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TEXAS GAME, FISH AND OYSTER COMMISSION
DIVISION OF WILDLIFE RESTORATION
PROJECT 1-R

F. S. Henika — Lubbock, Texas

October 1, 1940 — SPECIAL REPORT — Region 5

PRESENT STATUS AND FUTURE MANAGEMENT OF THE PRAIRIE CHICKEN IN REGION 5

Historical

The grouse family in northwest Texas is now represented by one species, the Lesser Prairie Chicken, (Tympanuchus pallidicinctus). Formerly there were two, the southern extension of the range of the Greater Prairie Chicken (T. cupido americanus) overlapping into the Texas Panhandle. No very exact date may be assigned for the withdrawal of the Greater Prairie Chicken from its Texas range, and authentic accounts of its presence are rare. However there is little question but what it was once fairly common here, for within the memory of old time ranchers and sportsmen two kinds of prairie chickenwere met with in the field, "Big Ones and Little Ones." The "Little Ones" were the lesser prairie chickens, apparently always the more numerous, and found originally in all counties within the region which had prairie environment.

The greater prairie chicken is now only a memory in Texas, and its restoration in the light of present knowledge seems impractical. The lesser prairie chicken still holds out in 26 counties within the region. However doubtful its eventual status as a game bird may now appear, its restoration and increase is at least a possibility. We are interested in assaying existing opportunities for such restoration, rather than in extensive analysis of the changes in environment which have reduced the species to its present level. A brief resume of these changes, however, is justifiable as a basis for understanding the limitations placed on future management.

The term 'Prairie Environment' as herein used includes a variety of vegetative types having in common certain properties which make habitable environment for prairie grouse. With the exception of cedar breaks adjoining the Edwards Plateau, the Palo Duro canyon, the Croton breaks, and a small area of West Texas Cross Timbers in the scutheastern portion, most of Texas Region 5 was originally prairie. Its composition according to W. T. Carter (1) is shown on the accompanying key map, (Map 1). The high plains portion of the region with limited rainfall and relatively flat topography sustained on the heavier soils a good growth of short grasses, especially buffalo grass and gramas. Interspersed sandy soils and sands were grown over with shin oak, sage brush, and a mixture of grasses. To the south and east, the eroded or rolling plains were also short-grass country, bunch grass predominating with needle grass and gramas associated on the heavier soils, and shin oak communities on the sands.

There is reason to believe that the shin oaks were the key to habitability of the region originally by prairie grouse, since prior to cultivation they furnished a stable source of winter food in the form of acorn mast. Lesser prairie chicken were not restricted to the shin oak areas in the early days, but if the stories of old timers are to be believed they were more abundant there than on neighboring heavy soils. (Bent (2) gives the wintering range of the lesser prairie chicken as "Confined chiefly to Central Texas," which implies not only a considerable influx from out of the state, but also an appreciable intra-state movement in the winter from the Panhandle southward. Such general movements are not remembered by any of the older Panhandle residents in the present chicken range who have been questioned in this regard, although isolated cases of migrations in recent years are known. Hence mass migrations while plausable enough in the days when prairie chicken were present in great numbers, evidently have not occurred for some years. The most logical picture of the original prairie chicken distribution within the region which can be pieced

together from evidence now available is one wherein the extensive areas of shin oak accommodated dense breeding populations and at least moderately heavy winter populations. [On the heavy soil, short grass prairies, prairie chicken were perhaps less dense and more migratory.]

With the opening of the region to livestock grazing after 1870, modification of the prairie chicken range began. Buffalo grass and bunch grass mixed with gramas on the heavier soils provided better for livestock than did the shinnery soils, hence first caught the full impact of grazing. By the time the older present residents of the region arrived, chickens were still very plentiful, but had been forced out of much of the heavy soil prairie. As cultivation spread into the region there may have been a time when winter grain available in fields counterbalanced reduction of native foods due to livestock grazing. Austin O'Neil is of this opinion, at least for the Panhandle portion of the region. O'Neil gives 1910 as the date when additional cultivation in the Texas Panhandle began to push the chicken range back. This date seems correct for that part of the region, but a little late for the southern half. Since that date, however, there is no questioning the combined influence of cultivation, drought, livestock grazing, and the oil industry in reducing prairie chicken to present range and density. The common practice of market hunting in the vicinity of early population centers undoubtedly helped in forcing the chickens into the more remote ranges, as well as directly reducing their numbers. Present range boundaries of the prairie chicken in region 5 are shown on the accompanying map (Map 2), and pepresent in the main, large blocks of shinnery lands remaining unplowed or uninvaded by intensive oil developments, with adjacent or interspersed cultivation.

Present Status

Of particular interest from the standpoint of future management of the prairie chicken in northwest Texas is the fact that present ranges are surrounded either by heavily grazed range land, or by areas of intensive cultivation.

Region now has about 20$ cultivation and 80$ pasture, or roughly about 36,000,000 acres of range land. Under the present system of land use the pasture land is with a few exceptions heavily overstocked with livestock. Over much of the region the original prairies have been invaded by mesquite to the point where even with no grazing at all they would be uninhabitable for prairie chicken. [Overgrazed open short grass pasture is not habitable by prairie chicken either, hence the possibility of re-establishing breeding range for the species on the heavier soils within the region is too remote and too difficult of accomplishment to merit serious consideration.] Evidently therefore opportunities for increasing prairie chicken in northwest Texas will have to be sought along the lines of increased density on existing range, with possible restoration on those shinnery pastures not now habited.

Most of the area shown on Map 2 is thinly stocked with prairie chicken and populations are thought to be on the increase, recovering from the all-time low reached during the recent drought. This is known to be true across the east Panhandle border in Oklahoma, where seven years census records have been kept on the Davison ranch near Arnett. Comparable records are lacking on the Texas side, but general opinion of landowners, sportsmen, and game wardens who have followed prairie chicken closely in the field through the last five years is unanimous in estimating an increase this past year over immediately preceding years. Just how high natural recovery will carry existing populations cannot be predicted, nor for that matter is there any basis at present for accurately estimating the numbers of chickens now in hand as breeding stock.

Reports have been received during the past winter of hundreds of prairie chickens concentrating a t various points in the region on farmers feed fields. The number of such reports was not large, however, and while the concentrations undoubtedly occurred as reported, they were not permanent enough to permit field verification by the game manager. The combined total of such reports taken at

face value would not total 1000 birds. While any estimate of present numbers by anyone is mostly guesswork, it is considered safe to estimate last winter's population in the region at a minimum of 2000 prairie chicken. Whether this number is too low by one thousand or by five thousand birds is relatively unimportant in view of the fact that it is thinly spread. Many miles of occupied range have been travelled during the past year and very few prairie chickens seen. On one occasion, for example, the game manager and Warden Harris spent four consecutive days in Dawson, Yoakum, Terry, and Gaines counties, checking feed fields, talking with landowners and travelling the shinoak range where a few years back prairie chicken were abundant. Only one or two chickens were seen in the entire four days. It must be accepted as fact, therefore, that thoughtout the present occupied range prairie chicken exist in thin density by comparison with populations of ten years ago.

While the species will undoubtedly continue to show increases in portions of Region 5 where environment is suitable, it appears almost certain that such increases will not be held through another succession of drought years without more management than has been practiced to date. Drought apparently operates against the prairie chicken throughout its entire life cycle. In normal years there is considerable winter food available in the form of waste grain on stubble fields, or in the form of shocked grain left until late winter in fields adjacent to or included within occupied range. Such is not the case is dry years when feed crops are short, and even the most sketchy grazing resource are used by cattle. Shortage of nesting cover in dry years unquestionably is one of the chief factors operating to hold the prairie chicken down, for there is always some lag in adjusting numbers of livestock to grass shortage in dry years.

Native food weeds used by prairie chicken in winter and formerly occurring in sufficient density on range lands to form an appreciable part of their diet are now thinly scattered where they occur at all. Under current range management practice the odds are against their increasing to the point where they will again play a major part in prairie chicken winter diet.

Poaching of young prairie chicken by local residents in small towns within or adjacent to the present prairie chicken range has in some instances been an influential factor in holding populations down within a small area. Admittedly there is no good way to measure its influence over large areas except as common sense and good judgment dictates an opinion. In the opinion of the game manager, poaching has not played a major role in holding prairie chicken down over large areas of their range in recent years. Large blocks of range almost surely unpoached are known, such as the Pitchforks and Matador ranches in Motley, King, and Dickens Counties. These ranches have many riders out, and enforce trespass laws rigidly, and since this is commonly known locally they enjoy relative freedom from trespass. Yet prairie chicken populations on these ranches are not appreciably higher than on other areas where poaching is known to have occurred.

Present Research Status

The preceding background on general status of the lesser prairie chicken in Texas Region 5 has been drawn from general observation by the writer and others. The research status of the species is next reviewed to complete the picture.

Most of the pertinent research findings on the lesser prairie chicken come from the Oklahoma prairie chicken investigation, conducted by Verne Davison (3) on the Davison ranch in Ellis County, Oklahoma from 1932 through 1935. This location is about 35 miles east of the Texas Panhandle, in the same general type of range as characterizes Hemphill and Wheeler counties in Texas. With the exception of certain differences in range character brought about by land use which will be referred to later, the Davison ranch closely approximates the

prairie chicken range of the north Texas Panhandle, and the results secured there are accordingly of special interest. They are available in an original report, copy of which was secured for the regional and Austin office files. Davison findings are tabulated with extreme brevity under several headings as follows.

Life History

Nesting--April 15 to June 15.
Eggs per clutch--13.
Hatch--11 per clutch (approximate, not accurate)
Broods per year--1
Young per bfood--5, 6 or 7, at 5-15 weeks of age, varying with season.
~~Young per brood 5, 6 or 7~~
Breeding habits--Polygamous
Sex ratio--1.4 male: 1 female, in young birds at 5-14 weeks of age.
Mobility--1-2 mile drift in fall, banding records up to 80 miles. Breeding range in sandhills without exception, winter range along creeks, at edge of hard land fields, and in shinnery.

Ecology

Winter foods--Grain available in fields, acorns in fall and winter, shinoak flowers in late winter, early spring.
Wild greens eaten at all seaspons, especially the following:
Wild sweetpea (Cracca sp.)
Hairy puccoon (Lithospermum sp.)
Prairie marigold (Thelesperma sp.)
Beardstongue (Pentstemon)
Umbrellawort (Allonia sp.)
Evening Primrose (Oenothers sp.)
Wild seeds--seasonal as available:
Ragweed (Ambrosia sp.)
Queens delight (Stillingia sp.)
Hairy Puccoon (Lithospermum sp.)
Wild sweet pea (Cracca sp.)
Day flower (Comelina)
Water requirement
Indepent of water in midsummer if shade and green food available.
Mortality--Most measurable mortality is juvenile; no appreciable adult mortality noted. Mortality of young birds high, almost 50% by October. Differential sex ratio in favor of male.

Management

1. Burning shinoak periodically on rotation stimulated native legumes and the acorn crop, but no definite conclusions reached as to application as a management measure.
2. Food patches planted and fenced against stock at rate of 2 acres per section of range (patches about 5 acres in soze) found to be inadequate for wildlife attracted to them, especially rabbits and small birds.

In addition to the material briefed above Davison's manuscript contains a wealth of detail along life history lines, working methods, and ecology not possible to list briefly. The whole manuscript has the unmistakable ring of an alert investigator and accomplished field man.

Some of Davison's findings listed so briefly on the preceding page are of major significance to the Texas prairie chicken work. The differential mortality between sexes in young birds, resulting in an unbalanced sex ratio of 1.4 males to 1 female may reasonably be expected to occur in Texas. Considering the polygamous nature of the species the direction of unbalance is especially significant, for a proportion of the inherent productivity of the species is nullified before the following breeding season. Davison's conclusions anent the water requirement of prairie chicken in summer should also carry over to Texas conditions, and provide an effective answer to those enthusiastic but misguided individuals who believe that scarcity of live water is responsible for recent decreases in numbers of prairie chickens.

Similarly, the evidence that a considerable proportion of the chickens on the Davison ranch, an area of about 100,000 acres winter on acorns, never going near a feed field, must be taken into consideration. The densities of prairie chicken found there should also be taken to heart by those who out of hand estimate too many thousands of prairie chickens on the Texas range. The Davison ranch was visisted by the writer this past summer and without question has better grass and more interspersion of desirable old fields reverting from cultivation than any area of equal size in the Texas prairie chicken range. Yet the best 10,000 acres of the Davison ranch held only 850 prairie chicken in 1932, prior to the drought.

The light adult mortality and the heavy juvenile mortality with almost 50% of the young birds disappearing by fall very probably holds true on Texas range.

Summarizing the research status of prairie chicken, from a Texas viewpoint it appears that the Oklahoma work has provided an excellent base in general life history and working method, with some very pointed ecological conditions that probably carry over across the border. Actual contribution to workable management method for increasing prairie chicken was not large. From the viewpoint of a game manager, no additional life history research of general nature is needed, and

such may in fact be regarded as time ill spent. If management is to benefit research attention now needs to be concentrated on a few specific ecological points, plus trial and evaluation of whatever practical management measures can be devised. As has been pointed out in other communications, detailed ecological research requires the time of one qualified field biologist, resident within or closely adjacent to a large block of prairie chicken range. Daily contact with the birds is essential.

First and most important is the measurement of nesting mortality factors under Texas conditions. Davison began such a study in Oklahoma but support was withdrawn before it bore fruit. Sex ratios in young birds in Texas needs to be verified, and banding studies conducted for the light they may shed on mobility.

There is of course no assurance that once the mortality factors in nesting and in young prairie chicken are known for Texas, means and methods for controlling them on a large scale can be found. The same may be said for any other ecological research suggested for any species. At the very least, however, such research will leave the Game Commission in possession of many facts that it does not now have, and may very well save its cost in futile attempts at so-called practical management. Unless and until more is known about juvenile mortality, there can be no very practical management, for this is probably the biggest leak in productivity for this species.

Future Management

Whatever the outcome of future prairie chicken research, it now appears that management has two directions in which it can expand. These are augmenting the winter food supply, and restoration or improvement of nesting cover. The number of available techniques is limited in each case.

Winter feeding

Winter food for prairie chicken on existing range can be improved over a long period of years by lighter stocking of cattle. However, no workable method

exists at the moment for bringing this about, hence it must be relegated to the catagory of those methods which only years of education will make feasible.

A second method is the use of planted food patches located within or on the periphery of the breeding range. These in most instances would require breaking sod on sandy land, thus creating a wind erosion hazard. Further more, the crop on such lands is always uncertain. Davison's experience with food patches was disappointing, for aside from wind erosion which was severe in some cases, the patches produced relatively poor crops and did not fulfill their function because rabbits, blackbirds, and other wildlife exhausted them before the critical winter period. These patches averaged about five acres in size and were installed at the rate of about two acres per section. Both size and relative density were large enough for a fair trial.

Winter feeding stations consisting of small fenced areas interspersed at suitable intervals would be a third possible winter feeding method. They would create no erosion hazard, but would require cash outlay and servicing.

On the whole, considering Texas conditions ahd the composition of prairie chicken range as respects pasture and cultivated lands, the value of any wide-flung system of food patches or feeding stations appears questionable. Both might be useful on individual range units under special conditions of weather, range composition, or soil type. Quite generally throughout their present range, prairie chickens in northwest Texas have access to farm or ranch feed fields within reasonable flight distance from suitable winter roosting cover. In favorable years there is a fair amount of feed available to them in such fields, and in poor years very little. Management therefore would need to provide only for the poor years.

It should be evident by now that the whole subject of winter feeding prairie chicken is in need of clarification. There is no real evidence that winter grain is essential as long as acorns are available. Nevertheless, experience proves that they will use it, at least in part, if it is available,

and in years of a short acorn crop it might be essential. [Management of the acorn crop through the cultural use of fire was explored by Davison in Oklahoma. Shinoak plots were burned at various times of year on a three-year rotation and late winter burning resulted in a stimulation of the acorn crop, as well as other natural legumes desirable for prairie chicken food.] These experiments were not carried through to the point where large scale management recommendations were worked out, [However, and it is doubtful if burning would fit into the land use scheme in Texas. Fire was formerly used in portions of the Texas Panhandle to hold the shinoak down, and prevent overshading of grass, but in recent years this practice has been almost abandoned. It might possibly be revived in the future in areas of normal rainfall, or higher.]

A preliminary trial of various winter feeding methods is planned for Region 5 this winter. At least one winter feeding station will be established on the Big Bull ranch in Hemphill County, and various grains offered. Planted food patches will be followed on the Pitchforks ranch in King and Dickens counties with perhaps some supplementary feeding of shocked grain.

One point in policy is deserving of mention in connection with both winter feeding and other attempts to increase the prairie chicken in northwest Texas. Without question, large increases in numbers of prairie chickens are going to be attended by complaints from numerous individuals operating farms within or adjacent to the prairie chicken range. Are such complaints to be ignored, or is some suitable compensation system to be undertaken? This should be decided as soon as possible, for one way or the other it is going to affect opportunities for cooperative work. About 50% of the larger landowners in the present chicken range do not want compensation for grain eaten by prairie chicken. The other 50% do. The smaller landowners, farmers mostly, will run 90% for compensation. Damage claims at the present time are restricted to a small number of individuals, but it is predicted that should a combination of favorable seasons with future management multiply present chicken populations tenfold, these damage claims

would multiply one hundred fold. Hence the importance of determining policy ahead of time.

Improvement of Nesting Cover

Aside from the long time improvement in grass on range lands due to lighter stocking with cattle, the use of fenced areas to control overgrazing in the prairie chicken range has been suggested. This technique has not yet been tested, but might well succeed if the fenced areas are infiltrated into the breeding range in accordance with ideas developed by former Warden Captain Austin O'Neil. Briefly, his plan called for fencing portions only of suitable shinnery motts, including in the fenced area some short sinnery for nesting cover. The rest of the mott would be left unfenced, to be tromped out by cattle, thus insuring open shade and adequate dusting facilities.

Whether or not this technique, if successful, would be taken up by ranchers within the prairie chicken range on their own initiative is uncertain. A number who have been sounded out on the subject advance objections to the presence of such areas, claiming that they interfere with handling cattle. Nevertheless, the system is worthy of trial because it seems to offer the only feasible method of providing better nesting cover under present conditions of heavy stocking. It is the only effective preventative measure against complete denuding of pastures within the prairie chicken breeding range in dry years.

Restoration of Vacant Range.

As already pointed out no great amount of vacant range for the prairie chicken remains in habitable condition. Most of the suitable range within the region now vacant lies close to inhabitated range and may reasonably be expected to restock naturally if prairie chicken continue to increase. However, there are a few areas of isolated range which might not restock naturally, and which appear suitable for experimental release of prairie chickens. One of these, the Bert Wallace ranch in Kent County, is being considered for such an experiment, and will probably be restocked with wild trapped birds next summer. Other areas

can be similarly restocked at some future time, as knowledge of management and ecology is developed.

RECOMMENDATIONS FOR RESEARCH AND RESTORATION ACTIVITIES

In the light of the foregoing considerations, specific recommendations for the future activities of the Game Commission in restoring the Lesser Prairie Chicken are as follows:

1. Ecological research and practical management frankly experimental in nature should be combined on one large project. Such a project should be located either in the central portion of the region or in the northeast Panhandle, and should be under lease for five years with privilege of renewal for a similar period.

   Such a project should be 100,000 acres in size, and should include adjacent farm lands as well as breeding range.

   A system of fenced oak motts should be installed, and provision made for testing various winter feeding systems as judgment dictates.

   Ecological studies as outlined in the foregoing pages should be undertaken and carried through to conclusion.

2. The project should be staffed with a full time biologist, working under the direction of the regional game manager, but competent to carry foward ecological research on his own initiative. This biologist should, if possible, live on the area, or at the least in the closest small town. Grouse experience is desirable, but not essential, but the biologist should be hand picked for ability and drive in the field. Either Mr. A. S. Jackson of Throckmorton, Texas, or Mr. Jack Manweiler of Baudette, Minnesota, would qualify, preferably the latter. Both are available supposedly at $2000 per year, and from a qualitative standpoint are much farther advanced than any biologist now employed in Texas. To pay less than this is a false economy for a prairie chicken field man.

3. The Regional Game Manager with the assistance of Wardens should establish this winter throughout the prairie chicken range a series of booming ground census areas, to be censused annually hereafter. This will reflect accurately the population trend of the species.

4. An educational campaign should be conducted for prairie chicken in the counties surrounding the project area, through service clubs, boys clubs, schools, and sportsmen. This can be handled by the game manager through personal talks, and provision of slides and lecture material.

5. Restoration of suitable unoccupied prairie chicken range should proceed slowly, and with respect to both ecological research and natural population expansion on occupied range.

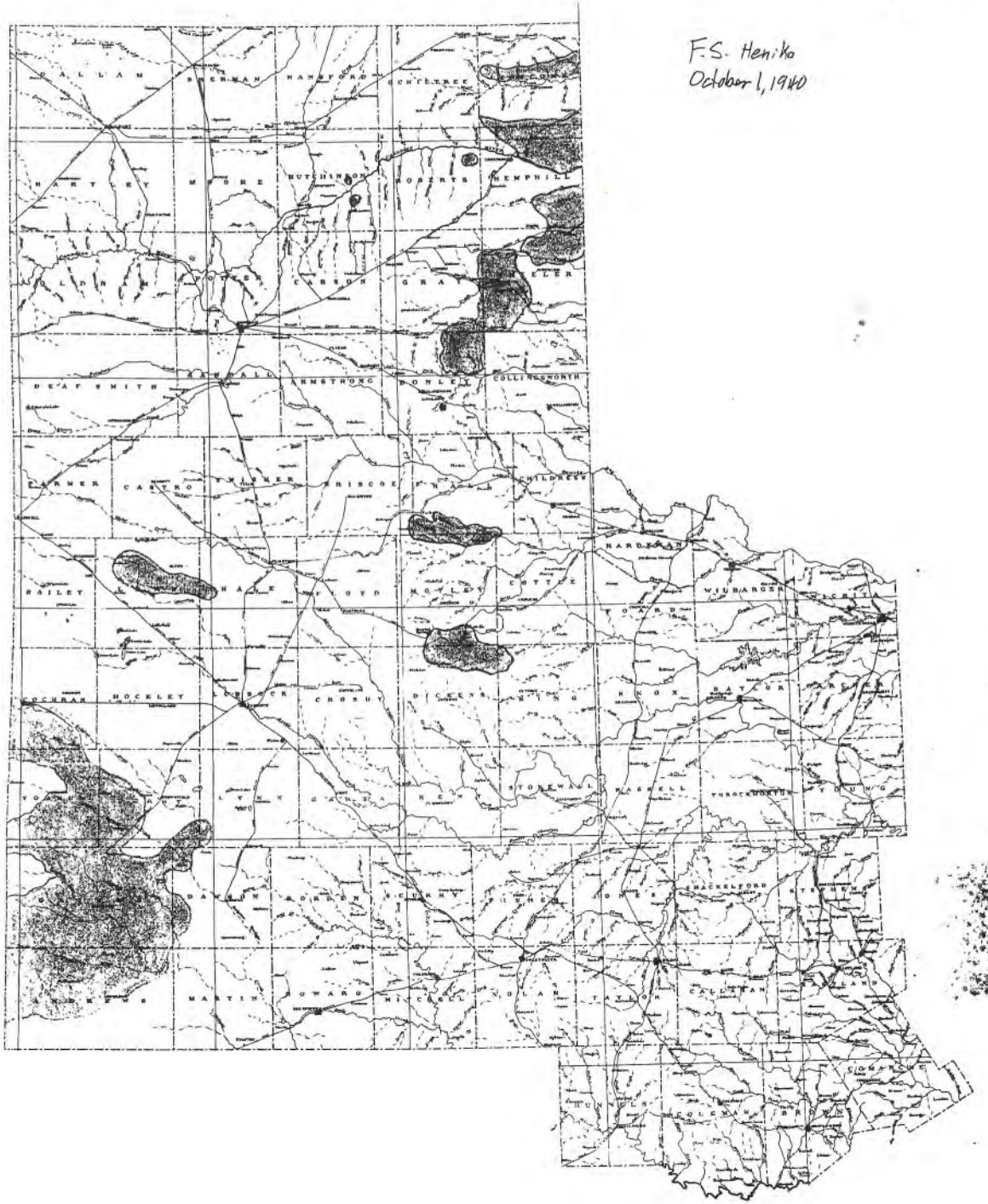
References

1. The Soils of Texas; Agricultural Experiment Station Bull. 431 by Dr. W. T. Carter

2. Life Histories of North American Galliraceous Birds, by Arthur Cleveland Bent, Bull. 162, U. S. Natl. Museum, 1932.

3. Austin O'Neil, former Captain of Game Wardens, Region 5. Unpublished letter to Mr. Wm. Tucker, Executive Secretary, Texas Game, Fish and Oyster Commission.

MAP OF OCCUPIED PRAIRIE CHICKEN RANGE
Region V, Texas

M. J. PETERSON

F.S. Henika
October 1, 1940