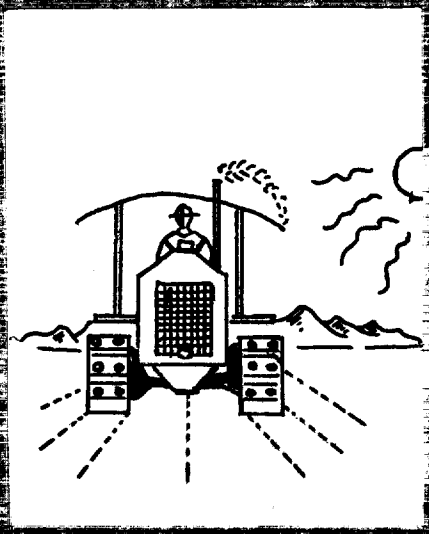


PREVENT FOREST, RANGE, AND WATERSHED FIRES
Keep
CALIFORNIA
Green and Golden
BE CAREFUL

SALTON SEA NATIONAL WILDLIFE REFUGE

AND

WATERFOWL DEVELOPMENT AREA

NARRATIVE REPORT

MAY, JUNE, JULY, AUGUST

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

CONTENTS

REFUGE PERSONNEL

Regular Personnel

EDWARD J. O'NEILL	Refuge Manager
ROBERT C. WATSON	Refuge Manager, Asst.
FRANK L. BEALS	Clerk-typist
CLYDE W. STEWART	Foreman, Farm Operations
MICHAEL J. KARI	Mechanic
JOSE BARROS	Tractor Operator
LEO E. COX	Tractor Operator
W. CARL FORD	Tractor Operator
CHESLEY WILLIAMS	Tractor Operator
PAUL R. WILLIAMS	Tractor Operator
ALFRED W. MCFARLAND	Tractor Operator
JOHN BARROS	Irrigator
SYLVESTER BARROS	Irrigator
MANUEL CARDOZO	Irrigator
MELVIN FORD	Irrigator
JULIO RIBEIRO	Irrigator

Temporary Personnel

None during period.

NARRATIVE REPORT

I GENERAL CONDITIONS

A. Weather and Conditions

The period started out with fierce, sand-filled winds that slashed through the Valley leaving damaged crops, property and power lines in their wake. As usual about half of the television antennas were erased from the skyline.

On the morning of May 1 it was reported one 65-mile per hour wind left trucks and cars crushed under trees, ripped one lettuce packing shed roof off and pushed telephone and power line poles over like straw on a ditch bank. Wind-churned dust clouds swirled up to 16,000 feet or more over the desert floor according to Navy pilots.

Strong 70-mile per hour gusts of wind which knifed across Salton Sea from the southwest were reported to be part of the windstorm that spread across the entire southern California creating a blow of 100-miles per hour at Barstow, California where considerable damage was done.

Valley farmers reported damage to cantaloupes, watermelons, squash, hay and grain crops.

No serious damage resulted at the refuge but one tractor operator caught out in a duster one afternoon reports it became so dark that it was necessary to use tractor headlights to find his way. Midway to headquarters he claimed a strong gust bent the headlight beams down causing the tractor to run astraddle of them. It took him two hours to back the tractor off and complete the trip in reverse!

As indicated by the tabulations and weather data the period saw temperatures which ranged well into the 100's. Humid days as well as long, hot spells with no break or relief were numerous, chopping human efficiency down to mere "tired dog" existence.

A change in hours of duty to take advantage of early, cooler hours helped the men escape afternoon heat.

Old timers are pretty well in accord that July has been one of the most uncomfortable in their memory. Storm clouds hung around day after day in humid, sticky skies and the variety included vivid lightning, thunder, rain and dust storms. There was very little break in the heat at any time.

On July 25th a freak storm and flood hit Calipatria leaving a veritable lake of water. Just one week later, August 1st another dust storm struck.

Medical history was noted in the Imperial Valley on July 15th when a Mexican contract laborer was admitted to a local hospital with the amazing temperature of 110.2°, the result of a heat stroke. He remained in an unconcious and critical condition two days although packed immediately in ice and treated intravenously. Finally, his temperature dropped, he regained consciousness actually recovering. Every tissue in his body was reported damaged by the effects of over exposure to the tertuous sun. According to a medical journal article the only known similar heat stroke victim to survive such was a patient here some 15 years ago with 111° temperature.

Despite the high temperatures the number of death and heat stroke cases in Imperial Valley and Mexicali Valley were lower than last year.

The last night of August saw a powerful electric storm which raised hob in general throughout the Valley.

Listed below is the weather data as compiled by the Naval Auxiliary Air Station, Seley, California.

MONTH	MAXIMUM	MINIMUM	PRECIPITATION	DAYS OF WIND OVER 25 MPH
May	104°	54°	---- inches	10
June	116°	59°	0.74 "	13
July	121°	75°	.03 "	6
August	114°	68°	.03 "	5
	Total		0.80 "	

B. Precipitation And Water Conditions

Precipitation received was negligible. Light, spotted showers were of little consequence.

On the night of August 31st an unprecidented electric storm struck the area. Several power outages occured and strong winds ripped down the floor of the Valley raising hob in general.

Salton Sea stood at an elevation of -234.80 May 1st. Evaporation during the 4-month period dropped the level down to approximately -233 feet below sea level.

Water now stands in the northwest corners of Tracts 5 and 13, Unit II and 6, 7, 8, 9 and 19 of Unit I

Temperatures of the water of Salton Sea were taken weekly by refuge personnel to compile data pertinent to future work or speculation on the introduction of favorable acquatic plant species which might have value as Widgeon food. Temperatures ranging from 86°F along the shore in May to 106°F in August and 72°F at 6-foot depth 2½ miles out in May to 92°F at the same point in August were recorded.

C. Fires

As mentioned earlier, it got mighty hot here but no fires occured on the refuge area.

II WILDLIFE

A. Migratory Birds

1. Population and Behavior

The waterfowl population at Salton Sea Refuge, with the exception of a very few late migrants, had approached the summer low by May 1. The total population at the beginning of the period was an estimated 1,450 birds with Ruddy ducks comprising approximately 65 per cent of the total. American Widgeon, Pintail, Cinnamon Teal, Shoveler, Redhead, Scaup, and Fulvous Tree Ducks accounting for 30 per cent and the remaining 5 per cent was made up of Mallard, Canvasback, and Bufflehead. These percentages remained relatively constant throughout the first half of the period.

The first noticeable influx of Pintails occurred on August 6 when an estimated 100 birds were seen on Unit I leach area. By August 24, however, an aerial census revealed a total of 5,890 birds were using the New River delta area and the Unit I leach area. This population figure, though markedly increased over previous weeks, does not compare favorably with the estimated 8,695 Pintails seen during the aerial census of the comparable period in 1953.

Differences other than in population are also noteworthy. During the 1953 aerial census approximately 57 per cent of the Pintails in Imperial Valley were located on Service-controlled lands and Salton Sea. The remainder of the birds were using leach areas on private land. In 1954, with the acreage of privately owned land under leach only slightly less than in 1953, the Pintails were utilizing Service-controlled lands and Salton Sea almost exclusively. Population pressure created by late-arriving Pintails will undoubtedly result in dispersal into private leach lands.

A brief tabulation of comparable aerial census data obtained during August of 1953 and 1954 is as follows:

COMPARISON OF LEACH

	1953	1954
Estimated Pintail population	8,695	5,850
Total private leach area (acres)	3,080	2,644
Pintails on private leach area	3,895	-----
Pintails on Refuge and Salton Sea	4,800	5,850

2. Geese and Swans

The bulk of the goose population left the Salton Sea area during the last week in February and the first part of March, consequently very few geese were seen during the period. Several Lesser Snow Geese were seen in every month of the period with 8 noted in the Mullet Island area on July 16. Two Canada Geese were seen on July 2. It is assumed that the summer population of geese was primarily made up of cripples.

3. Ducks

From early May until the arrival of Pintails in August over one-half of the duck population was comprised of Ruddy Ducks. The population figure varied from 200-400 birds but in all instances they were located in or near inundated Tamarix on the north portion of Unit I. Many flightless Ruddys were seen during the period and several were trapped during banding operations the last week in April and throughout the month of May. A total of 30 Ruddy Ducks were banded in May.

The Cinnamon Teal population remained at from 50 to 100 birds until August then increased rapidly to an estimated 1,150 birds by the end of the period. During May, June, and July the Cinnamon Teal were useing the area adjacent to the freshwater pond (Tract 11, Unit I) but as the population increased the majority of the birds were found near the New River delta.

An appreciable build-up of the Fulvous Tree Duck population did not occur until late in June though a few were seen as early as April 9. The peak population was an estimated 150 birds on July 16. The preferred habitat for the Fulvous Tree Duck appeared to be Tract 8, Unit I, which was under leach and had a generous supply of cattails and wild millet, and the adjoining freshwater pond with an abundance of tamarix cover.

On June 25 two Blue-winged Teal were seen on the inundated section of Tract 8, Unit I.

During May and June occasional small flocks of Shovelers were seen on Units I and II. The population remained low until August. An estimated 1,030 Shovelers were on the Refuge and Salton Sea at the close of the period.

Redheads, Scaup, Buffleheads and Canvasbacks were seen every month of the period. Places of habitat included mainly the bay areas along Unit I and the Tract 11 Unit I fresh water pond.

4. Disease

No known disease occured among waterfowl during the period. Two sick Snowy Egrets were picked up near the Alamo River Delta June 2nd and subsequently a few sandpipers were found on beach areas.

5. Shorebirds, Gulls and Terns

Black-necked Stilts nested as usual. They were the most common nesting shorebird at Salton Sea.

Laughing Gulls. No record of nesting this year. Only 5 adults present as per previous report.

Ring-billed Gulls present throughout the previous period, showed definite population increases in mid-July. The introduction of fish into the Sea and their subsequent overpopulation, etc has made little influence on gulls so far as food is concerned. Favorite haunts are still farm fields.

Gull-billed Tern didnot attempt to renest during the period.

Caspian Terns.....Two records of nesting attempts. No reason for lack of success determined but probably due to crowded conditions on available small nesting islands and too low a number of birds in the colony. We estimate that about 100 birds of the species were present.

A few Forester's Terns were present throughout the period.

6. Water and Marsh Birds

Little Green Heron. Only limited nesting as usual; 10 nests in partly submerged growths of Salt Cedar. Earliest note on nesting is one for a nest discovered May 19th.

Least Bittern.....present and only 1 nest noted.

The largest rookeries of Cormorants, Common and Snowy Egrets in the history of the present refuge operations (and undoubtedly, the history of the present day Salton Sea), graced the off-shore submerged trees and lesser vegetation west of the New River delta and at the extreme north end of Salton Sea. Estimated numbers of Egret nests, 1500; Cormorants, 70; Great Blue Herons, 30; Black-crowned Night Herons, 100. A hurried survey of the rookeries on May 5th disclosed the following: Cormorant nests contained an average of 2.2 young in 15 nests checked; Great Blue Heron nests contained an average of 2.6 eggs in 10 nests checked

Some of the herons and egrets may have renested since several late nests with young were found in August. A thermometer placed in one of the late nests situated about 3 feet above water registered 112°.

We were both surprised and delighted to find a small group of Glossy Ibis had set up housekeeping in late July when 5 nests were discovered in submerged Salt Cedar trees west of the delta of New River. Nests consisted mainly of twigs from the same trees but all were lined with cattail leaves. During the last week of July Watson and Beals found a newly hatched ibis in one nest. The site was not visited until two weeks later when it was found that the small colony of only 5 nests had been abandoned and the young died.

Eared Grebes though not abundant during the summer persisted in entering the duck traps until a total of 146 had been banded.

White Pelicans nesting on one very small island on the Sea laid a total of 262 eggs by May 7th. Hatching started May 12th and a total of 42 successfully hatched. Survival amounted to 34 individuals by June 15th. A thermometer placed in the nest of one young pelican in early June recorded 124° Fahrenheit!

The factor of public interference with this and other endangered species using the small nesting site off shore may be somewhat overcome next year since the Service has been successful in obtaining a lease from the Imperial Irrigation District on the existing islands. They will be posted through the spring and summer and watched closer in the future as a part of the refuge program.

A lone Brown Pelican was observed at the south end of Salton Sea on May 5th. The species seems to be moving inland more frequently with time.

7. Food and Cover

No notable change in conditions for waterfowl or shorebirds noted. Fish eating species were well blessed with their needs what with the numbers of fish near the surface and those dying all summer long.

Pelicans as yet have utilized but very few of the introduced fish judging from the regurgitated fish examined on the nesting islands.

Cormorants on the other hand seemed to be feeding their young entirely on the introduced sea fish. Egrets seem to prefer the small minnows and insects available in and adjacent to agricultural areas.

The small Sphaerium clams have now spread through canal systems in all the area north and northwest of Westmorland, California and Holtville, California. Dr. Joshua Bailey of San Diego advised us back in 1952 that our specimens were the first collected at Salton Sea.

Leach Areas Inland From Salton Sea

NEW AREAS (Acres)	OLD AREAS (Acres)	DUCKS
160	10	
80	160	
80	160	M
160	160	
4	80	
80	160	
80	10	0
160	80	
160	10	
80	160	
30	80	M
80	20	
160	80	
80	20	
1394	80	E
	20	
	10	
	160	
	8	
	1468	

There were no ducks or coots in any of the leach areas. All puddler ducks were absent on New River, Unit I of the refuge (millet crop) and the Tract A leach field.

8. Banding Operations

Activities under this heading were continued through most of the summer. In August other activities delayed setting up waterfowl traps somewhat however, the expected usual early flight of immature pintails ....which didn't exist, spelled 'no wasted effort'. Carp presented a real problem in Tract 11 by entering the traps apparently for the bait.

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

Species	May	June	July	August	Totals
Pintail	3				3
American Widgeon	2				2
Cinnamon Teal	4				4
Bufflehead	1				1
Redhead	32				32
Ruddy Duck	38				38
Coot	18				18
Mourning Dove	8	4	1		13
White Pelican		34			34
Common Egret		104	5		109
Snowy Egret		26	1		27

Species	May	June	July	August	Totals
Great Blue Heron	20	1			21
Pied-billed Grebe		1			1
Eared Grebe	62				62
Double-crested Cormorant	17				17
				Total....	382

9. Upland Game Birds

Mourning Doves. The status of this species appeared to be about the same as of last year. Banding operations were slow, 13 trapped and banded as shown in the tabulations. Only 4 nestlings were tabbed. One nest (we presume the same bird), produced 5 separate clutches of eggs in a small tamarix tree near Rock Hill, Unit II. Two settings were successful for reasons undetermined. The last clutch was destroyed by one of the IID bulldozers clearing ditchbanks.

White-Winged Dove. No apparent change in status. Population still too low to warrent hunting of this species.

Gambel's Quail. No apparent change in status noted. On June 7 the first brood of the season was noted. A total of 7 chicks, one-month-olds, made up the family.

Ring-necked Pheasant. First brood of this species noted May 28 when 2 young about 1-month old were seen. The State Fish and Game Department continues to "dump" hatchery-reared birds around the refuge boundary in what appears to be nothing more nor less than a costly publicity stunt. Pheasants are just about as successful here as roadrunners in the arctic circle.

10. Other Birds.

Western Tanagers were noted this year as early as May 16. For some reason the species was noticably lower in numbers than previous years.

Spectacular swarms of Cliff Swallows joined later by lesser numbers of Barn Swallows showed up in mid-may and perched in what seemed endless rows on power lines adjacent to refuge Unit I. They afforded a spectacular sight to country folks.

Throughout the July-August part of the period Cliff Swallows again swarmed into dry, leveled fields at Unit I to rest each day.

Blue Grosbeaks showed up about May 22 which was the first date we noted them this year. The same day Mocking Birds started hatching at Unit II.

11. Animals

On three occasions during the period bobcats were observed. Cottontails appear lowest in population yet over a several year period.

Coyotes were seen once in Unit II. The species and signs of same are very rare anymore.

Local citizens were all a'stir in late June when several individuals observed two Mountain Lions at different times and places. A detail of hunters with hounds went to the Elmore Ranch northwest of Westmorland to stalk the cats but were never successful in locating them.

12. Fish

Countless thousands upon thousands of the fish planted in Salton Sea by the State Fish and Game Department continue to die apparently from suffocation, high temperatures and lack of food. As early as June the Sea Bass, stunted with large heads and knife-shaped bodies, started to belly-up and come floating shoreward. With the myriad numbers of this species which resulted from plantings and reproduction we fear for the existence of the piling worms which were reported none too abundant.

A number of Mullet, scattered over a wide area, covering the south end of the Sea, likewise died as the water temperatures rose higher and higher.

III REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development

1. Cultivated Crops

Unit I.

Tracts 1 and A (160 acres) were leached during the period from the month of June on.

Tract 26 (160 acres) was leached for a 60 day period also.

Tract 2 and B (160 acres), newly leached areas, underwent subsoiling, discing and landplane operations preparatory to cropping to barley this fall.

Tract 3 (80 acres) was seeded to Sudangrass and Red-top Cane. Due to the summer irrigation alkali pushed right back to the surface with each succeeding irrigation until finally the young, tender seedlings were killed to the extent that the crop was abandoned.

Tracts 4 and 7 (130 acres) produced what appears to be the best crop of mixed Sudangrass and Red-top Sorghum (cane) yet. If all goes well there should be a yield of about 2,000 pounds per acre. The lack of funds prevented a good treatment with fertilisers however we were able to apply 150 pounds per acre of 48 per cent nitrates for a starter.

The north half of Tract 8 (160 acres) was seeded to Wild Millet and produced only a fair crop. Cattails are dominating the balance of the tract or about 90 acres and will probably provide some excellent forage for White-fronted and Snow Geese during the winter months.

Tract 28 (80 acres) developed a fair crop of barley for fall use despite very late "head" grazing by Snow Geese the previous period.

Leveling work in Tract C (160 acres) was discontinued in mid-July and all efforts and attention were focused on preparing the balance of Unit I for fall-winter green barley crops. When all tracts are prepared and eventually planted, leveling work will be resumed.

It is estimated that about 700 acres of land will be prepared in this unit for seeding to barley in the early fall months. Combined acreages in Unit I will provide the following:

Mature barley	80 acres
Sudan-sorghum 150	"
Wild Millet 80	"
Cattails 80	"
Green barley 700	"

(All matured barley will be volunteered)

Unit II

Only a small amount of leaching was carried out in Unit II this year. The extreme northwest portion of Tract 2 (10 acres) was leached for some 60 days to clean up a very bad alkali condition. At first natural growth of weeds started in some of the contours but after a time the soils appeared to seal or waterlog and it soon became apparent that leaching was not taking place. The area was drained for a 30 day period in August during which time the soil dried and cracked from one to three feet deep. Next, contours were deep-chiseled and reflooded. From the air this area was seeded to Sesbania and a good germination resulted in a growth which covered most of the area. Later, strong winds whipped most of the seedlings out but the treatment was beneficial and vegetation which "took" helped considerably in putting more CO_2 into the sick soils. This tract has given sufficient promise that we now propose to plant it in barley some fall.

Tracts 7-14 (160 Acres) alfalfa crop turned out to be a failure. What growth survived was allowed to go to seed and volunteer later.

Tracts 1-2, 9-12, 8-13 and 15-22 (consisting of 560 acres), produced a fairly good crop of barley, however individual grain heads were the lightest and poorest yet. It is improbable that it will weigh 20 pounds

per bushel. In some sections of the fields Canary Grass (Phalaris c.), "Mitler Weed" (Bassia h.), and Sunflower (Helianthus a.) have staged a real invasion.

Tract 6 (80 acres) which was leached last winter was planted to mixed Sudangrass and Red-top Sorghum. There is evidence of a good crop coming along. An estimated 30 acres of this tract is still too alkaline in spots to support a crop.

The combined acreages in Unit II will probably provide the following:

Mature barley ..... 560 acres
Sudangrass-Sorghum ..... 80 "
Green barley ..... 460 "
(All mature barley will be volunteered)

2. Improvements

New ditches were constructed to service Tract 9 Unit I. At the headquarters shop tool storage facilities were provided so that wrenches and handy tools could be arranged on wall boards for ready use.

A concrete floor and hoist beams were installed at headquarters shop to provide for a work place just outside the shop where much of the heavy equipment which will not fit into the shop must be repaired.

Entrance and access roads were improved and general maintenance and property upkeep were continued.

With permission from Imperial Irrigation District a 42 inch pipe was placed under the road at Trifolium 13 Canal near Tract 11 Unit I. Water can now pass into the impoundment area and should produce a crop of cattails and some lesser aquatic plants.

IV ECONOMIC USES

A. Haying and Grazing

No operations under this heading.

V PUBLIC RELATIONS

A. Recreational Uses

There are no recreational facilities on the refuge.

B. Refuge Visitors

The number of visitors during the hot part of the season never over works the refuge staff. The following visitors are the only ones that spent any appreciable amount of time here.

NAME	DATE	IDENTIFICATION	PURPOSE
Mr. Ed. Meager	6/8	Writer - L.A.Times	Story
Mr. Art Rogers	6/8	Photographer "	Story
Mr.- Mrs. Tom Brown	6/13	San Diego Audubon Society	Tour
Mr. Cy La Tour	7/15	Photographer - Writer	Story

C. Official Visitors

NAME	DATE	IDENTIFICATION	PURPOSE
Mr. Ray Glahn	8/24-25	Service Pilot-Biologist	Waterfowl Survey
Mr. John Parish	5/10	Cal. Fish & Game, Asst. Mgr.	Geese Return

D. Refuge Participation

On May 13th Bob Watson attended a G.S.A. Surplus Property Disposal Proceedings meeting to obtain up-to-date information on acquisition of surplus property from federal agencies.

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From July 18th to September 20th Mechanic Michael Kari was detailed to the Willapa Refuge, Washington to assist in supervision of dike construction and earthmoving work.

.....

Periodic reports to the Audubon Field Notes publication were made covering the migration and nesting seasons.

.....

June 31st Bob Watson, Assistant Refuge Manager, attended the Colorado River Regional Control Board meeting at El Centro, California. Purpose of the meeting was to consider the beneficial uses of the New, Alamo, Colorado Rivers and Salton Sea.

The board is charged, by state law, to establish waste discharge requirements designed to protect the beneficial uses of surface and underground waters.

At the meeting Mr. Watson presented the value of the rivers and Sea as waterfowl habitat and the allied wildlife recreational aspects both now and contemplated.

Navy personnel of the Eleventh District are interested in the Sea for emergency landings of sea planes and as a target area.

The Atomic Energy and Air Force are interested in high altitude bombing and "classified tests" within their danger zone which now covers more than 50 per cent of the Sea and several thousand acres west of Highway 99 north to Truck Haven.

The California Fish and Game Department sent a letter to the board outlining fishing and hunting aspects.

The State Parks and Beaches will soon open a new recreational beach at the north end of Salton Sea.

Local county health department representatives presented the problems of contamination of New River from Mexicali to Salton Sea. It was estimated that over 50 per cent of the population of Mexicali dump raw sewage in the river.

E. Violations

During the period someone started the International TD-18 tractor, drove it some 50 yards out of Tract 6 Unit II and caused no small amount of damage. The tractor was headed toward the top of Rock Hill and the driver apparently jumped off. At the foot of the hill (Rock Hill) a pile of stacked 12 inch drop boxes and concrete pipe obstructed the tractor but it climbed over most of them and continued to run until it had broken an estimated $20 worth and churned itself down into the gravel finally lugging the motor down. Upon closer examination we found two rod bearings "knocked out" in the motor. Had the unit climbed Rock Hill it would have rolled over and over down the steep incline. We hope this will never occur again and as a precaution all engines are "fixed" when shut down at night.

VI APPLIED RESEARCH

Starting in May and continuing throughout the summer months weekly temperatures were taken of shoreline soil and water of Salton Sea as related under Precipitation and Water Conditions. It is hoped that the data compiled will be used to compare Salton Sea with other bodies of water in foreign countries which are older than Salton Sea and contain plant life which would be of importance as waterfowl food.

.....

On April 18th Refuge Clerk Frank Beals made a trip to San Diego Bay and collected a large number of Salicornia (Salicornia pacifica) plants which were brought in and transplanted along the moist shores of the Salton

Sea. Despite the fact that clumps were sheltered from the sun by shingles, one by one they eventually all died. Most critical influence of all seemed to be corrosion of plants and soil by salt minerals following strong winds which pushed waves inland.

VII OTHER ITEMS

A. Items of Interest

At Los Angeles the California Fish and Game Commission ruled against a limited hunt on Tule Elk at Bishop, California this year.

The perennial complaints by cattlemen brought forth considerable controversy over the estimated number of Tule Elk remaining in the Owens River bottomlands. Cattlemen say 400; the Fish and Game claims 250; some conservative counts show 125; Devereaux Butcher of the National Parks association reports only 85.

Despite recommendations by the California Fish and Game Department to issue 150 permits for 50 bulls and 100 cows, the testimony of Messrs Horace Albright, formerly of the Park Service, and Walter Dow, conservationist influenced the commission.

The Owens herd introduced from Yosemite National Park in 1933 by Walter Dow, is the last remnant of the race which once inhabited the Central Valley of California.

.....

At Resada, California a Killdear made the headlines by setting up housekeeping and laying two eggs between the rails of a small amusement park train. William Miller, owner, promptly shut down the train---"at a loss of money" to favor the nesting bird. Miller estimated it would cost him, "about $60 per week." "Nature put her there on my tracks and there she'll be. I keep the ride shut down until something happens".

.....

United States and Mexico continue to push the $34,933,000 Painted Rock Dam on the Gila River, Arizona and the new lower Colorado River diversion channels to forestall any future posibility of Gila River flash floods and the Colorado River reentering Imperial Valley. Below the International Boundary there is still some question as to where the channel should cut to straighten the river and eliminate meandering and silt deposition.

From here it would seem a real detriment to wildlife to initiate the latter project since it will isolate the vast marsh area where the Rio Hardy and the Colorado join. It is a choice bass fishing area and wintering place for fair numbers of waterfowl. The untamed, meandering muddy waters have for years kept people out of the tidal flats at the delta of the river where Snow and White-fronted Geese winter with puddler ducks

driven out of Imperial Valley by hunting. This area will no doubt become more and more accessible as time goes on. With the Gila River harnessed by the new dam there won't be enough water in the river to flood the old dried up marshes.....let alone Imperial Valley.

.....

Sports writer Drew West entered the following in his Brawley News column....."Here's a bit of information that will soon reach my file reserved for items which mean absolutely nothing.....Did you know that Northern California antelopes are now producing a crop of 84 kids per 100 does? Twice that of last year! Only comment here.....SO WHAT?"

.....

Item seen in the local Brawley News under the heading, Ten Years Ago, August 31, 1944....."Bombing of Salton Sea game refuge, feeding at strategic points and the use of private planes, was promised Imperial Valley as a means of reducing concentrations of ducks ravaging northend crops by the Federal Wildlife Service in a letter to Charles Rice, Secretary of the Chamber of Commerce here".

.....

From the Sacramento office comes the newspaper release that, "The special Coot and Widgeon season observed in the agricultural lands of some 26 counties, including Imperial, may not have cut down the bird population materially, but they did result in successful ventures in farmer-sportsman cooperation, according to the State Department of Fish and Game."

.....

California's waterfowl baiting.....er feeding program..... started last year as a crop relief measure.....will begin September 15th this year, according to another press release quoting the Fish and Game Commission. October 1st is the "latest date feeding can be started on flooded clubs." This year the permittee will be held responsible for any hunting which takes place within 200 yards of the feeding sites. Application for all so-called "feeding" is to be handled by the State's regional offices.

.....

On August 7th Baxter Loveland, Chairman of the local Depredations Committee which is supposed to represent the interests of Valley sportsmen and farmers, announced through the Brawley News that: "The U.S.Fish and Wildlife Service will again issue a depredations order in Imperial Valley for control of damaging Widgeon expected to arrive here in the fall..... Measures have been tried in the past to control them by revolving lights and fire techniques furnished by the U.S. Fish and Wildlife Service but

they would have been futile in providing the needed protection". (We say- you tell'em Mr. Loveduck - millions for cure but not one thin dime for protection through habitat restoration or expansion).

.....

On May 19th the Calipatria, California Chamber of Commerce petitioned and urged the Imperial Irrigation District to replace the wooden bridge at the extreme northeastern corner of Unit II where it borders the Alamo River. Their contention is that the area has been made unavailable to hunters and fishermen and the campsite is also lost.

(The District of course ignored the petition; refuge personnel happily crossed 2 miles off the present 18 miles of tough boundary we patrol. It's okay to lose some 2,000 acres of habitat to the rising Sea - that's one thing - chop off some hunters standing room though and that calls for action! - drastic action!)

.....

On July 2nd Mr. R.M.Chapman, Secretary of the Calipatria, California Chamber of Commerce telephoned us and inquired if it would be objectionable if the Niland and Calipatria Chambers of Commerce rebuild the bridge. We advised that there was no objection. The bridge never did materialize.

.....

In Outdoor California, August, 1954 issue, under the title "Increasing Hunting Opportunities" there are some fair tid-bits for digestion: "...Providing For Game Populations....The threat to habitat is particularily severe in the case of waterfowl. These birds are absolutely dependent on marsh lands which are rapidly being dedicated to agricultural uses.....

"The Federal Government has the primary obligation to provide habitat for these birds. Steps are being taken to permit expenditure of more federal funds in acquiring waterfowl areas for public shooting grounds in this state in fulfillment of the existing agreement between California and the U.S. Fish and Wildlife Service.....

".....federal participation is presently extremely difficult..... Should the Fish and Wildlife Service assume its full obligation, California's load would thereby be lessened....."

.....

At the time the P.&E.Dragline was transfered to Sacramento Refuge we got to chattin' with Joe Bailey, trucker and moving contractor, an old timer in these parts. Joe is quite a poet having produced the nationally famous Rotarian and A Boy Becomes a Scout. We would like to present here one of his more humorous works written way back in 1914:

LITTLE HELL or IMPERIAL VALLEY

The devil in hell, we are told was chained
A thousand years, there to remain;
He never complained, nor did he groan,
But he was determined to start a little hell of his own.
So he asked the lord if he had on hand
Anything left where He made the land.
The Lord said, "Yes, I have plenty of sand
Which I dumped on the silt near the greaser land."

The Lord and the devil went to look at the truck;
The devil said, "If it comes as a gift I'm stuck."
But to give it good riddance and get it off His hands
The Lord promised the devil He'd water the lands,
For He had some water, or rather some dregs,
A regular cathartic that smelled like bad eggs!
So the deal was closed and the deed was given
And the Lord went back to his home in heaven.

The devil said, "I have all that is needed
To make a good hell," and hence he succeeded.
As he entered the land intent on his way,
He scattered the flies to travel by day.
As the sun went down, he chuckled with delight,
For mosquitoes and sidewinders could travel by night.
He stationed tarantulas along the roads,
Put thorns on the cactus and horns on the toads.

He lengthened the horns of the Imperial steers
And put an addition on the rabbits' ears.
The heat in the summer is one-hundred-and-ten;
Too hot for the devil and too hot for the men!
The wild boar roams the black chaparrel----
It's a hell of a place he picked for his Hell.
The red pepper grows on the bank of the brook,
Which the Mexicans use in all that they cook.

Just dine with these greasers and then you will shout,
"I've hell on the inside and hell on the out!"

Joe Bailey

.....

Clerk's note.....The lateness of this report is, we know, a bit on the inexcusable side in the eyes of higher ups. By way of explanation at least in part, the following note which was left on my desk by the manager is reprinted. (It seems that someone deliberately ripped the "S" from our typewriter necessitating a major repair---thus a long delay)...

"Dear Frank:

Theme louthe of a dirty thneaking, thtinking THUNK hath tholen the etheth from our typewriter and thkedaddled like a wild thnow goothe. Pleathe get thith thtuff written and thent in before Mac blowth hith futhe."

. . . . . o . . . . . .

Respectfully submitted,

Edward J. O'Neill
Refuge Manager

Note: Credit is due.....to Mr. Watson who recorded most of the data for and wrote the section on Migratory Waterfowl; to Mr. Beals for the editorial work and the last comment under Other Items.

Approved: _____

_____

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

WATERFOWL

REFUGE SALTON SEA MONTHS OF MAY TO AUGUST, 19 54

(1) Species	(2) Weeks of reporting period									
	5/7 (1)	5/14 (2)	5/21 (3)	5/27 (4)	6/4 (5)	6/11 (6)	6/17 (7)	6/25 (8)	7/2 (9)	7/8 (10)
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada									2	
Cackling										
Brant										
White-fronted										
Snow									1	
Blue										
Other										
Ducks:										
Mallard		2		10	2					
Black										
Gadwall										
Baldpate	20	10	10	10						
Pintail	30	20	20	10	20	50	20	20	20	50
Green-winged teal										
Blue-winged teal								2		
Cinnamon teal	30	10	20	20	20	20	20	10	10	20
Shoveler		3	4	1	1	1		2		
Wood										
Redhead	20	40	30	20	10	20	20	20	20	60
Ring-necked										
Canvasback										
Scaup	20	10	10	10	10	10	10			
Goldeneye										
Bufflehead	1	4								
Ruddy	300	300	300	300	250	200	120	90	150	300
Other										
Fulvous	20	10	9	10	10	10	30	20	50	100
Coot:	100	70	200	150	150	120	110	160	120	100
Totals	541	470	603	541	473	431	330	324	373	630

Int. Dup. Sec.,
Wash., D. C.

3-7150a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE SALTON SEA MONTHS OF MAY TO AUGUST, 1954

(1) Species	(2) Weeks of reporting period: 7/16 (11)	7/23 (12)	7/30 (13)	8/6 (14)	8/13 (15)	8/20 (16)	(17)	(18)	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada									14		
Cackling											
Brant											
White-fronted											
Snow	3				1				27		
Blue											
Other											
Ducks:											
Mallard									966		
Black											
Gadwall						2	6		56		
Baldpate									5360		
Pintail	50	80	80	120	10	5850	3100		341,460		
Green-winged teal						2180	550		19,110		
Blue-winged teal									14		
Cinnamon teal	20	40	60	80	22	1150	340		132,090		
Shoveler						1030	250		90,160		
Wood											
Redhead	30	20	20	10			10		2,805		
Ring-necked											
Canvasback		1				3			28		
Scaup					4				560		
Goldeneye											
Bufflehead									35		
Ruddy	400	400	300	450	100	200	110		29,750	2	10
Other Fulvous Tree Duck	150	80		60	20	30	90		48,160		
Coot:	400	100		200	120	2300	550		34,510	5	30
Totals:	1058	721	460	920	277	12,745	5,096				

Aerial census - includes all contiguous area.

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans			
Geese	41	8	
Ducks	867,944	10,861	10
Coots	34,510	2300	30

SUMMARY

Principal feeding areas: Refuge food plots & water areas

Principal nesting areas: Salton Sea

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 Months of May to August 194[illegible]

(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:	Previous Period	Previous Period								
Wood Ibis	"	"	1,300	8/24			1	5	1	4,000
Glossy Ibis	"	"	200	8/13			1	5	1	500
Green Heron	"	"	10	7/16			—	10	5	20
Common Egret	"	"	500	7/16			2			1,000
Snowy Egret	"	"	300	7/16			2	1,500	Unknown	800
B.-C. Night Heron	"	"	100	7/16			1	100	"	200
Great Blue Heron			25	8/24			3	30	"	50
Gallinule			20	8/6						40
Western Grebe			30	7/16						150
Eared Grebe			250	6/25						1,000
White Pelican			850	8/24			1	130	3½	1,500
Brown Pelican	1	8/6	2	8/24						2
Cormorant	Previous period		30	8/24			2	70	30	300
Least Bittern			1	7/16				1	1	10
American Bittern			1	6/25						5
II. Shorebirds, Gulls and Terns: L.-b. Dowitcher			500	8/13						1,000
Lesser Yellow-legs			75	8/24						100
Marbled Godwit			175	8/24						200
Willet			75	8/24						100
Long-billed Curlew			60	8/6						1,000
American Avocet			1,750	8/24						2,000
Black-necked Stilt			8,575	8/24				100	Unknown	15,000
"Peep" (Sandpiper)			2,500	8/24						50,000
Wilson's Phalarope	2	8/13	250	6/6						5,000
Northern Phalarope	Previous period		100	8/24						10,000
Black Tern	"	"	300	6/6						2,000
Caspian Tern	"	"	100	6/25				2		100
Forester's Tern	"	"	10	5/1						150
Ring-billed Gull	"	"	250	8/24						1,000
Solitary Sandpiper	1	8/13								10
Baird's Sandpiper	2	8/13	250	8/16						500
Semipalmated Plover	10	5/1								20

(over)

(1)	(2)		(3)		(4)		(5)		(6)
III. Doves and Pigeons:									
Mourning dove	Previous period		2000	June	---	----	200	300	30000
White-winged dove	"	"	10	August			10	10	50
IV. Predaceous Birds:									
Golden eagle									
Duck hawk	Previous period								2
Horned owl	Resident								4
Magpie									
Raven	1	May							
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.

(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.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

1613

Refuge Salton Sea Months of May to August, 194 54

(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.
Gambel's Quail	Est. 100 acres	1/2	11	88	(No data)				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 _____ Months of MAY through AUGUST, 1954

(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
Henschen Barley	300							300			
India Alfalfa	4							4			

(8) Indicate shipping or collection points Brawley, California

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

(10) Remarks _____

*See instructions on back.

16—61482-1

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.

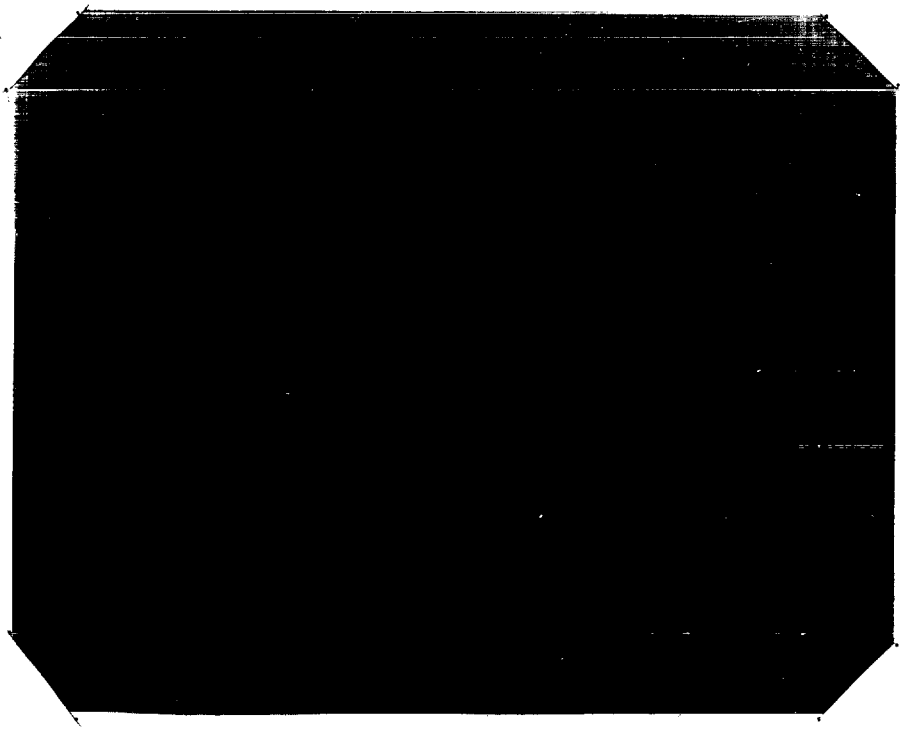
(7) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.

(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.

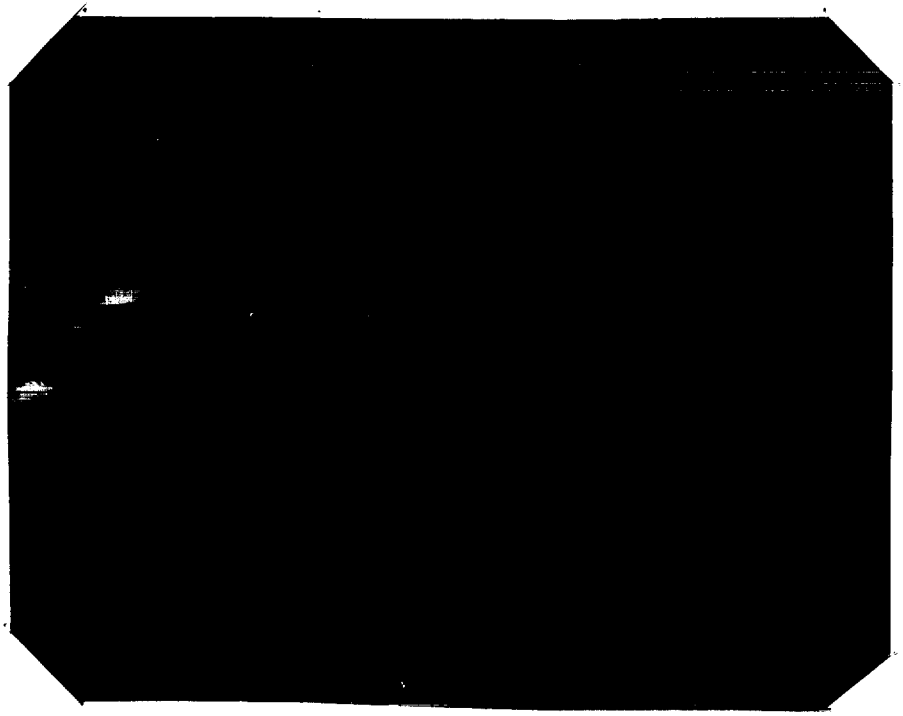
16—61482–1 U. S. GOVERNMENT PRINTING OFFICE



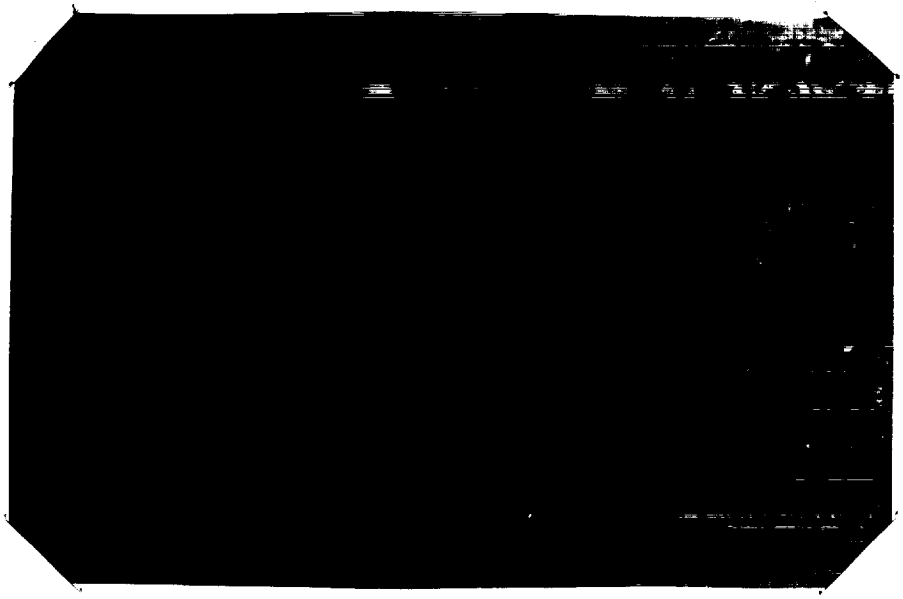
West end of K-Lateral road showing inundation due to rise of Sea. Two years ago this road was in full use. (May, 1954)

Desert Beach south of Mecca, California showing inundation by Sea. (May, 1954)

Pintails utilizing Wild Millet on leach field east of Imperial. Volunteer growth which obscures contours was matted down by the birds. (August, 1954)

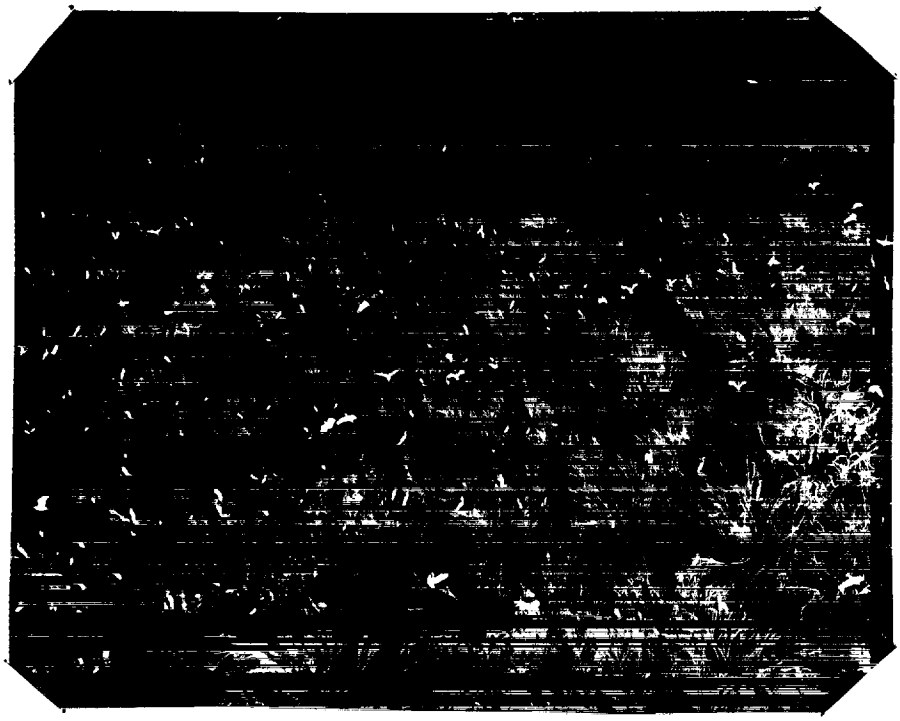


Same as above. Area is east of Brawley. (August, 1954)

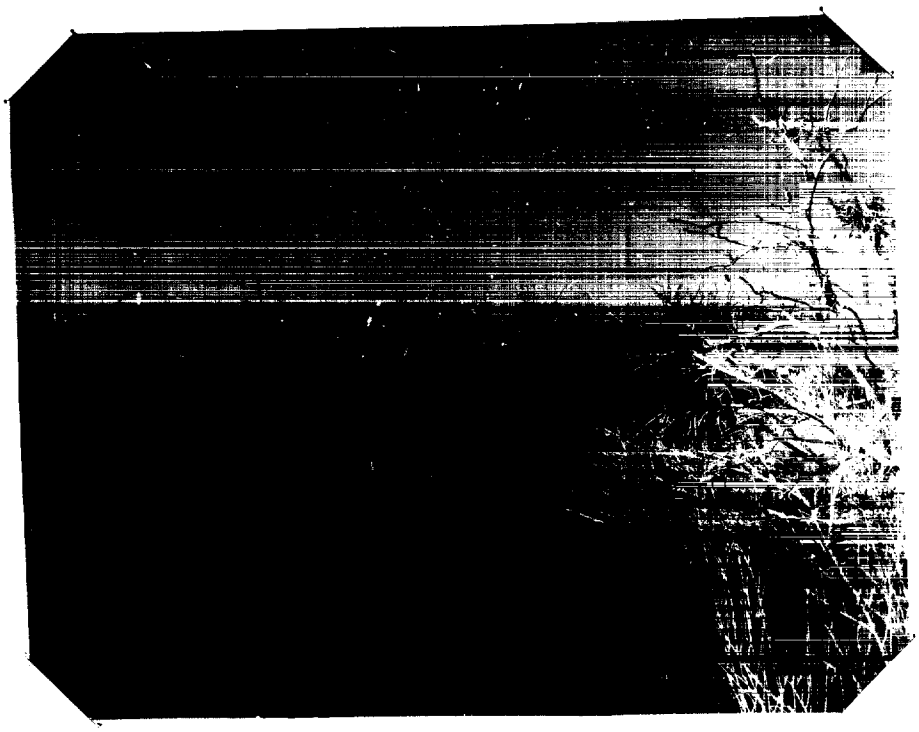


Adult, flightless Ruddy ducks taken in banding trap in late April. Coots and Ruddy ducks unable to take flight have been noted on Salton Sea every month of the year.

R. Watson banding waterfowl during August migration. Temperature - 110°; during period 997 birds were banded.



Largest rookeries of Cormorants, Common and Snowy Egrets in refuge history. (Aerial photo by F. Beals, April, 1954).



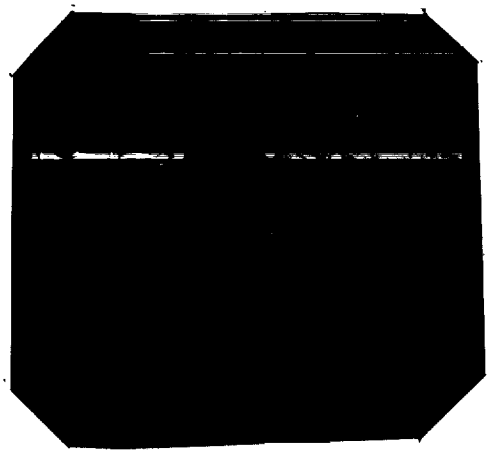
Nesting occured in submerged Tamarix vegetation at north and south ends of Sea. (Photo by R. Watson).

Aerial view of Pelican-Islands along shallow west shore of Sea. (May, 1954).

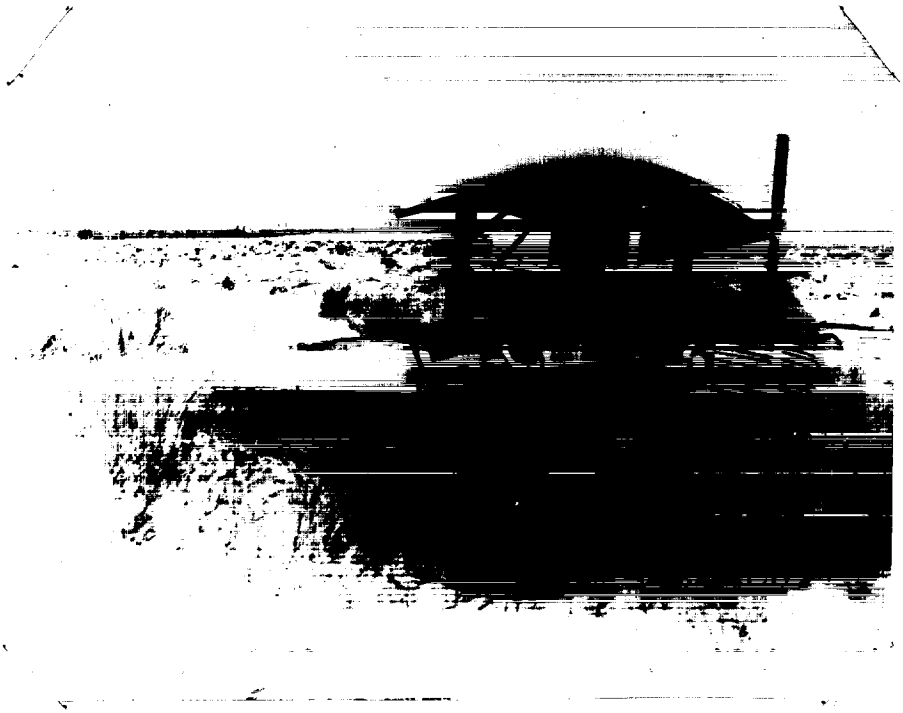
A total of 262 Pelicans' eggs were laid; 42 hatched; 34 young birds survived. Last year nesting was totally unsuccessful. (April, 1954).

Strong winds caused wave errosion which resulted in high mortality among nestlings. (May, 1954).

Small patches of Widgeon Grass (Rupia), occured in favorable spots along S.W. shore and S.W. of New River delta of Sea. First note of species in Sea was four years ago.



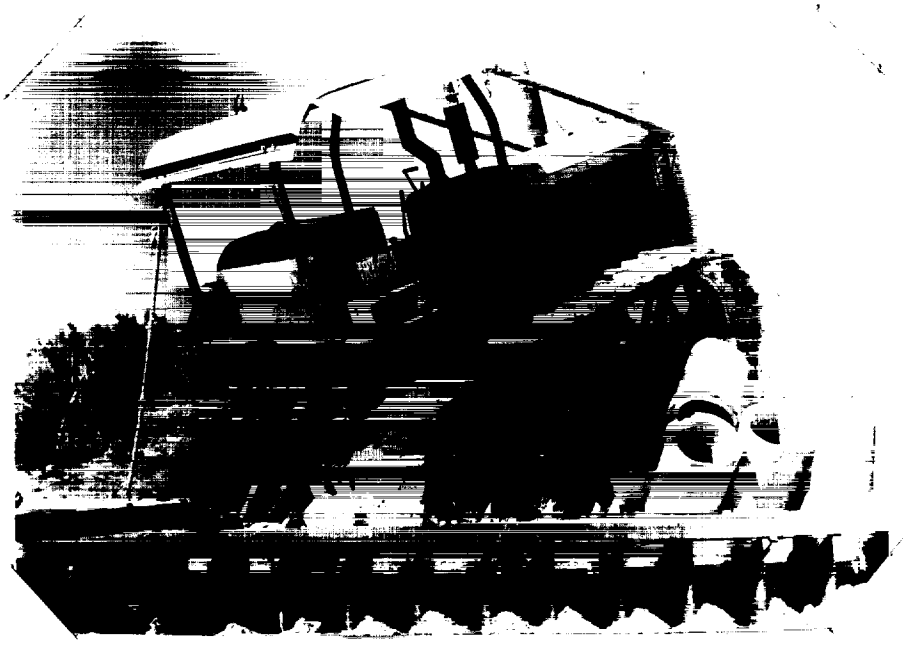
Fresh water clams (Sphaerium), introduced several years ago are becoming numerous in canals & drains.



Operator McFarland with AC HD-7 and drag scraper starting level job on raw desert land Tract C Unit I.

Salton Sea at last will have a place where hunting is prohibited. (Photo by F. Beals - June, 1954).

Ribeiro, Barros and Cardonzo setting out Salicornia plants along moist shoreline of Sea. None of the specimens set out under varying conditions in 50 plots survived. (May, 1954 - Photo by F. Beals).



Vandals stole the TD-18 Tractor one night and attempted to run it up Rock Hill. Twenty dollars worth of pipe high-centered tractor but bearings burned on engine. Secret engine ignition now in use.