SALTON SEA NATIONAL WILDLIFE REFUGE

AND

WATERFOWL DEVELOPMENT AREA

XXXXXXXXXXXXXXXXXXXXXX

NARRATIVE REPORT

MAY, JUNE, JULY, AUGUST 1956

COVER - EGRETS (E. O'NEILL)

XXXXXXXXXXXXXXXXXXXXXX

UNITED STATES DEPARTMENT OF INTERIOR
FISH AND WILDLIFE SERVICE
BRAWLEY, CALIFORNIA

CONTENTS

REFUGE PERSONNEL

Regular Personnel

EDWARD J. O'NEILL	Refuge Manager
WILLIAM NUESS	Refuge Manager (Asst.)
JOSEPH L. CUDDY	Clerk-typist
CLYDE W. STEWART	Supervisor, Farm Oper.
HENRY STEER	Mechanic, Hvy. Duty

JOSE' BARROS	Tractor Operator
LEO E. COX	Tractor Operator
CARL W. FORD	Tractor Operator
ALFRED W. MC FARLAND	Tractor Operator
CHESLEY H. WILLIAMS	Tractor Operator
PAUL E. WILLIAMS	Tractor Operator
MELVIN FORD	Oiler
JOHN BARROS	Irrigator
SYLVESTER BARROS	Irrigator
MANUEL CARDONZO	Irrigator
JULIO RIBEIRO	Irrigator

Temporary Personnel

None during period.

N A R R A T I V E R E P O R T

I GENERAL CONDITIONS

A. Weather & Conditions

Temperatures during May averaged 1.9° more than May of 1955. Mean or average for May of this year was 76.8° as compared to 74.9° for May of last year. Hottest day in May was on the 16th. There were 29 clear days and only 2 partly cloudy days. A very light sprinkle of rain (.01 in.), fell over part of the Valley May 17 and 18.

Temperatures in June were comparatively mild and somewhat on a par with the average for the past few years. Average maximum temperature was 104° as compared to 101° one year ago. Hottest day in June was the 12th when the mercury read 114°. There were 5 partly cloudy days. No precipitation occured.

Temperatures for July were lower than last year. Average maximum was 105°. Hottest day was the 8th with a reading of 113°. Only 5 partly cloudy days were recorded during the month. A slight, unmeasurable trace of rain fell.

August temperatures averaged 2.6° cooler than during the corresponding month of 1955. Mean temperature was 88.3°. Coolest day was August 3 with a reading of 60°.

On August 25th west winds with gusts up to 44 miles per hour dumped cool air down into the Valley. Cooler weather followed for several days with a drop from a maximum of 116° to a minimum of 61°.

All in all this has been perhaps the mildest summer in several years. There were 23 clear days, seven partly cloudy days and one cloudy day in August compared to 12 clear days, 17 partly cloudy days and two cloudy days in August, 1955.

Tabulated below is the weather data as compiled at the local U.S. Navy Auxiliary Air Station, Seely, California:

Month	Maximum	Minimum	Precipitation	Winds 25 MPH (Days)
May	104°	55°	T	19
June	114°	63°	-	12

Month	Maximum	Minimum	Precipitation	Winds/25 MPH (Days)
July	115°	65°	T	14
August	110°	62°	-	8
	Totals.		T	53

Two light earthquakes shook the Valley May 20th with no damages reported.

B. Precipitation and Water Conditions

High temperatures and evaporation with no precipitation lowered the elevation of Salton Sea slightly. During June there was a drop of .15 of a foot.

On July 2, Imperial Irrigation District - U.S. Geological Survey gauge reading showed the elevation of the sea as 233.95. July 1, 1956 compared to -234.30 one year ago --- a difference of .45.

August 31, 1956 reading was -234.45 below sea level which represents .4 of a foot drop since August 1 when the elevation was -234.05.

Checking the August 31, 1956 elevation with the September 1, 1955 reading (-234.50) we have a total gain in elevation of only .05 of a foot the past year.

Peak elevations of the sea came during the late spring before evaporation became effective. Red Hill at Unit II was completely surrounded by salt water except for a small earth fill along the north side.

II WILDLIFE

A. Migratory Birds (By William Huess)

1. Populations and Behavior

a. Ducks

Conditions during the report period on the Salton Sea Refuge approximated those of previous years. By May 1st all but the lame and the brave had departed. There does appear to be a tendency, however, for greater numbers of several species to spend the entire summer in the immediate vicinity. Noteworthy among these are the Ruddy Duck and the Redhead. Just what enticed

these particular species to remain is unknown, but there is evidence that a goodly number even nested here.

The writer, on several occasions, noted broods of redheads and ruddy ducks on refuge Unit I. During the last two weeks in August fifteen immature redheads, barely capable of flight, were taken in the live trap and banded.

Throughout the period unprecedented numbers of ruddy ducks were observed using the fresh water delta created by diverting the water of Trifolium # 1 drain into Tract 6, Unit I.

A small number of mallards were observed from time to time throughout the period on Unit I. Although no young were noted, the suspicion was present that they attempted to nest since they appeared to be paired off.

A cinnamon teal was observed leaving her nest many times by tractor operators working on Tract 4-5, Unit II. This was strange in that during almost a month of observation there was never any evidence of her having laid any eggs.

Pintails first made there presence known in appreciable numbers during the aerial survey of August 7-8 when 150 were observed on Unit I. This observation coincides with the report from the Merced Refuge on August 8 when 200 newly arrived pintails were reported there. By August 31st almost 1000 birds were using the Salton Sea refuge units. This is somewhat under numbers observed at comparable times of previous years.

During the month of July broods of Fulvous Tree Ducks were observed on numerous occasions by refuge personnel. Several of the little fellows were taken in the live trap. It is interesting to note that even at three to four weeks of age the feet of a fulvous are large enough to keep the band (#7) from slipping off once it is attached to the leg. Another fact worthy of comment is that of 36 fulvous banded in 1955 by states included in the Western Bird-Banding Association, all 36 were banded on the Salton Sea Refuge. To date, in 1956, there have been 92 fulvous banded on the Salton Sea Refuge.

On August 21st a Goldeneye was seen on Tract 9, Unit I. The bird was flightless and with the expenditure of a little effort he was captured and found to be in poor condition.

b. Geese

On Tuesday June 5th Game Management Agent A.W. Elder stopped by the office with 2 Canada Geese and 6 Snow Geese given him by an unnamed game farm owner. They were banded and released on Tract 6, Unit I. On June 15th it was noted one snow goose had disappeared and another lay dead on the delta. By August 24th there

were but three snows and one canada left.

On June 15th a lone Black Sea Brant was observed on Unit I. We observed him repeatedly at close range both in flight and at rest. This is the first time since March 3rd 1953 that this species has been recorded on the refuge. He remained several days and then apparently left this area.

c. Shorebirds, Gulls and Terns

Black-necked Stilts nested in their customary numbers. An estimated 100 nests were found on the refuge units.

Laughing Gulls (6), were observed early in May on a nesting island along the west shore of the sea which is now included in the refuge lease. Three nests were noted.

Caspian Terns made use of the nesting island. There were 23 nests with 66 eggs and two young present. Success was not noted since further ground observations were not made due to possible disturbance.

Gull-billed Terns were seen throughout the period, but to the best of our knowledge there was no attempt made to nest.

d. Water and Marsh Birds

There were several noteworthy occurances during the period one of which was the appearance June 27th of 3 Roseate Spoonbills on the fresh water delta of Trifolium #1 drain. On June 28th 4 were seen and on June 29th a total of 5 were present.

Many people will be pleased to learn of the establishment of what we hope will turn out to be a permanent nesting colony of White-faced Ibis this year. In 1954 there was an unsuccessful attempt made by 5 nesting pairs. Again in 1955 two pair failed. On Thursday, August 9th, a trip was made out on the New River Delta to see if the year 1956 held any charm. There was much enthusiasm generated with the discovery of 28 nests with 54 young and 14 eggs. A total of 41 of the youngsters were banded on this date with another 7 being banded on August 15th.

Wood Ibis, (15), were observed for the first time on June 6th. They continued to arrive until over 1000 were noted on an aerial survey census conducted August 7-8.

Cormorants, Snowy Egrets, Common Egrets, and Black-crowned Night Herons nested in numbers comparable to previous years. A number of the nestlings were banded, tabulations for which are listed under "Banding".

The White Pelican colony attempted (unsuccessful) to nest this year. A trip to the island early in May disclosed 24 nests with a total of 65 eggs and 10 chicks. The nests were situated at the waters edge and later observations showed them destroyed as a result of wave action. Extreme crowding on the island may have been a factor also.

2. Disease

There was no verified evidence of disease in Migratory Birds during the period. However, several dead and dying Black-necked Stilts, Common and Snowy Egrets, and Mourning doves were seen on Tract C, Unit I and along the sea fronts. Field symptoms suggest botulism affected the few which died.

3. Banding

Tabulated below are the species and numbers banded for the period:

	May	June	July	August	Total
Pintail				910	910
Redhead				24	24
Fulvous Tree Duck			6	10	16
Mallard				5	5
Green-winged teal				3	3
Cinnamon teal			1	1	2
Coot				1	1
Snowy Egrets	100	92		9	201
Common Egrets	8	29			37
Black-crowned Night Heron	15	4		2	21
Cormorants	24	7			31
White-faced Ibis				48	48
		Total			1379

4. Food and Cover

Waterfowl, upon arrival, made immediate use of the wild millet in the fresh water areas of the refuge Units. It is feared that overall success of the banding program may be effected as the result of the abundance of this food.

A heavy production of chara has been noted in several of the fresh water areas. By the end of the period Coots had started to make heavy utilization of this submergent.

B. Upland Game Birds

Mourning Doves appear to be as plentiful as in previous years.

No concentrated effort was made to effect a banding program due to a heavy work load. However, there were 28 nestlings of the "gray speedsters" banded. It is regretable that a number of ground nests were destroyed as a result of the entensive farming program conducted on the refuge.

Gambel's Quail No visible change in status evident. On Thursday June 21, while drilling wild millet on Tract C, Unit I, a nest was noted on a contour with a deposit of 14 eggs. Upon completion of the drilling the land was flooded soon after which the writer made a point to revisit the site. There, calmly sitting on her nest with the water lapping inches away, sat the her.

Ring-necked Pheasants noted in the previous report continued to use the area west of sub-headquarters. On June 30th 4 three-week-old chicks were observed nearby.

C. Other Birds

Ravens (2), were seen near the Pumice area on June 3rd.

A lone Duck Hawk was noted on Tract 9, Unit I on June 29th.

Black-bellied Plover (7), were observed August 10th on Unit A.

A pair of Ash-throated Flycatchers with 2 young were seen on Trifolium 13 canal on August 21st.

D. Animals

No change in status. On Thursday July 12th a coyote was seen crossing the road north of headquarters. Evidence indicated a crossing point for him or some of his brethern.

E. Fish

Following is a compilation of material from several news releases in the Brawley News: "Twenty corvina, including one weighing 16 pounds 9 ounces, have recently been netted at Salton Sea by a State Fish and Game Research crew. Rapid growth in the Salton Sea was indicated by the fact that the big fellow was only three years old, while the one year old fish average 3 pounds.

Out of 35 different species introduced into the Sea from 1948 through 1951 only the corvina and the little gulf croaker are known to have lived and reproduced.

On June 24th 1956 Richard Easton of Westmorland, California became the first person to make a verified hook-and-line catch of an ocean corvina from the Salton Sea. His history - making catch was made at the mouth of Salton Creek using shrimp for bait.

Mr. H.A. Chemnitzer of Redondo Beach, California took the second specimen on June 28th using a bass plug for a lure and landed another using shrimp on July 4th. The first two fish weighed just under one pound and the third weighed approximately two pounds. Biologists claim that it is entirely possible for good sport fishing to develop on the Sea in the near future.

On Wednesday July 18th the west levee of Ramer Lake, near Calipatria, broke allowing an estimated 550 to 600 acre feet of water to escape. The break, 40 feet wide and 12 feet deep, was not detected until early Thursday morning when fishermen discovered it. It was first feared that many fish were lost, but Ray Knight, manager of the refuge, later said that the number probably would not be as large as some observers thought. It was apparently caused by muskrats boring holes in the levee."

III REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Developments

1. Cultivated Crops

Unit I

All barley crops (mariout) mentioned in the previous report continued growth until the first part of May when irrigation was discontinued. Some 150 acres of mature barley is ready for fall flights of birds.

Throughout the period attention was focused on the production of fresh water habitat supporting cattails and wild millet crops. Some 760 acres was plowed, leveled, seeded and concrete drop boxes installed in the contour borders.

At the end of the period a good crop was maturing at Tracts C, 8, and 9. Tracts A, B, and 3 failed to produce satisfactory crops of either cattails or wild millet, however water impoundment was continued to further the leaching process.

Considerable progress was made on preparation of land for fall - winter green barley crops. Tracts 5, 6, 18, 19 and 26 were deep tilled, headditches rebuilt and brush and weeds removed mechanically.

Proposals include:	Acres
Mature Barley (Mariout)	150
Wild Millet - Cattails	700
Green barley (Hanschen)	260
Total	1110

Unit II

As in Unit I the barley grain crop (mariout), consisting of some 260 acres, was matured by early May. The crop will remain standing, unharvested on the stalk for the birds use this fall and winter.

Considerable growths of sunflowers (Heliantlella), Russian thistle (Salsola), shadscale (Atriplex), and Hitler weed (Bassia) persisted and developed in grain fields after irrigation of barley was discontinued. The possibility of crop rotation offered a few years back when the ground water table was much lower is no longer present. Sometime in the future it might be necessary to look to chemical weed killers to suppress these summer weeds.

Tracts 4, 5, 7 and 14 (260 Acres) were developed, contour - bordered and seeded to a cattail - wild millet crop. Production and leaching have been satisfactory and at this writing blackbirds and ducks are making full use of the areas.

Tracts 3, 6 and 8 (260 Acres) where green barley (Hanschen), will be planted early next period are nearing complete preparation after headditch, deep tillage, landplane, etc.

Proposed developments call for the following crops:

	Acres
Mature barley (Mariout)	260
Wild Millet - Cattails	260
Green barley (Hanschen)	260
Total	780

Unit A

Some 200 acres of this new land were contour-bordered and placed under wild millet - cattail production.

2. Improvements and Developments

The program of general structure maintenance work, roads, buildings, etc was continued.

Unit A received most of the new developments. In addition to the 200 - odd acres formerly used by the State Fish and Game Department some 50 acres in the SE¼ of the SE¼ of Section 19 were developed. It was necessary to take water west across county road Y to the west (highest point) of the tract. Despite the fact that two 18 inch drain pipes were installed where the Service

ditch crossed road there has been objection voiced on the part of neighboring landowners who fear the ditch will obstruct floodwaters.

At Unit B, acquisition by lease of some 380 acres in the former State Fish and Game Departments holdings was not negotiated and the parcel of land continues to lie idle. Alkali penetration and surface rise has been quite bad this summer and it is now possible that leaching should preceed cropping.

IV ECONOMIC USES

A. Haying and Grazing

No activities under this heading.

V. PUBLIC RELATIONS

A. Recreational Uses

Several rockhound groups and photographers visited the pumice and obsidian hills at Unit II.

A few bird watchers passing through the general area stopped in and made brief excursions over refuge units. Otherwise the recreational uses of this refuge were nil.

B. Refuge Visitors

Name	Date	Identification	Purpose
Mr. & Mrs. Kenneth Fisher	6/13	Holtville, Calif.	Photography
Mr. Leo Von Wald	6/20	R.O. - Auditor	Inspection
Mr. Graham Elmore	7/21	I.V. County Roads	Bridge job inspection
Mr. W. Anderson	8/27-30	Asst. Refuge Supv.	Inspection
Mr. Ray Glahn	8/7-8,9/5-6	Pilot-Biologist	Census-survey
Mr. A.W. Elder	9/29	Game Agent, L.A.	Contact

D. Refuge Participation

University of Southern California researchers conferred relative to aquatic plants we have introduced into the Salton Sea and adjacent estuaries. Although there has been no evidence of success with any of the several species introduced these men showed considerable interest in the attempts that have been made to date.

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A small, 110-V Homelite electric generator was loaned to the local U.S. Department of Agriculture Southwestern Field Experiment Station for use in operating a bird frightening device. Approximately two acres of specially grown flax was protected from House finches and Redwings for two months. The device consists of parallel overhead wires spaced with 4-inch glass insulators. Constant electrical sparks, snapping and even shocking when contacted eliminated all nuisance bird species during critical seed development of the specially cultured crop. Full details of the frightening device are outlined in the Agronomy Journal, Vol. 48, 139-141, 1956.

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The refuge cannon net, used for special waterfowl banding projects, was loaned to Biologist Ade Zajano for coot banding operations in the Central Valley of California.

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Surplus property items acquired at Camp Pendleton were brought in and stored for future transfer to McNary and Columbia Refuges.

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Surplus property items were obtained at March and Norton Air Force Base and shipped to Fort Peck Refuge to assist in outfitting shops at that station.

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Early in the period the Columbia Fumigation Company of San Diego, under federal and state agriculture men completed the job of building fumigation which had been started during the previous period.

As a result of fumigation some 50 sacks of Wild Millet, 10 sacks of Sudangrass and 60 sacks of certified barley seed were damaged by killing the seed germ.

Considerable inconvenience, loss of time, and the expense of seed damaged were main objections to the operation. The contractors left a trail of debris, dug up wooden cement forms around one building and bent aluminum roofing on headquarters structures.

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E. Violations

Only wildlife violations during the period consisted of several entrances by 'coon hunters in Units I and II. In June hunters with their dogs entered Unit II and removed one of the entrance gates and made off with posts, sign, two locks and all.

In July four men from El Centro and Holtville were apprehended at Red Hill, Unit II with several dogs hunting raccoons on the refuge.

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VI APPLIED RESEARCH

Mr. Wuess is carrying out an experiment with the type duck trap used on the refuge. (Adaptation of Ohio Pheasant trap). Purpose of the experiment is to determine if more than the usual two openings will net more pintail ducks during trapping operations. One trap has been set up with six throats or openings for comparison.

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Waterfowl retrap data is being obtained and tabulated in response to requests from Patuxent Research Refuge, Laurel, Md.

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A survey of fresh water outlets and drains entering the Salton Sea was made in June to determine if any unknown important waterfowl plants exist in that section of the area. Usual growths of Widgeongrass (Ruppia), Horned pondweed (Zanichellia) and Southern Naaid (Najas) were found. One plant which might produce some seed crop without cultivation around freshwater inlets is a species of smartweed located in scattered clumps along Salton Sea in Coachella Valley.

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VII OTHER ITEMS

Two new suits, claiming more than $ 68,000 for damages from rising waters of Salton Sea have been filed against the Coachella Valley and Imperial Irrigation District.

Mr. & Mrs. William Kortsley owners of lots at Desert Beach near Mecca, in Riverside County filed claim for $ 64,000 in damages.

Another claim for $ 3500 was filed by Mr. & Mrs. Thomas Klinkington also owners of lots at Desert Beach.

Total claims of this nature now on the books amount to something like $ 800000.

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Los Angeles Times Newswriter Jack Gurnow in his column "Fish "N" Game" warned hunters August 19th....." heavy spraying for aphis in the Valley is causing lot of concern because many dead doves being

found in the fields....While the doves aren't exactly plentiful in the Valley yet, the spray might affect the influx flying into Imperial area.

"This spray hazard undoubtedly will be throughly checked by Department of Fish and Game personnel and if there's any danger to hunters eating affected birds, warning will be given in plenty of time". (M-m-m-m-m, we wonder....has anyone checked the bird's diet lately!).

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Sugar beet curleytop virus, carried by leaf hoppers is drawing considerable local attention. This year agriculturalists and beet growers carried out a sizeable publicity campaign to control all roadside weeds which are known hosts to the leaf hopper. Hundreds of acres over the Valley were sprayed with insecticides.

No requests were made for control on refuge lands but it could become of sufficent importance in adjacent fields that pressure might be brought to bear.

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The special order, granting unlimited shooting of widgeon over agricultural areas in Imperial Valley ended March 31, 1956. The vital statistics gathered by California Fish and Game Department at their checking station in the Brawley Chamber of Commerce are as follows:

Permits granted to sportsmen	783
Widgeon killed	223
Long distance calls (inquiries)	164
Local calls (inquiries)	54
Farmers reported damages during year.	19
Farmers reported damage after special order became effective.	9

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The complex suit to determine rights to Colorado River water continued in San Francisco. Among other things 78-year old Arizona water engineer Ralph I. Meeker testified against California and submitted a seven-year report in which he charged Imperial Valley with "wasting water into the Salton Sea".

On the home front there was storm clouds. One water engineer with the Los Angeles Water Department commented recently on impending city water shortages. Recalling the history of water works he dwelled on varous aspects and shortages and the remidies used in the past. Owens Valley acquisition, resources taken over,

lakes, reservoirs, wells were all pointed out. In conclusion the speaker allowed as how Los Angeles County might even conceiveably buy the Imperial Valley------Lock, stock and irrigation water rights!

Meanwhile we understand that all Arizona cars returning from vacations in California are being stopped before crossing the line and their radiators drained to maintain California's drinking water supply!

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Respectfully submitted,

Edward J. O'Neill
Refuge Manager

Approved: _____

_____

3-1750
Form NR-1
(Rev. March 1953)

WATERFOWL

REFUGE Salton Sea National Wildlife Refuge MONTHS OF May TO August, 1956

(1) Species	Weeks of reporting period (2) 5/4 (1)	5/11 (2)	5/18 (3)	5/25 (4)	6/1 (5)	6/8 (6)	6/15 (7)	6/22 (8)	6/29 (9)	7/6 (10)
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada										
Cackling										
Brant							1			
White-fronted										
Snow										
Blue										
Other										
Ducks:										
Mallard					4			15		
Black										
Gadwall										
Baldpate	25	10					2			
Pintail	25	10			10	25	20	25		25
Green-winged teal	10	10			10					
Blue-winged teal										
Cinnamon teal	10	10				10	10	10		10
Shoveler	50	50			10	10				10
Wood										
Redhead	10	10			4		10	10	10	25
Ring-necked										
Canvasback	10									
Scaup	10									
Goldeneye										
Bufflehead										
Ruddy	3700	3600			1200	1000	600	500	1000	500
Other -Fulvous Tree duck		10			10	10		30	35	50
Coot:	500	1100			200	200	100	200	300	150

3 -1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Salton Sea Nat'l Wildlife Refuge MONTHS OF May TO August, 19 56

(1) Species	(2) Weeks of reporting period: 7/13 (11)	7/20 (12)	7/27 (13)	8/3 (14)	8/7-8 (15)	8/16 (16)	8/24 (17)	8/31 (18)	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada											
Cackling											
Brant									7		
White-fronted											
Snow											
Blue											
Other											
Ducks:											
Mallard				2	25	10	10	10	546		
Black											
Gadwall			30	30					420		
Baldpate	4	10							357		
Pintail	35	25	10	85	160	290	625	990	15,540		
Green-winged teal					10	75	290	625	7,830		
Blue-winged teal											
Cinnamon teal	10	25	25	90	20	100	30	100	2,940		
Shoveler											
Wood											
Redhead	90	150	150	850	200	150	100	100	8,603		
Ring-necked											
Canvasback	1								77		
Scaup									70		
Goldeneye											
Bufflehead											
Ruddy	500	500	500	500	500	300	500	200	110,600		
Other Fulvous Tree Duck	50	50	50	90	35	25	10	20	3,045		
Coot:	150	200	100	1000	1000	500	125	500	44,275		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans			
Geese			
Ducks	~~50,895~~	~~3,850~~	
Coots	~~44,275~~	~~1,130~~	

SUMMARY

Principal feeding areas ~~Divers - Sutton Pen, Dabbling~~ Refuge Units and agriculture leach fields, Widgeon - agricultural alfalfa fields.

Principal nesting areas

Reported by

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D C. 37944
1953

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Salton Sea Nat'l Wildlife Refuge Months of May to August 1956

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Pied-Billed Grebe	Previous	period								
Eared Grebe	"	"								
Western Grebe	"	"								
White Pelican	"	"								
Brown Pelican	3	8/9/56								
Cormorants	Previous	period								
Common Egret	"	"								
Snowy Egret	"	"								
Black-Crowned Night Heron	"	"								
Great Blue Heron	"	"								
Green Heron	"	"								
Glossy Ibis	"	"								
Wood Ibis	15	6/8								
Florida Gallinule	Previous	period								
Clapper Rail	1	8/24								
Roseate Spoonbill	3	6/27	5	6/29	5	6/29				
II. Shorebirds, Gulls and Terns:										
[illegible]	Previous	period						100		

(1)	(2)		(3)		(4)		(5)			(6)
III. Doves and Pigeons:										
Mourning dove										
White-winged dove										

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Salton Sea Nat'l Wildlife Refuge Months of May to August 1956

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Pied-Billed Grebe	Previous	period								
Eared Grebe	"	"								
Western Grebe	"	"								
White Pelican	"	"								
Brown Pelican	3	8/9/56								
Cormorants	Previous	period								
Common Egret	"	"								
Snowy Egret	"	"								
Black-Crowned Night Heron	"	"								
Great Blue Heron	"	"								
Green Heron	"	"								
Glossy Ibis	"	"								
Wood Ibis	15	6/8								
Florida Gallinule	Previous	period								
Clapper Rail	1	8/24								
Roseate Spoonbill	3	6/27	5	6/29	5	6/29				
II. Shorebirds, Gulls and Terns:										
American Avocet	Previous	period								
Black-necked Stilt	"	"						100		
Least & Western Sandpiper	"	"								
Dowitcher	"	"								
Caspian Tern	"	"								
Black Tern	"	"								
Gull-billed Tern	"	"								
Ring-billed Gull	"	"								
Laughing Gull	"	"								
L-B Curlew	"	"								
Hudsonian Curlew	"	"								
Marbled Godwit	"	"								
Killdeer	"	"								
Snowy Plover	25	7/20								
[illegible]	[illegible]	[illegible]								
[illegible]	"	"								
Greater Yellowlegs	10	7/20								
Lesser Yellowlegs	25	8/16								

Species	First Seen		Peak Numbers		Last Seen		Production			Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Pied-Billed Grebe	Previous	period								
Eared Grebe	"	"								
Western Grebe	"	"								
White Pelican	"	"								
Brown Pelican	3	8/9/56								
Cormorants	Previous	period								
Common Egret	"	"								
Snowy Egret	"	"								
Black-Crowned Night Heron	"	"								
Great Blue Heron	"	"								
Green Heron	"	"								
Glossy Ibis	"	"								
Wood Ibis	15	6/8								
Florida Gallinule	Previous	period								
Clapper Rail	1	8/24								
Roseate Spoonbill	3	6/27	5	6/29	5	6/29				
II. Shorebirds, Gulls and Terns:										
American Avocet	Previous	period								
Black-necked Stilt	"	"						100		
Least & Western Sandpiper	"	"								
Dowitcher	"	"								
Caspian Tern	"	"								
Black Tern	"	"								
Gull-billed Tern	"	"								
Ring-billed Gull	"	"								
Laughing Gull	"	"								
L-B Curlew	"	"								
Hudsonian Curlew	"	"								
Marbled Godwit	"	"								
Killdeer	"	"								
Snowy Plover	25	7/20								
[illegible]	4	[illegible]								
[illegible]	"	[illegible]								
Greater Yellowlegs	10	7/20								
Lesser Yellowlegs	25	8/16								
[illegible]	[illegible]	7/27								

(over)

(1)	(2)		(3)	(4)	(5)	(6)
III. Doves and Pigeons:						
Mourning dove						
White-winged dove						

(1)	(2)		(3)	(4)	(5)	(6)
III. Doves and Pigeons:						
Mourning dove	Previous	period				
White-winged dove	"	"				
IV. Predaceous Birds:						
Golden eagle						
Duck hawk	1	6/29				
Horned owl						
Magpie						
Raven	2	6/5				
Crow						

Reported by.....

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

	(1)	(2)	(3)	(4)	(5)	(6)
III. Doves and Pigeons:						
Mourning dove	Previous period					
White-winged dove	"	"				
IV. Predaceous Birds:						
Golden eagle						
Duck hawk						
Horned owl	1	6/20				
Magpie						
Raven						
Crow	2	6/5				

Reported by.....

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

INT.-DUP. SEC., WASH., D.C.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

1613

Refuge [redacted] Months of [redacted] to [redacted], 19[redacted]

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
[redacted]	200 Acres	1	3	30	[redacted]	[redacted]			200	

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

3-1570
NR-8a

REFUGE GRAIN REPORT

Refuge Sutter Nat'l Wildlife Refuge Months of May through August, 1956

(1) Variety*	(2) On Hand Beginning of Period	(3) Received During Period	(4) Total	(5) Grain Disposed of				(6) On Hand End of Period	(7) Proposed or Suitable Use*		
				Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
Mariout Barley	100	0	100					100		X	
Feed Barley	50	0	50			50		0			
Sudangrass	20	0	20					20	X		

(8) Indicate shipping or collection points Marysville, California

(9) Grain is stored at Refuge headquarters and sub-headquarters storage sheds.

(10) Remarks None

*See instructions on back.

16—61482-1

NR-8a

REFUGE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)—55 lb., corn (ear)—70 lb., wheat—60 lb., barley—50 lb., rye—55 lb., oats—30 lb., soy beans—60 lb., millet—50 lb., cowpeas—60 lb., and mixed—50 lb. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

(1) List each type of grain separately and specifically, as flint corn, yellow dent corn, square deal hybrid corn, garnet wheat, red May wheat, durum wheat, spring wheat, proso millet, combine milo, new era cowpeas, mikado soy beans, etc. Mere listing as corn, wheat, and soybeans will not suffice, as specific details are necessary in considering transfer of seed supplies to other refuges. Include only domestic grains; aquatic and other seeds will be listed on NR–9.

(3) Report all grain received during period from all sources, such as transfer, share cropping, or harvest from food patches.

(4) A total of columns 2 and 3.

(6) Column 4 less column 5.

(7) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.

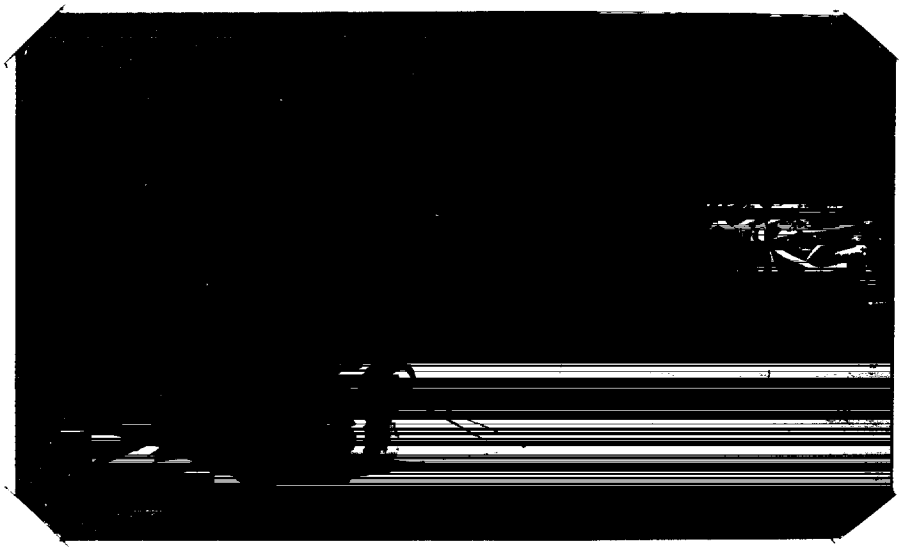
(8) Nearest railroad station for shipping and receiving.

(9) Where stored on refuge: "Headquarters granary," etc.

(10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

16—61482-1 U. S. GOVERNMENT PRINTING OFFICE

Salton Sea has dropped almost one foot this summer. Two markers in left foreground indicate high water points in 1954 and 1955.



A number of sick and dead birds were found during the period.

Nestling Mourning doves in Athel tree. Some 28 were banded on the refuge bringing total to 540 tagged thus far.

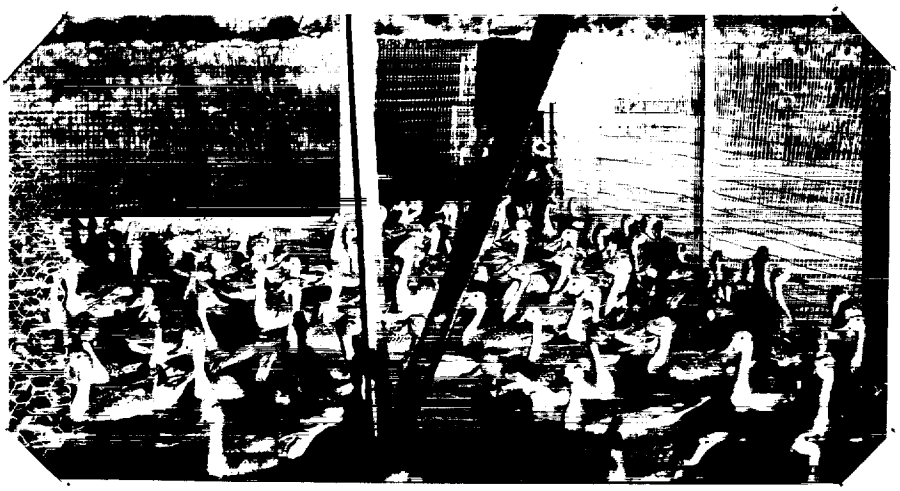
Pair of Mocking birds which renested at headquarters in August. Daily mate entered nest, spread one wing and sheltered other from hot sun.

Aerial view of heron, egret, ibis and cormorant nests in submerged trees in Salton Sea.

Nestling Glossy Ibis. Some 48 of these were banded; the first at Salton Sea.

Banding egrets at the north shore nesting colony.

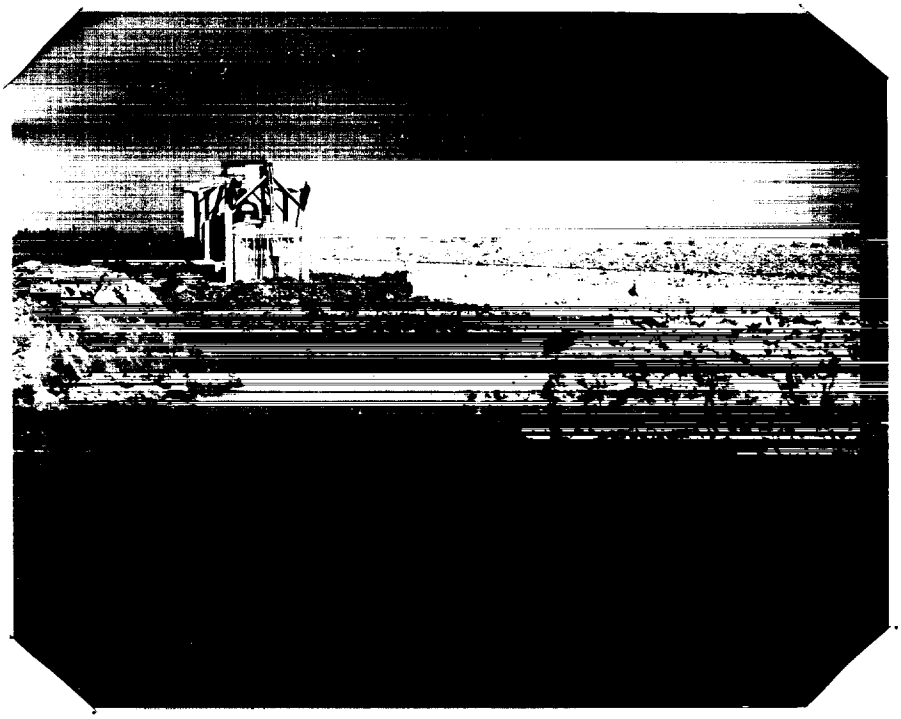
South end nesting colony.



1379 ducks were trapped and banded by refuge personnel during August.

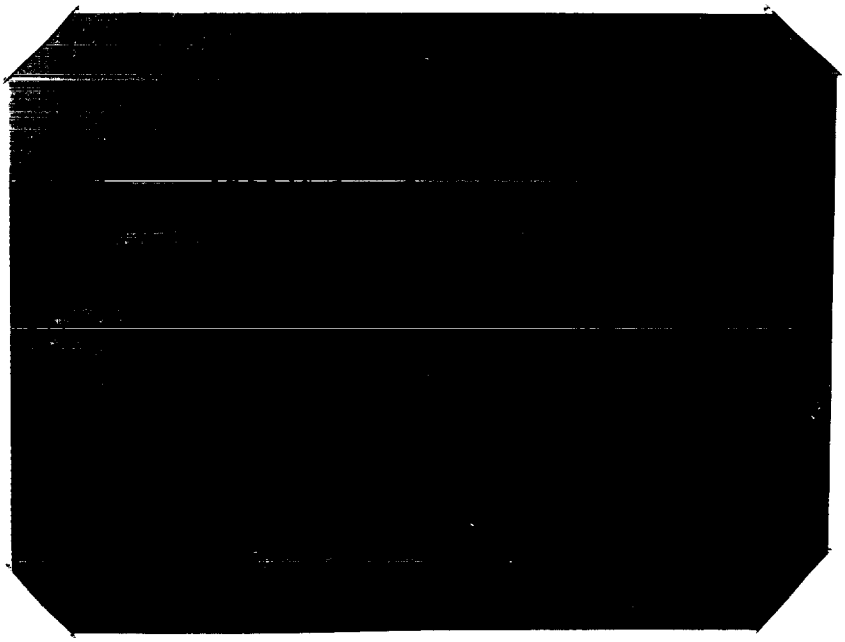
Refuge Manager (Asst.) Nuess examines Caspain Tern egg found in nest on small islands in June.

White Pelicans nested but young failed to survive as was the case last year.

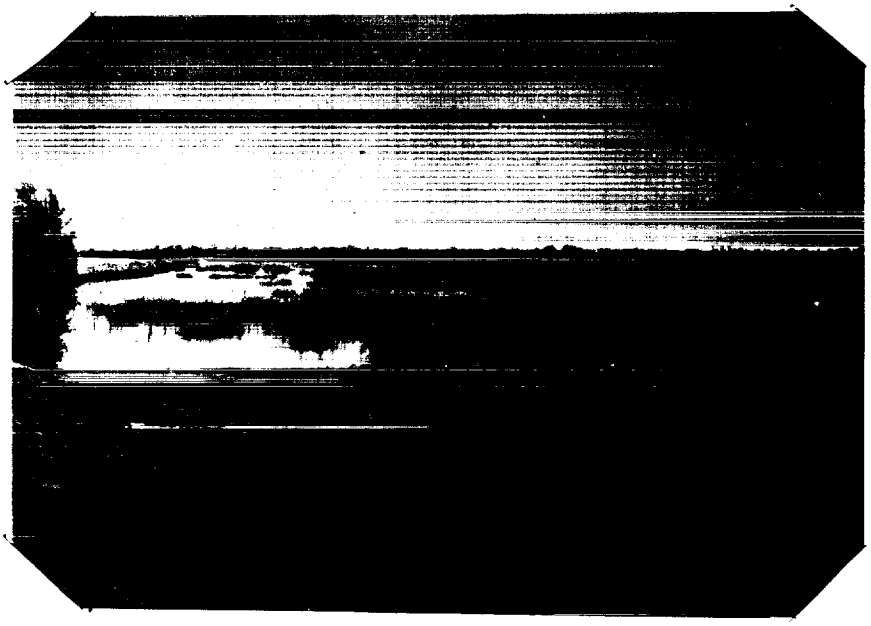


Operator Carl Ford repairing washed out contour dike at Tract 2 Unit I. Numerous similar breaks slowed down initial flooding work.

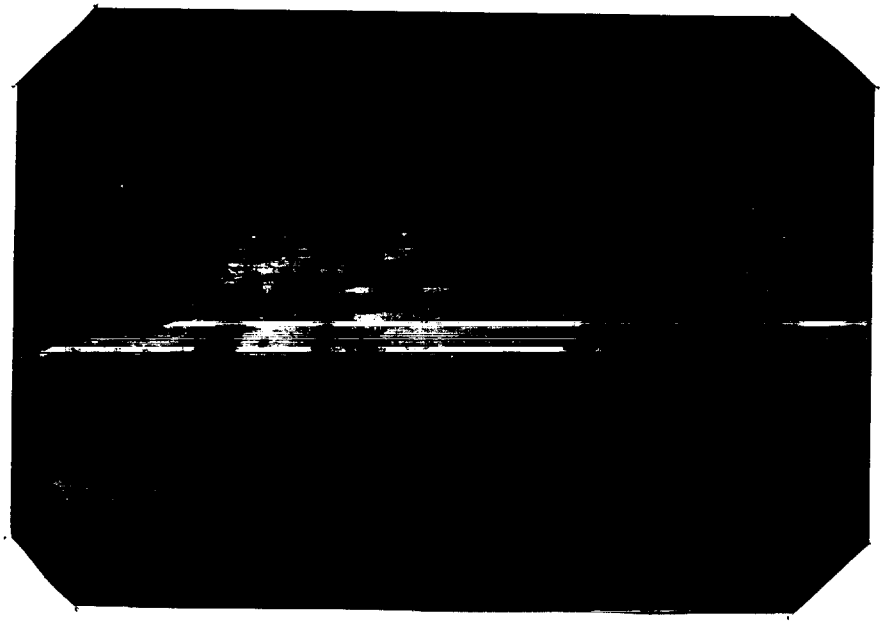
Messrs McFarland and Stewart spreading cattail seeds in Tract 9 Unit I contoured area.



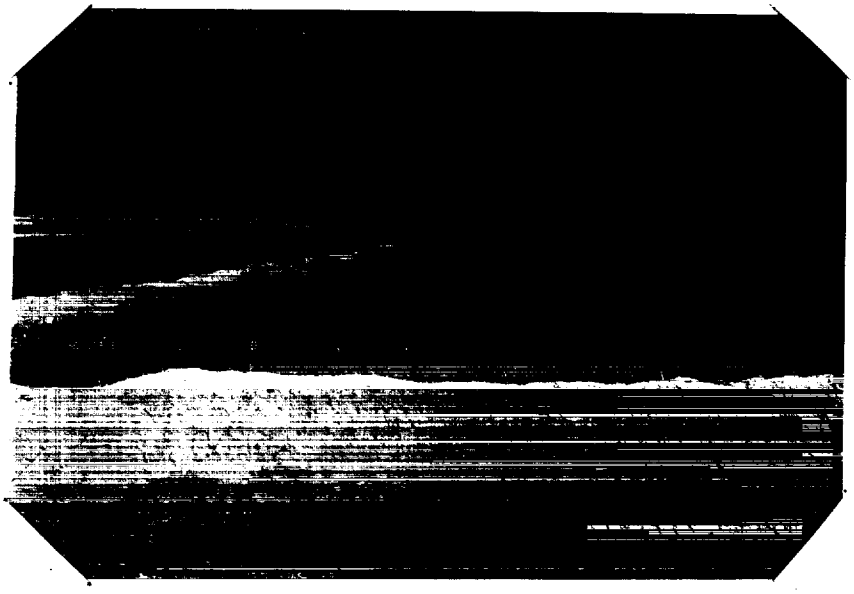
Tract 9, Unit I at time of first flooding.



Same as above showing Wild-millet crop with understory of Cattails.



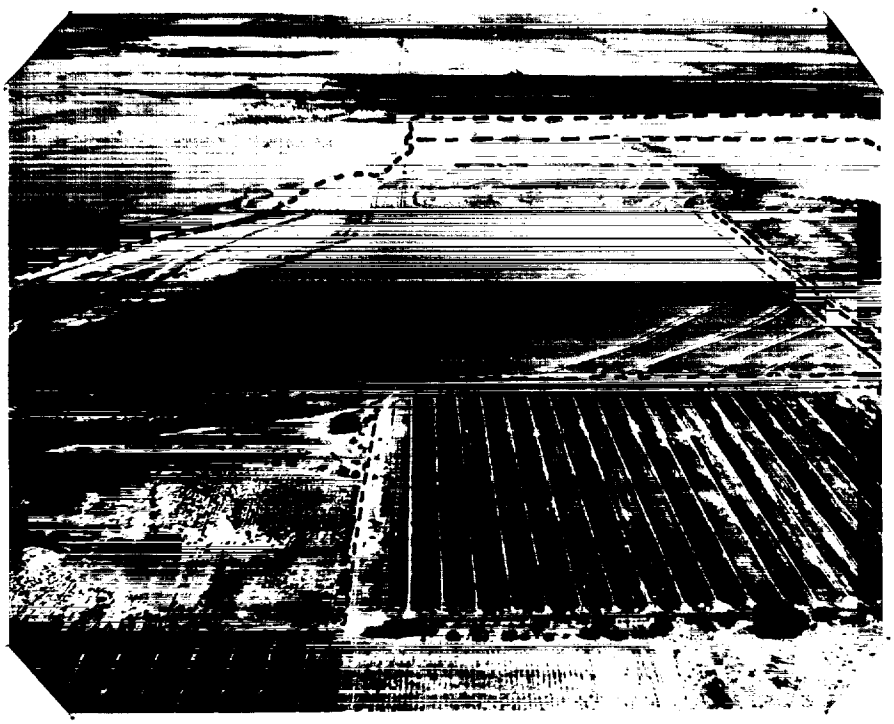
Before - East edge Unit A as acquired following lease by State.



After - Same area as above.

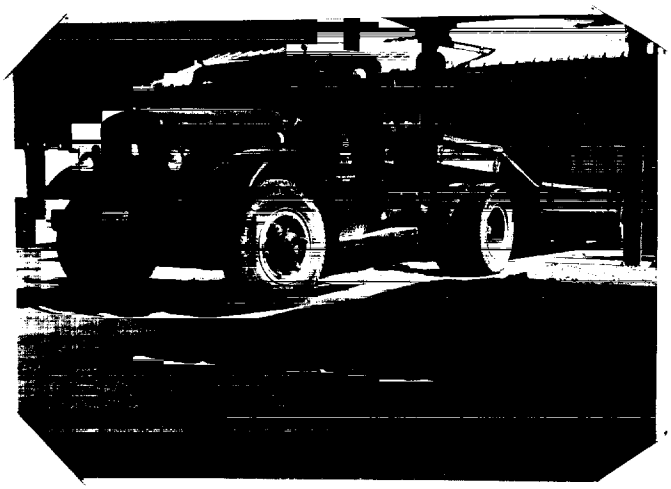
West portion of Unit A as relinquished by California Fish and Game last year.

Same as above showing wild millet, bulrush and cattail growths after reclaimed by the Service.



Unit A showing situation of newly leased and reclaimed lands.

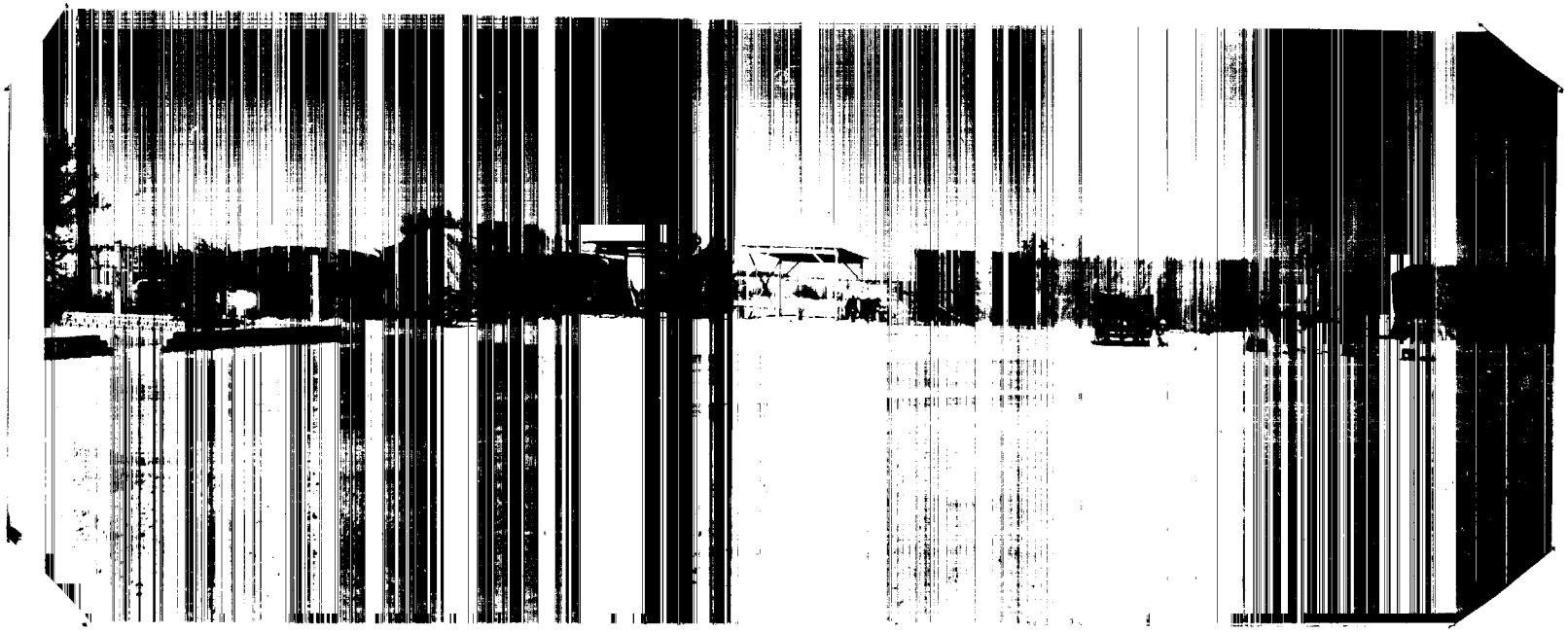
Aerial view of outlay of electrical ("Perch wires") passerine bird scaring device in use at USDA, Brawley experiment station. Parallel galvanized wires on poles continuously snap and spark.



Five-ton Autocar truck-tractor which was retired during the period.

Ford truck, with dump bed removed, will replace old Autocar truck for equipment transportation.

Headquarters tract just prior to Khapra beetle fumigation job.



Same as above during fumigation work. Plastic sheets over structures retain poison being pumped into buildings. Process killed all living things..... ncludi g stored seed.