographs in studying marsh vegetation.
2. To analyze the vegetative associations in Merrymeeting Bay from aerial photographs.

Assignment: David P. Olson, Graduate Assistant

On August 28, twelve aerial coverages of the study area in Merrymeeting Bay were flown. Coverages at 1:5,000, 1:12,000, and 1:20,000 in Ektachrome, Ektacolor, Aerecon, and Pancromatic Super XX were taken. The film has been processed except for printing the Ektacolor negatives. Correspondence is in progress to locate facilities for having this done.

Two-hundred and ten plots of vegetation, sand and silt were selected and interpreted on the nine available photographic coverages. After interpreting the areas each was visited and the vegetative type recorded. The method used for measuring plant composition is a modified transect which gives percent of ground cover. Stereo pairs were taken of each of the nine plant associations.

Two student photo-interpreters were trained in the field as were two biologists and one experienced photo-interpreter. This field training is conducted to familiarize the interpreter with the photographic materials and plant associations. The stereo pairs of the plant types will aid in this training.

Plans for next quarter:

- a. Score interpretation already completed.
- b. Consolidate study areas to eliminate duplication and minimize time required of photo-interpreters.
- c. Get complete interpretations by student photo-interpreters.
- d. Analyse results and obtain interpretations from the biologists and experienced photo-interpreter in necessary areas.
- e. Circulate a letter to aerial photographic concerns to establish costs and capabilities for handling color film.
- f. Analyse photographic types and scales for potential value to wildlife workers.
- g. Begin writing thesis.

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

In the last quarterly report a seasonal summary was given which included data through part of the current quarter (mid-July). Therefore, the few additional records of late nesting did not materially affect the findings already reported. Brood averages fell off slightly during the latter part of the season. This may have been a result of the prolonged mid-summer drought which, during August, noticeably reduced the quality of rearing cover on many breeding marshes. Late reneesting alone would not explain the decline.

The tentative conclusions of mid-July probably should be modified a little relative to ultimate production. It is likely that the 1957 crop of waterfowl was about the same as that of a year ago.

Plans for next quarter: Inactive.

(b) Renesting and Homing Study

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

Assignment: Malcolm W. Coulter, Assistant Leader

The season's field work was completed during August. A total of 9 usable cases of renesting was observed and studied. These consisted of renests of 7 black ducks, 1 mallard and 1 ring-necked duck.

These renests followed collection of the original nests when the latter had been incubated for periods varying from 1 to 21 days. Although the data gathered are not yet sufficient for detailed analysis it appears that in the black duck at least, the renesting interval is rather variable among individuals that lose original nests at approximately the same stage. Among the 9 renesters each of the birds laid either the same number or one less egg than they had laid in their original nest.

Ninety-six birds, hatched in incubators from eggs collected in the field, were reared, banded and released when approximately 4 to 5 weeks old. Incubator hatching success was 86 per cent for black ducks and 88 per cent for ring-necked ducks. Ninety per cent of the blacks and 60 per cent of the ring-necks were successfully reared to the release date. It is believed that rearing success for the ring-necked ducks can be improved with some modification of techniques. Also, it appears that there is some relationship between the way the eggs are handled and rearing success. Eggs that are chilled before reaching the incubator may hatch, but from the few cases observed, it is likely that mortality during the first two weeks after hatching is much greater.

Sixteen mallards and 110 black ducks were reared and released in Vermont as a result of the joint studies there.

Plans for next quarter: Inactive.

(c) Waterfowl Banding

Objectives: To study the movements and migration routes of waterfowl in Maine.

Assignment: Malcolm W. Coulter, Assistant Leader

The regular Penobscot River banding stations were operated by undergraduate wildlife junior, Clayton Hardy. Banding was initiated during the week of July 7 and was terminated on September 5. A total of 664 ducks were banded including 517 black ducks, 136 wood ducks and 11 mallards. The early banding resulted in the capture of many birds hatched and reared on the river.

Additional records of homing among female black ducks and wood ducks with broods were gathered through recapture of birds banded during previous seasons.

Plans for next quarter: Inactive.

(d) 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

Plans were made for the annual hunter bag checks to be carried out

jointly by personnel of the Unit and the Game Division of the State Department of Inland Fisheries and Game. Extent of sampling by regions was decided upon and individual assignments made.

Plans for next quarter: Conduct bag checks throughout the hunting season of October 4 to December 12.

WOODCOCK RESEARCH

Woodcock Census Studies

Objectives: To conduct an annual census on the Unit's permanent census routes in Maine; and to correlate census results of cooperators in the northeastern states.

Assignment: Howard L. Mendall, Leader

Inactive during quarter.

Plans for next quarter: Inactive.

UPLAND GAME BIRD RESEARCH

Ruffed Grouse Cover Requirements and Populations

Objectives: To determine preferred winter cover types and population densities.

Assignment: Howard L. Mendall, Leader

Inactive during quarter.

Plans for next quarter: Largely inactive.

BIG GAME RESEARCH

(a) Moose Studies in Norway

Objectives: To study the productivity and management of moose on a private forest of 80,000 acres in Romerike, Norway.

Assignment: Arne Krafft, Graduate Student

Inactive during quarter.

Plans for next quarter: It is hoped that work on the final thesis write-up may be resumed.

(b) Winter Cover Studies of the White-tailed Deer

Objectives: To measure the effects of a deficiency of winter cover on penned fawn deer.

Assignment: William L. Robinson, Graduate Assistant

A rectangular enclosure ten feet high encompassing an acre and a half of land on the University of Maine forest was erected. The type of fencing used was standard coarse-mesh, woven 8-10 ga. hog fencing, over-lapped in necessary places, thus decreasing the mesh size to prevent injuries to deer. Two strands of barbed wire were stretched above the woven fence to discourage deer from trying to leap over the fence, as well as to prevent entrance to the pen by humans. A 3/8 inch width of hen wire was aproned and anchored about the bottom of the fence to eliminate the access of dogs into the pen.

Two other previously built pens of equal (1 1/2 acre) size were remodeled for the present study. This consisted mainly of removing leaning windfalls from the fence, resinking frost lifted posts, and repairing gates.

The enclosures are in coniferous forest vegetation. One pen has been given a typical commercial pulpwood cutting resulting in sparse crown cover and little shelter. A second pen has intermediate cover, consisting of a practically all-aged stand of mixed conifers. The third pen encloses a growth of mature trees which provide rather dense crown cover and shelter. Most of the browse in the pens has been cut and, by the time of release of the study animals, all browse will be eliminated so that feeding of the deer can be accurately controlled.

Following numerous conferences, final decisions were made as to feeding. Eastern States Champion A-14 goat feed, supplemented by small amounts of Eastern States Rabbits, will be used. This supplementation will be done (at the advice of the Eastern States Company) to provide vitamin A which is deficient in the goat feed and necessary for growing animals. A ton of goat feed was procured and stored in the storehouse. The local availability of Rabbits was confirmed by the Eastern States Company.

The amount of food to be given the deer will be standardized at a quantity somewhat below the maximum daily consumption of the control animals (those in the dense cover). This will be done so that all deer will be held below their prime health, as normal conditions may not give satisfactory results. Winter situations, in most cases, probably produce this sub-optimal condition.

Portable wooden feeding troughs were built. These will be moved frequently within each pen to force the deer to move about for food. A number 3 washtub was placed in each pen for watering the deer. Watering will be discontinued when snow is available to the deer. The store house on the area was provided with windows, a stove, and new sill supports. The road to the area was made passable with the aid of a bulldozer from the Department of Forestry of the University.

Three adult does, for temporary trial purposes, were obtained from the State's Swan Island Refuge and placed in the pens to consume the remnants

of browse and to test the effectiveness of the pens. These deer are providing a great deal of information and experience in the anticipation of problems to be encountered in the study.

Visits and conferences have been held at various points in Maine, New Hampshire, and Michigan regarding techniques for studying and handling captive deer.

Plans for next quarter: An accurate cover map, using a grid system, will be prepared of each pen. It is expected that the twelve fawns to be used in the study will arrive from Swan Island in December. These animals will be weighed, each marked with a colored collar for individual identification, and released, four per pen.

(c) A Study of Hardwood Browse for Deer

Objectives: To determine the time at which supplemental hardwood cuttings for deer should be made in order to provide the most nutritious and palatable winter food.

Assignment: Philip U. Alkon, Graduate Assistant

This is a new project to be initiated this fall. Alkon's study is being sponsored through a P-R assistantship. As visualized at the present time this study will consist of three phases:

1. Determination by chemical analysis of the nutritional value of tops of three species of common Maine hardwoods cut at monthly intervals from September through March. The potential deer browse will be analyzed for protein, carbohydrates, moisture, fat, ash, and fiber.

2. Determination of the relative values of the browse as reflected by living animals by means of controlled experiments on laboratory mice.

3. Determination of the palatability values of the tops by means of penned deer and by monthly cuttings around a known yarding area.

During this quarter an area within the Penobscot Experimental Forest was selected and 65 trees of each of the three study species (red maple, sugar maple, and paper birch) were marked for cutting. Numerous conferences were held with State and University personnel, also with Dr. Kenneth Fuller of the Jackson Memorial Laboratory, to plan the project.

Plans for next quarter: Preparation of a detailed outline of the project. Continue the monthly collections and analyses of browse samples. Continue survey of related literature.

COOPERATION AND EDUCATIONAL WORK

Coulter and Mendall continued to furnish technical aid when requested to the State P-R program. A number of conferences were held, especially in connection with the graduate studies of Robinson and Alkon. Both these

involve P-R sponsored assistantships.

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

Personnel

A new graduate assistant, Philip Alkon, reported for duty September 1. He is a graduate of Cornell University, majoring in wildlife management. During the summer Alkon has been employed by the State Game Division and stationed at the University. He holds a P-R assistantship and is assigned to the new deer nutritional study.

Publications

During the quarter, Mendall completed the preliminary draft of the ring-necked duck publication, mentioned in previous reports. Much of the work on the text figures and plates was also completed.

Upon request of the Maine Extension Service, Coulter revised and brought up to date the manuscript of Extension Bulletin #425 - "Big Game and Fur-Bearing Animals of Maine". This bulletin has already been reprinted once but is again out of print. Data obtained since the original printing will be included in the new version.

Respectfully submitted,

Howard L. Mendall
Howard L. Mendall, Leader
Maine Cooperative Wildlife
Research Unit

University of Maine
Orono, Maine
December 16, 1957

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MAINE COOPERATIVE WILDLIFE RESEARCH UNIT

University of Maine

Orono, Maine

QUARTERLY REPORT

October-December, 1957

Cooperating Agencies

Maine Department of Inland Fisheries and Game
Wildlife Management Institute
University of Maine
United States Fish and Wildlife Service

Unit Personnel

Leader - Howard L. Mendall
Assistant Leader - Malcolm W. Coulter
University Representative - Gregory Baker
Faculty Collaborators - Horace F. Quick
 David C. O'Meara
Graduate Assistants - David P. Olson
 William L. Robinson
 Philip U. Alkon
Graduate Student - Arne Krafft
Clerk - 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, 1957

RESEARCH PROJECTS

FUR ANIMAL RESEARCH

Ecology of the Fisher

Objectives: To obtain data on the distribution, habitat preferences and winter food habits of the fisher.

Assignment: Malcolm W. Coulter, Assistant Leader

Graduate students and undergraduates, under the direction of Graduate Assistant Olson made two trips to the Sucker Brook study area in Sangerville during December. By dividing the area into compartments it was possible to obtain data as to the number of fisher using the study area during the observation periods. Further data were also recorded concerning food habits and the use of various cover types. Detailed maps of the study area have been prepared and are used in plotting the field observations.

The detailed observations being made this winter at the Sangerville area constitute part of one of Olson's problems courses. In addition to supplementing field data gathered in previous years, this work is providing excellent winter field experience for the students who have been assisting on some of Olson's field trips.

Continued progress was made in examination of food habits material on hand.

Plans for next quarter: To continue periodic field trips to the Sangerville area; and to continue examination of food habits material.

HABITAT RESEARCH

The Use of Aerial Photographs for Detailed Study of Marsh
Vegetation in Merrymeeting Bay

- Objectives:**
1. To determine the value of various kinds of aerial photographs in studying marsh vegetation.
 2. To analyze the vegetative associations in Merrymeeting Bay from aerial photographs.

Assignment: David P. Olson, Graduate Assistant

Olson devoted much time to interpretation of the various kinds of photographs taken at Merrymeeting Bay and to an analysis of the accuracy of the results from interpretators with different levels of experience. This work will not be complete until the end of the next quarter. However, preliminary findings suggest several interesting results.

Although more information is available from larger scale photographs, the amount of additional detail is not great. Accuracy of interpretation of marsh plant associations varied from 70 per cent, at scales of 1:20,000, to 80 per cent at 1:5,000. No difference has been found between photographic film materials at any scale. Some kinds of plants and plant associations can be identified with 90 per cent or more accuracy, whereas accuracy in identifying others is consistently low.

Photography of other marsh areas will be used to supplement the Merry-meeting Bay photography. These photos will furnish image descriptions and estimates of accuracy for different types of habitat and plant species. They will also be used in the analysis of film types and scales of photography. Four aerial photographic coverages of the Delta marsh in Manitoba, have been ordered, and coverages of certain areas in Maine are being selected.

During the quarter valuable technical assistance was given by Mr. Ted Wood of the Sewall Company, Old Town, Maine and Dr. Harold Young of the University Forestry Department.

Plans for next quarter: Score, and analyse interpretations of the student photo interpreters; obtain and analyse interpretations from biologists and experienced photo interpreters; analyse photographic film types and scales for value to wildlife workers; begin thesis write-up.

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 quarter.

Plans for next quarter: Inactive.

(b) Renesting and Homing Study

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

Assignment: Malcolm W. Coulter, Assistant Leader

Inactive during quarter.

Plans for next quarter: To begin preparations for intensive field work during the spring quarter.

(c) Waterfowl Banding

Objectives: To study the movements and migration routes of waterfowl in Maine.

Assignment: Malcolm W. Coulter, Assistant Leader

Inactive except for routine tabulation of returns.

Plans for next quarter: Inactive.

(d) 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

During the waterfowl hunting season personnel of the Unit and the Game Division of the State Department of Inland Fisheries and Game conducted the regular hunter bag checks. The coverage and extent of sampling was essentially the same as during 1956. The data are being tabulated at present. A full report will be made in the next quarterly report.

Plans for next quarter: To complete tabulation of the data and prepare the annual report.

WOODCOCK RESEARCH

Woodcock Census Studies

Objectives: To conduct an annual census on the Unit's permanent census routes in Maine; and to correlate census results of cooperators in the northeastern states.

Assignment: Howard L. Mendall, Leader

Inactive during quarter.

Plans for next quarter: To plan the details of the spring census program.

UPLAND GAME BIRD RESEARCH

Ruffed Grouse Cover Requirements and Populations

Objectives: To obtain data on preferred winter cover types and population densities.

Assignment: Howard L. Mendall, Leader

Largely inactive during the quarter. In December, a new study area was selected in the Millbridge-Harrington region of western Washington

County. No data have been obtained in the coastal belt for several years and it is hoped that comparative information from this new area will supplement data gathered during early years of the study. Because of pressure of other winter work, this project has been only on a semi-active status for the past 4 years. It is planned to continue the program for two more winters, then tabulate all accumulated data.

Plans for next quarter: To conduct limited field checks on the new study area and on one of the three original inland areas.

BIG GAME RESEARCH

(a) Moose Studies in Norway

Objectives: To study the productivity and management of moose on a private forest of 80,000 acres in Romerike, Norway.

Assignment: Arne Krafft, Graduate Student

Krafft reports that he has been able to resume his thesis write-up.

Plans for next quarter: To continue writing thesis.

(b) Winter Cover Studies of the White-tailed Deer

Objectives: To measure the effects of a deficiency of winter cover on penned fawn deer.

Assignment: William L. Robinson, Graduate Assistant

Robinson continued his preparatory work in anticipation of the arrival of 12 experimental animals. A fourth pen of 1 1/2 acres was renovated to hold excess deer. These extra animals will be used for part of Alkon's studies of palatability of hardwoods cut at various seasons. It is also anticipated that these deer will be of use in experimenting with techniques for handling penned deer, including use of tranquillizing drugs.

In mid-December six of the experimental animals were received. They were divided 2 per experimental pen (1 male, 1 female). Unfortunately, as of the end of the quarter, the remaining deer had not been received.

Each deer was marked with a distinctive leather collar similar to the one devised by D. R. Progulsk (Jour. Wildl. Mgt., 21(2):251-252). Weights, hind foot length and heart girth was recorded for each animal. Blood samples were obtained for four of these deer and are being analyzed for calcium, phosphorus, glucose, hemoglobin, and specific gravity.

Observations during the few days of the quarter when these deer were present soon indicated that dominance in each pen was quickly established. The animals appear to be in good condition and appear to be adjusting to the penned conditions satisfactorily.

During the remainder of the winter an attempt will be made to record

all factors that may relate to the deer's reaction to the various degrees of cover in each pen. General behavior and condition, plus systematic observation and plotting of activity patterns, together with weight changes for the period, and final physical condition (as determined by autopsy), will be used to determine any influences of deficient winter shelter.

Details of snow depth, temperature, humidity and air movement are being recorded for each pen. Activity patterns of the animals are being plotted on maps. This is facilitated by a grid system established in each pen.

Plans for next quarter:

1. Continue systematic observation of experimental animals.
2. Experiment with handling techniques with extra deer to be held in a separate (non-experimental) enclosure.

(c) A Study of Hardwood Browse for Deer

Objectives: To determine the time at which supplemental hardwood cuttings for deer should be made in order to provide the most nutritious and palatable winter food.

Assignment: Philip U. Alkon, Graduate Assistant

Alkon's thesis work was largely confined to review of the literature and to the routine collection of the monthly samples from his study area. Samples collected consist of the twigs from felled hardwood trees. Twigs are collected to a maximum diameter of 3/16". Leaves and persistent fruiting structures present on some species are removed from the samples.

Samples were collected from trees felled during September and October and will be obtained from these trees each month through March. Samples from trees cut monthly from November through March will be gathered only at the time of cutting.

This plan is based upon the premise that twigs exhibit the greatest nutritional value during the period immediately preceding the dessication and fall of leaves. At this time large amounts of nutritional elements are reabsorbed by the leaf-bearing twigs.

Chemical analysis has been completed for the September-November samples. The results suggest certain interesting trends in variation of the nutritional components of the various samples. A detailed discussion of these results will be made when all samples have been collected and examined at the end of the next quarter.

Plans for next quarter:

1. Continue monthly collections and chemical analysis of browse samples.
2. Complete arrangements for the use of a white mouse colony for further testing the nutritional levels of the various samples.

COOPERATION AND EDUCATIONAL WORK

Coulter and Mendall continued to furnish technical aid when requested to the State P-R program. A number of conferences were held, especially in connection with the graduate studies of Robinson and Alkon. Both these involve P-R sponsored assistantships.

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

Coulter organized a new wildlife seminar designed to provide an opportunity for staff members and technical personnel of the Department of Inland Fisheries and Game stationed on campus to critically discuss various projects and problems. The initial meeting, held in December, proved stimulating and worthwhile and it is anticipated that these seminars will be held about twice a month during the school year.

At the request of the Fish and Wildlife Service, data and parts from several waterfowl specimens were submitted to research personnel at the National Museum.

In preparation for instruction at the warden trainee school to be held later in the winter at Augusta, several waterfowl specimens were collected and frozen. These specimens will supplement study skins normally used and will permit better demonstration of several points connected with identification.

PUBLICATIONS

Mendall devoted much time to completion of the ring-necked duck manuscript. This material has been accepted for publication in the Maine Studies Series and is scheduled to be printed this spring.

At the request of the editor of the Handbook of Birds, being published by the American Ornithologists' Union, Mendall prepared most of the manuscript material for the ring-necked duck.

Coulter completed revision of Extension Bulletin #425 - Big Game and Fur-Bearing Animals in Maine. The galley proof was returned to the University printing shop late in the quarter.

Coulter also completed a manuscript describing a new waterfowl nest trap that has been used successfully during the renesting study.

Some time was devoted to meetings and preliminary outlining of a new bulletin in which the Extension Service is interested. This bulletin will cover the life histories and methods of control of several of the smaller

mammals in Maine and will be co-authored by Coulter and Clarence Faulkner,
U. S. Fish and Wildlife Service Predator and Rodent Control Agent.

Respectfully submitted,

Howard L. Mendall

Howard L. Mendall, Leader
Maine Cooperative Wildlife
Research Unit

University of Maine
Orono, Maine
January 31, 1958