

1960

# Nesting Survey Report, Melvin R. Evans

Report on the  
1960 Nesting Survey Conducted  
on the  
Monte Vista National Wildlife Refuge  
Monte Vista, Colorado

By  
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Monte Vista, Colorado  
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## INTRODUCTION

### PURPOSE OF REPORT

This report is aimed at giving the procedures and the findings of the nesting survey made on parts of four units of the Mate Vista National Wildlife Refuge. The purpose of this study was to determine what factors were effecting nesting and what nesting success occurred under varying conditions.

### ABSTRACT

The body of the report is divided into five main sections. Section I describes the procedures used in making the survey.

Section II discusses the vegetation used for nesting.

Section III covers each unit separately and all of the units collectively with respect to terrain and nesting results.

Section IV gives a recommendation for future surveys which will improve the accuracy of the data.

Section V gives a summary of the report.

### METHODS OF THE INVESTIGATION

The areas chosen for this survey were covered on foot and all nests which were located were marked with stakes. The following information was recorded for each nest: species, number of eggs, location, and general remarks. Those nests which were found were then rechecked in 27 to 30 days after the initial survey. During this check the results of the nesting cycle were determined for each nest. Some nests were checked twice.

### CONCLUSIONS

The conclusions of this report are:

(1) Sedge complexes of vegetation were the most important vegetative types used, with the exception of Pintails. They used weed complexes primarily.

(2) Seventy and six tenths percent of the nests brought off young, and 65.5 percent of the eggs which were laid hatched.

(3) Mallards were the most abundant nesters. Pintail and Teal were the second and third most important nesters.

(4) Desertion was the most important factor effecting nesting success. Flooding was the second most important.

(5) Predation and nest destruction of unknown causes were not important factors reducing nesting success.

### P R O C E D U R E S

Prior to entering the field, each refuge unit was studied with respect to cover, water availability, predator problems, and future development and management. These prefield studies were carried on to pick areas which contain factors affecting nesting success. Four units were chosen for the survey. A fifth unit would be covered if the sample of nests was insufficient at the completion of the first four.

Each unit was covered in strips twenty five to fifty feet wide, and every possible nesting site was checked. Many of the nests were located when the female was flushed. Species identification was difficult on these nests which were not occupied when they were found. The nests not definitely identified to species were classified as species unknown.

Upon locating a nest the following procedures were followed:

1. The location of each nest was marked with a numbered yellow stake. These stakes were placed approximately ten feet from the nest.
2. The following material was recorded for each nest: species, number of eggs, location with respect to two permanent land marks, and general remarks. Materials included under general remarks were: bird flushed, nest hatched, nest destroyed(including cause of destruction, if apparent), and any other general information which was available.

3. The nests were then <sup>covered over</sup> ~~recovered~~ before leaving the nest site.

## VEGETATION AND VEGETATIVE TYPES

### VEGETATIVE TYPES

The vegetation was classified into twenty three vegetative types. Table number one lists these vegetative types with respect to the number of birds using each type and the percent use each nesting type receives.

Table Number One. Number of Birds Using Each Type and the Percent Use Each Nesting Type Received.

<u>Vegetative Type</u>	<u>Number Nests in Types</u>	<u>Percent Use</u>
Sedge-Juncus	107	52.4
Sedge-Juncus-Greasewood	1	0.5
Sedge-Juncus-Reed	1	0.5
Sedge-Juncus-Cattail	2	1.0
Sedge-Juncus-Grass	6	2.9
Sedge-Juncus-Weed	1	0.5
Sedge-Grass	13	6.4
Sedge-Greasewood	11	5.4
Sedge-Reed	1	0.5
Sedge-Weed	6	2.9
Weeds	10	4.9
Dike Weeds	2	1.0
Laid Over Weeds	3	1.5
Weeds-Grass	3	1.5
Weeds-Greasewood	5	2.4
Weeds-Grass-Greasewood	1	0.5
Weeds-Saltgrass	3	1.5
Greasewood	8	3.9
Greasewood-Grass	6	2.9
Bulrush	7	3.4
Laid Over Reeds	4	2.0
Laid Over Reeds and Grass	1	0.5
Grass	2	1.0
<u>Totals</u>	<u>204</u>	<u>100.0%</u>

To simplify the writing of this report the vegetative types are being broken into vegetative complexes. Table number two gives these complexes and the percent use each complex

received.

Table Number Two. Vegetative Complex Use by Waterfowl.

<u>Vegetative Complex</u>	<u>Percent Use</u>
Sedge Complex	73.1
Weed Complex	13.2
Greasewood Complex	6.9
Bulrush	3.4
Laid Over Reed	2.4
Grass	1.0
<b>Total</b>	<b>100.0%</b>

VEGETATIVE COMPLEX USES

Vegetative complexes were used in varying degrees by different species of waterfowl. The Pintail and Ruddy Duck are the only species not using sedge complexes predominately. The Pintail preferred weed complexes, and the Ruddy Duck preferred Bulrush. Table number three gives the use of vegetative complexes by the various waterfowl species.

Table Number Three. <sup>Percent</sup> Vegetative Complex Use by Waterfowl Species

<u>Vegetative Complex</u>	<u>Mallard</u>	<u>Pintail</u>	<u>Shoveller</u>	<u>Ruddy Duck</u>	<u>Unknown</u>
		<u>Teal</u>		<u>Gadwall</u>	
Sedge Complex	75.1	36.0	95.0	100.0	85.8
Weed Complex	11.3	40.0			14.2
Greasewood Complex	6.8	12.0	5.0		
Bulrush	2.3	4.0			
Laid Over Reed	3.4	4.0			
Grass	1.1	4.0			
				100.0	
					7.0
					5.2
					1.8

The birds used all types of cover. Sedge complexes surrounding Saltgrass highs were heavily used on some units. Small clumps of vegetation were used irregularly, and the use of tightly compacted

clumps was limited. With proper land use much of this compaction could be eliminated. Nesting use in areas of short vegetation was limited.

### U N I T S

#### UNIT 4G

##### Location

This unit includes that portion of Unit 4G which is bounded by section and quarter section boundaries south and east of Spring Creek in the <sup>South</sup> northeast one-fourth of section six. Spring Creek forms the northwest boundary. See the refuge map included in Appendix A for more detail.

##### Vegetation

The vegetation on this unit was in good condition for nesting. The grasses and sedges were long and dense, providing good nesting habitat. Greasewood <sup>mixed</sup> ~~accompanied~~ with grasses and weed provided good nest protection when used. Weeds were heavily used and were primarily present in areas in early successional stages, such as dikes and islands from pothole <sup>construction</sup> ~~digging~~.

Seventeen, or 70.8 percent, of the Mallard nests were in Sedge complexes, Sedge-Juncus being the most important. Three, or 12.5 percent, of the nests were in Greasewood complexes. The other four nests were in weed complexes and grass.

Weed complexes were the most important cover for Pintails. They made up 72.9 percent of the nesting cover. Greasewood comprised 18.2 percent and grasses made up 9.1 percent of the nesting cover.

Eighty percent of the Teal nests were in Sedge-Juncus. Greasewood was the only other vegetative type used for nesting.

Sedge-Juncus comprised fifty percent of the nesting habitat used by birds of unknown species. The remainder of their nesting cover was constituted of thirty percent weed complexes and twenty percent Greasewood complexes.

### Discussion

#### Terrain

Approximately 130 acres of unit 4G were covered in this survey. Fifty nests, one nest to every 2.6 acres, were found. These nests were primarily concentrated on the northeast quarter of the area. Thirteen nests were found on the islands formed when the potholes were constructed. The cover on these islands is grass and weed complexes.

Six nests were found on the dike in the northeast quarter of the unit. Vegetation on this dike consists of weeds and greasewood. The Pintail nests on this unit were located on this dike and the above mentioned islands. This may indicate that development of such habitat increases Pintail nesting.

#### Nesting Results

Seventy percent, or 35, of the nests on the area hatched, producing 202 ducklings. Three hundred thirty four eggs were laid on the area, but only 60.2 percent hatched. Table number four gives a breakdown of the projected production on the area for these nests which were found.

**Table Number Four. Projected Production for Nests on Unit 40.**

Species	Number Nests	Number Nests Hatched	Number Eggs Produced	Number Ducklings Produced
Mallard	24	19	170	114
Pintail	11	9	65	38
Teal	5	4	50	35
Unknown	10	3	49	14
Totals	50	35	334	201

Desertion was the most important factor preventing hatching. Nest destruction was also important, but predation was not thought to have occurred on any of the nests found. Destruction of nests and desertion accounted for the results of 28 percent of the nests. Table number five gives a breakdown of the nesting results for these nests which were found.

**Table Number Five. Results of Nesting Cycle for Nests in Unit 40.**

Results of Nesting Cycle	Number of Nests	Percent of Nests
Hatched completely	15	30
Hatched all but one	8	16
Hatched all but two	4	8
Hatched all but three	2	4
Hatched all but four	5	10
Hatched all but five	1	2
Nest destroyed, cause unknown	2	4
Nest destroyed, flooding	3	6
Nest deserted	9	18
Nesting results unknown	1	2
Totals	50	100

The average brood and clutch sizes are given in Table number 6. **Table Number Six. Average Brood and Clutch Size for Ducks Nesting on Unit 40.**

Species	Average Clutch Size	Average Brood Size
Mallard	7.1	6.1
Pintail	5.9	4.2
Teal	10.0	8.8
Unknown	4.9	4.7
Average Over All	6.7	5.8

## Unit 6H

### Location

This survey included all portions of unit 6H which are included in the north one-half of Section 32. See the refuge map included in Appendix A for more detail.

### Vegetation

The vegetation along the northern portion of this unit is under water during the nesting season. The heaviest <sup>nesting</sup> vegetative use was in the southeast corner of the unit. The vegetation in this corner was composed primarily of Sedge-Juncus, and has grass and weeds mixed throughout. Seventeen of the twenty-one nests were located in this area. The vegetation in the southwest portion was primarily Greasewood and was not utilized for nesting.

The Mallard, Teal, Shoveller, and Unknown species nested in Sedge complexes, mainly Sedge-Juncus. There were two Pintail nests in the area. One nested in Sedge-Juncus and the other nested in a Weed-Grass complex.

### Discussion

#### Terrain

Approximately 105 acres of unit 6H were included in this survey. There were 21 nests, or one nest to every five acres, on the area.

The south central and southwestern portions are raised and covered with Greasewood. The southeast corner is also raised and is heavily used for nesting.

### Nesting Results

Eighty six percent of the 21 nests, or 18 nests, hatched off, producing 115 ducklings. Eighty seven and seven tenths<sup>Percent</sup> of the 131 eggs produced on the area hatched.

Table number seven gives a breakdown, by species, of the projected production for those nests found on the area.

Table Number Seven. Projected Production for Known Nests on Unit 6H.

Species	Number Nests	Number Eggs Produced	Number Nests Hatched	Number Ducklings Produced
Mallard	13	92	11	16
Pintail	2	9	2	9
Teal	1	10	1	10
Shoveller	1	11	1	11
Unknown	4	12	3	9
Totals	21	131	18	115

Two of the nests on the area were destroyed. The causes of destruction were unknown. Table number eight gives a breakdown of nesting results for the nests found on the unit.

Table Number Eight. Results of Nesting Cycle for Nests Found on Unit 6H.

Results of Nesting Cycle	Number Nests	Percent of Nests
Hatched completely	17	81.0
Hatched all but one	1	4.75
Nest destroyed cause unknown	2	9.5
Results of Nesting Cycle unknown	1	4.75
Totals	21	100.0

Table Number Nine gives a breakdown, by species, of the average brood and clutch size.

Table Number Nine. Average Brood and Clutch Size for Nests Found on Unit 6H.

Species	Average Clutch Size	Average Brood Size
Mallard	7.1	6.9
Pintail	4.5	4.5
Teal	10.0	10.0
Shoveller	11.0	11.0
Unknown	3.0	8.0
Average Over All	6.7	6.5

### UNITS 10 AND 11G

#### Location

The map in appendix A shows those portions of Units 10 and 11G which are included in the survey. The area covers the land west of the Empire Canal described in the following legal descriptions:

1. SE $\frac{1}{4}$ , Sec. 34, T38N, R8E, New Mexican Principle Meridian.
2. NE $\frac{1}{4}$ , Sec. 3, T38N, R8E, New Mexican Principle Meridian.
3. NE $\frac{1}{4}$ , SE $\frac{1}{4}$ , Sec. 3, T38N, R8E, New Mexican Principle Meridian.
4. NE $\frac{1}{4}$ , NW $\frac{1}{4}$ , SE $\frac{1}{4}$ , Sec. 3, T38N, R8E, New Mexican Principle Meridian.

#### Vegetation

There were 19 vegetative types found on these units, with Sedge-Juncus receiving the heaviest use. Sedge-Greasewood was the second most important nesting cover on the area. Bulrush is present on these units in the form of islands and mixed with other vegetation. The Bulrush appeared to be desirable for nesting and brood cover.

A large portion of these units was water-covered, but submergent vegetation was poor in the pond on the area. This was caused by drainage of the area for development.

Sixty three and four tenths percent of the cover used for nesting was in Sedge complexes. Weeds and weed complexes comprised 14.3 percent of the nesting cover. Bulrush made up 8.3 percent

of the cover used, and Greasewood and reed complexes comprised the remaining 13.1 percent of the cover utilized for nesting.

Nesting was spread over the entire area. The only duck species using a definite cover type was the Ruddy Duck and it used Bulrush islands.

### Discussion

#### Terrain

Approximately 155 acres were covered in this study area. Eighty four nest, excluding Coot Nests, were found, giving an average nesting density of one nest for each 1.8 acres.

The area is level to slightly rolling, with ditches running throughout it. Three potholes have been developed on the area. The banks and islands which have been developed by the construction of these potholes received little nesting use. This is the opposite of the banks and islands on Unit 40.

#### Nesting Results

Seventy-five percent, or 63, of the nests on the area hatched, producing 330 ducklings. Seventy-two and seven tenths <sup>percent</sup> of the eggs produced on the area hatched. Table number ten gives a breakdown of the projected production for the nests found on Units 10 and 110.

Table Number Ten. Projected production for Known Nests on Units 10 and 110.

Species	Number Nests	Number Eggs Produced	Number Nests Hatched	Number Ducklings Produced
Mallard	34	217	28	160
Pintail	9	52	7	37
Teal	10	76	8	54
Shoveller	1	10	1	10
Gadwall	4	30	2	24
Ruddy Duck	1	5	1	5
Unknown	25	61	15	40
Totals	84	455	62	330

Fifteen of the 84 nests on the area were destroyed or deserted. Six were deserted, five were destroyed by predators, and the other four were destroyed by flooding or causes which are unknown. Table number 11 gives the nesting results for the nests found on this area.

Table Number 11. Results of the Nesting Cycle for Nests Found on Units 10 and 11G.

Results of Nesting Cycle	Number Nests	Percent Nests
Hatched Completely	47	55.97
Hatched all but one	9	10.71
Hatched all but two	2	2.38
Hatch all but three	1	1.19
Hatched all but four	2	2.38
Hatched all but one due to predators	2	2.38
Destroyed Predators	5	5.95
Destroyed Flooding	1	1.19
Destroyed General	3	3.57
Nest deserted	6	7.14
Results of nesting cycle unknown	6	7.14
Totals	84	100.00%

Table number 12 gives the average brood and clutch sizes for the nests found on this area.

Table Number 12. Average Clutch and Brood Sizes for Nests Found on Units 10 and 11G.

Species	Average Clutch Size	Average Brood Size
Mallard	6.3	5.7
Pintail	5.75	4.4
Teal	7.6	7.0
Shoveller	10.0	10.0
Gadwall	9.5	12.0
Ruddy Duck	5.0	5.0
Unknown	2.6	5.0
Average Over All	6.4	6.1

When comparing average clutch size to average brood size, in this report, remember the sample of clutches is larger than the sample of broods. This accounts for brood averages being larger than clutch averages in some instances.

### Coot

Nine Coot nests were found during the initial survey. Eight, or 89 percent, of these nests hatched completely. The nine nests produced 66 eggs, of which 87.8 percent hatched. The average clutch size was 7.3 eggs and the average brood size was 7.25 young.

When the survey was rerun on June 28, 1960, several new Coot nests were found, but none of these nests were considered in this survey.

### UNIT 20

#### Location

This survey included that portion of Unit 20 located between the east and west boundaries of the unit and two imaginary east-west lines. The northern line extends along the south side of Bowen Drain. The south line extends west from the point where Spring Creek leaves the unit. See the refuge map included in appendix A for more detail.

#### Vegetation

The vegetation on the area is a Sedge-Juncus complex which is interspersed with Greasewood and Saltgrass highs. All 49 nests were in Sedge complexes.

#### Discussion

The area is flat to rolling with ponds spread on it. Bowen Drain borders the area on the north, and Spring Creek cuts diagonally across the east end. The area northeast of Spring Creek was flooded during the early part of the nesting season. This area is where most of the nests, which were destroyed by flooding

were located.

There is approximately 160 acres in the area. Forty-nine nests were found giving an average nesting density of one nest for each 3.3 acres.

#### Nesting Results:

Fifty two and three tenths percent, or 182, of the eggs produced on the area were hatched. Fifty-nine percent, or 29, of the nests on the area hatched, producing 182 ducklings. Table 13 gives, by species, the projected production on the area for the nests found.

Table Number 13. Projected Production for the Known Nests on Unit 20.

Species	Number Nests	Number Eggs Produced	Number Nests Hatched	Number Ducklings Produced
Mallard	18	131	10	75
Pintail	3	21	3	17
Teal	4	34	1	10
Shoveller	3	24	2	14
Gadwall	3	16	3	16
Unknown	18	122	10	50
Totals	49	348	29	182

Thirty-one percent, or 15, of the nests were destroyed or deserted. Predators destroyed four nests and flooding destroyed eight. Desertion did not appear to be important on this unit. Table number 14 gives the results of the nesting cycle for the nests found on this unit.

Table number 15 gives, by species, the average brood and clutch sizes for the nests found.

#### ALL UNITS

#### Vegetation

There were 23 vegetative types encountered during this survey. Sedge-complexes were the most important form of nesting

Table Number 14. Results of Nesting Cycle for Nests Found on Unit 20.

Results of Nesting Cycle	Number Nests	Percent Nests
Hatched completely	22	45.0
Hatched all but one	3	6.1
Hatched all but two	1	2.0
Hatched all but three	2	4.1
Hatched all but five	1	2.0
Distroyed predators	4	8.2
Distroyed flooding	0	16.4
Distroyed cause unknown	1	2.0
Deserted female killed	1	2.0
Deserted general	1	2.0
Results of nesting cycle unknown	5	10.2
Totals	49	100.0%

Table Number 15. Average Clutch and Brood Sizes for Nests Found on Unit 20.

Species	Average Clutch Size	Average Brood Size
Mallard	7.3	7.5
Pintail	7.0	6.0
Teal	8.5	10.0
Shoveller	8.0	7.0
Gadwall	5.3	5.3
Unknown	6.8	5.25
Totals	7.2	6.7

cover, comprising 73 percent of the vegetative cover used. The availability of sedge complexes was about equal to the use made of these complexes.

Weed complexes constituted 13.3 percent of the vegetation used for nesting. These complexes make up less than six percent of the nesting cover.

Bulrush, reeds, and grass were used about equal to their availability. They collectively constituted 7.9 percent of the nesting cover.

Mallards nested primarily in sedge complexes. Eleven and three tenths percent of their nesting habitat was weeds, and 6.8 percent was greasewood. Bulrush, reeds, and grasses provided

6.7 percent of the cover used by Mallards.

Forty percent of the Pintail cover was weed complexes. Sedge complexes provided 36 percent of their nesting habitat, and Greasewood complexes constituted 12 percent. Bulrush, reeds, and grasses comprised 12 percent of the nesting environment used by Pintails.

Ninty-five percent of the Teal nests were in Sedge complexes. Greasewood was the only other type of nesting cover used.

Sedge complexes were the only type of vegetation used for nesting by Shovellers.

Cadwall nests were found in Sedge and weed complexes. Sedge complexes provided 85.8 percent of their nesting habitat, and weed complexes comprised the remaining 14.2 percent.

One Muddy Duck nest was found during the survey, and it was found on a Bulrush island on Unit 113.6 Three nests were found on August 2, but they were not included in this report. These nests were also located on Bulrush islands.

Seventy-five and three tenths percent of the cover used by birds of unknown species was Sedge complexes. Weed complexes provided 10.7 percent of the cover, and Greasewood complexes made up 7.0 percent of their nesting cover. Bulrush and reeds comprised 7.0 percent of their cover, with Bulrush being the most important.

Table number 16 gives the most important cover complexes for each species.

Table Number 16. Cover Complexes- Preferences by Species.

Species	First Choice	Second Choice
Mallard	Sedge complex	Weed complex
Pintail	Weed complex	Sedge complex
Teal	Sedge complex	Greasewood
Shoveller	Sedge complex	-
Gadwall	Sedge complex	Weed complex
Ruddy Duck	Bulrush	-
Unknown	Sedge complex	Weed complex

### DISCUSSION

#### Nesting Results

Seventy and six tenths percent, or 144, of the 204 nests found during the survey hatched, producing 830 ducklings. Sixty-five and five tenths <sup>Percent</sup> of the eggs produced on the four areas hatched. Table number 17 give, by species, the projected production for all the nests found.

Table Number 17. Projected Production for Known Nests.

Species	Number Nests	Number Eggs Produced	Number Nests Hatched	Number Ducklings Produced
Mallard	89	606	68	427
Pintail	25	147	21	101
Teal	20	170	14	109
Shoveller	5	45	4	35
Gadwall	7	54	5	40
Ruddy Duck	1	5	1	5
Unknown	57	241	31	113
Totals	204	1268	144	830

The four factors responsible for nest mortality were desertion, flooding, predation, and nest destruction in general. Desertion was the most important factor causing nest mortality. The cause of this desertion was undetermined, but it would be interesting to know if our working on these areas increased this factor. Flooding was the second most important nest destroying factor. This factor was increased by the heavy water runoff

which occurred early in the nesting period. Nine nests were destroyed by predators and eight nests were destroyed by unknown causes. Table number 18 gives the nesting results for the nests found during this survey.

Table Number 18. Results of the Nesting Cycle for Nests Found During the Survey.

<u>Results of Nesting Cycle</u>	<u>Number Nests</u>	<u>Percent of Nests</u>
Hatched completely	101	49.4
Hatched all but one due to predators	2	1.0
Hatched all but one	21	10.3
Hatched all but two	7	3.4
Hatched all but three	5	2.6
Hatched all but four	7	3.4
Hatched all but five	2	1.0
Destroyed, cause unknown	8	3.9
Destroyed, flooded	12	5.9
Destroyed, predators	9	4.4
Deserted general	16	7.8
Deserted female killed	1	0.5
Results unknown	13	6.4
<b>Totals</b>	<b>204</b>	<b>100 .0%</b>

Table number 19 gives, by species, of the average clutch and brood sizes.

Table Number 19. Average Clutch and Brood Sizes for Nests Found During this Survey

<u>Species</u>	<u>Average Clutch Size</u>	<u>Average Brood Size</u>
Mallard	6.8	6.2
Pintail	5.8	4.5
Teal	8.5	7.9
Shoveller	9.0	8.8
Gadwall	7.7	8.0
Ruddy Duck	5.0	5.0
Unknown	4.9	4.6
<b>Average Over All</b>	<b>6.7</b>	<b>6.2</b>

### R E C O M M E N D A T I O N S

The stage of incubation should be determined for each nest, permitting the separation of complete and incomplete clutches. This is necessary for the determination of the correct average clutch size. It was not done this year and I feel that the averages obtained were low.

S U M M A R Y

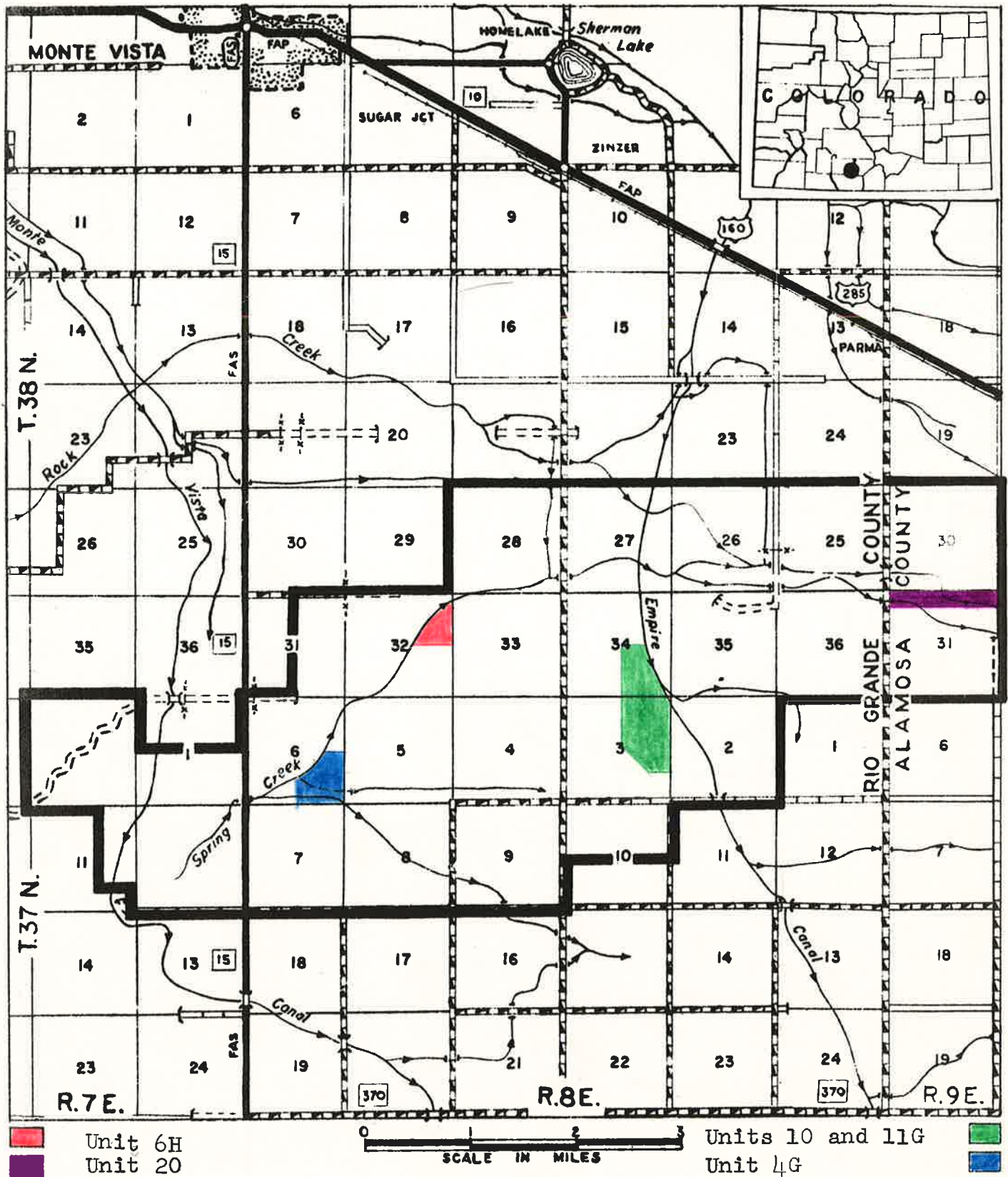
Four areas were chosen for this nesting survey. They were covered on foot in an attempt to locate all of the nests on each area. When a nest was located it was marked with a stake, and the following information was recorded: species, number of eggs, location, and general remarks.

Two hundred four nests were found, of which 144, or 70.6 percent brought off young. Sixty-five and five-tenths<sup>percent</sup> of the 1268, or 830, eggs produced hatched. Mallards were the most important nesters. Pintails and Teal were the second and third most important nesters, in that order.

A P P E N D I X   A

# MONTE VISTA NATIONAL WILDLIFE REFUGE

Rio Grande and Alamosa Counties, Colorado



# MONTE VISTA NATIONAL WILDLIFE REFUGE

RIO GRANDE AND ALAMOSA COUNTIES, COLORADO

FISH AND WILDLIFE SERVICE  
BUREAU OF SPORT FISHES AND WILDLIFE

UNITED STATES  
DEPARTMENT OF THE INTERIOR

106°10'

R7E R8E

106°08'

106°06'

106°04'

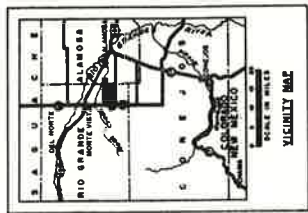
37°32'

37°30'

T 38 N

T 37 N

37°28'



REFUGE BOUNDARY

R8E R9E

106°04'

106°06'

106°08'

R7E R8E

106°10'

COMPILED IN THE BRANCH OF ENGINEERING  
FROM AERIAL PHOTOGRAPHS, B.L.M. SURVEYS,  
AND SURVEYS BY U.S.F.W.S., JUNE 1954,  
REVISED JAN. 1955, JUNE 1955.

ALBUQUERQUE, NEW MEXICO

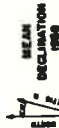
APRIL 1960

NEW MEXICO PRINCIPAL MERIDIAN



TOWNSHIP DIAPHRAM

36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
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Report on the  
1960 Breed Survey Conducted  
on the  
Monte Vista National Wildlife Refuge  
Monte Vista, Colorado

By  
Melvin R. Evans

Monte Vista, Colorado  
September 12, 1960

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## I N T R O D U C T I O N

### OBJECT OF REPORT

This report was written to describe the procedures and finding of the brood survey conducted on the Monte Vista National Wildlife Refuge during the summer of 1960.

### ABSTRACT

The body of this report is divided into six sections.

Section I <sup>e</sup> describes the procedures used in conducting the survey.

Section II covers the results of this study.

Section III <sup>s</sup> discusses the accuracy of the field work.

Section IV discusses several refuge units with respect to brood use.

Section V gives recommendations for future surveys.

Section VI summarizes the report.

### METHODS AND SCOPE OF THE SURVEY

A drive cen<sup>s</sup>us technique was used to cen<sup>s</sup>us the refuge. All area<sup>s</sup> having brooding ha<sup>b</sup>itat were covered.

### RESULTS

An estimated 7770 ducklings were produced on the refuge. Other migratory waterfowl produced included 17 Canada Geese, four Pied-billed Grebes, and 250 Coots.

### RECOMMENDATIONS

The recommendation included in this report are:

(1) Run the survey late in the season, but before the birds get on the wing.

(2) Make early morning and late evening pond counts on  
Goats.

(3) Differentiate broods into age classes when running  
the survey.

(4) Do not use dogs.

### PROCEDURES

When planning the survey, I decided to cover all brooding areas. Four men, including myself, were used to run the survey. My knowledge of the refuge was not complete enough to permit the use of a larger crew efficiently.

When covering lakes and ponds, the men were spread in a line at 25 to 100 foot intervals. The best results were obtained when they were spread about 50 feet apart. The increased accuracy achieved by placing the men closer together would not pay for the time involved.

Some ducks on the shores of lakes and ponds will go to open water and are more easily counted if the driving line is diagonal to the shore. The lead man is the individual furthest from the water.

Ditches and creeks were usually run in two man crews, but if the vegetation on the areas was large enough and the ducks ranged away from the waterway, all four men were used.

Broods were recorded to species when the survey was made. No attempt was made to determine the brood size, because ducklings would be missed in the vegetative cover. Average brood sizes were determined for each species by making early morning counts when the broods were active. Those averages were applied to the number of broods of each species which were seen. This gives the estimated number of ducklings seen.

Broods were represented by two things, brooding hens and

ducklings without brood hens present. Brood hens were the most obvious; they put on the broken wing act or some similar act. Broods which were unattended by hens were harder to find, and were probably missed in most cases.

When a unit was started, it was completed before leaving for any length of time. I feel that a more complete count was obtained in this manner.

The size of the flying population was estimated during the survey. Many of the young Mallards, Teal, Gadwalls, Redheads, and Shovellers were on the wing at the time the survey was made, making it difficult to get an accurate production estimate.

### RESULTS OF SURVEY

#### DUCKS

Six hundred sixty-one broods were found. Mallards were the most abundant. Teal were second in abundance. Table number one gives, by species, the number of broods seen, the average brood size, and the estimated number of birds seen.

Table Number One. Number of Broods Seen, Average Brood Size, and Estimated Number of Birds Seen During Survey.

Species	Number Broods Seen	Average Brood Size	Estimated Number of Birds Seen
Mallard	191	7.3	1394
Pintail	102	6.6	673
Teal	127	6.6	838
Green-winged Teal	12	6.0	72
Shoveller	83	4.4	365
Gadwall	121	7.8	944
Ruddy Duck	6	4.7	28
Redhead	4	4.0	16
Unknown	15	6.9	103
Totals	661	6.9	4,433

Average brood size for brood of unknown species was determined

by averaging all of the broods of known species together. Table number two gives the figures used in determining average brood sizes.

Table Number Two. Determination of Average Brood Size.

Species	Number Broods Counted	Number Young Counted	Average Brood
Mallard	56	410	7.3
Pintail	25	165	6.6
Teal	19	126	6.6
Green-winged Teal	2	12	6.0
Shoveller	17	774	4.4
Gadwall	57	447	7.8
Ruddy Duck	7	33	4.7
Redhead	1	4	4.0
Unknown	--	---	6.9
Totals	184	1271	6.9

The population of birds on the refuge when the survey was conducted was approximately 9500 ducks. An estimated 7770 birds were produced this year. Table number three gives <sup>the</sup> estimated number of <sup>birds</sup> broods seen and produced on the refuge this year.

Table Number Three. Estimated Number of Ducklings Seen and Estimated Total Production.

Species	Estimated Number Seen	Estimated Number Produced
Mallard	1394	2600
Pintail	673	1100
Teal	638	1300
Green-winged Teal	72	100
Shoveller	365	700
Gadwall	944	1700
Ruddy Duck	26	50
Redhead	16	20
Unknown	103	200
Totals	4433	7770

CANADA GEASE

Three broods producing 17 goslings were brought off this year. These birds were on the wing before they were located.

A fourth pair <sup>was</sup> known to have nested on the refuge, but apparently their nesting attempt was unsuccessful.

#### COOTS

During the survey young Coots were only seen on Units 10 and 11G; however, it is known that other areas were also productive. The birds seen were around the Bulrush islands on Unit 11G.

Other areas known to have produced Coots were Unit 4G and 6H. During certain periods Pool 4A was occupied by large populations. The dike ponds in Unit 6H are also known to have produced young birds.

Eighteen broods were seen, and the average brood size was four. The estimated production for these broods was 72, and the overall production was estimated at 250.

Coots were one of the hardest species to census. They are not easily flushed and remained under cover. A different censusing technique should be used on this species.

#### PIED-BILLED GREBE

Two broods of Pied-billed Grebes were found during the survey. They were both on Unit 6H. There were four young in the two broods. A third brood may have been present on Unit 11G, but no young were located.

#### ACCURACY OF SURVEY

More than 50 percent of the broods not on the wing were

probably counted during the survey. Young birds which were not flushed or were flying were missed, but when the survey results were projected the<sup>sc</sup> two factors were taken into consideration.

Ruddy Ducks are known to produce two broods <sup>er</sup>pre year (Kortright, 1953), and this is thought to have occurred on Unit 11G. The ducklings on the area were large and three active nests were found. It is possible that these nests were the second clutches of the year for some of the females. These nests were located on the Bulrush islands on this Unit.

The field identification was satisfactory. The men were briefed on the distinguishing characteristics of each species and they were then checked on their identification of the birds upon entering the field. They were not split into two man crews until they became confident of their work.

The best breeding areas on the refuge was the big pond on Units 10 and 11G. This pond was large and had an ample supply of water when the survey was made. The vegetation in general provides good cover. The Bulrush islands provided the best breeding habitat on these units, and they were heavily used.

The ponds which have been developed on units 6H, 7G, and 4G are good breed areas. Dense Bulrush stands <sup>and</sup> or islands are not present on these areas, but Bulrush is beginning to develop. Pool 4G is the best breeding pool on the three units. The submergent vegetation is well established and the cover adjacent to this pool provides good resting cover.

Unit 20, the upper Spring Creek area, was not heavily populated. Men were working on the area and may have caused a movement of broods out of the area, but this is doubtful. The lack of desirable brooding cover may account for the low brood population on the area. Water and submergent vegetation were readily available on the area.

The area from the Empire Canal to the east boundary was not heavily used. This may be caused by the lack of available water during the brooding season. Bowen Drain was the heaviest populated area on this portion of the refuge.

#### RECOMMENDATIONS

##### AGE CLASSES

The data collected during this survey would be more valuable if the broods were split into age classes. The purpose of this survey was to determine the number of adult birds produced, and if the broods observed were mostly in the young age classes, the production estimate would probably be high. This is caused by mortality in young ducklings.

##### TIME OF SURVEY

Conducting the survey late will increase the completeness of broods counted, provided the birds are not on the wing. Older broods move to open water more readily and are more easily located than young birds. If the broods are on the wing the accuracy of the survey will be decreased, because the adult and juveniles cannot be <sup>readily</sup> separated when they are on the wing.

### GOOT CENSUSING

The drive technique of censusing appears to be unsatisfactory for Goats. They move into resting cover adjacent to the pools and ponds during the midday hours, and are not easily flushed.

A more desirable method of censusing Goot would be early morning and late evening counts. During these hours they are grouped on areas of open water.

Pied-billed Grebes also lend themselves to early morning and late evening censusing. They, like the Goot, spend the midday hours in cover bordering the pools and ponds and are not easily flushed.

### USE OF DOGS

I saw no reason for the use of dogs in running this survey. I agree that more broods would be found when using dogs, but with the excitability of dogs many young birds would be injured and killed. This is not necessary.

### S U M M A R Y

A brood survey was conducted on the Monte Vista National Wildlife Refuge, using a drive censusing technique. While in the field only the species was recorded. No attempt was made to determine the size and age of the broods. Early morning counts were made to determine the average brood size for each species of waterfowl.

The estimated waterfowl production on the refuge was 7770<sup>P</sup> ducks, 17 Canada Geese, 250 Goats, and four Pied-billed Grebes.

The species of ducks found on the refuge were Mallard, Pintail, Teal (Blue-winged and Cinnamon), Green-winged Teal, Shoveller, Gadwall, Ruddy Duck, and Redhead.

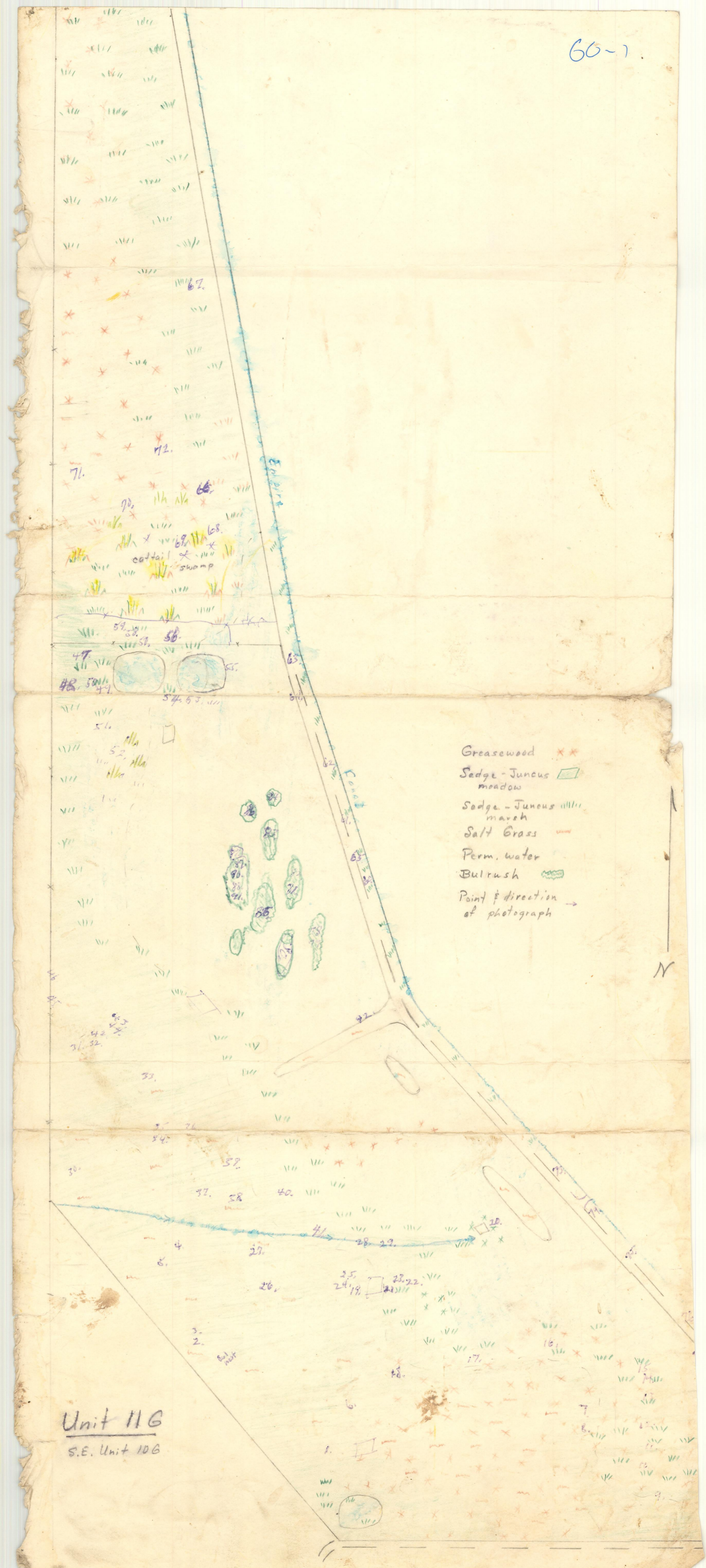
BIBLIOGRAPHY

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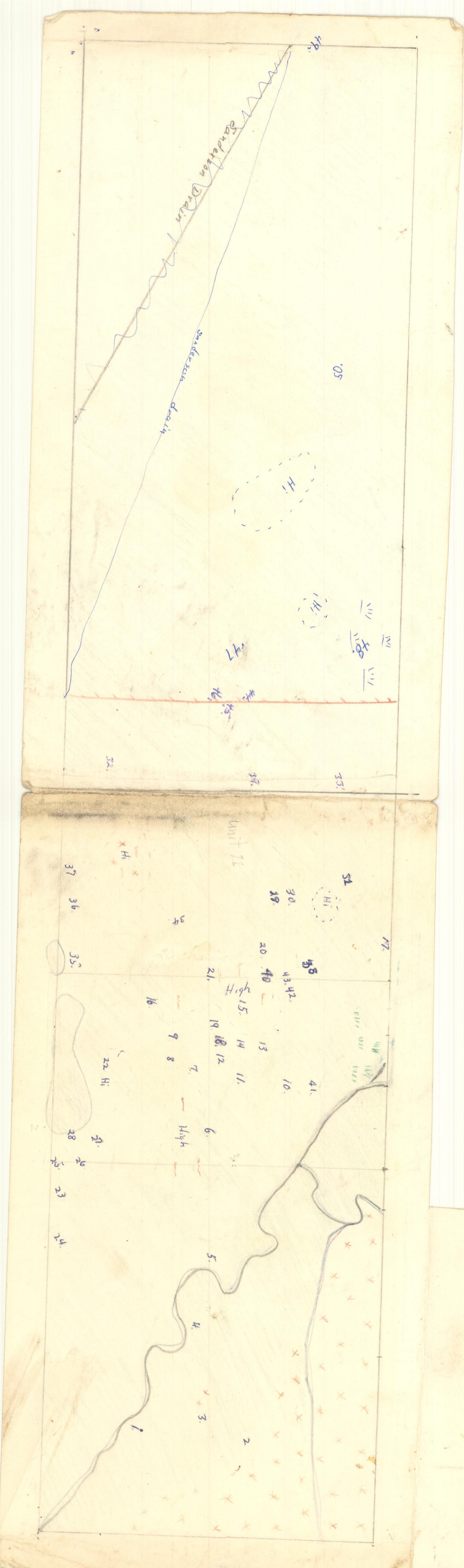
Kortright, Francis H., 1953. The Ducks, Geese, and swans of North America. Wildlife Management Institute., Pages 364-371.

# Maps

60-1

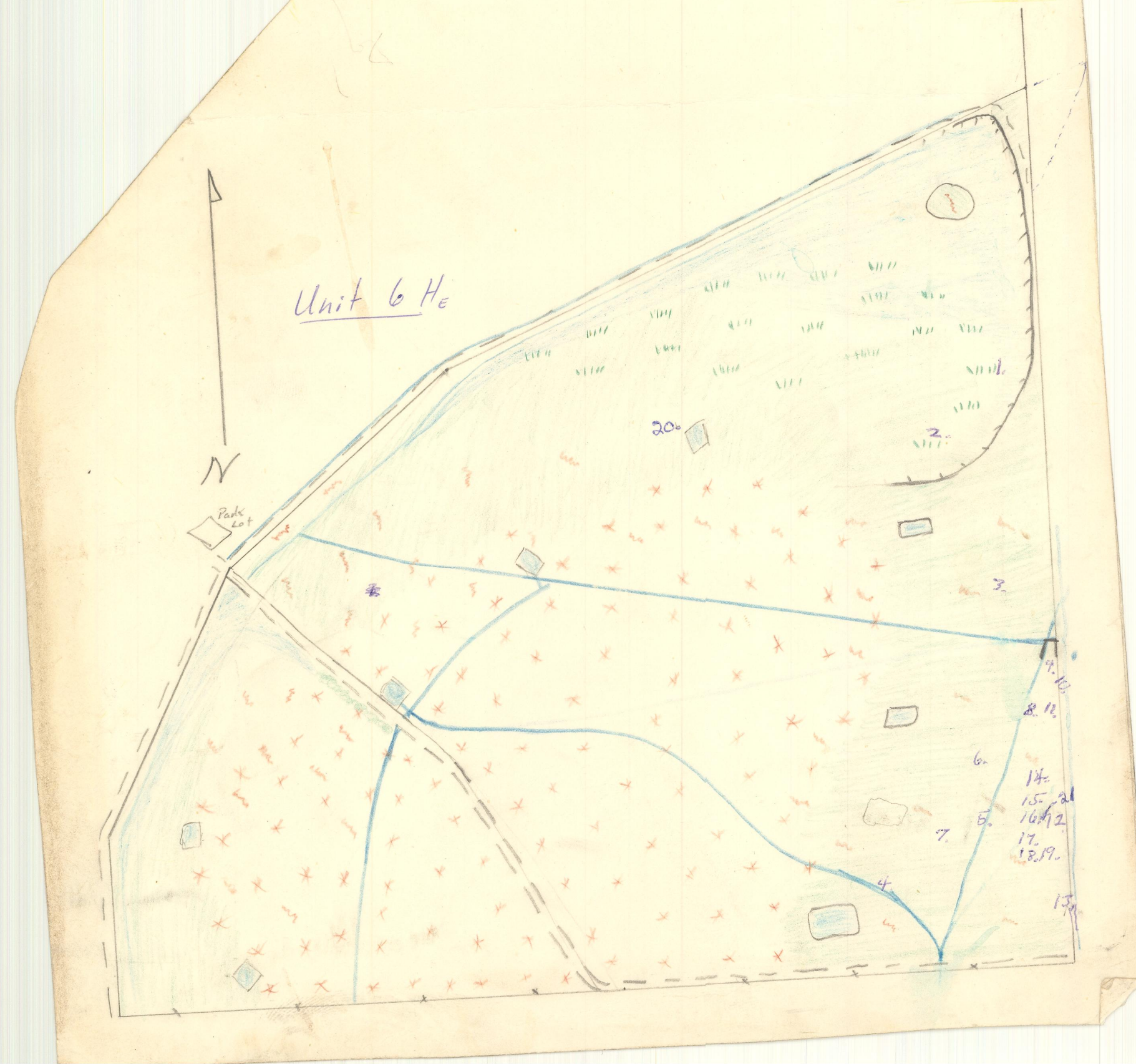


Sanderson Cliff





60-4



Unit 8G

- |                                 |     |
|---------------------------------|-----|
| Greasewood                      | xx  |
| Sedge - Juncus meadow           | ■   |
| Sedge - Juncus marsh            | /// |
| Salt Grass                      | ~   |
| Permanent water                 | ■   |
| Point & direction of photograph | →   |

