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Maine Cooperative Wildlife Research Unit  
University of Maine  
Orono, Maine

QUARTERLY REPORT

July-September

1942

RESEARCH PROJECTS<sup>1/</sup>

ECOLOGICAL STUDIES OF MUSKRAT HABITATS IN CENTRAL MAINE

- Objectives: 1. To study environmental conditions and factors influencing muskrat populations in Maine.  
2. To determine specific interrelationships existing between the muskrat and its plant environment as well as between the muskrat and other wildlife species inhabiting the same marsh areas.

Assignment: Eldon R. Clark, Field Assistant

Clark spent the greater part of the time during July and the first week of August on the Gorinna Stream study areas, but conditions there were very discouraging. Only seven animals were banded and the population of muskrats on these areas is at an extremely low point. As was mentioned in the last quarterly report, winter mortality was high in central Maine. Moreover, flood conditions occurred in mid-June and many young muskrats, as well as some adults, died. As a result, most of the remaining animals apparently moved back into the almost inaccessible parts of the marsh.

It seemed advisable to temporarily suspend activities on this project early in August, and it will be necessary to select a new study area when work is resumed by the new graduate assistant, Malcolm Coulter.

DEER MANAGEMENT STUDIES

Sub-project: Relation of small mammals to availability of northern white cedar for deer browse

<sup>1/</sup>Only those projects on which work was actually carried out during the present quarter are listed in this report. For the complete list of active projects of the Maine Unit, see memorandums to Dr. Bell of February 27, 1942, and June 15, 1942.

- Objectives: 1. To determine the influence on cedar of various species of small mammals.
2. To determine the relation of damage by small mammals to deer browse.

Assignment: Eldon R. Clark, Graduate Assistant

Clark has now completed all field work and tabulation of data on this project. At present he is engaged in his thesis write-up.

Sub-project: Northern white cedar investigations

- Objective: To determine silvicultural factors involved in obtaining cedar reproduction suitable for deer browse.

Assignment: Professor James D. Curtis

Curtis spent the entire month of July, two weeks in August, and two weeks in September on field work connected with seedling studies and regeneration of cedar in pure stands. During this time he was given the services of the new graduate assistant, Leslie Glasgow. Field assistant Clark maintained the weather station at Alton. Since the season's data have not been tabulated, a summary of accomplishments will not be given until the next quarterly report.

Sub-project: Layering experiments with white cedar

- Objectives: 1. To determine what percentage of living limbs which are put in contact with the soil will send out roots.
2. To determine whether the branches which are not in contact with the soil will continue to grow and produce trees of browse size for white-tailed deer.
3. To determine in this connection the approximate time required to place the trees in a position so that layering will take place.
4. To determine what size of trees it is feasible to work with.

Assignment: Professor D. B. Demeritt

Demeritt devoted a total of one month during the quarter to field work in connection with this study. Accomplishments will be summarized in the next quarterly report.

## RUFFED GROUSE MANAGEMENT STUDIES

**Sub-project:** Cover requirements of grouse in Maine

**Objectives:** To determine the forest cover types preferred or required by the birds with particular reference to those during the winter months and during the breeding season.

**Assignment:** Howard L. Mendall, Leader.

Mendall spent about five weeks during this quarter on field checks in various parts of the State, chiefly in eastern and central Maine. Considerable data on cover preferences were obtained. The downward cyclic trend of the species over most of the State is very apparent, although in the extreme northern and northwestern part of Maine, grouse are relatively abundant and would seem to be near the peak of the cycle. This <sup>latter</sup> is apparently true only in Aroostook County and the northern parts of Penobscot, Piscataquis, and Somerset counties.

About a week was spent in southern Quebec and western New Brunswick checking grouse conditions. Since the results were summarized in a special report, they will not be repeated at this time.

**Sub-project:** Influence of forest types on food habits of ruffed grouse in Maine

**Objectives:** To ascertain, by collection of the digestive tracts of grouse and analyses of contents of same, the relative amounts of the various kinds of food taken, as correlated with the cover type in which feeding occurred.

**Assignment:** Charles P. Brown, Assistant Leader.

Brown made four trips, totaling about two weeks, to the St. John Pond area in Somerset County. Heavy populations of birds were seen and apparently the breeding season was successful. A few specimens were collected for stomach analyses.

Considerable progress was made in the analyses of the contents of digestive tracts previously collected and this work is now nearly caught up to date.

## MISCELLANEOUS STUDIES

### Waterfowl Distribution Studies

**Objectives:** To obtain and compile all possible data on the distribution and abundance of waterfowl species in Maine, especially during the breeding and migration seasons.

**Assignment:** Howard L. Mendall, Leader.

Mendall devoted about half time during July and August to this project, checking breeding populations. Both species of teal continue to show an increase as summer residents throughout the northern half of the State, although their total numbers are, of course, still small. Two new county records were established for breeding blue-winged teal and one for green-winged teal. Breeding ring-necked ducks likewise showed an increase in numbers this year as well as a more widespread distribution and now are known to nest in all but the most southeasterly counties. In two of Maine's important breeding marshes, ring-necks outnumber all other waterfowl species. In spite of an increase in breeding stock, however, ring-necked ducks did not have as good a nesting season as they did last year. The heavy and prolonged rains of mid-June resulted in considerable nesting mortality, only part of which was offset by re-nesting attempts. Black ducks showed a marked increase in numbers and apparently had an unusually successful breeding season, as the average brood size for this species was the highest in six years. Golden-eyes also showed a definite increase in numbers. The relative scarcity of wood ducks, indicated in the last quarterly report, was even more apparent as the season progressed and there is no doubt but that their population in Maine this year was far below that of 1941. No reason can be advanced for this situation.

About a week was spent in checking waterfowl in southern Quebec and western New Brunswick, the results of this survey being already submitted in a special report.

Field Assistant Clark devoted a total of about a week to the waterfowl project in the Corinna area and appreciably supplemented Mendall's studies.

### Hungarian Partridge Studies

**Objectives:** To release Hungarian partridges in a carefully selected study area, and to check on the success or failure of these releases in an endeavor to obtain specific information on the feasibility of attempting to stock certain areas in Maine with this species.

Assignment: Howard L. Mendall, Leader.

Mendall made a three-day check in July in the Fort Fairfield area where the experimental release was made last spring. Since hay and grain was still uncut in most of the fields it was difficult to make observations. One bird, apparently a young one, was actually seen, and farmers contacted on the trip reported seeing a few from time to time during the summer.

#### GENERAL NOTES:

Some interesting data on crow depredations were found by Clark and Mendall during investigations at the Gorinna area, this being the first instance in Maine known to the writer where crows have really caused appreciable damage in any given locality. The crow population was heavy and a considerable quantity of birds' eggs were found that had been eaten by crows. Eggs definitely identified were of the black duck, blue-winged teal, ring-necked duck, Virginia rail, sora rail, long-billed marsh wren, and red-winged blackbird. Ring-necked ducks and the rails suffered most extensively.

During Clark's numerous observations at the Gorinna area, he definitely established both the sora and Virginia rail as nesting in considerable numbers. Several years ago Mendall found the King rail breeding here, thus making three species nesting in this locality. All species of rail, except the Virginia, are rather rare as breeding birds in Maine.

#### PUBLICATIONS

Former Graduate Assistant Severaid's manuscript on the snowshoe hare has now been published by the Maine Department of Inland Fisheries and Game, under the title of "The Snowshoe Hare: Its Life History and Artificial Propagation".

Former Graduate Assistant Takos completed the revision of his manuscript on live-trapping and banding of muskrats and this has been submitted to the Journal of Wildlife Management.

#### COOPERATION AND EDUCATIONAL WORK

Mendall continued his supervisory duties of the State Pittman-Robertson projects.

Several specimens were autopsied during the quarter by the Unit personnel. A number of additions to the study skin collection were made by Brown and Mendall.

PERSONNEL CHANGES

During the past quarter two new graduate assistants were obtained, both of whom come with excellent scholastic records and recommendations. Leslie Glasgow, a graduate of Purdue, entered the Unit in July and spent most of the summer as Curtis' assistant on the cedar reproduction studies. He is to be assigned to the winter deer yard study. Malcolm Coulter, a graduate of Connecticut State College, arrived in September and is to be assigned to the muskrat project.

Respectfully submitted,



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

University of Maine  
Orono, Maine  
October 12, 1942.

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Maine Cooperative Wildlife Research Unit  
University of Maine  
Orono, Maine

QUARTERLY REPORT

October-December

1942

RESEARCH PROJECTS<sup>1/</sup>

ECOLOGICAL STUDIES OF MUSKRAT HABITATS IN CENTRAL MAINE

- Objectives: 1. To study environmental conditions and factors influencing muskrat populations in Maine.
2. To determine specific interrelationships existing between the muskrat and its plant environment as well as between the muskrat and other wildlife species inhabiting the same marsh areas.

Assignment: Malcolm Coulter, Graduate Assistant

Coulter made several preliminary surveys of various muskrat habitats in central Maine and selected a study area near Orono that offered promise for some worthwhile research. In November, however, Coulter was drafted by his local Selective Service Board and resigned his position as Graduate Assistant. It has been necessary to suspend all work on muskrats as a major project, although a limited amount of activity of a reconnaissance nature will be undertaken from time to time by Brown and Mendall.

DEER MANAGEMENT STUDIES

Sub-project: A study of conditions in winter deer yards

- Objectives: 1. To locate the important deer yards in Maine.
2. To develop plans for improving food and cover conditions in such yards as may be inadequate at present.

Assignment: Leslie L. Glasgow, Graduate Assistant

Glasgow tabulated and analyzed the questionnaires that had been sent out last spring to all State game wardens. These questionnaires

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dealt with the locations, population estimates, and general conditions of the various deer yards in each warden district. Several yards offering possibilities for intensive study were investigated further and from this list, two have been selected as study areas for detailed ecological investigation. A third study area is to be picked out in the near future. Glasgow made two trips to the study areas in December to obtain preliminary data and to make plans for procedure when weather conditions cause deer to start yarding.

Glasgow also reviewed the available literature dealing with ecological factors of deer in the northeast.

Sub-project: Relation of small mammals to availability of northern white cedar for deer browse

- Objectives:
1. To determine the influence on cedar of various species of small mammals.
  2. To determine the relation of damage by small mammals to deer browse.

Assignment: Eldon R. Clark, Graduate Assistant

Clark completed his thesis under the foregoing title and was voted his Master's Degree in November. His conclusions are as follows:

1. Northern white cedar, while not the favorite winter food of snowshoe hares in pasture growth cedar and cedar swamp types, is eaten very readily and appears to be a staple winter diet.
2. The heaviest browsing by hares occurs in areas affording the most protection for these animals. Areas having no protective overstory are not often frequented by hares even though food may be more abundant than in better protected localities.
3. Average hare populations do not seriously damage cedar stands or appreciably deplete the supply of cedar foliage for winter deer food. Only a very small percentage of the foliage that might be eaten by deer is available to hares. Furthermore, most of the hare browsing is done on stems which would die eventually as a result of being shaded by higher growths.
4. Red squirrel damage to cedar consists mainly of seed eating. In pasture growth stands where large cone crops are usually present, this work may be extensive, but apparently enough seed remains to regenerate a satisfactory stand of seedlings. In cedar swamp types cones are less plentiful and cone-cutting is less in evidence. Here too, however, the young seedlings are usually numerous enough to show that the seed-eating habits of red squirrels do not seriously hamper the regeneration of northern white cedar.

5. Only three trees in approximately 250 acres of cedar type observed had been appreciably damaged by porcupines. It is not to be expected that these animals will seriously damage cedar reproduction or reduce the supply of cedar foliage for winter deer food.

A copy of the complete thesis will be forwarded to Chicago in the near future.

Sub-project: Northern white cedar investigations

Objective: To determine silvicultural factors involved in obtaining cedar reproduction suitable for deer browse.

Assignment: Professor James D. Curtis

Curtis completed the season's field work and tabulated the data. This is summarized as follows:

During July and August, 1942, some 900 northern white cedar seedlings from different sites were examined and their tops and main roots measured. A sample of the medium in which the seedling was growing was weighed in the field, brought to the laboratory, completely dried and weighed again. In this way the moisture content of the medium was found. The purpose of this work was to determine the moisture percentage for different media on which northern white cedar grows, and to find further what moisture percentage was optimum for one- and two-year-old seedlings.

Media included mineral soil, sphagnum moss, raw humus, and decayed wood. With the exception that the first mentioned medium averaged about half the moisture content of the other three, there was revealed no particularly significant results. It is planned to present these data in a detailed report later when they have been thoroughly analyzed and correlations noted.

In conjunction with the carrying out of the above, other collateral studies and observations were made. These included some discoveries on disease, insects and mammals in relation to cedar, cedar seed production and collection, seedling mortality and causes, and confirmation of the means by which the species regenerates itself vegetatively rather than by seed in the majority of cases. A new experiment in artificial seeding on mineral soil was initiated, and spring and fall examinations were recorded.

Sub-project: Layering experiments with white cedar

- Objectives:
1. To determine what percentage of living limbs which are put in contact with the soil will send out roots.
  2. To determine whether the branches which are not in contact with the soil will continue to grow and produce trees of browse size for white-tailed deer.
  3. To determine in this connection the approximate time required to place the trees in a position so that layering will take place.
  4. To determine what size of trees it is feasible to work with.

Assignment: Professor E. E. Demeritt

Demeritt completed the tabulation of the past season's study, and his summary follows:

During the fall of 1941 an experiment was started on the probability of success in securing vegetative reproduction of northern white cedar by bending trees over to determine whether they would take root as layers and how long would be required for this procedure to operate satisfactorily. During the summer of 1942 observations were made on the trees previously bent over, and more trees were bent at a different season of the year, with the ultimate idea of determining whether the season had any effect upon the layering capacity.

Observations made on the 1941 trees showed that while none had started rooting all were still alive and thrifty. Numerous observations were made on these trees to determine their condition. Only one tree out of fifteen had begun to turn its stem growth to an upright position and this only to a small degree. It was noted that trees which had been bent over were browsed by rabbits and deer in preference to small trees growing within a very few feet and which had not been bent over.

Many observations were taken on trees which had previously been windthrown or which had been bent over by snow or otherwise, and indications are that these trees, in a great many cases, produce roots from limbs which become covered with duff, and trees are produced at this same point. Furthermore, the leader of the main stem on thrown trees tends to remain alive and turn to an upright position and continue to grow for many years. Individual trees 50 years old at the point of bending were observed in several instances. In the fall of 1942 observations were again made on all trees which had been artificially bent over for the past two seasons, and all were still thrifty but no root growth had begun.

As soon as any success is obtained in this respect, detailed measurements on tree sizes, position of limbs--dead and live, etc., can be correlated with the layering rate for further progress information on this subject.

## RUFFED GROUSE MANAGEMENT STUDIES

### Sub-project: Cover requirements of grouse in Maine

**Objectives:** To determine the forest cover types preferred or required by the birds with particular reference to those during the winter months and during the breeding season.

**Assignment:** Howard L. Mandall, Leader.

Mandall devoted about a month during this quarter to field checks in various parts of Maine. The general shift in habitat of the birds from hardwood tracts toward coniferous stands, or mixed wood having plentiful coniferous clumps, was not as pronounced in November and December as it was a year ago, probably due to the lack of very much snow or extremely low temperatures prior to the middle of December; nevertheless, the majority of birds flushed in December (except at times of intensive feeding) were either in thickets or in coniferous stands.

The general conclusions mentioned in the last quarterly report that the species appears to be at a rather low point in the cycle over much of the southern two-thirds of Maine still hold, although there are some local exceptions. In the extreme northern part of the State good populations were found, both during and after the hunting season.

Brown assisted in this sub-project by taking two grouse censuses on permanent mile-square census plots in Washington County.

### Sub-project: Influence of forest types on food habits of ruffed grouse in Maine

**Objectives:** To ascertain, by collection of the digestive tracts of grouse and analyses of contents of same, the relative amounts of the various kinds of food taken, as correlated with the cover type in which feeding occurred.

**Assignment:** Charles P. Brown, Assistant Leader.

Brown completed the analyses of the contents of all digestive tracts collected in 1941, and also the spring and summer stomachs of 1942. He made several collecting trips during this quarter and obtained a few fall and early winter specimens. At present he is engaged in analyzing all digestive tracts obtained during the 1942 hunting season.

Mandall assisted in this sub-project by collecting about a dozen stomachs during December while engaged in his own grouse studies.

## MISCELLANEOUS STUDIES

### Waterfowl Distribution Studies

**Objectives:** To obtain and compile all possible data on the distribution and abundance of waterfowl species in Maine, especially during the breeding and migration seasons.

**Assignment:** Howard L. Mendall, Leader

Mendall devoted about a month during October and November to field work on this study. In general, the trends indicated by the summer checks were borne out by the fall observations. The prophesy of a remarkably good breeding season for black ducks was fulfilled by noting in early October more than the usual numbers of this species in Maine's principal marshes. The same observations were true of teal, especially blue-winged teal. Ring-necked ducks, however, were definitely fewer in numbers than for several years, confirming the fear that the late June floods had caused heavy nesting losses. Likewise, wood ducks were apparently the scarcest that they have been for many years and it is believed the legal kill of this species was comparatively insignificant in Maine, chiefly due to the fact that so few were present.

The flights of northern ducks were rather disappointing but this may well have been due to fall weather conditions rather than because of any severe decreases in population. The entire month of October and the first part of November were comparatively warm and mild. Scaups and buffleheads were nearly two weeks late in arriving in Maine and the usual heavy November flights of red-legged black ducks and green-winged teal did not materialize. The highlight of the waterfowl season was a flock of 12 to 15 canvasbacks which remained on the St. Croix River in Washington County for nearly a week. A male and female were collected by the local game warden. This species is rare in this State and seldom occurs except in southwestern Maine. The presence of a dozen or more in eastern Maine is noteworthy.

### Woodcock Studies

- Objectives:**
1. To take an annual census on the Unit's census area located at the Moosehorn Refuge in Washington County.
  2. To band as many juvenile woodcock as possible during the height of the hatching season.

**Assignment:** Howard L. Mendall, Leader

Although very few field checks were made this fall by Mendall, efforts were made to contact as many hunters and wardens as possible.

In eastern Maine (the most important woodcock area), the birds appeared to be present in fairly satisfactory numbers. This is in line with increased breeding populations shown by the spring censuses in eastern Maine and in the Maritime Provinces of Canada. In the central Maine covers, however, most of the observers contacted reported the birds as decidedly "spotty" in distribution and in fewer than normal numbers.

#### COOPERATION AND EDUCATIONAL WORK

Brown conducted the regular course in Game Management for undergraduate students majoring in Wildlife Conservation and Forestry. Mendall gave lectures on waterfowl and woodcock in this course. Brown also gave four days instruction in Wildlife Field Methods to the senior students at the Forestry Winter Camp in Washington County.

Mendall continued his supervisory duties of the State Pittman-Robertson projects, and made two inspection trips during October and November to the development and management area on Swan Island in Merrymeeting Bay.

A number of specimens were autopsied during the quarter by the Unit personnel. Several additions were also made to the study skin collection by Glasgow, Brown, and Mendall.

A valuable acquisition to the Unit was the donation by Mrs. Walter Clayton, Lincoln, Maine, of a number of bird skins, and mammal skins and skulls from the collection of her late husband, prominent Maine taxidermist and naturalist. In addition, Mrs. Clayton graciously turned over the stomach analyses records belonging to her husband. These deal with predatory birds and mammals, examined by Mr. Clayton, and date back to 1920. The data are being tabulated by Mendall, and it is believed that some of this material will be well worth publishing.

#### PUBLICATIONS

A manuscript by former Graduate Assistant Merwin Marston, entitled "Winter Relations of Bobcats to White-tailed Deer in Maine", was published in the October issue of the Journal of Wildlife Management.

#### PERSONNEL CHANGES

During this quarter, two personnel changes occurred. Eldon R. Clark, former Graduate Assistant, and more recently Field Assistant, resigned and accepted a position as Junior Refuge Manager with the Fish and Wildlife Service. He has been assigned to the Federal Refuge at Chincoteague Island, Virginia. Malcolm Coulter, the new Graduate Assistant, who reported for duty in September, was drafted by the Selective Service in November, and is now in the U. S. Army.

Respectfully submitted,

*Howard L. Mendall*  
Howard L. Mendall, Leader,  
Maine Coop. Wildlife Research Unit

Orono, Maine  
January 8, 1943.