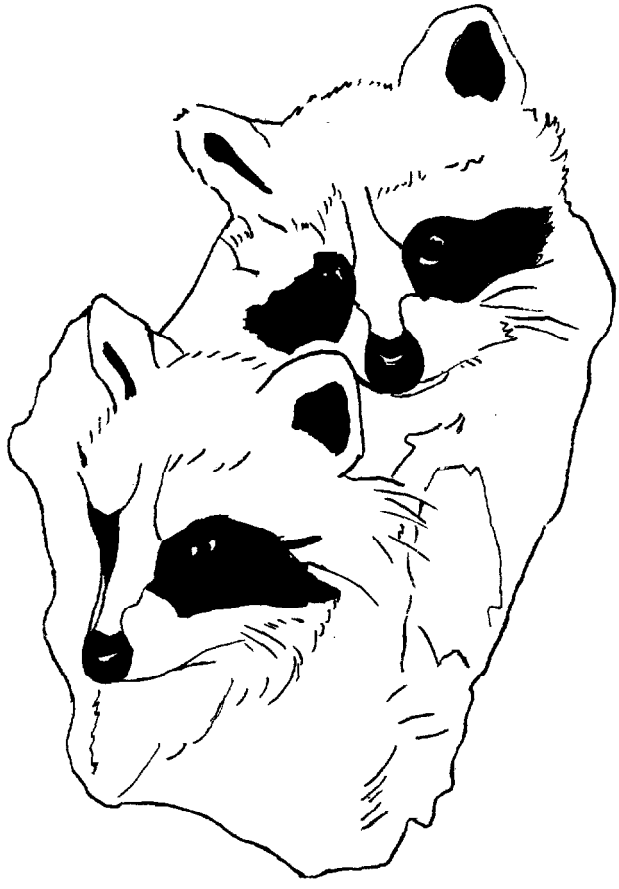
SALTON SEA NATIONAL WILDLIFE REFUGE

AND

WATERFOWL DEVELOPMENT AREAS

NARRATIVE REPORT

SEPTEMBER - DECEMBER, 1952



UNITED STATES DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

BRAWLEY, CALIFORNIA

CONTENTS

REFUGE PERSONNEL

Regular Personnel

Edward J. O'Neill	Refuge Manager
Eugene Kridler	Refuge Manager, Asst.
Clyde W. Stewart	Foreman, Farming Operations
Herbert Lamansky	Clerk, Typing
Michael Kari	Mechanic
Jose Barros	Maintenance Man
Will T. Wesley	Maintenance Man
James W. Hamilton	Dragline Operator
Lee E. Cox	Tractor Operator
W. Carl Ford	Tractor Operator
Melvin Ford	Tractor Operator
Chesley Williams	Tractor Operator
Paul Williams	Tractor Operator
John Barros	Irrigator
Sylvester Barros	Irrigator
Manuel Cardonzo	Irrigator

Temporary Personnel

Elden Nichols	Tractor Operator
William Lynch	Irrigator
Julio Ribeiro	Irrigator
John A. Hoffman	Laborer

Cover ..... RACCOONS ..... By Eugene Kridler

NARRATIVE REPORT

I GENERAL CONDITIONS

A. Weather Conditions

On September 10th winds, which appeared to be a break in the long summer heat, blasted every corner of the refuge. Thin-blooded citizens all over the valley reached for coats, jackets, or more bed covers as tree limbs, television aerials, and raked hay fields caught hob before gusts which reached velocities up to 50 mph. Temperatures plummeted from 110 degrees to 60 degrees.

The break in heat was 18 days ahead of the relief of last year when thermometers stayed above the 100-degree mark until September 28.

To the surprise of everyone concerned, the temperature again climbed to the 100-degree mark, and ole Sol succeeded in keeping this part of Region 1 well warmed up until mid-October.

A series of light quakes on December 26th shook the general area of Unit II without visible damage to our structures.

Winter temperatures, for the first time in several years, never dipped lower than 32 degrees in the interior of the Valley, and tender crops survived well.

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

Month	Maximum	Minimum	Precipitation	Winds Over 25 mph (Days)
September	115	61	T	1
October	108	60	0	0
November	88	36	.18	0
December	81	35	.17	0
			Total..... .35	

B. Precipitation and Water Conditions

During the period, scattered showers of varying intensity hit the Valley paralysing dirt road traffic and vexing the out-of-town nimrods here in quest of game.

Once in October, during planting operations, strong winds blowing from the west across the open see. blocked normal stream flow at the delta of the Alamo River, and the backwaters overpouredthe stream bank below Vail 3 Canal and flooded a portion of Tract 23, Unit IX. TheImperialIrrigation District moved in with two tractors where, we hod reinforced the bank and soon pushed up a small levee.

All along Units I and II the salty waters of the sea were gradually pushing inland as the period came to a close. This is typical of the "inhale-exhale" hot-cool weather fluctuations which have taken place since its birth.

C. Fires

No firer ooourrad on the refuge during the period.

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II WILDLIFE

A. Migratory Birds

1. Populations and Behavior

In the beginning of the period the refuge tally sheets showed a total population of 5,841 ducks, geese, and coots, a population figure which is lower by a couple of thousand birds than that of the same period last year. The peak population was higher than last year.

2. Geese and Swans

Three Whistling Swans were seen here November 26th.

Several reports of geese in the valley during August and September proved to be false when investigated. Audubon Field Notes for October, 1952quotesFat Gould:

> "A flock of 50 geese, Canada and White-fronted, was seen flying over Whittier on August 13th."

William Anderson and Roger Wilber of the California Fish and Game Department observed 6 White-fronted geese in the Red Hill area on September 30th. The next day Tractor Operator Melvin Ford observed about 20 with 3 Snow geese.

About 40 Snows and 30 White-fronted geese arrived the week of October 1st, about one week later than in 1951 for both species. Canada geese were first noted the week of October 13th which date is identical to the arrival time in 1951. It would appear that perhaps the arrival dates of the geese have advanced on the calendar a couple of weeks since records were first kept here.

By mid-October 12 Canada geese, 150 White-fronts, and 200 Snows were present. The increase was steady for all species in the weeks that were to follow. In mid-November 600 White-fronts were here for a period of two weeks, or until about the 24th, after which numbers dropped down to about 200 individuals. The Canada goose population reached 2020 on December 26th, and Snow geese climbed in numbers to 8500 at the same time.

Canada geese in Unit II were extra noisy and active the night of December 6th, and the next day we observed a group of approximately 200 of these birds which stayed seperate and apart from the large flock of "residents". The arrival of more geese may have been the cause for all the commotion. Among the new arrivals we observed, for the first time this season, the partial albino which stayed here last year. On December 9th we were successful in showing the specimen to Assistant Regional Director Paul Quick and Refuge Manager Gene Kridler. Since that date, no one has seen the distinguished visitor.

Cackling geese returned again. A single bird was seen November 24th, and on the 30th four were recorded.

A Ross's goose was noted on Unit I on the 24th of November, but since that date, none have been seen.

The 1952 kill of geese tops that of all previous years in the history of the present refuge units. All geese checked, observed, or reliably reported killed in the vicinity of the refuge units are tabulated below.

Species	No. Killed Around Refuge
Canada Goose	201
Lesser Snow Goose	617
White-fronted Goose	27
Subtotal . . .	845

Kill In State Shooting Grounds

Species	Number
Canada Goose	56
Lesser Snow Geese	27
White-fronted Goose	28
Subtotal	111
GRAND TOTAL	956

It is estimated that perhaps 75% of the goose kill in the Valley is represented here. In addition, each season a couple of hundred cripples die along the Salton Sea, on refuge ponds and in open fields.

3. Ducks

The early Pintail migrants appeared to reach a peak in population during the last two weeks in August. Only a small portion of the Valley population used the refuge despite flooded wild millet ponds and adjacent tracts of dry barley and Sudangrass. Almost every leach field in the county supported Pintails which apparently were harassed but little by landowners and poachers.

Reports of 300,000 to 500,000 Pintails by the local State game warden stimulated bigger and better estimates by would-be sportsmen and local farmers in speculation of big depredations damages. After the arm-chair estimates reached the six-digit figures, we employed a Mr. Harold W. Jenson to fly us over the Valley for a closer look at all of the concentrations. On September 12th the writer, accompanied by two State of California Fish and Game men, William Andersen and Roger Wilber, estimated that there were 43,200 Pintails in the vicinity. At that time we estimated that 1400 acres of land throughout the Valley was being flooded and leached. The areas supported about 60% of the waterfowl population observed.

In mid-September the population of Pintails started to dwindle; however, at the same time and for some unexpected reason the refuge units supported an increasingly higher population each succeeding week. On September 14-15 there were 3060 on the refuge, and by September 28th, 8200 were recorded. After that date there were definite signs of low numbers over the country in general despite a rather stable population on the refuge along the Salton Sea. Even the banding operations bore this out, for in a short time it seemed as though they were literally "trapped out". The number of retraps soared.

In mid-October the Pintail again showed signs of an increase. A population of 4000 were here October 12th, and by the week ending October 18th this had jumped to 6000. On October 24th we recorded 8200; on November 1st 9200. We witnessed, in effect, a rapid buildup during August of the juvenile Pintails mixed with very few Mallards and Shovellers. The overall population in the general area showed signs of a decrease following mid-September, but this was not so on the refuge units, perhaps the reaction to the influx of up-state dove hunters at the time. It could be that weed and crop seeds in flooded leach fields were by that time becoming scarce. Early in December the population of Pintails again dropped, but in late December the species was on the increase.

Cinnamon Teal started increasing in early September. 1100 were seen on the 20th of that month. Counts showed ups and downs, presumably due to local spread, but a peak population figure was obtained November 9th when 4600 were here. Late in November the species started to dwindle in numbers, and only a mere 100 were seen December 30th.

Shovellers started building up the last part of September. By October 24th 2060 were using the refuge, On November 1st there were 4000, on November 9th 5000, December 6th 6700, and on December 26th 8000.

Baldpates put in their appearance the week of September 19th when we observed 250. One week later the count showed 400 after which weekly increases were steady until by November 1st 10,000 were using the refuge. On November 15th there were an estimated 22,000, and the last days of the month saw 26,000. At the close of the period 30,600 were present on the Unit I fresh water impoundments. Our observations during the period would indicate that about 60% of the population in the valley stayed out on the Salton Sea and around the mouth of the Alamo River. During October and November, nightly naval operations out in the Salton Sea, where 3-minute flares were used and targets strafed, didn't seem to upset the large concentrations so distressing to the local depredations committee.

An estimated 60 Fulvous Tree Ducks were here in early September. The usual influx during that month brought the population up to 230 birds on September 28th. The species was recorded this year as late as October 24th when 100 were observed in Unit I.

A single sick Ring-neck Duck was picked up in Unit I on December 15th. Reports indicate that anumber have been taken by hunters on the State's Imperial Refuge at Calipatria.

A hybrid cross between a Pintail and Green-winged Teal was taken by a hunter on the State shooting grounds. The

specimen was as near half and half as could be, for it had a Pintail head with a green stripe through the eye, Pintail wings with the white bars of the Green-wing, a Pintail neck with the faint stripe, and spotted Green-wing breast feathers. The specimen was turned over to the University of California. This is perhaps the only such bird of this cross in existence to our knowledge.

The annual waterfowl inventory conducted this year during the hunting season turned up some interesting figures compared to those of previous post season surveys. Tabulated below are the figures obtained during 11 hours of air observations in the State's 170 Cessna aircraft which was used to cover all of the Imperial Valley, the Colorado River from Blythe to its delta, and the Rio Hardy between Mexicali, Mexico and the Colorado River.

Imperial Valley- Salton Sea- Rio Hardy-Colorado River Waterfowl Inventory Summary, Dec.27-28

Species	1952	1951
Mallard	10	50
Gadwall		50
Baldpate	73,230	28,120
Green-wing Teal	1,030	1,620
Pintail	16,410	13,470
Shoveller	21,290	2,010
Redhead	90	100
Canvasback	1,810	860
Lesser Scaup	29,600	2,900
Cinnamon Teal		500
Goldeneye	10	
Bufflehead	260	60
Ruddy Duck	17,680	4,800
Coot	31,530	8,220
Unidentified ducks	29,050	40,600
Snow Goose	20,830	8,800
White-fronted Goose	100	560
Canada Goose	4,150	3,620
Swan	8	17
GRAND TOTAL	249,088	115,947

Unidentified birds listed for 1951 were encountered principally on the Salton Sea which may account for the big increase in Ruddy Ducks and Scaup. Baldpates may have gone unidentified in the count taken last year in view of the fact that they tend to loaf in sizable rafts out on the sea, especially during the hunting season.

The remarkable upswing in Coot and Shoveller is

surprising and difficult to explain. The kill, however, substantiates the presence of the latter species since it was the main bird taken by hunters on State shooting grounds and along the sea. Previous to this year the Pintail had been listed at the top of the kill reports. State kill figures disclosed that the take of Lesser Scaup increased considerably.

The number of Snow geese in this section of the country compares closely with the figures of last year. Below the International Boundary, where the Rio Hardy spreads and enters the Colorado River, we observed large acreages of tender, current years growth of cattails. Newly flooded delta lands in that area appeared to have opened up an almost unlimited amount of Snow goose forage. This is where most of the increase was noted. Grazed or cut areas in dense growths of tule were plainly visible and numerous. The main agricultural crops in the vicinity was cotton. Only a few hundred Snows were in this area last year. If the flooding or spread of the river over new delta lands continues, this may develop into a real mecca for Snow geese.

At the delta of the Colorado the same condition described in the inventory flight account of last year appears to provide suitable habitat for larger concentrations of Snows than were seen last year. We are still uncertain of the identity of the tidal grass around the mouth of the Colorado; however, judging from ~~from~~ the growth habit, it might be Distichlis spp. At any rate, it produces a lush growth and feed in an area not too accessible to humans.

Just below the Mexican border an estimated 8000 Pintails were encountered in a type of habitat that probably produces very little food for the species. It is probable that hunting pressure caused them to seek the peace and quiet of that area. Deeper into Mexico Green-wing Teal showed up often but in small numbers. Shovellers were the most abundant species. The 18,540 unidentified birds which were seen down there could well have been Shovellers because these birds were the most prevalent of the identified species, 10,990 being counted. Even at the delta this bird was observed intermingled with the shorebirds.

4. Disease

Sickness among the ducks again occurred this season. Earliest indications were noted about mid-September. In late October and early November the malady reached its peak. On November 18th 211 dead ducks were gathered from 5 miles of ~~impoundment~~ shorelines. On November 26th the same area yielded 172 dead birds. On December 1st and 2nd 442 were

gathered, and on December 8th, 19. A survey of the area on December 15th disclosed 54 dead and 100 sick birds. During the period, 958 dead birds were picked up disposed of. A number of shorebirds, pelicans, cormorants, grebes, gulls, and one Forester's Tern were brought in.

The ducks and geese gathered are here tabulated by species. The sex ratio was also recorded and placed on file for reference work.

Species	No. Picked Up
Pintail	357
Baldpate	206
Green-wing Teal	73
Shoveller	57
Ruddy Duck	8
Mallard	3
Snow Goose	5
Gadwall	3
Lesser Scaup	2
Canada Goose	2
Redhead	1
Ring-neck Duck	1
White-fronted Goose	1
Coot	24
Unidentified	140
Total.....	958

We estimated that between 4,000 and 5,000 ducks died of sickness in the valley.

On the winter inventory flight into Mexico a number of apparently sick Pintails were seen just a short distance beyond the border. A few times during the season we heard reports from hunters of stagnant water and "lots of sick ducks" on the State shooting grounds. Harvey Hastain, former California Fish and Game Commissioner, reported sickness on the Walker Duck Club south of Calipatria. The caretaker there gathered 10 to 20 birds each day and disposed of them.

After a series of light showers, wind, and a drop in the temperature in mid-December, sickness on the refuge subsided.

5. Shorebirds, Gulls, and Terns

Thousands of Ring-billed Gulls flocked in irrigated fields during the period. On the refuge they frequently resorted to feeding on dead ducks.

Estimates on October 3rd indicated that about 500 Glossy Ibis were using the refuge. Flocks of 1000 to 1500 were seen occasionally in late December.

Hudsonian Curlews were here in small groups during December. A single dead bird was observed in late December along the Salton Sea.

Black-bellied Plover were here in November and December in rather low numbers.

From November on Forester's Terns were often seen along the east shores of the sea. During aerial surveys, at least a dozen were observed out over the sea on the extreme south end.

During one moonlight night late in December, 5 Wilson's Snipe were flushed in a field which was being irrigated, this in view of the fact that during a special census conducted last year, we could not even locate one.

American Avocets were here throughout the period in flocks of 5 to 50.

A flock of about 250 Mountain Plover were seen in a newly leveled field a few miles south of Niland along Highway 111 on the 16th of October. This species was never seen again until approximately 300 appeared in Tract 2 of Unit II in the last week in December.

The Wilson's Phalarope and Black Terns were somehow missed this fall. Very few terns appeared, and to our knowledge no phalaropes were seen.

6. Marsh and Water Birds

On December 16th 5 Sandhill Cranes were seen in Unit I. The species seems to have bypassed the Salton Sea this year. During the waterfowl inventory, 135 of these birds were spotted along the Colorado River some 20 to 30 miles below Yuma, Arizona. As the plane circled and dropped to about 100 feet, the cranes, though apparently upset and frightened, refused to take flight. Some of them acted as though they were prepared to put up a real defense. Agent Elder stated that some Chinese native had been taking a few and delivering them to Los Angeles. Little can be done under the regulations since the species can be legally taken in Old Mexico.

The annual influx of Eared Grebes started here bout the 8th of October. During a flight on November 24th,

the writer and Pilot Glahn estimated 20,000 of them on the Salton Sea. At the same time we saw about 250 Western Grebe.

A lone Brown Pelican was observed by William Anderson of California F & G at the mouth of the Alamo River early in October. This may have been the same individual reported in the previous period.

Wood Ibis were here to the extent of about 3000 during September. Most of these birds were gone by the first of October. Seven stragglers were seen October 9th.

7. Food and Cover

It is certainly true that cotton is "king" here in Imperial Valley this year. The crop took plenty of water to produce maximum growth, and in the process a beneficial crop of duck food grew in the bottom of the rows and between stalks. During September, it was common to see hundreds of Pintails in irrigated cotton fields where wild millet volunteered. One calm morning we could scarcely believe our eyes when we saw cotton stalks shaking and trembling. We discovered that about 500 Pintails were busily gleaning the wild millet seeds.

On the refuge the farmed tracts produced an acreage of waterfowl foods that topped all previous endeavours. The predictions of some skeptics, present at the September farmer-sportsmen depredations meeting, that the waterfowl population would either starve or consume tremendous acreages of crops never did occur.

No one, to the best of our knowledge, has received any goose damages. Some 400 acres of alfalfa is the estimated loss to Baldpates.

Early in the period Pintails moved out of the leach fields in the Mulberry District, east of Imperial, California, and consumed a considerable amount of mowed Sudangrass from one farmer's field. West of Imperial Pintails did some damage in a maturing rice field owned by a Mr. Dahlquist. This damage occurred during the week of October 26, and reports have it that the farmer refused to allow hunters into the unharvested fields. One Chinese grower in the same locality reported slight damages by Pintails before the fields were dried for harvest.

The week of October 20th saw the first duck light of the season on the Hudson place east of Mullet Island. On November 3rd duck lights were noted just north of Westmorland on the Sweetwater place where irrigation of barley-alfalfa was in progress. By mid-November operating duck lights were common in the northern part of the valley.

In mid-October several hundred acres of barley was irrigated on the L.E. Sinclair Ranch several miles west of Calipatria. Pintails visited the unattended fields where water was running; however, when they were noticed, flares protected the crop until the ground dried somewhat.

All in all, it looks as though there has been definitely less depredations on crops this year than last.

B. Upland Game Birds

The pheasants released by the state fish and game department during the previous period in Unit II refused to move out of the refuge into adjacent areas which were open to hunting. The refuge was criticized by some for this because the birds were seeking food and protection where the State had planted them.

Quail received a heavy trimming in population during the season, but the survivors look good.

Flights of Mourning Dove arrived here in late September and early October. The main movement appeared in mid-September, and hunters perhaps missed out on them in expectation of late flights. Mr. Guy Noel, California Fish and Game warden from El Centro reports that 617 shipments were made from five shipping points in the Imperial Valley. This means that approximately 6170 birds were killed by out-of-town hunters. Over the same period last year 3000 limits or 30,000 birds were shipped out of the county.

The usual, very low population of White-winged Doves had completed migration from the valley by October 10th. They showed up in the bags of hunters in about the proportion of their presence--very few. It is regretful that the pioneering population of this species is hunted so heavily on the justification that hunters can't distinguish them from other species here, or that California is just as entitled to them as Arizona. They present no economic problem, and their preferred nesting cover of Eucalyptus trees and citrus trees is none too abundant.

C. Other Birds

White-crowned Sparrows put in their appearance about October 5th, which is the first record of the season.

A single Belted Kingfisher stopped in November 27th. The species has never been common but surprisingly winters

here each year.

On December 31st a partial albino Audubon Warbler was observed near Red Hill. The bird does not seem to be too timid, and it has been observed and its identification has been confirmed by a number of people.

D. Fur Animals, Predators, etc.

No change in status since the previous report.

E. Fish

The fall "spawning" of Mullet was perhaps the poorest in several years. No runs were noted or reported in the New River, and at the Alamo River very few came within reach of the fishermen with their snag hooks, nets, etc. During late November and December, dead mullet were observed along the shores of the sea. A one mile sample area along Tracts 28-30 of Unit I turned up 71 dead fish which averaged about 18 inches in length. This loss of mullet is an annual event that, to our knowledge, has never been explained by ichthyologists. Some suspect bombing, night strafing of targets under aerial flares on the sea, or algal-induced suffocation during periods of calm weather. Considering the immensity of the sea and the relatively low population of mullet as reported by commercial fishermen, it would appear that none of the mentioned causes would be of importance.

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III REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Developments

1. Cultivated Crops During Period

Unit I

Acres under lease	3800
Acres under fallow	280
Acres cropped	1410
Acres producing successful crop coverage	1090
Acres under sump, river, backwaters, etc.	2150

Unit I (Cont'd.)

Crops Available (Acreages)	Green Feed	Dry Feed	
Mature barley		430	
Green barley-clover-alfalfa...	360		
Cattails.....	90		
Wild millet.....		225	
Wild millet-Sudangrass.....		160	
Alfalfa.....	160*		
Volunteer green barley.....	160		
TOTALS.....	770	+ 815 =	1585

* 120 additional acres planted lost through crop failure

Three fields were partly leveled and the direction of irrigation water changed to obtain better gradient and water penetration.

Tracts 5 & 6 were seeded to mixed barley and clover and irrigated late in October. As before, the crop was well utilized by geese, but by using scarecrows we have been able to manuever the birds from field to field during irrigation. Tract 4, seeded to alfalfa in early November, has suffered from overuse more than any other field in Unit I. Canadas and Snows both prefer the crop to the extent that they went in and grazed all but within a 20-foot radius of the scarecrows before they were removed.

As the dry barley in Tracts 7&8 were utilized, the land was disked and irrigated to allow weeds and volunteer grain to sprout and provide green forage for geese. Construction of a levee along the west and north boundary of Unit I should give some protection from future flood waters in the No.1 drain ditch.

Tracts 18&19 were seeded to mixed barley and Hubam clover in late September. The crop was utilized but little owing to the hunting around the boundary. Barley was actually heading out and alfalfa producing seeds by the end of December.

Strips were planted to test vetch and rye grass as green foods. Where alfalfa or barley was mixed with vetch, the latter was not taken by geese. Where ryegrass and alfalfa were mixed, the same was true of ryegrass. Barley was also taken in preference to ryegrass. The sample plots will be watched throughout the following period before conclusions are made.

Only the aflafa fields were fertilized this season at the rate of 120 lbs/acre with phosphoric acid, 46%, treble super-phosphate in powedered form.

Unit II

Acres under lease	1400
Acres under fallow	160
Acres cropped	940
Acres producing successful crop coverage	750
Acres under sump, river, backwaters, etc	300
Acres being leached	160

Crops Available (Acreages)	Green Feed		Dry Feed	
Mature barley			160	
Green barley-clover-vetch	390			
Cattails	20			
Wild millet-Sudangrass			60	
Alfalfa	180			
Volunteer green barley	80			
Sudangrass			80	
TOTALS	670	/	300	= 970

Leveling work on Tracts 7-14 was completed. Touch-up work was started in Tracts 1-2 where a few low spots in the land have resulted in poor irrigation and crop drowning.

One example of real utilization is Tract 4 (80 acres) of Unit II where a good crop of Mariout barley developed last spring. The State released more than 1000 pheasants, as reported in the previous report, which spent the entire summer, or about 4 months, there. At the rate of about 70 lbs. of feed per bird, the released birds probably required close to 20 lbs. of the grain crop to keep healthy. That would mean that perhaps 23,000 lbs. of feed went for these resident, semi-domesticated birds which do not appear to be self-sustaining in this climate. Doves nested everywhere in thefield during the dry summer. A hog owned by a neighboring farmer spent at least two days in the field before he was discovered. Cottontails and Jackrabbits were common all the time. In the fall ducks and geese flocked to the field and applied the finishing touches in about one week.

Late in the period the same field was reworked and irrigated. As the volunteer growth is showing up, the geese are grazing it; a couple of hundred pheasants-which never did leave-are digging it, and in the evenings the rabbits are rather common.

A good crop of mixed barley and vetch was produced in Tracts 8-13 where spotted leveling was done and the direction of lands altered for better gradient. All species of geese using the refuge kept the crop well clipped. Hunters who illegally ventured out into the the field during the wet stage killed out some of the crop where they had wallowed in mud after crippled birds.

Alfalfa in Tract 3 produced a fair to mediocre crop, but it was again utilized very heavily by Snow and Canada geese. Tracts 9-12 will require reseeding since most of the alfalfa appears to have been overutilized and killed, as was the case last year.

Tracts 5-6 were contoured, flooded, and a leaching process started during the period to clear up some very bad spots of alkali.

Tract 17, the fresh water impoundment west of Red Hill, produced an excllent crop of mixed wild millet and Sudangrass. The latter was rather scattered and produced well considering the frequency of irrigation. Up until the time the hunting season opened, a few thousand ducks utilized the area.

B. Receipts of Seed and Stock

None received or gathered during the period.

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IV ECONOMIC USE OF THE REFUGE

A. Grazing and Haying

No activities under this heading during the period.

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V PUBLIC RELATIONS

A. Recreational Uses

There are no recreational facilities on the refuge.

TRACTS 17 & 20 WERE opened to hunting. (100 Acres).

B. Refuge Visitors

On September 29th the Imperial Valley Depredations Committe toured the refuge units. The party first traveled to the State's Hazard Area where they were informed of the operations of the State. The roads were reportedly wet, as was the case last year, and no actual tour of the area was made.

All of Unit II and most of Unit I of the federal areas was covered by the group which included the following:

Name	Identification
R.F. MacDonald	USFWS Portland, Oregon
Harry Rubke	Cal. F&G Shooting Grounds Mgr.
J. Ward Casey	District State Assemblyman
Albert Farris	Cal. F&G Game Farm Mgr.
Hal Ferguson	I.V. Hunter
Carl B. Miller	" "
Bob Jefferson	" "
Otto Witcher	" "
Howard Loveland	" Farm Bureau
Dexter Loveland	" " "

A number of visitors interested in the farming program, wildlife conservation, etc. visited the refuge units throughout the period. During November, a group of advance students from the University of California spent two days here studying the birds and the habitat. On the 6th of December 63 county school teachers made a tour of Unit I.

Mr. Ross of the Los Angeles City College was here again with a group of amateur naturalists and students.

On December 31st Edwin Way Teale and Mrs. Teale toured Unit II and conversed with us at some length on the insect life available to gulls on irrigated fields, etc. Mr. Teale is a very prolific writer, and added several new birds to his bird list while he was here.

C. Official Visitors

Name	Date	Identification	Purpose
William Anderson	Numerous	Cal. F&G	Banding
Howard Sargeant	9/10/52	USFWS, Region 1	Inspection
Dr. Morley	9/10/52	USFWS, Washington	"
R.F. MacDonald	9/28/52	USFWS, Region 1	"
John B. Bennet	9/2/852	Office of Sec. Interior	"
Dr. Warren Bourne	11/23-24	USFWS, Washington	"

Name	Date	Identification	Purpose
C.A. Leichardt, A.W. Elder, C. Lostetter	12/29/52	USFWS, Region 1 " Los Angeles " Berkeley	Inspection " "
Fred Kreller	Numerous	" Los Angeles	Law Enf.

D. Refuge Participation

During the period, only one meeting of the local depredations committee was held. At this meeting the group continued to use the theme of "bigger bag limits and longer seasons". Farmers called for more dispersal of concentrations and joined hand-in-hand with the wishes of sportsmen.

On November 17th a meeting of the Colorado River-Great Basin Field Committee of The Pacific Southwest Federal Interagency Technical Committee was attended at the U.S. Salinity Laboratory at Riverside, California.

A number of local seminar meetings, which includes a gettogether of local federal and state agencies, were attended and the operations of the services discussed.

F. Violations

Very few apprehensions were made during the season since we directed all our efforts this year toward preventive law enforcement.

Two young hunters, Donald Woland and Donald Hall of Lemon Grove, California, landed a small plane in Unit I. They commented that hunting possibilities looked good from the air.

Most trouble with hunters was noted along the refuge boundary where some foolhardy gentlemen persisted in shooting into flocks of geese with small calibre rifles or venturing out into tracts to flush the feeding birds.

. . . . . .

During the period, only one employee was available for refuge law enforcement work. For the patrol of some 25 miles of refuge boundary it became quite apparent that more help will be needed under the same conditions. During late December, we had the aid of Agent Fred Kreller when the numbers of shooters and temptations were at a peak.

. . . . . .

Some hunters stood so close to the boundary lines that the food plots had 8 wide strip of ungrazed crops where the birds feared to venture. One individual used a boundary sign post for a scoreeard. Innumerable marks appeared under the captions of "misses" and "near misses". In place of the total score there was inscribed "10,000 geese missed today, December 28".

OTHER ITEMS

In late September *a* contract for dike work on the State's Ramer Lake unit on the Imperial Refuge, south of Calipatria, was awarded and work was in progress during the period.

. . . . . .

On September 17th Mr. Larry Rubke, manager of the State's local shooting grounds, told Lions Club members at Brawley that the Imperial Valley nets about $75,000 during duck hunting season. Statistics show that I.V. duck hunters spend about $20 a dry per hunter for equipment, lodging, etc. for the season.

Rubke said that " Thousands of acres *near* Salton Sea whioh have been planted to cereal grasses for duoks are being ravaged by geese. The *area* had been prepared Per the duoks so they wouldn't bother the farmers' orops, but the geese *are* flying in by the flocks and feeding on the grasses."

. . . . . .

In mid-September reports reached us that some 35,000 duoks on ponds near Sunset Beach were suffering from sickness. Most of the dead and dying birds were discovered on sloughs of the Lomita Gun Club. The foreman of the club was authorized to pump fresh water into the area, and reports have it that the sickness subsided after about 1500 ducks died.

. . . . . .

On the 26th of December State Game Warden James Reynolds announced through the local paper that, "Farmers worried about the possibility of orop destruction should eontact him as soon as possible." It was stated that he would furnish herding permits, lights, guns, etc. Reynolds estimated that ," as many as 300,000 sprig were in the Valley. Sprig are the duoks whioh cause the most damage."

In the October issue of "American Magazine", writer Don Eddy describes Imperial Valley as a place where "Californians have transformed perdition into Paradise."

. . . . . .

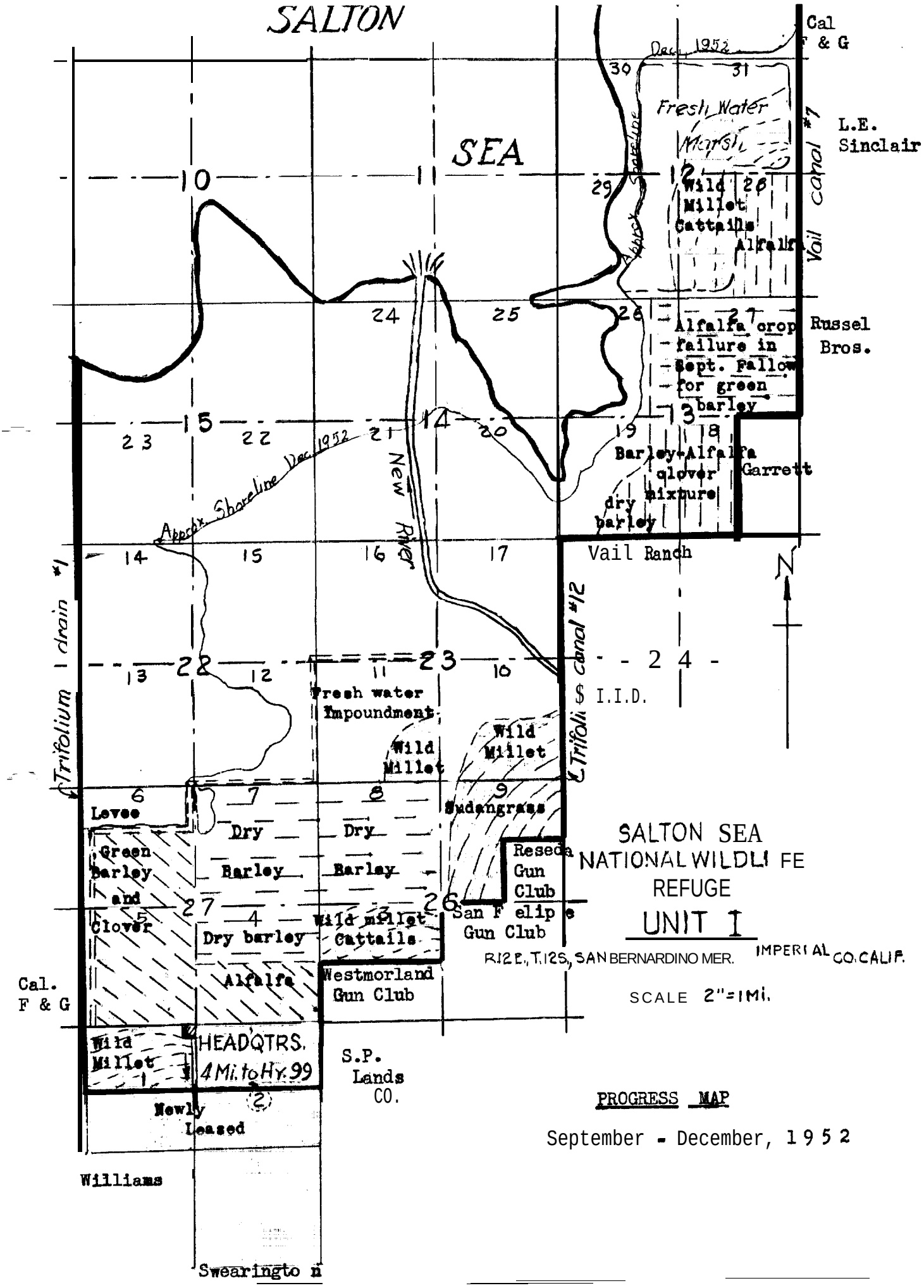
Several minor accidents took place during the hunting season. No less than six hunters suffered from cold and exposure due to unchartered plunges into Salton Sea. In December three youths hunting out on the sea east of Squeaky Springs nearly lost their lives when a boat capsized in rough waters. After nearly an hour in the icy lake, all three made it to shore minus their guns, boat, and other equipment.

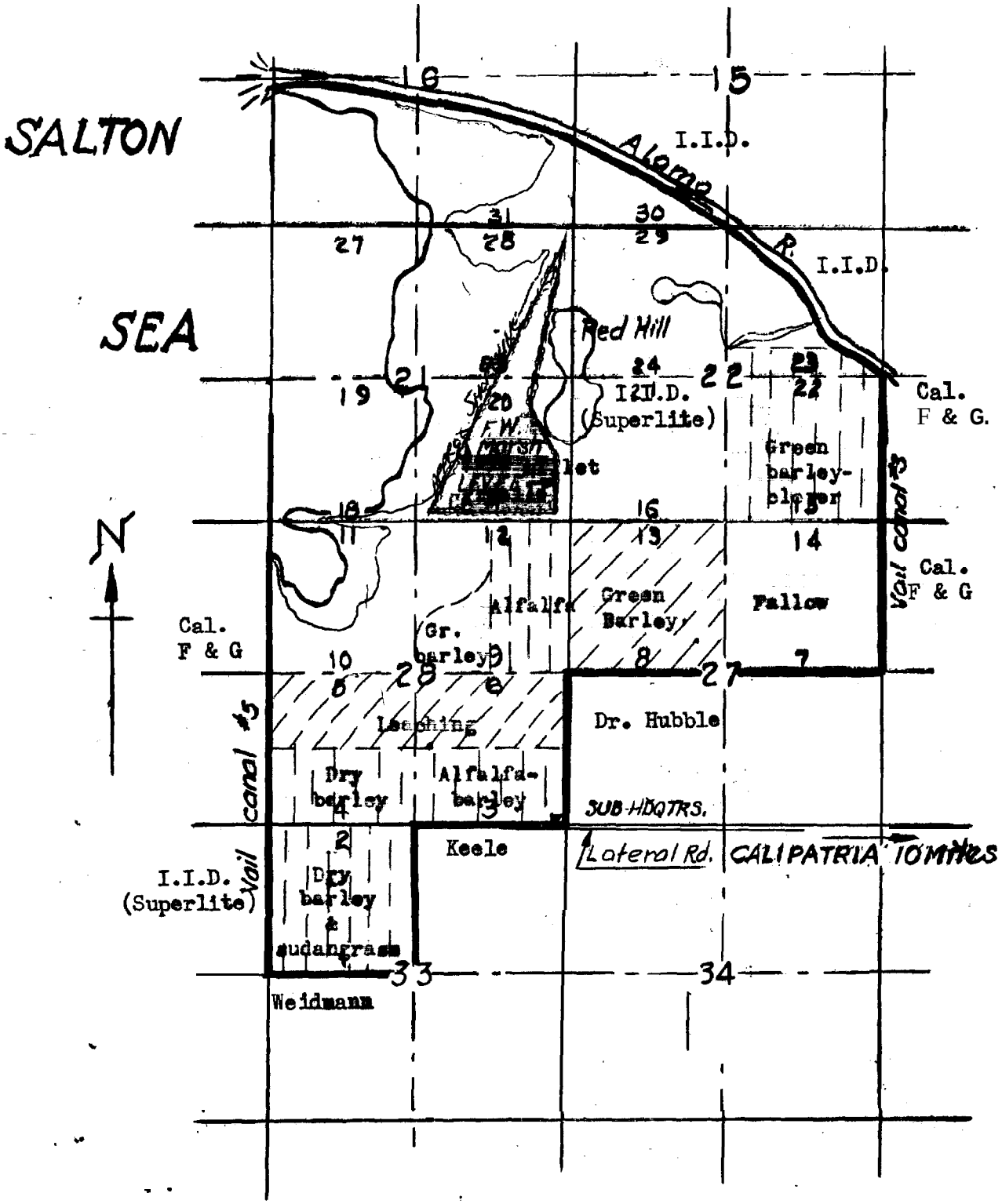
Respectfully submitted

Edward J. O'Neill
Refuge Manager

Approved: _____

_____


SALTON SEA
Cal F & G
Dec. 1952
Approx. Shoreline
Fresh Water Marsh
L.E. Sinclair
Vail canal #7
Wild Millet Cattails Alfalfa
Alfalfa crop failure in Sept. Fallow for green barley
Russel Bros.
Barley-Alfalfa clover dry mixture
dry barley
Garrett
Vail Ranch
Approx Shoreline Dec. 1952
New River
Trifolium 1 drain #1
Trifolium 5 canal #12
I.I.D.
Fresh water Impoundment
Wild Millet
Sudangrass
Levee
Green barley and clover
Dry Barley
Dry Barley
Wild millet Cattails
Dry barley
Alfalfa
Reseda Gun Club
San Felipe Gun Club
Westmorland Gun Club
Cal. F & G
Wild Millet
HEADQTRS.
4 Mi. to Hy. 99
Newly Leased
S.P. Lands CO.
Williams
Swearingto n
SALTON SEA NATIONAL WILDLIFE REFUGE
UNIT I
R12E., T.12S., SAN BERNARDINO MER.
IMPERIAL CO. CALIF.
SCALE 2"=1Mi.
PROGRESS MAP
September - December, 1952

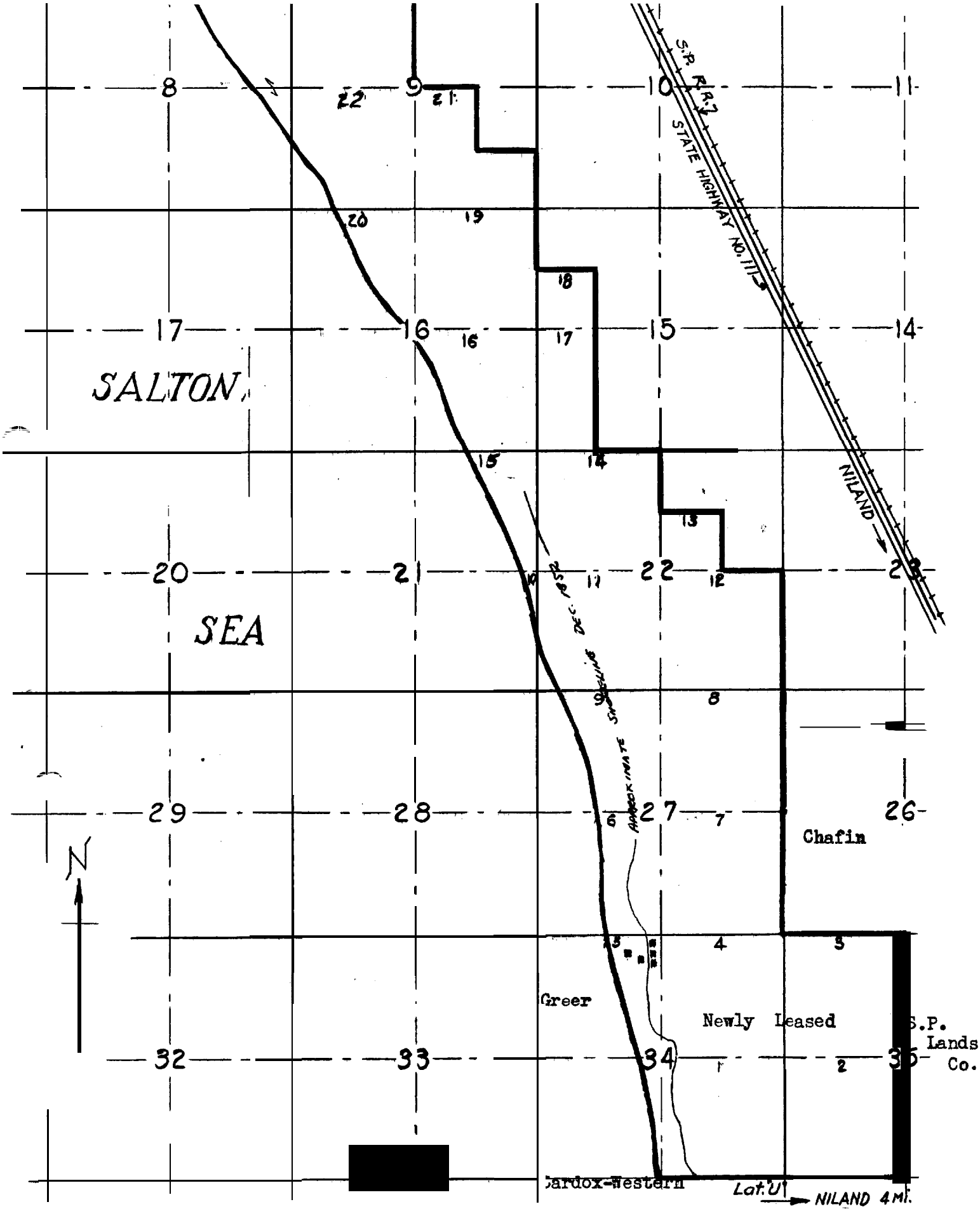


SALTON SEA NATIONAL WILDLIFE REFUGE

UNIT II

SCALE 2"=1 MI.

R.13 E., T. 11 S., SAN BERNARDINO MER. IMPERIAL CO. CALIF.



SALTON SEA NATIONAL WILDLIFE REFUGE

UNIT III

R.13E., T 10S., SAN BERNARDINO MER. IMPERIAL CO. CALIFORNIA. SCALE 2" = 1 MI.

PUBLIC USE - C.Y. _____

Please supply figures, or your best estimates for the following categories when applicable to your refuge:

A. Salton Sea _____ National Wildlife Refuge.

B. Estimated total use of all types 3000 visitor-days.

1. Hunting use (for those refuges having public or regulated hunting.)

Estimate visitor-days 500*

2. Fishing use. Estimate visitnr-days _____.

3. Miscellaneous use (lump such. uses as picnicking, swimming, sightseeing, birdwatching, as well as those on the area for business or official use, including economic uses such as farming or trapping.)

Estimate visitor-days 250*.

C. Remarks.

* State reported 216 hunters used the Red Hill Unit. Actually the area was overrun by hunters due to mismanagement and the complete absence of enforcement of regulations.

January 1, 1953
Date

Signed - - _____
Manager
Edward J. O'Neill

WATERFOWL

Refuge Salton Sea Months of September to December 31 19 52

(1) Species		(2) First Seen		(3) Peak Concentration		(4) Last Seen		(5) Young Produced		(6) Total
	Common Name	Number	Date	Number	Date	Number	Da	Broods Seen	Estimated Total	Estimated use days for Period
I.	Swans:									
	Whistling swan	3	11/30	3	11/30		/3			21
II.	Geese:									
	Canada goose	15	10/13	2020	12/31					80, 465
	Cackling goose	1	11/24	4	11/30	4	/3			42
	Brant									
	White-fronted goose	30	9/30	600	11/24					25,060
	Snow goose	3	10/1	9100	12/31					335,160
	Blue goose									
	Ross' goose	1	11/24	1	11/24		/24			7
III.	Ducks:									
	Mallard	3	9/8	2000	11/1					22,001
	Black duck									
	Gadwall	10	9/26	200	11/30					5,285
	Baldpate	250	9/19	38000	12/26					1,209,950
	Pintail	Previous	Period	9200	11/1					605,850
	Green-winged teal	Previous	Period	3500	11/8					132,860
	Blue-winged teal									
	Cinnamon teal	Previous	Period	4600	11/8					136,290
	Shoveller	Previous	Period	8000	12/26					327,305
	Wood duck									
	Redhead	10	10/11	50	11/8					910
	Ring-necked duck	1	12/15	1	12/15					7
	Canvas-back	20	11/1	40	11/15					518
	Scaup	3	9/19	300	11/15					8,771
	Golden-eye									
	Buffle-head	10	10/24	10	11/15					364
	Ruddy duck	Previous	Period	2000	12/6					86,765
	Fulvous tree duck	Previous	Period	230	9/26	00	10/24			5,600
IV.	Coot:	Previous	Period	2300	10/24					107,170
									TOTAL USE DAYS	3,090,261

3-1750
(July 1946)

(over)

Form NR-1

SUMMARIES

Total Production:

Geese _____

Ducks _____

Coots _____

Total waterfowl usage during period 3,090,261

Peak waterfowl numbers 56,150

Areas used by concentrations Fresh water areas in Units I and 11

Principal nesting areas this season _____

Reported by Edward J. O'Neill, Refuge Manager

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 Concentrations: 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 inthereporting 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 on an analysis of the rest of the form.

2338

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

MIGRATORY BIRDS
(other than waterfowl)

Refuge Salton Sea Months of September to December 1952

(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:										
Western Grebe	Previous	Period	250	November						
Eared Grebe	Previous	Period	20,000	11/24						
Great Blue Heron	Previous	Period	14	December						
American Egret	Previous	Period	200	December						
Brewsters Snowy Egret	Previous	Period	300	December						
White-faced Glossy Ibis	Previous	Period	2,500	December						
Wood Ibis	Previous	Period	3,000	September	7	10/9				
Green Heron	Previous	Period	10	Period						
Least Bittern	Previous	Period	10	Period						
Black-crowned Night Heron	Previous	Period	30	November						
Clapper Rail	Previous	Period	10	Period						
Sora Rail	Previous	Period	10	Period						
Gallinule	Previous	Period	50	Period						
White Pelican	Previous	Period	300	September	50	December				
Brown Pelican	1	October	1	October	1	October				
Cormorant	Previous	Period	100	October						
Sandhill Crane	5	12/18	5	December	5	December				
II. Shorebirds, Gulls and Terns:										
Forester's Tern	10	October	10	October						
Ring-billed Gull	Previous	Period								
Wilson's Snipe	5	December	5	December						
Black-necked Stilt	Previous	Period	150	September						
American Avocet	Previous	Period	200	September						
Western Sandpiper	Previous	Period	1,500	October						
Black-bellied Plover	Previous	Period	150	November						
Mountain Plover	250	10/26	300	December						
Least Sandpiper	Previous	Period	3,500	November						
Hudsonian Curlew	10	October	100	December						
Long-billed Curlew	1,000	September								
Long-billed Dowitcher	2,000	September	3,500	December						
Yellowlegs	1,100	November	1,100	November						

(over)

(1)	(2)	(3)		(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 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.

3-1826

WEEKLY WATERFOWL CENSUS

REFUGE Salton Sea — MONTHS OF Sept. 1 TO Dec. 31, 1952

Species — Common Name	Weeks of Reporting Period 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Swans:																		
Whistling															3			
Trumpeter																		
Geese:																		
Canada								15	30	60	100	750	1800	1800	1000	2000	1920	2020
Cackling													1	1	4			
Brant																		
White-fronted						30	210	150	150	300	500	520	600	600	200	120	100	100
Snow						40	140	200	300	600	500	3000	5500	5500	7000	7500	9100	8500
Blue																		
Other																		
Ducks:																		
Mallard		3	10			50	10		30	2000	200	140			50	10	10	
Black																		
Gadwall					10	5		300	10	80	50	60			200	30	10	
Baldpate				250	400	600	2000	3400	2200	10000	18000	22000			26000	38000	20000	30000
Pintail	5600	1800	3060	6080	8200	7100	4000	6000	8300	9200	5000	6010			4000	2700	3000	6500
Green-winged teal	10	10		10	390	380	3000	1300	1000	650	3500	2100			3000	1200	2200	230
Blue-winged teal																		
Cinnamon teal	10	40	200	1200	1100	500	1000	500	4000	3500	4600	2080			500	200	40	
Shoveller	10	5	10	60	200	1250	800	720	3060	4000	5000	7500			6000	6700	6300	8000
Wood																		
Redhead							10		20	50	10	20			10	10		
Ring-necked																	1	
Canvas-back										20	10	40			4			
Scaup				3	20	130	50	100	10	300	120	300			200	10	10	
Golden-eye								10	2	10		10			10		10	
Buffle-head																		
Ruddy	50	30	5	130	200	300	300	1500	1780	1500	300	1600			1300	2000	1400	
~~Ruddy~~ Fulveus Tree	60	50	80	100	230	100	10	70	100									
Unidentified				20		40												
Coot:	100	170	100	400	130	1500	2000	1200	2300	1900	1000	1400			610	600	1000	800
TOTALS	5842	2108	3465	8253	10880	12025	13530	15485	23302	34170	39690	47530			44091	41100	45081	56150

Reported by

Interior - Duplicating Section, Washington, D. C.

Form NR-1B

Reported by Edward J. O'Neill, Refuge Manager

3-1753
Form NR-3
(June 1945

BIG GAME

Refuge Salton Sea Calendar Year 1952

(1) Specie	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions		(7) Estimated Total Refuge Population		(8) Sex Ratio
Common Name	Cover types, total Acreage of Habitat	Number	Hunting	For Re-stocking	Sold	For Research	Predation	Disease	Winter Loss	Number	Source	At period of Greatest use	As of Dec. 31	
(There are no species of big game on the refuge.)														

Remarks:

Reported by Edward J. O'Neill, Refuge Manager

INSTRUCTIONS

Form NR-3 - BIG GAME

(1) SPECIES: Use correct common name; i.e., Mule deer, black-tailed deer, white-tailed deer. It is unnecessary to indicate sub-species such as northern or Louisiana white-tailed deer.

(2) DENSITY: 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 Serfes No. 7 should be used where possible. Figures submitted should be based on actual observations and count8 on representative sample areas. Survey method used and size of sample area or areas should be Indicated under Remarks.

(3) YOUNG PRODUCED: Estimated total number of young produced on refuge.

(4) REMCVALS: Indicate total number in each category removed during the year.

(5) LOSSES: On the basis of known records or reliable estimates indicate total losses in each category during the year.

(6) INTRODUCTIONS: Indicate the number and refuge or agency from which stock was secured.

(7) TOTAL REFUGE POPULATION: Give the estimated population of each species on the refuge at period of its greatest abundance and also as of Dec. 31.

(8) SEX RATIC: Indicate the percentage of males and females of each species as determined from field observations or through removals.

116008

Form NR-5 DISEASE 1616

Refuge [illegible] Year 194[illegible]

Botulism

Period of outbreak Mid-September-December 31st

Period of heaviest losses Late October-early November

Losses:

	Actual Count	Estimated
(a) Waterfowl	958	4 - 5,000
(b) Shorebirds	100	[illegible]
(c) Other		

Number Hospitalized	No. Recovered	% Recovered
(a) Waterfowl		25%
(b) Shorebirds		
(c) Other		

Areas affected (location and approximate acreage)
Shoreline of Salton Sea and all state and federal areas.

Water conditions (average depth of water in sickness areas, reflooding of exposed flats, etc.
Rising sea level, flooded ponds of wild millet and leach fields

Condition of vegetation and invertebrate life

Remarks

Lead Poisoning or other Disease

Kind of disease

Species affected

Number Affected Species	Actual Count	Estimated

Number Recovered

Number lost

Source of infection

Water conditions

Food conditions

Remarks

Form NR-6

FISH

1617

Refuge Salton Sea Year 1951

Species	Relative Abundance	Sport Fishing		Commercial Fishing		Restocking		Number removed for Restocking
		Man days Fishing	Number Taken	No. of Permits	Pounds Taken	Number Stocked	Area Stocked	
No fishing on the refuge--resources undeveloped								

REMARKS:

Submitted by Edward J. O'Neill, Refuge Manager

3-1757
Form NR-7
(April 1946)

PLANTINGS
(Marsh - Aquatic - Upland)

Refuge Salton Sea, California Year 1952

Species	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount & Nature of Propagules	gate of Plant-ing	Survival	Cause of Loss	Remarks
(None)								

TOTAL ACREAGE PLANTED:

Marsh and aquatic.....
Hedgerows, cover patches_____
Food strips, food patches_____
Forest plantings.....

3-1758
Form NR-8
(April 1946)

CULTIVATED CROPS

Refuge Malheur Lake Refuge, California Year 194[illegible] 52
Sept.-Dec.

Permittee (If farmed by refuge personnel, so indicate)	Permit No.	Unit or Location	Crops Grown	Avg. Yield per Acre	Permittee's Share		Government's Share or Return				Compensatory Services, or Cash Revenue
					Acres	Bu. Harvested	Harvested Acres	Harvested Bu.	Unharvested Acres	Unharvested Bu.	
			Alfalfa seed	300lbs.	One-half		160	50,280 lbs	160*		
			Dry barley	20 bu					430	4600	
		Unit I	Volun. barley						160		
			Green barley w/clover, vetch or alfalfa						360		
Refuge Personnel			Wild millet	50 lbs.					225	11,250	lbs.
			Wild millet-Sudangrass	50 lbs.					160	8,000	lbs.
			Cattails						90		
			Ryegrass						5		
			Alfalfa						320		
			Dry barley	20 bu					160	3200	
		Unit II	Green barley w/clover, alfalfa or vetch						320		
			Sudangrass	15 lbs					80	1200	
			Volun. barley						80		
			Wild millet-Sudan.	50 lbs.					60	3000	lbs
* 120 acres crop failure Tract 27			Cattails						20		

Summary of Crops Grown: Crop	Acreage	Permittee's Share Acres	Permittee's Share Pounds	Government's Share Harvested Acres	Government's Share Harvested Bu.	Government's Share Unharvested Acres	Government's Share Unharvested Bu.	Total Revenue $
Alfalfa seed	160	80	25,140	80	25,140			
Green forage	1605							
Dry grains	955							

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS

Cultivated Crops Report Form NR-8 should be prepared on a calendar-year basis for all crops harvested or utilized during the calendar year and submitted with the December 31 refuge report.

Permittee - List each permittee separately. If lands of the refuge are farmed by refuge personnel or hired labor, this should be indicated in the Permittee column.

Permit No. - List the number of the Special Use Permit issued to the individual .

Use or Location - The Unit No. or name specified in the Economic Use Plan should be listed in this column.

Crops Grown - A separate line of the form should be used for each crop grown by each permittee or by refuge personnel. This is important, since if each crop grown by each operator is not specifically enumerated, the report will be of no value for statistical purposes.

Average Yield per Acre - It is important that the average yield per acre of each crop grown by each operator should be shown.

Permittee's Share - Only the number. of acres harvested or utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. It is requested that all crops harvested be reduced to bushels wherever possible, or, as in the case with the harvesting of seed such as that of sweet clover, alfalfa, bromegrass, etc., the total harvested crop in pounds may be shown. Timothy, alfalfa, or other hay harvested by the permittee should be shown on Form NR-10 and should not be shown in the Permittee's Share column.

Government's Share or Return - Harvested - Show the number of bushels, harvested for the Government and the acreage from which this share is harvested, both for grain raised by refuge personnel and by permittees. Unharvested - show the exact number of acres of crops allowed to remain unharvested as food and cover for wildlife. An estimate of the number of bushels of grain that is available for the wildlife in such unharvested crops should be shown in the Bushels column.

Compensatory Services, or Cash Revenue - Show other services received by the Government in cooperative farming activities, the number of acres of food strips planted for wildlife, the amount of wildlife crops not otherwise reported that are planted by cooperators for the Service, or the cultivation of wildlife plantations. If the permit is on a fee basis, the total cash revenue received by the Service.

3-1570
NR-8a

REFUGE GRAIN REPORT

Refuge Salton Sea — Months of ___a_____ through December, 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	Total		Seed	Feed	Surplus
Mariout barley					742		742	400	X		
Hannchen barley	150		150			50	50	100		X	
Wild Millet								100	X		
India alfalfa	500		[illegible]		171			[illegible]	[illegible]		
Hubam clover					all				X		
Purple vetch		70	70		70		70	0			
Italian ryegrass		16	16		8		8	8			

(8) Indicate shipping or collection points Brawley or Westmorland, California

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

(10) Remarks

*See instructions on back.

16—61482-1

NR-8a

REFUGE GRAIN REPORT

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

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

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

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

(4) A total of columns 2 and 3.

(6) Column 4 less column 5.

(7) This is a proposed breakdown 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

3-1759
Form NR-9
(April 1946)

COLLECTIONS AND RECEIPTS OF PLANTING STOCK
(Seeds, rootstocks, trees, shrubs)

Refuge Salton Sea, California Year 194~~2~~3

Species	Collection				Receipts		Total Amounts on Hand	Amount Surplus
	Amount	Date or Period or Collection	Method	Unit Cost	Amount	Source		
	None this period or year							

3-1760
Form NR-10
(April 1946)

HAYING AND GRAZING

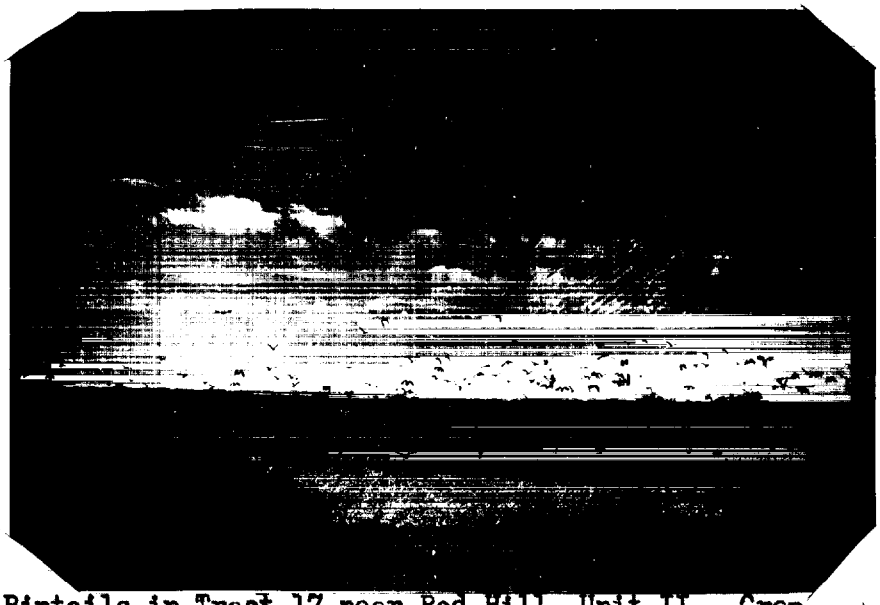
Refuge Salton Sea, California Year 1952

Permittee	Permit No	Unit or Location	Actual Acreage Utilized	Animal Use Months	Tons of Hay Harvested	Period of Use From - To	Rate	Total Income	Remarks
Arnolds Shields	Sal-23	Tr.3,9,12 Unit II	180	35.535 AUD's.		4/18-5/10/52	$.03 per hd. per day	$1066.05	

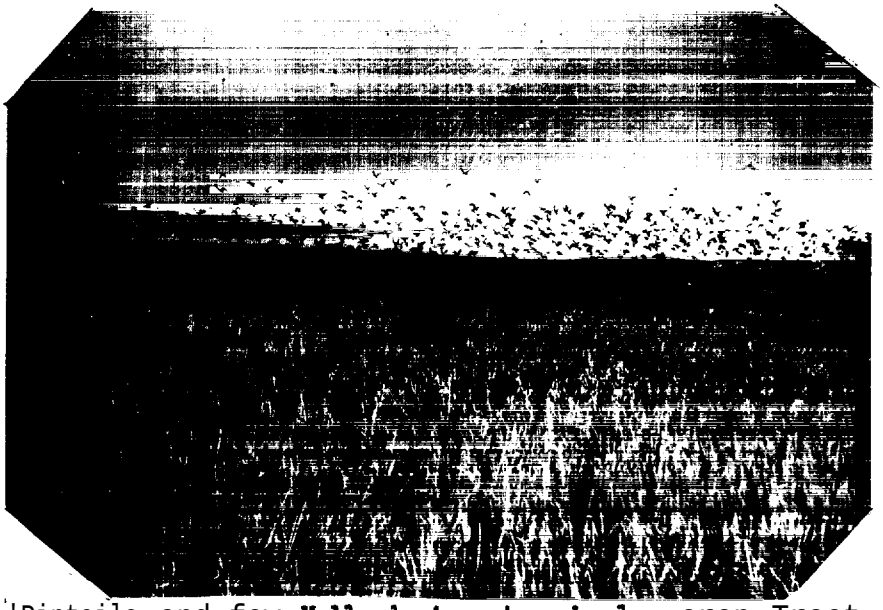
Totals:

Acreage grazed 180 Animal use months 35.535 A.U.D. Total income Grazing 1066.05

Acreage cut for hay ..... Tons of hay cut ..... Total income Haying .....

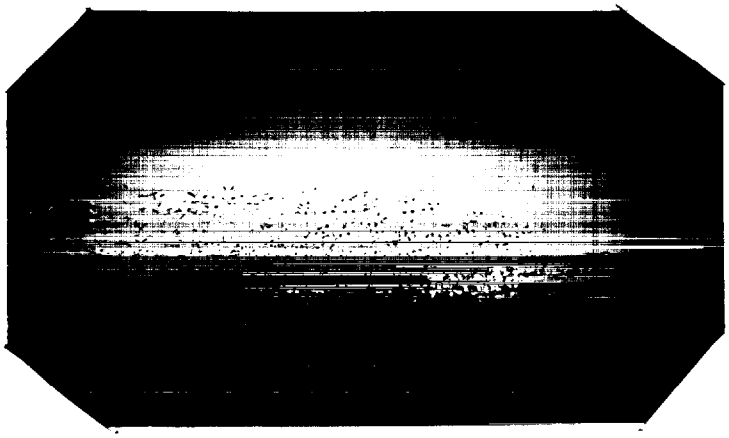


Pintails in Tract 17 near Red Hill, Unit II. Crop consists of W.millet, Sudangrass & cattails. Area was open to hunting during period. Sept.,1952.



'Pintails and few Mallards in mature barley crop Tract 4, unit II. Oct.,1952.

Refuge sudangrass crop, Tract 1 Unit II. (Obsidian or Pumice Hill in background--Wm.Lynch, Irrigator Sept.,1952)



Snow geese utilizing mature crop.' Oct.,1952