SALTON SEA NATIONAL WILDLIFE REFUGE

AND

WATERFOWL DEVELOPMENT AREA

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NARRATIVE REPORT

JANUARY, FEBRUARY, MARCH, APRIL

1957

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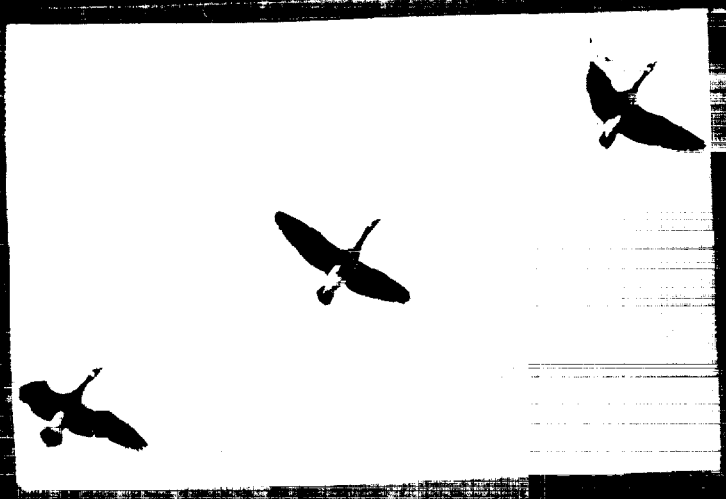
UNITED STATES DEPARTMENT OF INTERIOR
FISH AND WILDLIFE SERVICE
BRAWLEY, CALIFORNIA



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REFUGE PERSONNEL

Regular Personnel

EDWARD J. O'NEILL	Refuge Manager
WILLIAM NUESS	Refuge Manager, Asst. (Trsfd. Minidoka Refuge, Idaho)
JOSEPH L. CUDDY	Clerk-typist
HENRY STEER	Mechanic, Hwy. Duty

JOSE' BARROS	Tractor Operator
CARL W. FORD	Tractor Operator
ALFRED W. MC FARLAND	Tractor Operator
CLYDE W. STEWART	Tractor Operator
CHESLEY WILLIAMS	Tractor Operator
LEO E. COX	Oiler
JOHN BARROS	Irrigator
SYLVESTER BARROS	Irrigator
MANUEL CARDONZO	Irrigator
JULIO RIBERIO	Irrigator

Temporary Personnel

None during period.

NARRATIVE REPORT

I GENERAL CONDITIONS

A. Weather & Conditions

Imperial Valley experienced cooler days in January, 1957 than it did during the corresponding month of 1956. Mean average temperature was 54 degrees or about 3.5 degrees lower than January 1956. Mean maximum for January of this year was 66.5 degrees, compared to 72.9 degrees for January 1956. Mean minimum was 42.7 degrees, just slightly lower than the same period of 1956. There were 11 clear days, 6 partly cloudy days and 14 cloudy days during January. On the 25th a heavy fog capped the Valley from about 7:00 to 9:00 AM.

February 1957 was warmer than the corresponding weeks of 1956. Mean temperature this year was 63.7 degrees or 9.4 higher than February, 1956. Mean maximum this year was 77.6 degrees. The mean minimum was 49.9 degrees ------ 11.1 above the minimum for February, 1956.

Weather conditions during March and April were rather mild compared with previous seasons on record. Maximum temperature during March was 92 degrees, during April, 94 degrees. Minimum temperature in March was 43 degrees, in April, lowest temperature recorded was 49 degrees. Winds which generally rip through Imperial Valley in March and April were lacking this year.

Tabulated below is the weather data as compiled by the El Centro Naval Air Station, Seeley, California.

MONTH	MAX.	MIN.	PRECIPITATION	DAYS OF+25MPH WINDS
January	73°	35°	0.61"	
February	90°	36°	0.10"	
March	92°	43°	0.09"	6
April	94°	49°	T.	17
	Totals		0.80"	23

B. Precipitation & Water Conditions

Rainfall for January totaled 0.61 inches. Storms occured on January 3, 7, 8, 9, 29, and 30. The total was about .13 higher than that measured one year ago. The general area storm

of the 28th and 29th put considerable variety in the winter weather for local residents. Howling winds, spiked with rain, sleet and snow left the mountains west of Salton Sea covered with 4 feet of snow. For the first time in the memory of most citizens the Chocolate mountains, east of Imperial Valley, were whitened with a light snow blanket.

Precipitation for February totaled 0.10 inches. Traces of rain fell on the 21 and 22nd but main moisture was recorded on the 23rd when .08 inch fell and the 28th when .02 inch was received.

A light earthquake jolted the general Imperial Valley area about 12:45 PM February 23rd. No damages were noted but the trembler was strong enough to rattle dishes and utensils in most everyones home.

For a period of about two weeks light earthquake tremors were felt daily at the refuge in early April. On April 25 four separate heavy shocks jarred the entire Imperial Valley area. Worst damage done was within a narrow 2-mile wide strip about 1 mile south of refuge Unit II extending about 4 miles in a southwesterly direction. The hard ground was left broken and cracked. In the fields, canals, and roads, water and fine sand flowed to the surface through "sand-boil" fissures. The boils flowed for about 3 hours leaving large acreages of wet fields. The Vail 4 road (4 miles) was about three-fourths under water. About 2,000 acres of farm land south of refuge sub-headquarters was affected by the boils. In the wake was mounds of sand in cotton rows spread over a dozen adjacent rows leaving high spots and cracked ground. Undoubtedly a lot of land will require releveling. Tiled lines too, appeared to have slipped and mudded in here and there.

C. Fires

No fires during period.

II WILDLIFE

A. Migratory Birds

1. Populations and Behavior

Geese and Swans

Hunting pressures both on and around refuge Unit II caused unprecedented shifting of populations and feeding sites among the geese.

Although Canada goose hunting after December 15th was illegal, nevertheless some of the hunters persisted both through ignorance (other counties were not closed) and nefarious attitudes.

A number of Canada goose cases were made by wardens. At least 5 Canadas were shot on the refuge during the balance of the season.

Another contraband species, the Ross' goose, owing to it's habit of mingling and flying with canada geese on refuge Unit II, received very heavy gun pressure for such a tiny flock. Of the 31 Ross' geese here during the previous period only 4 remained at the close of the season.

Snow geese, although showing the effects in numbers of a flock reduction over last year, seemed to fair well. Most of the Snows moved into refuge Unit II and shuttled between cattail fields and the Alamo river delta or open sea during the day.

A single Blue goose was observed January 29th.

Returns from banded Canada geese which were killed on Salton Sea Refuge originated at Bear River Refuge, Utah, Neponset Reservoir, Utah, and Pathfinder Reservoir, Wyoming.

On March 20, when the last general aerial census was made some 300 Snow geese, 1 White-front, and 5 Canada geese were still here.

In previous reports the figures taken from annual census or winter inventory totals have been pointed out to show the definite downward trend of geese in this part of the flyway. Although total number in the Salton Sea area appear insignificant to some they nevertheless are real and represent the general attitude or negligence to keep closer tab on certain species locally. (Canada geese have shown a drop from 4150 in 1952 to 300 in 1956. Snow geese have dropped from 20,830 in 1952 to 9,000). It is interesting to note how the trend is reflected in fugures for the Colorado River. Population figures for Arizona counties along the river, taken from 1950 through 1957 are as follows:

Canada and Snow Goose Populations-Lower Colorado River

Year	Arizona Counties							
(Jan.)	Gila		Maricopa		Mojave		Yuma	
	Snow	Can.	Snow	Can.	Snow	Can.	Snow	Can.
1950		2304		170	1200	2500	143	1853
1951		1826		215	1150	955	430	1230
1952	7	1150		282	885	985	500	1612
1953		1135		260	1400	946		473
1954	5	1907		437	1817	830	143	315
1955	2	1486		527	900	401		270
1956	17	2110	1	604	232	452	63	611
1957	10	2388		350	204	254	2	510

Ducks

Duck species continued to use the refuge similar to population numbers and pattern mentioned in the previous report.

Shovelers, which had shown lower numbers this year, showed local population increases through March and early April.

Widgeon remained stable population-wise until March 15th when they showed signs of dwindling population and migration. Most duck species appeared to have moved from Salton Sea slightly earlier than previously.

Fulvous-tree ducks were first noted when 9 were seen March 30th.

Disease

No known diseases occured during the period.

Shorebirds, Gulls and Terns

No change in status noted.

Water, Marsh and Wading Birds

No change in status noted.

An estimated 10 Common Egrets were found incubating eggs in small colony at the north end of the sea March 20th.

Food and Conditions

No change noted.

B. Upland Game Birds

No change in status noted.

C. Other Birds

An estimated 500 Mountain Bluebirds were present at Unit II from January 20 to March 5th.

A Mourning Dove banded at this station March 13, 1953 as an adult bird was re-trapped here March 20th.

A light influx in Mourning Doves occured about January 20th at which time a definite increase was noted. By January 24 the increase was quite pronounced. By February 14th the species was again common.

One ground dove was seen near trifolium 13 canal at Unit I February 12.

Robins were present from January 8 to April 15. About 500 were at Vendel's Corner February 7 where they were feeding on dates. February 20th about 500 were observed at Brawley feeding on pyracantha berries.

Some 50 Mountain Plover used Tract C, Unit I from February 4 to about February 28th.

A flock of about 1500 Horned larks remained at tracts 18-19 Unit I from February 5 to April 15th, and Rough-winged swallows were observed here in mid-March.

A pair of Verdins were observed feeding a young verdin at Unit II april 5th.

Pine siskins were observed east of Unit II February 9.

Mr. William Anderson of California Fish and Game Department observed 1 Ladder-backed woodpecker near Finney-Ramer February 9.

Western Kingbirds were first seen April 5th.

Roadrunners were observed constructing nests as early as February 19th.

Night Hawks arrived about March 28 when 4 were observed at Unit I.

Shrikes, which nested at headquarters, had young on the wing by March 30th.

Red-winged Blackbirds were actively constructing nests in mid-April.

Several Kingfishers were seen throughout the period.

A single Phainopepla showed up at Unit I April 23.

D. Fur Animals, Predators, etc.

No change in status noted.

A Coyote was observed a few times at Unit I in mid-February.

E. Predaceous Birds

One Osprey was seen March 5th near Calipatria.

One Golden eagle was observed often in early February.

On February 7th a lone Swainson's Hawk was seen at Unit II.

Cooper's and Sharp-shinned hawks occured in the general area as uncommon visitors.

F. Fish

University of California biologist continue to predict a tremendous sportsfishing resource at Salton Sea from the ocean fish transplanted here in recent years. Latest prediction is that good fishing will be enjoyed within the year 1957.

Corvina were found abundant and believed to have spawned in February. Since 1948, when 1000 adults were introduced, it is estimated 65,000 now inhabit the sea.

G. Waterfowl Depredations

Complaints of crop damage by waterfowl and particularily Widgeon reached a new low. This does not infer that losses were not received. It does indicate, we believe, that without spokesmen and general rabel-rousing the problem, although present, didn't receive the publicity of other years.

Alfalfa damages were noted on the Seibert Farms 3 miles east of refuge headquarters at Gate 155 Trifolium 8 canal March 24, Elmore ranch, John Williams place one-half mile south of headquarters, C.T. Dearborn and others along Trifolium 12 canal also reported some widgeon damages.

The widgeon showed an increased population over last year. Alfalfa prices dropped slightly during the winter months. Rains, which rendered alfalfa fields too wet for grazing, caused a surplus of livestock feed and alfalfa for dehydration meal.

III REFUGE DEVELOPMENTS AND MAINTENANCE

A. Physical Developments

Development work was confined to land clearings at Tract 9 Unit I and Unit A for contours and eventual leashing.

Cultivated Crops

Cropping program in previous report continued. Lands in Unit A are being prepared and about 200 additional acres will be brought under leach this summer. Approximately 24 acres of mature barley, 30 acres of Sudangrass, 1300 acres of cattails and wild millet and 900 acres of green barley are planned for fall-winter use.

B. Receipt of Seed and Stock

During the period 6,000 pounds wild millet seed was purchased at Sacramento, California.

Approximately 18 tons of oats were shipped from Tule Lake Refuge.

IV ECONOMIC USES OF REFUGE

None in effect during the period.

V PUBLIC RELATIONS

A. Recreational Uses

Eighty members of the Palomar Club toured the refuge January 26.

Sixty-two visitors checked in at headquarters during the period. A total of 1450 people visited the refuge including hunters who used the Lea Act lands.

B. Refuge Visitors

Name	Date	Identification	Purpose
Mr. Graham Elmore	1/15	County Road Supt.	Gravel haul-Red hill
Mr. Paul Quick	1/27-28	Asst. Reg. Dir.	Inspection tour
Mr. K.F. Mac Donald	1/27-28	Reg. Refuge Supv.	Inspection tour
Dr. H. Lee	1/28-29		Photography
Mr.&Mrs. Devereux Butcher	2/5	Nat'l Park Assn.	Photo & observation
Mr. L. Mc Kibben	2/11	Reg. truck driver	Seed haul
Mr. Phil. Douglas	3/1	Cal. F&G Dept.	Boat launching site
Mr. Wendell Miller	3/15	Cal. F&G Dept.	Experiment plantings
Mr. Bob Reynolds	3/22	I.I.D.	Water order
Mr. Wes. Fleming	4/57	Ariz. Biologist	Contact
Mr. Chas. Copley	4/57	Ariz.Area Supv.	Contact
Mr.&Mrs. Tom Brown	4/8	San Diego Audubon	Observation
Mr. Leo L. Laythe	4/8	Regional Director	Inspection tour
Mr.&Mrs. Eugene Cardiff	4/10		Bird collecting
Mr. E.R. Quortrup	4/30	San Diego Cty.Vet.	Tour
Mr. Paul Williams	Several		Contact
Mr. C. Logtetter	Several	Biologist	Contact
Mr. A.W. Elder	Several	Game Mgmt. Agent	Contact
Mr. Jim Johnson	Several	Game Mgmt. Agent	Contact
Mr. Raymond Galbn	Several	Pilot-biologist	Aerial census
Mr. Frank Baldan	Several	Cal. F&G Dept.	Hunting & patrol
Mr. John Parrish	Numerous visits	Cal. F&G Dept.	Contact

C. Refuge Participation

Mr. William Anderson and Mr. Gale Horn of California Fish and Game Department continued waterfowl trapping activities on the refuge throughout the period. Traps were set up at Tracts 9, and 11, Unit I and 7-14, Unit II was well as Finney-Ramer, Hazard area, and Wister unit.

April 6 a joint meeting of Service and California Fish and Game personnel w/the So. California Duck Hunters Assoc. and Federation So. California Sportsmen was attended at the Lafayette Hotel, San Diego, California.

Local Scout troops participating in conservation activities visited and toured the refuge. Refuge personnel served as wildlife conservation merit badge counselor for troops in Brawley and Calipatria.

D. Hunting

Restricting the acreage of Lea Act lands opened to hunting to 50% of what it was one year ago appears to have been a step in the right direction - now that the canada goose population has been scattergunned down to a mere remnant of former numbers.

E. Publicity

During the period another 6500 words were added to the weekly column "Wildlife Comments".

The Niland Tomato Festival brochure featured an article entitled "Desert Ducks" which covered refuge operations and objectives.

F. Violations

Court proceedings of apprehensions made by refuge personnel and not reported in the previous narrative are listed below:

Name	Violation	Date	Amount
Jerry Lee Young- Spring Valley, Calif.	Hunting on refuge	11/24/56	$ 35.00 —
William A. Richards- Redondo Beach, Calif.	" " "	12/1/56	$100.00 —
Ron Aland- El Segundo, Calif.	Pos. of 1 Snow goose " " " " " "	12/7/56	$100.00 /
Thomas R. Brank- Garden Grove, Calif.	Hunting on refuge	11/17/56	$ 35.00 —
P.A. Luke- Redlands, Calif.	Shooting waterfowl after legal shooting hours	12/15/56	$ 75.00 /
Robert H. McKinney- San Ysidro, Calif.	Hunting on refuge Three Snow geese seized	1/4/57	$100.00 —

Name (Cont'd)	Violation	Date	Amount
Pierce Sherman- Malibu, Calif.	Hunting after legal shooting time	12/8/56	$ 35.00
Robert K. Derige- Anaheim, Calif.	Hunting on refuge	11/17/56	$ 35.00
Eugene J. Sneed- Seal Beach, Calif.	" " "	11/17/56	$ 35.00
Paul Landers- Garden Grove, Calif.	" " "	11/17/56	$ 35.00
Albert E. Saunders- Los Angeles, Calif.	Possession firearms in refuge	10/20/56	$ 35.00
Donald R. Helland- Los Angeles, Calif.	" "	10/11/56	$ 35.00
Robert L. Gebert- San Diego, Calif.	" "	12/7/56	$ 35.00

VI APPLIED RESEARCH

Supplementary Feeding

During the period another supplemental green feed experiment was attempted similar to work done once by Bert Wardwell and twice by present refuge personnel.

The following shows dates and amounts of chopped alfalfa put out at refuge Tract 9, Unit I.

Date	Pounds	Delivery No.	Operator
1/21	2620	B-6826	Jose' Barros
1/25	2220	6884	Jose' Barros
2/4	1640	7040	Jose' Barros
2/5	1630	7062	Jose' Barros
2/6	1190	7078	Joseph L. Cuddy
2/7	1600	7093	William Nuess
2/8	1890	7104	Edward J. O'Neill
2/11	4130	7137	Jose' Barros
2/12	2430	7152	William Nuess
2/13	3140	7166	Jose' Barros
2/14	1820	7179	Joseph L. Cuddy
2/15	3530	7185	Jose' Barros
2/16	3940	7201	Clinton Lostetter

Some sixty tons of alfalfa were contracted for by biologist Clinton Lostetter. It was necessary to travel to the East Brawley, Fudge Milling Company, for each load. All loading was done by the truck operator by pitch fork. The stake truck was weighed and re-weighted each trip.

It was predetermined that alfalfa would be spread on the water at Tract 9 in four locations where widgeon loafed daily. It was

decided that as rapidly as the feed was taken by widgeon more would be obtained and set out.

Mr. Lostetter, accompanied by Agent Jim Johnson, hauled and put out one load of feed. All other feeding and observations was by refuge personnel as indicated on the foregoing tabulation.

Below is listed the sailient points of the feeding observations:

Date	Observation
2/4	time, 4 PM; estimated 500 widgeon at feeding station. When feed spread 5,000 widgeon present.
2/5	time, 9 AM; estimated 450 widgeon at feeding station. Alfalfa about 30% cleaned up; less than 25% of widgeon around feeding stations; 4500 widgeon present.
2/6	time, 9 AM; estimated 300 widgeon & 30 coots at Tract 9; alfalfa 50% cleaned up.
2/7	time, 9:30 AM; estimated 3,000 widgeon, 200 coots, 200 pintails; about 500 using alfalfa feeding stations.
2/8	time, 10:30 AM; estimated 4,000 widgeon, 350 coots in general area, about 200 at stations.
2/9-10	No supplemental feed put out.
2/11	time, 9 AM; estimated 5,000 widgeon in general area.
2/12	time, 9:30 AM; estimated 3,000 widgeon in general area, about 150 at feeding stations.
2/13	time, 8:45 AM; estimated 2,000 widgeon in general area, about 500 at feeding stations.
2/14	time, 9 AM; estimated 7,000 widgeon in general area, about 4,000 at feeding stations.
2/15	time, 12:30 PM; estimated 300 widgeon in general area, about 50 at feeding stations.

February 21 through March 1, 1957 (except February 23 & 24), eight sacks of oats were distributed each day at Tract 9. An estimated 2,000 birds, mostly pintails, green-winged teal and widgeon were held during the time feed was being distributed.

A total of about 15 tons chopped alfalfa and 6400 pounds of oats were put out as supplemental feed to hold widgeon.

It is our opinion that the supplemental feeding efforts held insufficient widgeon numbers to warrant its use as a depredations preventative. Each feeding required 6 man hours to load, weigh, haul, and unload.

Refuge Crop Manipulation

Experimental work with widgeon to encourage more use of refuge green crops was continued through January and February. The project entails encouraging widgeon to move inland to flooded rest areas where geese are feeding on barley crops. By providing a condition

of protection and minimum disturbance, the species was gradually concentrated at Tracts 1-2, Unit I through the use of oats.

By spreading oats on the water daily; widgeon moved in, consumed the oats and gradually joined canada and white-fronted geese grazing in adjacent barley crops.

On February 2, it was estimated 10,000 widgeon were using tract 4, Unit I daily. On February 9, 8,000 were estimated using the area exclusively. On February 10th we started flushing the widgeon from the general area to keep them from killing the barley. It took three days to discourage use of the green barley field by widgeon. Two days later damages occurred on the Seybert place.

Since we have succeeded in creating this condition two years now it is planned to elaborate on the work and hold the widgeon as much as possible next winter.

VII OTHER ITEMS

During the period the California Fish and Game Department under the direction of Wendell Miller, transplanted samples of shoal grass shipped in by the State of Texas.

Plantings were wrapped in cheese cloth and submerged near Mullet Island under the supervision of University of California fisheries research biologists.

At the same time we were offered samples for transplanting at refuge Unit I. A meeting was scheduled and preparations made for the work. Miller must have been delayed. He never arrived with or without the planting stock.

It is recalled how transplants of this species set out a few years ago proved unsuccessful.

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The Salton Sea Beach Estates, a land subdivision developed by Ed. Jorgensen and Cal Brown of Riverside County, received approval March 17th by the Imperial County Planning Commissioners. The subdivision is along the south east shores of Salton Sea near Bombay beach. It was jointly agreed by the estate and I.I.D. that no land would be sold below -220 foot contour without a waiver exempting I.I.D. from claims in case of rise in the sea.

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Seen in the Los Angeles Times Newspaper: "From various groups we heard main reason the com ission didn't ban cheese as trout bait this year was on account of a 2,000,000 pound inventory in warehouses in California alone------".

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In early February it became known that a strong possibility exists for the Miramar Naval Air Station being moved to Salton Sea. Final decision seems to hinge on the City of San Diego which is pressing for an international airport. Such would conflict with the air pattern at Kearney Mesa. Of course Imperial Valley Board of Trade, Navy League, Industrial Development Commission, Chamber of Commerce and County Supervisors are urging use of Salton Sea.

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On February 20th Beverley Hills Contractor Earl Brown was awarded a contract to construct a $ 63,896 boat basin at the Salton Sea State Park about 8 miles Southwest of Mecca on Highway 111.

A graveled parkway for 50 cars, concrete boat launching ramp, 3-acre boat basin 10 feet deep by 40 foot wide are included in the project.

Future plans call for more camping grounds, and picnicking areas.

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Tractor Operator Carl Ford made local headlines in the Brawley News February 16th when he 'dozed up and killed a 5-foot, 14-rattle diamond-back snake on east Unit "A" of the refuge.

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The suit-squabble over Colorado River water being waged between Arizona and California continued through the period at San Francisco with most of the testimony being presented by Palo Verde, Coachella and Imperial Valley water districts.

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The California Fish and Game Department's "Outdoor California" for February 1957 featured an article entitled "Salton Sea Project Seeks Reasons For Steady Decline of Mullet Fishery", by L. J. Hendricks. The article relates how mullet have apparently failed to reproduce or enter the sea.

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During the period Biologist Bob Smith and Horton Jensen of the Service and Chester Kibbe of Oregon Fish and Game Department spent three weeks at El Centro awaiting clearance to make the annual waterfowl inventory flight into Mexico. After contacting these men and gathering and returning cameras, sidearms, etc. three times during the interim, it developed that negotiations could not be made with Mexico to count any part of the countries waterfowl population.

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During the period the wrath of angry hunters was unleased full force against the move in California to outlaw Mourning dove hunting. Although a bill was introduced at Sacramento by the proponents of the kill ban, it was squelched by law makers for a two year period pending committee study.

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Respectfully submitted,

Edward J. O'Neill
Refuge Manager

Approved: _____

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CREDIT DEPARTMENT: Credit is due Mr. Cuddy for compiling banding recovery tabulations, preparing NR Forms, and typing this report.

SALTON SEA REFUGE

BANDING RECOVERIES - 1956 - 57

SPECIES / STATES	Baldpate	Cinn. Teal	Coot	G-W Teal	Fulvous T. Duck	Pintail	Redhead	Ruddy	Mallard	Canada Goose	Snow Goose	W-F Goose	Shoveler	Canvasback
Alaska	2													
Ark.		1												
Ariz.	7					17								
Calif.	200	24	7	41	1	546	18	1	2	1	3	1	2	1
Canada	12			5		38								
Colo.						3								
Idaho	1			1		5								
Iowa						1								
Kans.						2								
L.A.						13								
Mexico	3	7	2	6		58	1							
Minn.						1								
Mo.						2								
Mont.	1									1				
Neb.						1								
Nevada	3	1		3		4								
N.Dak.						3								
N.Mex.						2								
Ohio				1										
Okla.						1								
Oregon				1		2								
P.Canal Z.		1												
So.Amer.		1												
S.Dak.						3								
Texas				1		66								
Utah	42			8		55								
Wash.	1					1								
TOTALS-	272	35	9	67	1	824	19	1	2	2	3	1	2	1

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

WATERFOWL

REFUGE Salton Sea MONTHS OF January TO April, 19 57

(1) Species	(2) Weeks of reporting period 1/4	1/11	1/18	1/25	2/1	2/8	2/15	2/22	3/1	3/8
Swans:										
Whistling						Aerial Census				
Trumpeter										
Geese:										
Canada	700	700	750	900	950	850	500			15
Cackling										
Brant										
White-fronted	350	400	425	200	150		10			
Snow	8000	9000	9000	9000	6000	6500	9000			400
Blue										
Other - Ross'		4		2	4					
Ducks:										
Mallard				50						
Black										
Gadwall										
Baldpate	20,000	18,000	10,600	13,500	12,900	27,400 / 7600	24,200 / 5400			3600
Pintail	9500	11,000	9100	11,300	8300	7600	5400			2200
Green-winged teal	5000	4800	3100	4300	3700	600	2600			700
Blue-winged teal										
Cinnamon teal	50	75	100	100	50	150	125			750
Shoveler	2500	3000	1425	5400	4000	4200	5300			3500
Wood										
Redhead										
Ring-necked										
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy	700	1100	400	550	800	5600	1800			6000
Other										
Coot:	1000	700	1000	3000	2000	2000	2000			5000

3 -1750a

Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Salton Sea MONTHS OF January TO April, 19

(1) Species	(2) Weeks of reporting period 3/15	3/22	3/29	4/5	4/12	4/19	4/26	18	(3) Estimated waterfowl days use	(4) Production Broods seen	Estimated total
Swans:											
Whistling		Aerial Census				Aerial Census					
Trumpeter											
Geese:											
Canada	2								33,369		
Cackling											
Brant											
White-fronted		1							10,752		
Snow	400	300	5						575,255		
Blue											
Other Ross'									70		
Ducks:											
Mallard			2						364		
Black											
Gadwall											
Baldpate	2900	4000	1800			300	800	150	981,050		
Pintail	700	10	560			310	500	200	466,760		
Green-winged teal	1400	650	2290			1050	1160	680	253,870		
Blue-winged teal			1						7		
Cinnamon teal	1200	100	1550			80	160	46	31,332		
Shoveler	2400	1150	520			520	250	120	219,795		
Wood											
Redhead			10				10	4	168		
Ring-necked		3	1				4		56		
Canvasback	10						2		84		
Scaup	10	10	50			10	30	10	850		
Goldeneye	10						8	2	140		
Bufflehead	18		20			10	2		350		
Ruddy	3600	1500	800			1550	380	300	166,600		
Other											
Fulvous T. Duck			9				14	10	251		
Coot:	500	1680	2060			2650			164,980		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans			
Geese	149,426	10,155	
Ducks	2,131,637	45,950	
Coots	14,980	5,000	

SUMMARY

Principal feeding areas Divers-Salton Sea

Dabbling-Refuge Units and agriculture leach fields.
Widgeon-agriculture alfalfa fields.

Principal nesting areas Salton Sea

Reported by
Edward J. O'Neill, Refuge Manager

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 Months of January to April 1947

(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:										
Common Egret	Previous period		45	1/18						
Snowy Egret	"	"	10	Feb.						
Black-crowned Night Heron	"	"	80							
Western Grebe	"	"	50	Mar.						
Horned Grebe	"	"	300	Apr.						
Pied-billed Grebe	"	"	3	Mar.						
Gallinule	"	"	10	Mar.						
Coot	"	"	1	Feb.						
Cormorant	"	"	50	1/18						
White Pelican	"	"	1500	3/4						
Glossy Ibis	"	"	250	4/9						
Sandhill Crane	7	1/20			5	3/1				
II. Shorebirds, Gulls and Terns:										
Snowy Plover			50	4/22	10	4/25				
Black-necked Stilt	1	1/29	10	Feb.						
Am. Avocet	Previous period		300	2/15						
Marbled Godwit	"	"	10	Feb.						
L-B Curlew	"	"	1500	Feb.						
Willet	"	"	10	Feb.						
Dowitcher	"	"	1200	2/15						
Least Sandpiper	"	"								
Ring-billed Gull	"	"	800	2/15						
Gull-billed Terns	10	3/26								
Stilt Sandpipers			5	3/13	4	4/25				
Black Tern	200	4/22								
Black-bellied Plover	Previous period		80	2/15						
Mountain Plover			200	2/6						

(over)

(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					
Magpie					
Raven					
Crow					

Reported by [redacted]

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 Salton Sea Months of January to April, 19 57

(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.
	No change in status.									

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.

3-1754
Form NR-4
(June 1945)

SMALL MAMMALS

Refuge [redacted] Year ending April 30, 1957

(1) Species	(2) Density		(3) Removals					(4) Disposition of Furs						(5) Total Population
								Share Trapping						
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator Control *	For Re-stocking	For Re-search	Permit Number	Trappers Share	Refuge share	Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	
[redacted]	No notable change in status. (No control work being done)													

* List removals by Predator Animal Hunter

REMARKS:

Reported by [redacted]

INSTRUCTIONS

Form NR-4 - SMALL MAMMALS (Include data on all species of importance in the management program; i. e., muskrats, beaver, coon, mink, coyote. Data on small rodents may be omitted except for estimated total population of each species considered in control operations.)

(1) SPECIES: Use correct common name. Example: Striped skunk, spotted skunk, short-tailed weasel, gray squirrel, fox squirrel, white-tailed jackrabbit, etc. (Accepted common names in current use are found in the "Field Book of North American Mammals" by H. E. Anthony and the "Manual of the Vertebrate Animals of the Northeastern United States" by David Starr Jordan.)

(2) DENSITY: Applies particularly to those species considered in removal programs. 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, bottom land 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) REMOVALS: Indicate the total number under each category removed since April 30 of the previous year, including any taken on the refuge by Service Predatory Animal Hunter. Also show any removals not falling under headingslisted.

(4) DISPOSITION OF FUR: On share-trapped furs list the permit number, trapper's share, and refuge share. Indicate the number of pelts shipped to market, including furs taken by Service personnel. Total number of pelts of each species destroyed because of unprimeness or damaged condition, and furs donated to institutions or other agencies should be shown in the column provided.

(5) TOTAL POPULATION: Estimated total population of each species reported on as of April 30.

REMARKS: Indicate inventory method(s) used, size of sample area(s), introductions, and any other pertinent information not specifically requested.

3-1570
NR-8a

REFUGE GRAIN REPORT

Refuge Salton Sea Months of January through April, 1957

(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		100						X		
Feed Barley	50		50			30	30	20		X	
Sudangrass	20	4	24		4			20	X		
Wild millet		120	120		80		80	40	X		
Oats		1200	1200		100	500	600	600		X	

(8) Indicate shipping or collection points Unit I and II storage buildings.

(9) Grain is stored at Unit I and II storage buildings.

(10) Remarks

*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.

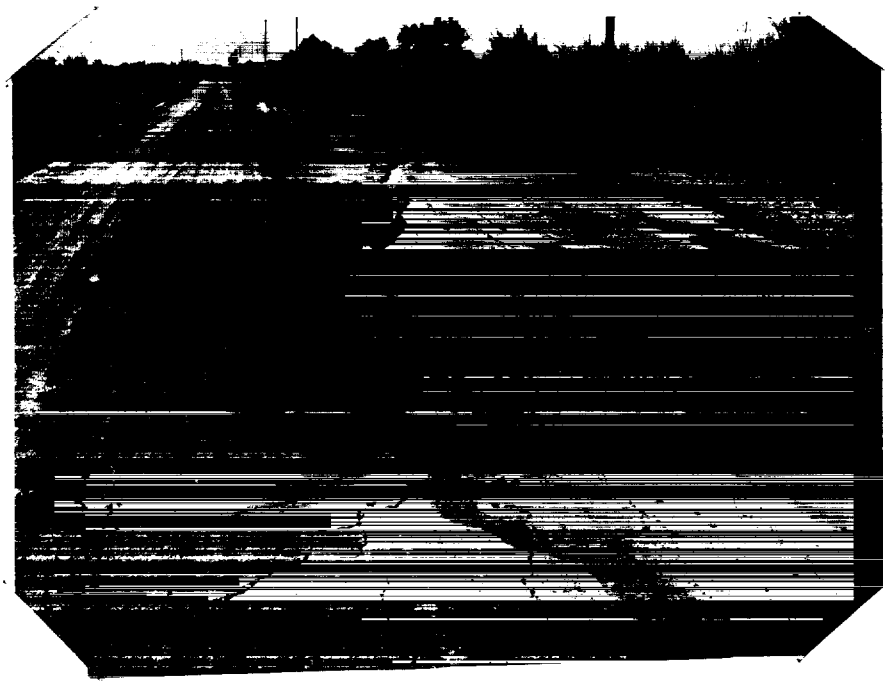
(7) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.

(8) Nearest railroad station for shipping and receiving.

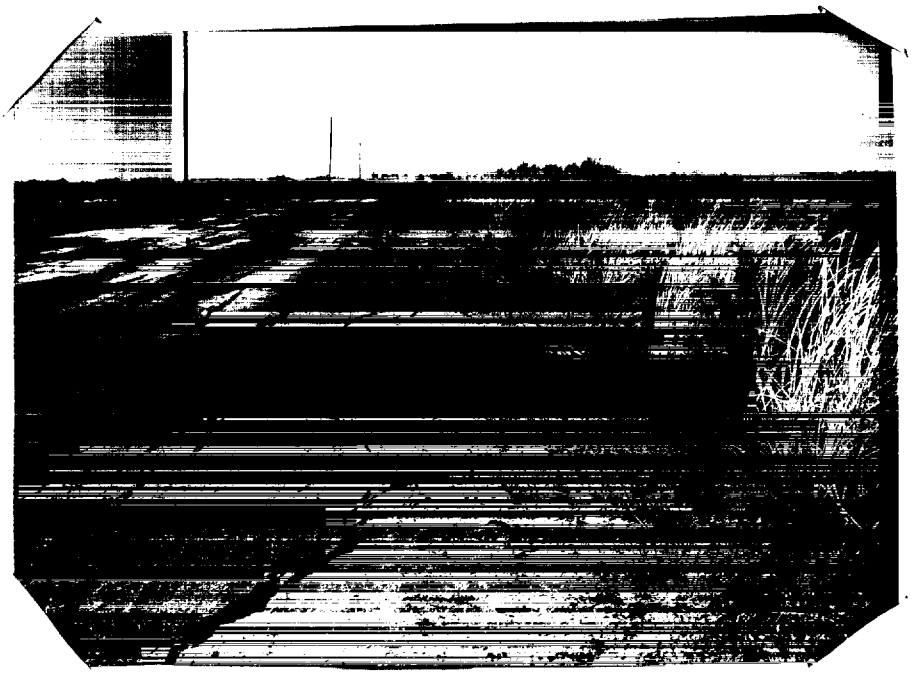
(9) Where stored on refuge: "Headquarters granary," etc.

(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



Earthquake cracks in road along west edge of refuge Tract 1, Unit II. Fissures resulted in "sand boils" which brought salty water and fine sands to surface.



April 25th earthquake damage to "I" road at point 3 miles south of refuge subheadquarters.

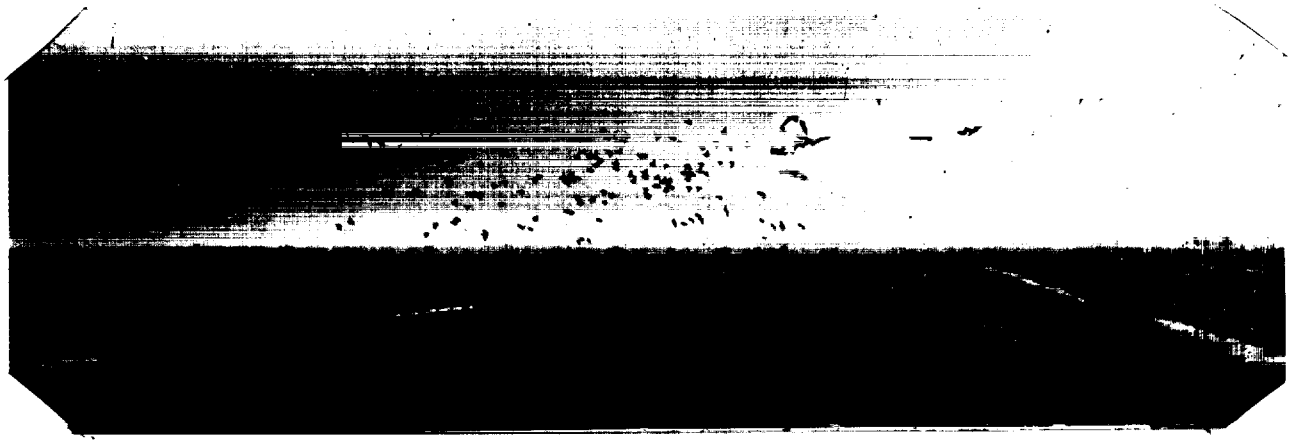
L.E. Sinclair ranch cotton crop showing typical "sand boil" damage by quakes. Field is 2 miles south of refuge Unit II. (April 25, 1957)

Jose' Barros unloading chopped green alfalfa during widgeon feeding experiment. (Jan.1957)

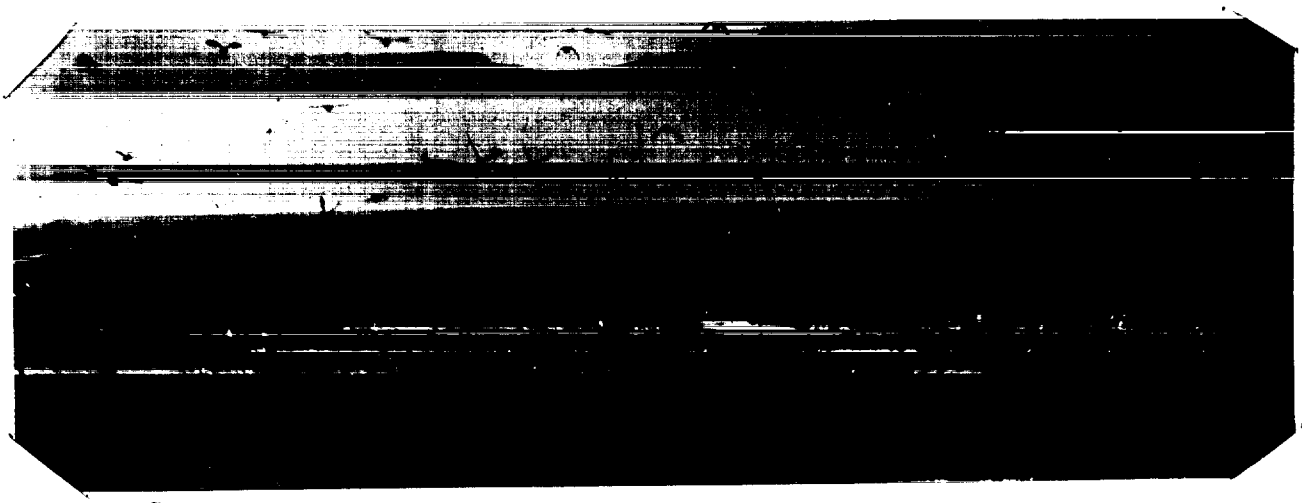
Green alfalfa was spread on water. Note drifting feed in background.

Tractor Operator Carl Ford points out grade fill stake where service ditch for Unit "A" will be located. Tract 1, Unit I. (March, 1957)

Mr. Ford points out same grade stake as ditch fill is being completed. (April, 1957)



Widgeon and Canada geese using green barley at Tract 4, Unit I as a result of crop manipulation efforts. Note varying degrees of utilization. (January, 1957)

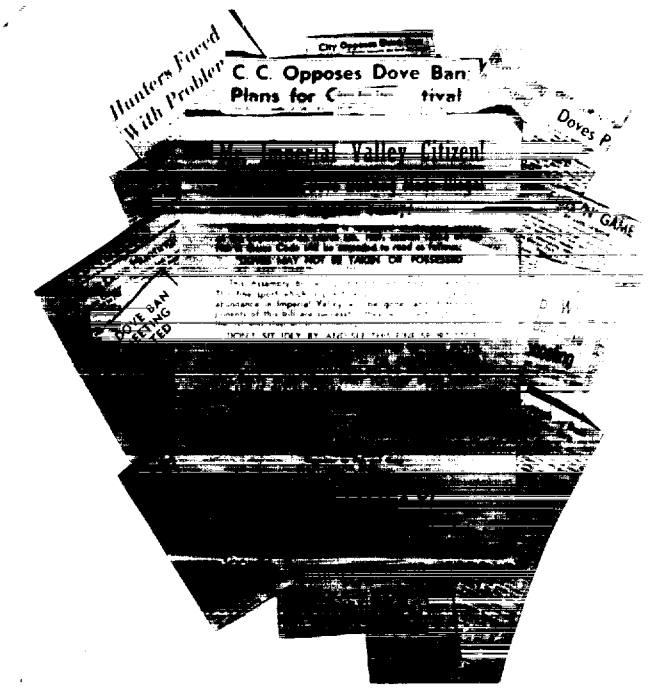


Same as above showing pintails and widgeon in green barley field.

Snow geese feeding in green cattails at Tract 8, Unit II. (Photo by Dr. Howard J. Lee, Milwaukee, Wisconsin, February, 1957)

Cormorant which impaled itself on broken tree limb at bird rookery. Limb passed completely through body except for skin on back. (April, 1957)

Calipatria, California Boy Scouts who visited refuge during conservation campaign. (L. to R. Ray Coronado, George Rocha, Bob Nash, Lonnie Dearborn, Johnnie Galleano, Tom Dearborn, Dwight Metzler, Joe Epley, Charles Moe, Dan O'Neill, Robert Gibson).



Local propaganda against ban on Mourning Dove hunting brought forth heated protests.