

SALTON SEA NATIONAL WILDLIFE REFUGE

AND

WATERFOWL DEVELOPMENT AREAS

NARRATIVE REPORT

MAY - AUGUST, 1952



UNITED STATES DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

BRAWLEY, CALIFORNIA

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* * *

REVISOR PERSONNEL

Regular Personnel

EDWARD J. O'NEILL	Refuge Manager
CLYDE W. STEWART	Foreman, Farm Operations
EARL BARKER	Mechanic (Resigned)
DUANE DAVIDSON	Mechanic (Resigned)
HENRY LAKANSKY	Clerk (Typing)
JOSH BARROS	Maintenance Man
WILL T. WESLEY	Maintenance Man
JAMES W. HAMILTON	Dragline Operator
LEO E. COX	Tractor Operator
W. CARL FORD	Tractor Operator
HELVIN FORD	Tractor Operator
CHASSEY R. WILLIAMS	Tractor Operator
PAUL E. WILLIAMS	Tractor Operator
JOHN BARROS	Irrigator
SILVSTER BARROS	Irrigator
MANUEL CARDENZO	Irrigator
WILLIAM L. LYNNH	Irrigator

Temporary Personnel

EDDIE C. MIGNOLA	Tractor Operator (Resigned)
MANUEL R. BARROS	Irrigator (Resigned)
ADRIAN McDANIEL	Irrigator (Resigned)

NARRATIVE REPORT

I GENERAL CONDITIONS

A. Weather Conditions

The weather was comparatively mild through early June. The last half of the month saw a steady rise in the mercury. By mid-June there were plenty of humid, sticky days. Oven-hot blasts, few windy days, and the mass migration of people from these parts in July spelled one thing for certain—summer was upon us. A comparison of the daily weather trends of last year indicate this summer temperature averages were a few degrees lower. The weather may have been on leave-of-absence when the report was made since we could find no mention of humidity and the long, long, hot spells, the like of which we've never witnessed. It got so hot that every time we saw a dog pursuing a jack rabbit they were both walking.

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

<u>MONTH</u>	<u>MAXIMUM</u>	<u>MINIMUM</u>	<u>PRECIPITATION</u>	<u> DAYS OF WIND OVER 25 MPH</u>
May	106	62		1
June	110	56		5
July	113	72	.11	0
August	115	76	.50	0
				<hr/>
			Total61	

B. Precipitation and Water Conditions

On July 25th .11 of an inch of rain fell in the vicinity of the refuge with little effect one way or another.

Again on August 16th scattered showers accompanied by terrific thunder and lightening hit parts of the Valley. Each storm brought more humid, sticky weather. Power poles were struck and lights failed in the Mesquite Lake section of the Valley.

Throughout the remainder of August, thunder storms in the surrounding hills and mountains were very common. High humidity and hot breathless winds were the only weather accomplishments so far as the Valley was concerned.

During the period, a large number of people were treated for heat prostration. Mexican field hands, in the stifling cotton fields, suffered most of all. A known total of 7 died from the heat. In Mexicali Valley it was reported that 32 people, mostly children, died from heat exhaustion.

The level of the Salton Sea gradually dropped in elevation as summer temperatures and evaporation took over. Before any drop in level had taken place, however, winds whipped a gaping hole in the levee of Tract 20-30, Unit I, and partly drained the unit of its fresh water.

There was another beautiful display of spring desert flora which extended well into the period. Arizona Lupine, brown-eyed primrose, lotus, encelia, sand blazing star, wild dandelion, flax, desert star, purple mat, chia, and woody bottlebrush represent a partial list of the plants which attracted thousands of tourists.

A. Fires

No fires occurred on the refuge during the period.

II WILDLIFE

A. Migratory Birds

1. Populations and Behavior

For the beginning of May our waterfowl population records show that some 20 Baldpates, 12 Pintails, 50 Green-winged Teal, 10 Canvasbacks, 10 scaup, 270 Ruddy Ducks, and 150 Coots were still here. At that time the Fulvous Tree Duck population was estimated to be about 10 individuals.

As in the past, a few crippled or straggler, non-mating, non-migrating geese were here in May. The first part of the month saw 2 Canadas and 2 Snow geese present.

The first week of June there were 3 Pintails, 100 Cinnamons, 20 shovellers, 14 Redheads, 6 Canvasbacks, 20 scaup, 1-0 Ruddy Ducks, and 50 Coots left. By this time Fulvous Ducks had built up to an estimated population of 50.

On July 20th we noted 3 Pintails at the Unit I water area. These may have been the first arrivals of the season or possibly the same individuals recorded the month before. On July 27th, 50 were here and by August 1st we were quite aware that the

early influx of Pintails had extended into this section of the country. At that time one straggler Canada Goose, (the last of the non-migrants (?),) was here playing leap-frog over freshwater and dry grain units at each encounterance. Some 18 Cinnamon Teal, 2 Shovellers, 30 Ruddy Ducks, 30 Fulvous Tree Ducks, and 10 Coots were here at that time.

The build-up of Pintails may not have been as spectacular as some claim, but we did notice that arrivals were rather sporadic throughout August. By mid-August, for example, about 3,000 Pintails were using the refuge units. (We estimated this to represent perhaps 30% of all ducks in the Valley). A week later the figure had doubled to an estimated 6,000. During the last week of August, the birds seemed to be slightly less in numbers, although our count for August 30 and 31 showed some 5,600 Pintails present. At that time 10 Green-winged Teal, 10 Shovellers, and about 100 Coots had shown up on the refuge.

A short reconnaissance of the few leach areas in the general vicinity of the refuge did not turn up any appreciable number of Pintails. It appears, now at the end of the period, that some of the early arrivals, which usually stay until late September, had moved out to more favorable conditions.

On August 10th fall banding operations were started using two traps in the tract 29, Unit I and Red Hill areas. Jose Barros was the only employee available to assist in the work this year, and his assistance has been commendable.

By the last of August some 700 Pintails had been tagged before the project was turned over to Messrs. William Anderson and Jim Bauer of the California Department of Fish & Game.

Feral pigs which have roamed the general vicinity of Unit I for the last 10 years made a nuisance of themselves by nightly ripping open one of the duck traps, partaking of the grain bait, and at times killing and consuming imprisoned, trapped ducks.

2. Shorebirds, Gulls and Terns

Killdeer and Black-necked Stilts nested again at Salton Sea.

This is perhaps the most outstanding refuge nesting season yet for the Stilt. They seemed to nest everywhere--on leaching areas, along the lower reaches of drains and canals, and on tiny islands dotting the west shoreline of Salton Sea. Nesting occurred all through June and July. It is interesting to note that past published records have overlooked this species as a summer resident at Salton Sea. It happens to be the most abundant nesting species of Shorebirds present.

Until the fifth of May, when Mr. John Ball came to Salton Sea with a new plane enroute to Sacramento Refuge, we were not certain whether Laughing Gulls and Terns had even nested this year. They were present in the area but apparently refused to use the same overcrowded Salton Sea Islands occupied by the White Pelican. Despite a number of boat trips and hours afoot, we failed to locate nesting terns or gulls. From the air within a very short span of time we discovered one colony of about 200 Cull-billed Terns and 50 Gannian Terns on a tiny, flat, sandy island just north of the State's Unit "A".

Later, on July 5, Laughing Gull nests were located. A total of 9 adult birds were seen during the period. Practically no change in status for a number of years.

3. Marsh and Water Birds

At the time the service plane was here we also observed a single Rosette Spoonbill, thanks to Mr. Ball's sharp eyes and quick recognition. This marks the third season of records for the species and an observation as early as May 21st should keep us more alert.

During June a large colony of American and Snowy Egrets nested in Salt Cedar trees along the Alamo river well out into Salton Sea. We estimated 200 nests, the largest colony we have ever encountered in the area.

Wood Ibis were here on June 2nd when 5 were first observed in a field near Calipatria. On the 15th of June, 200 were counted, and by mid-July we estimated about 4,000 present in the Valley. Several were found dead in the Hilland-Calipatria area where they had apparently struck power line wires.

Pelicans nested again on the very small islands along the southwest shore of Salton Sea. Persistent waves carved off large sections of the islands, and in instances of very high winds, swept nest and young birds off the island flats. Over-crowded conditions forced some birds to nest close to shore and each time portions of the islands were lashed by waves, the eggs, nests, or young toppled into the water.

On June 16th, Messrs. Jose Barros, Melvin Ford, A. W. McFarland, and Herb Lamansky assisted in rounding up and banding the nestlings.

During May and June, Messrs. George Bartholemew and William ~~Bartram~~ of the University of California at Los Angeles spent considerable time making studies of nesting pelicans. The writer collaborated

on most of the studies and a paper entitled, "A FIELD STUDY OF TEMPERATURE REGULATION IN YOUNG WHITE PELICANS" was submitted for publication in Ecology.

4. Food and Cover

For the first time, to our knowledge, the waters around the southwest shoreline of Salton Sea produced limited, scattered patches of Widgeon grass (Ruppia spp.). The patches were first noted in early July when plants were "blooming" commonly. There appeared to be a patch fringe extending some 200 feet out from shore covering a maximum depth of about 4-feet of water in which we found the species. The temperature of the water at 6 inches below the surface was 91° June 23rd.

On refuge units natural aquatic were less abundant as a whole this year, due to partial drying of the water areas in Unit I which required tillage, dike repairs, and seeding. Widgeon grass and Horned Pondweed, however, produced luxuriant growths through the early summer months where conditions were favorable. Early arriving coots and pintails always clean up those growths in a few days.

One field, Tract 3, Unit I, has produced an excellent stand of green, new cattails which should afford about 30 acres of dense growth for grazing by geese this winter. The leached areas of Tracts 7 and 11, of Unit II are now partly covered with young cattails which have attained a growth of one to two feet. When plowed up this fall, they should prove to be a real attraction to geese, as was the case last year.

Very little Spiny Mardi (Xajis n.), developed in the units this season, perhaps due to Intensity in flooding.

The Bullrush (Schoenus p.), plantings of last year are a complete "fizzle". Only a few widely scattered patches remain where the men laboriously planted tubers at 50-foot intervals.

Other food conditions are covered under Part III-A.

The most abundant crop of Screw Beans (Strombosia) we've ever seen is in the making. The first crop, produced in May, was rather scanty, but at this writing we find the trees almost weighted down with potential quail, pheasant, songbird, and raccoon food.

5. Upland Game Birds

The State's ostentatious program of transplanting large numbers of hatchery-reared pheasants on refuge units was carried out again this season.

Toward the last of August the Mourning Dove population was receiving much speculation as hotel and restaurant owners did big business due to the arrival of out-of-town hunters.

Considering the very low number of White-winged Doves in this area, the fact that they present no management problem, and the relative abundance of Mourning Doves, it would appear much sounder to keep the season closed on this pioneering species. (This season was extended from 15 days to 30 days).

At this writing our guess would place the local population of Mourning Doves about 20% still mated and nesting.

The local Brawley "News" newspaper has announced that it will publish favorite recipes for preparation of doves submitted by Valley women during the ensuing hunting season.

In August, Tractor Operator Paul Williams encountered a Mourning Dove nest in his path of operations and promptly moved it about 3 feet. The move was accepted to our surprise, and before long two young doves blossomed out.

6. Other Birds

Each evening in mid-August a large concentration of swallows came to the headquarters area where Tract 5 had been leveled. It was impossible to accurately enumerate the numbers. We believe there were at least 30,000. Most of the concentration stayed in the field over-night and in time the ground was widely littered with tiny feathers.

7. Fur Animals, Predators, Etc.

No change in status noted.

8. Fish

Numerous inquiries by fishermen prompted the California Department of Fish & Game to investigate the degree of success, if any, with which the plantings of ocean fish in Salton Sea have met.

Headed by Biologist Phil Douglas, a group of representatives netted a number of small Sea Bass.

The crew believed more fish would have been netted in deep water had time permitted further investigation.

It was reported the surface temperature of the Sea at that time (July) was found to be 97° Fahrenheit.

III REFUGE DEVELOPMENTS AND MAINTENANCE

A. Physical Development

1. Cultivated Crops

Wild Millet (Echinochloa) the main crop raised during the period, was seeded and flooding started by May 19. Last millet flooding was completed June 23 at Unit I, Tract 11. Indications are that the refuge is producing a better-than-average crop.

In Unit I, the leveling jobs at tracts 9 & 28 were continued during the period.

At Tract 28 the grade from east to west was changed for irrigation from south to north. The old residence site which was low and relatively sterile was elevated, leached and tree-trimmed.

At Tract 9 the situation of the Acceda Gun Club in the southeast corner of the quarter section completely blocks the Service from access to Trifolium 12 canal. Last winter, after refusal on the part of Club members to allow the Service to bring water through the Club in exchange for drainage rights, it was necessary to construct a ditch to by-pass the Club along the south line. Next move required a ditch extension which would take water along the Club's west boundary and then uphill again along the north boundary. After considerable carryall scraper work, Operator Leo E. Cox wound up with a five feet fill some 30 feet wide. By the end of the period the area had been contoured, planted to Wild Millet, flooded, and is producing a fair crop.

The usual deep subsoiler tilling, discing, landplaning, border construction, and pre-irrigation took place.

With tracts 1, 9, 11, 29, and 30 under water it is contemplated that the mixed Millet and Sudangrass will provide the most early fall feed yet on water areas.

Unit II operations involved the completion of the leveling job at Tracts 7-14 and construction of contours. By the close of the period the entire area had been leached a few weeks.

Through the irrigation district, neighboring farmer Bubble requested the leaching be stopped to eliminate any possible capillary rise (uphill) to his property.

In the Red Hill water area, nodding smartweed (Lapathifolium), was planted under a variety of conditions with absolutely no germination results. Samples were pre-soaked, treated with "root-tones" bromine, scarified, planted from 1/4 to 6 inches deep, and dry mulch-planted as well as flooded. To our disheartening surprise no germination occurred on any of the sample plots.

B. Other Developments

A new wooden bridge was under construction at Sub-headquarters to provide a route for heavy equipment & tractors to and from that area.

On May 26th three surplus house trailers were shipped from the U.S. Bureau of Reclamation at Fresno, California by Refuge Manager Gene Crawford. One of the units was set up at Headquarters, painted and equipped with water, power, butane refrigerator, range, and heater.

At Subheadquarters the grain storage shed was mouse-proofed with tin strips to eliminate entrance into the structure.

Several small palm trees were dug at Tract 15, Unit I and taken to Subheadquarters for landscaping purposes.

C. Receipts of Seed & Stock

Alfalfa seed harvest was turned over to Russel Brothers of Westmorland, California. Seed was produced on Tracts 15 and 26 of Unit I, and Tract 3 of Unit II.

On June 15th, the Viseo Air Service Company, employed by Russells, started dusting the seed crop. This was the first of three dusting jobs. In early August the crop was sprayed with defoliation compound, and by mid-August harvester were busy. A total of 50,200 pounds of seed was harvested with one-half the ~~amount~~ (25,100 lbs) being turned over to the permittee under the terms and conditions of Permit No. SAL-21. Approximate yield was 500 pounds per acre of uncleaned seed.

IV ECONOMIC USES

A. Grazing & Haying

Sheep grazing continued on Tract 26, 18 and 19, Unit I and Tract 3 of Unit II. Permit SAL-23 covered 15.5 head of sheep at the rate of 3¢ per head per day from April 15 through May 18th.

V PUBLIC RELATIONS

A. Recreational Uses

There are no recreational facilities on this refuge.

B. Official Visitors

<u>NAME</u>	<u>DATE</u>	<u>IDENTIFICATION</u>	<u>PURPOSE</u>
George Barclay	5/24	Regional Refuge Supv., Region II Central Office	Tour Refuge
John Ball	5/24	" " "	" "
Robert Prohling	5/18, 6/7	U. S. Navy	" "
Mr. Ross	6/7	San Diego Co. Museum	Visit Pelican colony
Howard Sergeant	6/4, 7/10-17	Regional Office	Inspection, tour, surveys
K. P. MacDonald	6/21	" "	" "
Insurance Rubke	7/9	Cal. Dept. Fish & Game	Discuss refuge hunting mg't.
W. H. Anderson	7/23-25	Regional Office	Quarters appraisal survey

C. Refuge Participation

On May 29th, personnel met with the Imperial Irrigation District board members and discussed at great length the Service's refuge activities and presented current land lease proposals. At this meeting I.I.D. agreed to extend the lease on all lands from a 5-year option to a 10-year option.

* * * * *

A meeting with California Fish & Game men was attended in Los Angeles at the Mayflower Hotel June 25-26. Messrs. MacDonald, Laythe, Fredahl, Crawford, Ross, Rubke, Gladding and Cleward attended.

The group discussed hunting and management of game on the Sacramento, Merced and Salton Sea Refuges. The State agreed to patrol, issue permits, take care of all clean up work, and supply copies of all research information projects undertaken on Salton Sea Refuge units. It was decided that all of the Red Hill unit would be opened to waterfowl hunting and possibly to pheasant shooting.

* * * * *

On June 27 Mr. MacDonald was accompanied at a meeting with Mr. Cole of the State Colorado Water Board. The availability of wildlife refuge water and the stringent limitations on any future ~~anytime~~ placed refuge operations in jeopardy. It was revealed that, should culinary or utility water become short in Los Angeles, it

would then be possible under present water compacts to condemn agriculture lands in Imperial or Palo Verde Valleys to provide the metropolitan area with its needs.

* * * * *

B. Violations.

No violations during the period.

VI OTHER ITEMS

A. Other Items

The State Department of Fish & Game Danner Lake Project on the Imperial Refuge went forward in full swing July 23 with front page newspaper coverage in heavy print.

A system of canals is to provide freshwater where two lakes, totaling over 600 acres, will be created.

Mr. Bob Jefferson, County Fish & Game Association leader stated, "Should ducks become so numerous that farmers complain of crop damage, the lake can be drained enough to discourage ducks from landing and still not harm the fish."

Some \$30,000 has been appropriated by the Wildlife Conservation Board.

When completed, fish nets or gates will be constructed to keep out undesirable fish. Stocking will include introduction of large and small mouth bass, crappie, bluegill and channel catfish.

* * * * *

During July, Mr. Page Stelle of West Point Pleasant, New Jersey, working for the Infantile Paralysis Research laboratories, inquired through Mr. E. R. Kahlbach as to the extent of botulism in Imperial County.

The requested information is to be used in a current study of poliomyelitis in Kern and Imperial Counties of California.

* * * * *

The State Health Department again made spot checks over the Valley of the very, very pesky eye-gnats which some writers claim are such a treat for swallows here each July and August.

It seems the population of gnats this season was unusually low, presumably due to climatic factors such as wind and high temperatures.

Periodic checks have been taken locally for some time now owing to the very high incidence of pink-eye among children.

Fishman traps and sweep stations at El Centro, Holtville, Brawley, and Niland disclosed that Niland and vicinity had the greatest population with El Centro, Brawley, and Holtville following in order. Collections by the vector control men also indicate that two species of gnats (Hippelates collusor and Hippelates horvsi), inhabit this region.

To the average visitor the gnat problem is simple—just get back out of the Valley. Some unsuspecting tourists have acclaimed natives to be the most friendly people in California. The never-ceasing shaking and waving of one's hands and arms is construed by some to be a friendly gesture or greeting.

The literature has the following to say about these winged "muggers."

"...some species appear to be especially attracted to the eye and lacrymal secretions of man, whence the name "eye-fly." The proboscis is fitted for lapping...but is capable of being used as a rasping instrument to cause minute scarifications on the delicate conjunctival epithelium, or on granulation of tissues of sores, thus assisting pathogenic organisms in gaining entrances.

"In the Coachella Valley of California, Hippelates is a sufficient nuisance to be a limiting factor in the development of the country. It is a small fly, 2 mm in length, which is active throughout the day for 9 or 10 months of the year, particularly in the spring and fall. In one high school district 1500 children were reported as suffering from "pink-eye" in 1929; 50% of the young people of the region had some conjunctivitis, and 10% had chronic trachoma."

* * * * *

The State Legislature has appropriated \$125,000 for a project in Coachella Valley to be known as the Salton Sea State Park.

The project will include 513 acres astride State Highway 111 and will have nearly one mile of sea frontage.

The park is being established on land acquired by lease from the U.S. Government. Location of said land is adjacent to and southeast of Desert Beach, near Mecca.

* * * * *

In Southern California the State Department of Fish & Game is experimenting on forage and range management to narrow the margin between the number of animals on the range and the forage available. Californians claim a deer herd of more than 1,120,000.

In the nearby San Jacinto Mountains, aided by Riverside County, the U.S. Forest Service has been bulldozing passageways through the brush to open up new feeding grounds without disturbing watersheds. Seanothus, redberry, mountain mahogany, and whitehorn have been made more and more available to deer according to reports. It is believed that through this activity many thousands of acres of good deer range will become available.

* * * * *

During the period the Imperial Irrigation District won the first heat in a court injunction case which may in time determine the priority (or lack of same) of the District to use the Salton Sea as an irrigation drainage basin.

Ralph E. Swing of Ralvert & Company late in the period requested and was granted a dismissal of his plea for an injunction against I.I.D.

During July, Ralvert & Co. sued the I.I.D. and Coachella Valley Water District for \$100,000 damage allegedly caused by waste waters entering the sea from irrigation projects. It was requested that superior court of Riverside issue an injunction to stop use of Salton Sea for drainage.

I.I.D. attorneys presented to Swing a statement setting forth the vital need for the water district and use of Salton Sea, and the claim was made that even if Imperial Valley were abandoned, water would still enter the sea through natural drainage and as drainage from Mexicali Valley.

The suit in damage will continue at a later hearing according to attorneys. The 640 acres of Ralvert land southwest of Mecca has been improved considerably and it is claimed that at least \$50,000 has been spent in drilling artesian wells. Salt intrusion is a real problem.

In June the Desert Beach Corporation placed an additional \$100,000 claim against I.I.D. (Last March \$250,000 was asked for damages).

* * * * *

Perhaps the most outstanding example of damage by rising water is the Atomic Energy Commission base at Sandy Beach. The pier, docks, air runways and other installations must be moved if the rise continues—and rise it no doubt will, but the 18 feet now predicted by engineers would seem like a good thing being carried too far.

The August 30, 1952 issue of The Saturday Evening Post carried a three page article on Salton Sea entitled, "California's Weird Overflowing Sea," by Keith Monroe.

The popularly written article described the Valley, agriculture, etc. and gave a resume of geological and recent history of the Sea proper.

Regarding wildlife, the article states, "Ducks, geese, terns and herons discovered the sea and made it a winter home, nesting comfortably in grain fields nearby. Farmers did their utmost to slaughter the birds, and encouraged Los Angeles sportsmen to organize duck-shooting clubs on the shores of the Sea. Finally the Fish & Game Commission established a game refuge at the south end, and has been trying to feed the birds enough to keep them out of fields."

Amidst the rise of the level of Salton Sea the author states, "The game refuge authorities say that 12,000 acres of their land have been ruined by encroachment of the Sea in the past year."

From El Centro comes rumblings amont the article. Some citizens in these parts don't like author Monroe's remark: "Like the Dead Sea—in one of the hottest and bleakest areas on earth." It seems a little more emphases on the beautiful homes and shady communities would tend more to lure the visitors in.

Consultant Engineer Mike Dowd in a speech before the El Centro Rotary Club commented on Monroe's "California's Weird Overflowing Sea" article. "There were few facts and many exaggerations about the dangers of overflowing water from Salton Sea."

The speaker remarked that the I.I.D. has outstanding some \$37,000,000 in bonds and that the magazine article was hurting their financial rating.

* * * * *

Respectfully submitted,


J. O'Neill
Game Manager

Approved: _____

3-1826

REFUGUE ~~WATERFOWL CENSUS~~ MONTHS OF ~~January~~ TO ~~April~~ 1, 1952

Species	Common Name	Weeks of Reporting Period												Reported by					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Swans:																			
Whistling																			
Trumpeter																			
Gees:																			
Canada																			
Cackling																			
Brant																			
White-fronted																			
Snow																			
Blue																			
Other																			
Ducks:																			
Mallard																			
Cinnamon teal																			
Gadwall																			
Baldpate																			
Pintail																			
Green-winged teal																			
Blue-winged teal																			
Cinnamon teal																			
Shoveller																			
Wood																			
Redhead																			
Ring-necked																			
Canvas-back																			
Scaup																			
Golden-eye																			
Buffle-head																			
Ruddy																			
Other																			
Kittiwake & Gull																			
Coot																			

MIGRATORY BIRDS (other than waterfowl)

Months Of [REDACTED] to [REDACTED] 19[REDACTED]

(1) Species	(2) First Seen	(3) Peak Numbers	(4) Last Seen	(5) Production	(6) Total Estimated Number
Common Name	Date	Number	Date	Total # Nests	Total Young
I. Water and Marsh Birds:					
Western Grebe	4/10	20	7/20	1	1
Blue-faced Pt. Kestrel	4/10	20	7/20	1	1
Glenay Tols	4/10	200	7/20	1	1
Wood Ibis	4/10	2100	7/20	1	1
Frigate Gull-like bird	4/10	200	7/20	1	1
Scaup Duck	4/10	300	7/20	1	1
Common Eider	4/10	400	7/20	1	1
Snowy Egret	4/10	300	7/20	1	1
An. Egret	4/10	400	7/20	1	1
Red-necked Phalarope	4/10	200	7/20	1	1
					2
II. Shorebirds, Gulls and Terns:					
Least Sandpiper	4/10	100	7/20	1	1
Long-billed Curlew	4/10	100	7/20	1	1
Wilson's Phalarope	4/10	100	7/20	1	1
Horned Lark	4/10	100	7/20	1	1
Willet	4/10	100	7/20	1	1
American Avocet	4/10	100	7/20	1	1
Greater Yellowlegs	4/10	100	7/20	1	1
Black-bellied Stilt	4/10	100	7/20	1	1
Lambkin Gull	4/10	100	7/20	1	1
Giant Tern	4/10	100	7/20	1	1
Long-billed Curlew	4/10	100	7/20	1	1
Spoon-billed Plover	4/10	100	7/20	1	1
Mallard Duck	4/10	100	7/20	1	1
					2

II. Shorebirds, Gulls and

Terms:

Least Flycatcher
Long-tailed Chaffinch
Willow's Warbler
Hartlaub's Starling
Willet
Avocet
Lacee Yellowlegs
Black-headed Grosbeak
Least Kingbird

(over)

(1) (2) (3) (4) (5) (6)

III. Doves and Pigeons:
Mourning dove
White-winged dove

IV. Predaceous Birds:

Golden eagle
Duck hawk
Horned owl
Magpie
Raven
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 Gruiformes)
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.

WATERFOWL

Refugee Station No. _____ Months of _____ to _____ April 1946

(1) Species	(2) First Seen	(3) Peak Concentration	(4) Last Seen	(5) Young Produced	(6) Total
Common Name	Number	Date	Number	Broods Seen	Estimated Total
I. Swans: Whistling swan					
II. Geese: Canada goose	Prev Pur				
Cackling goose					
Brant					
White-fronted goose					
Snow goose					
Blue goose					
III. Ducks:					
Mallard	Prev Pur	4	5/17	2	9
Black duck	Prev Pur		5/18	4	20
Gadwall	Prev Pur		5/17	3	15
Baldpate	Prev Pur		5/17	2	10
Pintail	Prev Pur		5/17	2	10
Green-winged teal	Prev Pur		5/17	1	5
Blue-winged teal	Prev Pur		5/17	1	5
Cinnamon teal	Prev Pur		5/17	1	5
Shoveller	Prev Pur		5/17	1	5
Wood duck	Prev Pur		5/17	1	5
Redhead	Prev Pur		5/17	1	5
Ring-necked duck	Prev Pur		5/17	1	5
Canvas-back	Prev Pur		5/17	1	5
Scaup	Prev Pur		5/17	1	5
Golden-eye	Prev Pur		5/17	1	5
Buffle-head	Prev Pur		5/17	1	5
Ruddy duck	Prev Pur		5/17	1	5
Pelagic tree duck	Prev Pur		5/17	1	5
IV. Coot:					

3-1750
(July 1946)

(over)

SUMMARIES

Total Production:

Geese _____

Ducks _____

Coots _____

Total waterfowl usage during period 8,600

Peak waterfowl numbers 7,800

Areas used by concentrations _____

Principal nesting areas this season _____

Reported by _____

INSTRUCTIONS

- (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) **First Seen:** The first refuge record for the species during the season concerned in the reporting period, and the number seen. This column does not apply to resident species.
- (3) **Peak Concentration:** 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 in the reporting period.
- (5) **Young Produced:** 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.
- (6) **Total:** Estimated total number of the species using the refuge during the period. This figure may or may not be more than that used for peak concentrations, depending upon the nature of the migrational movement.

Note: Only columns applicable to the reporting period should be used. It is desirable that the Summaries receive careful attention since these data are necessarily based ~ an analysis of the rest of the form.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

1613

Refuge Saltan Sea Months of Aug to Aug, 1946

(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	Total birds obs'd.	Hunting for Refuge stocks	Research for Refuge stocks	Estimated number using Refuge List introductions here.

No change in status from previous report

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.

REFUGE GRAIN REPORT

Refuge Saltan Seathrough May, 1952

(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		
Mariout Barley							X	
Rule Lake Barley							X	
Wild Millet							X	
India Millet		520					520	

(8) Indicate shipping or collection points Brawley and Imperial Land, California.

(9) Grain is stored at _____

Refuge Headquarters

(10) Remarks _____

*See instructions on back.

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.

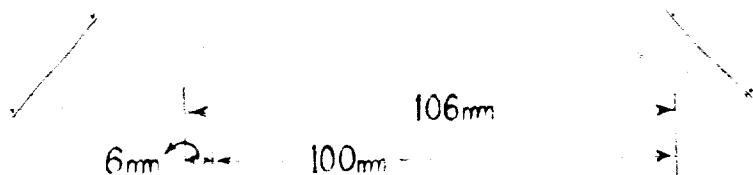
- (1) List each type of grain separately and specifically, as flint corn, yellow dent corn, square deal hybrid corn, garnet wheat, red May wheat, durum wheat, spring wheat, proso millet, combine milo, new era cowpeas, mikado soy beans, etc. Mere listing as corn, wheat, and soybeans will not suffice, 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.
- (2) Report all grain received during period from all sources, such as transfer, share cropping, or harvest from food patches.
- (3) A total of columns 2 and 3.
- (4) Column 4 less column 5.
- (5) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.
- (6) Nearest railroad station for shipping and receiving.
- (7) Where stored on refuge: "Headquarters granary," etc.
- (8) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.



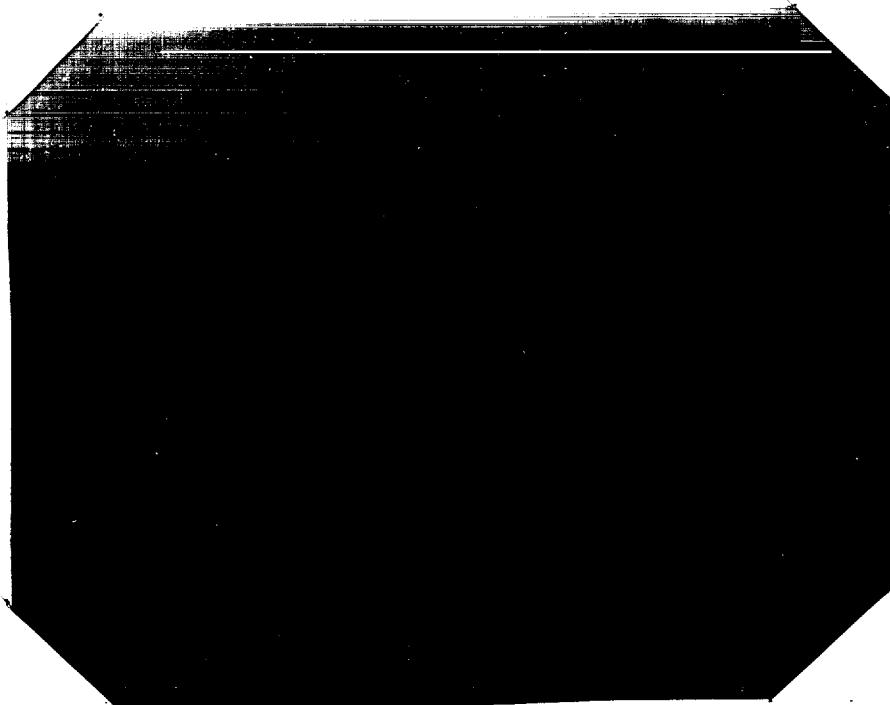
Winds Ripped Out Portions Of Outlying Levee,
Tracts 29-31 Unit I, During Previous Period.



Aerial View Showing Infundation Of Outer Levee,
Tracts 29 - 31 Unit I.



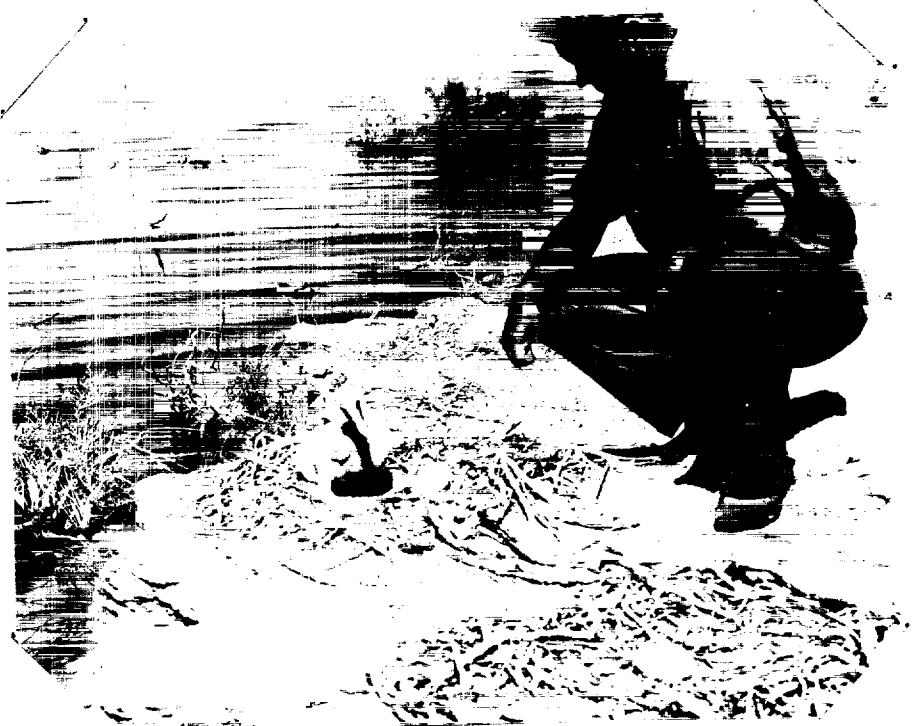
Sketch By Roger Wilber (Cal. Fish & Game), Of Freak Female Pintail Taken In Banding Trap (Band No. 526 - 03673). Lower Mandible To Back Of Cranium = 106 mm; Upper Mandible Measured 100 mm. By Comparison With Other Specimens It Was Concluded Upper Bill Most Likely Abnormal One.



Thousands Of Swallows Roosted Nightly In Smooth, Leveled Tract 5 Near Headquarters. (August)



Young And Adult White Pelicans At Largest
Remnant Island On Salton Sea. (June)



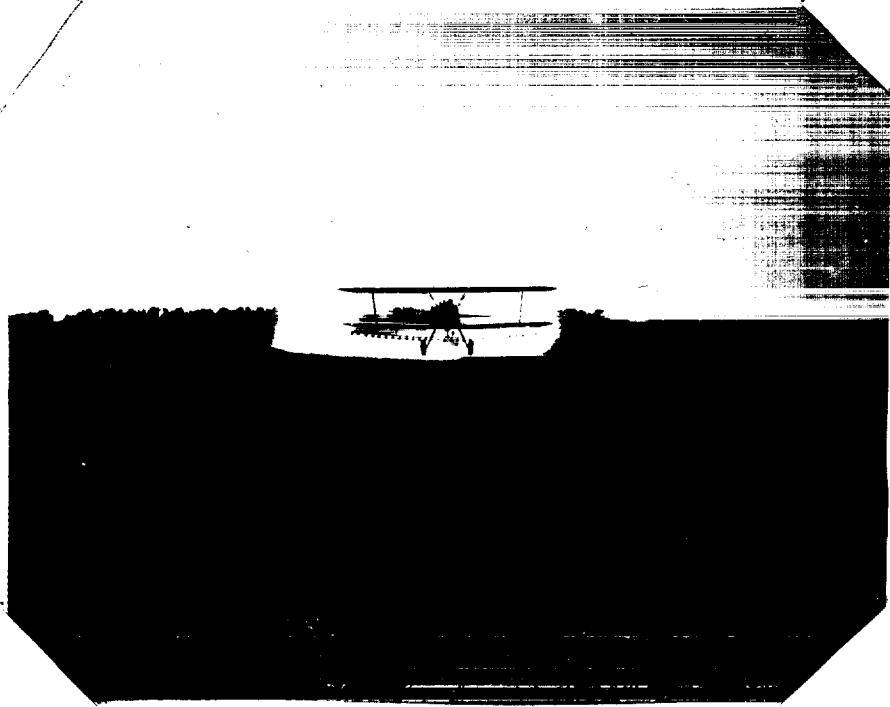
Inspecting Pelican Islands. Two Days After Picture Was
Taken High Winds Ripped Off 6 Feet More Of Island Eliminating
Number Of Nests. (June; Subject, Lt. Robt. Frohling, U.S.N.)



Float Leveling Red Hill UNIT
For Wild Millet Crop.



Pintails In Wild Millet Crop At Red Hill, Unit II. (August)



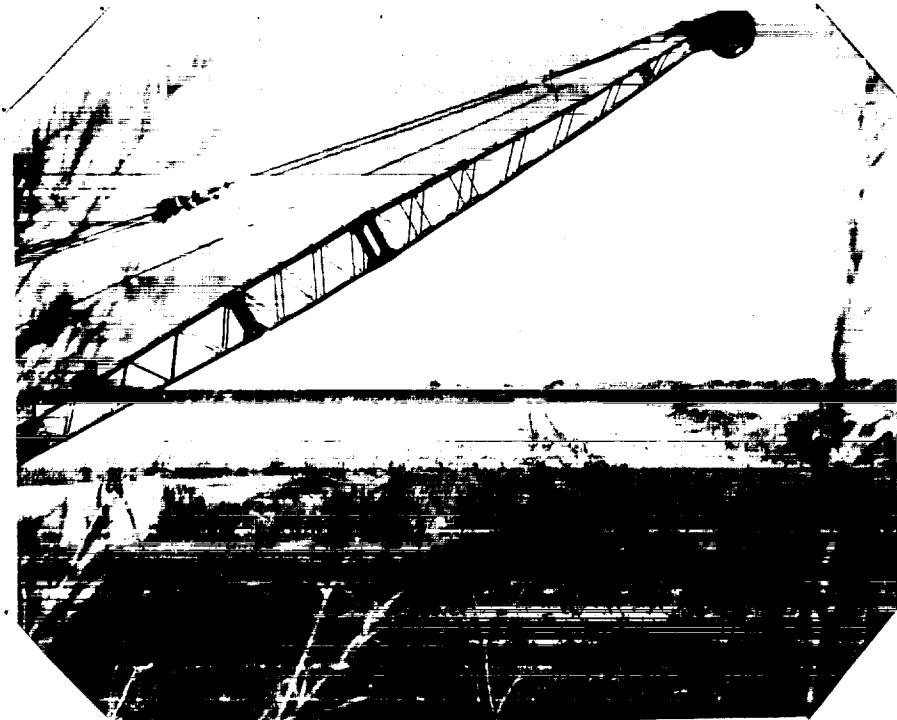
Visco Co. Plane Dusting Refuge Alfalfa Crop For Permittee.
Lygus Bugs And Red Spider Main Pests. (July)



Irrigators Cleaning Ditch At Red Hill Unit. Thermometer
Reading 115°! (Subject, L. to Rt., Sylvester,
Jose, Manuel and John Barros. August)



Leaching By Infundation Tract 7 - 1 $\frac{1}{4}$, Unit II. (June)



First Dragline Work On Drainage Ditches At Tract 9 Unit I.