REFUGE COPY

SALTON SEA NATIONAL WILDLIFE REFUGE

&

WATERFOWL DEVELOPMENT AREAS

NARRATIVE REPORT

Sep-Dec. 1948

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UNITED STATES DEPARTMENT OF THE INTERIOR
FISH & WILDLIFE SERVICE
BRAWLEY, CALIFORNIA

Salton Sea National Wildlife Refuge
&
Waterfowl Develop ment Areas

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NARRATIVE REPORT

September, October, November, December, 1948

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United States Department of The Interior
Fish & Wildlife Service
Brawley, California

REGULAR PERSONNEL

Edward J. O'Neill....Refuge Manager
James H. Hall.....Foreman-Farm Operations
Will T. Wesley.....Refuge Maintenance Man
Clyde W. Stewart.....Tractor Operator
Alfred W. McFarland..Tractor Operator

TEMPORARY PERSONNEL

Lee Fairley.....Laborer
Robert Cash.....Carpenter
George A. McLean.....Carpenter
Ernest M. Puryear....Carpenter

Cover [illegible] Crew Leader)

NARRATIVE REPORT

1. GENERAL CONDITIONS

A. Weather Conditions

Rain, strong winds and some snow came to the general area during the period.

October 17th saw a steady light rain which lasted 26 hours and brought .96 inches precipitation, damaging date crops and causing much inconvenience to duck hunters stranded on country roads.

On December 17th snow closed the mountain highways and unprecidented rains fell over the neighboring desert country. Locally residents emerged from cool night temperatures to an overcast sky which gradually approached moderate downpour here and there. At Brawley showers were intermittent up to noon at which time .01 inch precipitation was measured. The gentle, generally beneficial shower continued on through the night finally letting up with a .97 inch rain; more than twice 1947's .49 inch fall. Farmers were not greatly inconvenienced except for a short delay in planting, but schools were closed for several "mud holidays."

Along the coast winds sent small craft warnings flying and tore 20 large purse seiners loose from their moorings at San Pedro and blew them into the main channel of Los Angeles harbor. Tree limbs and billboards fell before the gusts. As a result the mercury dropped to a chilly 33 degrees.

A sharp earthquake that rocked southern California late one Saturday caused several thousand dollars damage but no deaths. The temblor, centered in the Coachella desert near Indio, was felt from the Mexican border to Santa Maria, some 250 miles to the north. Palm Springs, Hollywood's winter playground, was hardest hit. Landslides in the hills above Palm Springs and Indio sent up dust clouds visible for many miles.

A few hunters were again "rained in" along the Salton Sea the last of the period by December showers which made travel adjacent to drains and canals hazardous or impossible.

Tabulations below represent local weather records as compiled by the El Centro Naval Air Station.

	TEMPERATURES		
MONTH	MAXIMUM	MINIMUM	PRECIPITATION
September	118°	60°	T. (inches)
October	104°	51°	1.17 "
November	87°	36°	0.00
December	74°	32.5°	0.21
TOTAL			1.38

B. Water Conditions

There has been no change in the course of the diverted New River which has been carrying large deposits of silt into Unit I since last April 16th.

The plan on the part of the Imperial Irrigation District drainage engineers to cross Tracts 19 and 24 has been apparently dropped. A road was bulldozed along the old river channel to it's mouth and engineers now favor a proposal to redredge the old channel which could be made to nurse the muddy drain waters for a long time to come. All of the New River waters flow through the area now, the old channel being dry.

A cut effected in the west end of M-line dike in Section 22 during December caused a noticeable drop in the body of water standing on the development area to the north of headquarters and is tending at this time to bring silt to the lower land northwest of M-line dike.

At first, newly deposited silt created a veritable quagmire where it came to rest in quiet, deep, water but as the bottom built up, the load movement over it formed a very hard crust of coarser sand. Personnel patrolled and made a number of apprehensions along the north boundary by crossing afoot, this otherwise treacherous soft-bottomed little stream.

Salton Sea levels did not change substantially throughout the period. During high winds the east shoreline varied one-half mile in places of flat terrain. As the ground surface dried, a thin crust of salt formed killing all intolerant plant forms which had become established in moist areas during early fall.

C. Fires

There were no fires detrimental to property or wildlife witnessed on the area throughout the period. The dense growth of cattail in Tract 10 was completely burned off by the Irrigation District weed burner, and during December almost a section of cattail and Reedgrass just west of Tract 14 was burned off by hunters, destroying one of the Redwings favorite roosting places and very nearly costing the lives of two drunken hunters. The fire burned uncontrolled for 18 hours giving rise to a spectacular huge black column of smoke. Airborne pieces of burned cattail dropped beyond the town of Westmorland during the night.

II. WILDLIFE

A. MIGRATORY BIRDS

1. Population And Behavior

Twice during October Snow geese were heard high overhead late at night moving in a north-westerly direction. Each time we found an increase in the goose population on the area. It appears possible that at least some of the Snows enter the valley south-east of here, perhaps from the lower Colorado River area.

Snow geese were first seen on October 3rd. The following week 11 appeared on the area. By November 2nd some 620 were present. Early December saw 7,840 and during the month a high count of 8,200 was made.

The first Canada geese appeared October 9th when 4 were observed. On November 27th a count of 200 was made representing the peak in numbers for the period.

Whitefronted geese were on the area to the extent of 38 in early October. December 12th a period peak of 340 individuals was recorded.

No Cackling geese were observed in Imperial Valley this winter to the writers knowledge.

The low population figures of the previous period were gradually overcome as migrants moved into Imperial Valley. Counts and estimates herein continue to represent the development area only, since it has been impossible to cover the old Salton Sea Refuge holdings without a boat. Most of the information of the Salton Sea proper comes to use from hunters and fishermen or bird enthusiasts.

Mallards showed up in greater numbers this fall than over the same period of a year ago. Last season they were somewhat of a rarity after the first group of 8 appeared in September. In contrast, this year the area suited the greenheads as the opening days of the period saw 300 here. As weeks went by the population figures dropped gradually to an estimated 10 the last of November. There was a marked flare-up in numbers the first week of December when about 400 moved in. A definite taper again was taking place the last of the period as they went down in numbers. The species was somewhat of a rarity in the hunter's bag, ranking 5th of 8 species. Food preferences are believed to run high in alkali bulrush, however we observed small groups of them time and time again in the barley and milo fields with Snow geese. Natives hereabouts claim the Mallard was once the main species hunted in the valley.

Gadwalls failed to stop over in the high numbers they did last year. The first records didnot occur until mid-October. There were always a few to be found but in the main they were uncommon. In the hunters bag they rated 7th place.

Baldpates which started arriving during the previous period were here to the extent of an estimated 200 the first part of September. There were fluctuations but in general they decreased steadily until mid-October, when 2,000 stopped over for a few days. Early November saw very few but they gradually built up in numbers from the nucleus of 70 to 10,000 in December. First courtship flight of the season was observed December 18th after which they were rather common. The hunters take found the species in 6th place when averaged with all ducks checked.

Pintails were almost twice as numerous this year following closely the fluctuation pattern of one year ago. About 5,000 were present the opening days of the period. They held a rather stable population figure, but during the third week of December amidst light showers we estimated 78,000 on the development areas, Unit I. The species held 4th place in the bag limit.

Green-winged Teal were more than twice as numerous this year. The population trend was upward until the last days of October. A decline occured in late October, until the last days of the season when the species jumped to an estimated 3,900 individuals. About 6,700 represented peak numbers occuring here in December. As the period drew to a close the population dwindled rapidly, perhaps due to a shifting to more favorable areas. The tiny speedsters seemed plentiful on the marsh and their tender hides represented 1st place in the take figures during the first half of the season.

The Cinnamon Teal population rose higher in general than during the September-October period of last year. It is questionable that our figures on the species are even representative. They refuse to gather in sizeable rafts, prefering canals, drains or the dense cover of Reedgrass and Jack-willows along the river. A group of more than a dozen is unusual except in late summer months. Highest estimates came in early November with steady weekly decline thereafter until we were almost counting individuals the last days of the period. The species ranked about 3rd in the nimrod's bag the first half of the season.

Shovellers, commonly refered to as "Los Angeles Mallards," delighted many a "firing line" hunter down for a days shoot. Unlike the trend of one year ago the spoonie showed up early with fair representation and made a gradual increase until the peak of 5,000 was reached on the development area. Last years peak was an estimated 7,000. After the smoke cleared, the hunters kill records placed the species in 2nd place.

Redheads, at least on the development area, didnot return until November when 20 put in an appearance. Off and on we saw small groups but they were never numerous. A few reached hunters bags along the sea to the north where the divers could nearly always be found. Ditches and canals terminating in the deep water proved attractive places. A few Redhead and Canvasback stomachs were observed and the main item was common barnacles (Balanus sp.), which seem to thrive in the salty waters of the Salton Sea.

Canvasbacks and Scaup-ducks both followed the population trend of the Redheads, neither becoming abundant at any time.

The Ruddy-duck population on the development area was considerably lower this year. Many hundreds of Ruddy-ducks use the sea proper in which numbers we have no dependable reports and are unable to cover the area. During January there was found an estimated 200 Ruddy-duck carcuses here and there along dikes and trails. There was no apparent clue regarding the cause for this loss. Every carcus found was a juvenile bird. Almost daily observations failed to disclose any apparent sickness on the area.

Fulvous Tree Ducks put in a surprise reappearance the 9th of October when 200 were seen on the area. This was the last record for the season.

Coots at first followed the previous year's pattern closely, but during early November they dropped abrubtly with a late build-up that month which brought them up to a period high of 4,000, a slight edge over last years estimates. As in former years a great number were killed by hunters and left to lay. In the bag we found them lowest of all on the basis of abundance here. A few gallinules were shot and left to lay by hunters who mistook the species for "mud hens."

Bird Banding

The banding project was continued until several hundred ducks were banded, despite the fact that inexperienced personnel and other duties detracted greatly from the project. No returns have been submitted to date.

Hunting

During October a total of 320 hunters were contacted. On opening day 30 individuals brought in 120 ducks, or 4 per person. These same hunters reported a loss of 200 birds in dense growths of Cattail, Tamarix and Reedgrass. This years figures combined with notes of last years loss showed an average of 7.2 birds lost per hunter checked. Best hunting chances for the unattached was between the New River and the Alamo River.

Some 96 gunners bagged 107 Snow geese and lost an additional 14 in inaccessible areas or within the refuge boundary.

Tabulated below is age and sex data as obtained by checking 363 birds in the hunter's bag.

Duck Age And Sex Ratio Percentages
(Compiled From Hunter's Take)

Salton Sea Refuge Area

October, 1948

Species	Males			Females			Sex Ratio Percentages
	AD	JU	Totals	AD	JU	Totals	
Mallard	4	1	5	15	6	21	19.23 : 80.77
Gadwall	1	4	5	15	0	15	25.00 : 75.00
Baldpate	0	9	9	9	0	1	10.00 : 90.00
Pintail	0	16	16	22	4	26	38.09 : 61.90
Green-winged Teal	57	8	65	29	12	41	61.32 : 38.68
Cinnamon Teal	28	8	36	16	12	28	56.30 : 43.70
Spoonbill Shoveler	17	24	45	16	38	54	45.43 : 54.57
Totals	107	70	181	113	73	186	

2. Marsh And Water Birds

During September we saw less and less of the familiar Wood Ibises in preirrigated fields. A few of the birds that roosted nightly in Tract 15 of Unit I fell prey to raccoons. The last record of this species was October 13 when a flight group of 15 were seen in crane-like formation south-easterly across the valley.

Great Blue Herons and Egrets remained in fair numbers throughout the summer. A few glossy Ibis remained but the usual large flocks which winter here were absent.

In October we lost all trace of the gallinules and at first were lead to believe they were wintering south of here. During November a few could be found or heard along the tule marsh created by flood waters.

American Pelicans fluctuated but little on the developement area, there being 140 in mid-September. In November the population dropped as of one year ago, to a low of 15. There apears to be a rather common movement between the Salton Sea, the Colorado River, and Lake Henshaw during the winter months. The wintering group using the area consisted of about 25% juvenile birds.

3. Shorebirds, Gulls And Terns

Black-necked Stilts remained until early October then deserted the area completely. A few small groups of Avocets replaced the Stilts.

Long-billed Dowitchers spent the fall and early winter here in fair numbers, as did the Lesser Yellowlegs, Killdeers, Wilson's Snips and Sandpipers.

The unpredictable Long-billed Curlew was absent this year until after mid-December. Any freshly irrigated field is the species feeding grounds and they scatter widely over the valley.

The first Wilson Snipe arrived during November, and inhabited the "marshy" fringes of Unit I where Barmuda grass was partly submerged.

4. Food And Cover

The development activities and crops produced, coupled with the protection offered on the area, are paying greater dividends each year for both local and migrant wildlife species.

Early in September, Pintails, which had been steadily arriving since early August of the previous period, cleaned up the 160 acres of mature barley in Tracts 2 and 4. The field had the appearance of having been combine harvested, due to the manner in which the grain heads were pulled off of the standing stems. These two fields were completely utilized in one week by an estimated 6,000 Pintails using

the area at the time. The following weeks saw varying amounts of damage by pintails, the same Pintails that insist, each fall upon puddling Valley soils that are being irrigated preparatory to planting. The puddling effect cannot be overlooked, since it renders the soils impossible to till until sufficiently dry to support equipment. As the heavy, hard soils dry up, they crack, often to a depth of two feet, leaving a pattern suggestive of a huge jig-saw puzzle. When the lands are finally worked with equipment, provided the season isnot too late, large rock-like clods are the product everywhere the ducks had paused to strain grit and food from adobe soils. On the refuge, planting of Tract 8 in Unit I was abandoned the first week of December due to persistent puddling by Pintails.

One September 29th we started supplimentary feeding by scattering sacked barley in the fields and along the patrol roads. This resulted in good concentrations. One 40-acre field was flooded by lands to provide puddling ground. The success of this effort attracted but a small percentage of ducks and on the basis of damage to soils and cost of water, we wouldnot recomend the practice. By October 7th preirrigated farmlands which were harrassed most by early migrants, were nearly dry. The entire valley became a moving mass of working tractors, and farm equipment rolled both day and night as planting progressed. Pintails retreated from the farmed sections and complaints from farmers ceased. A total of 210 bushels of supplimentary barley had been fed to early migrants before damage complaints stopped, and a 40-acre field had been flood-irrigated twice.

Through December when marauding ducks were plying the surrounding green fields, supplemental feeding was again undertaken, this time a total of 1,266 bushels were fed. During October the last barley field in Tracts 18 and 19 of Unit I was discovered by ducks and geese. So neat was the "harvest" by White fronts, Snow geese, Mallards, and Green-winged Teal that one could not tell it had been utilized without close inspection.

Late in November dry barley was scattered in the Tract 4 milo field for the purpose of attracting ducks to the light sucker-crop of grain which had developed after 18,000 to 20,000 Blackbirds had spent the summer months there "milking" the heads of grain.

The attempt to encourage waterfowl to take to the remaining milo was gratifying. After the second load of barley was dumped, Snow geese moved in and cleaned off a landing strip of all trace of stalks. In so doing, they discovered the green sucker-crop of milo and for the next two months both ducks and geese covered the entire acreage, stripping the light sucker-crop of sorghum grain and seeking out green tender stems which were readily utilized by Snow geese.

The Snow and Whitefronted geese turned to green tender cattail growth in October, and weekly estimates of the acreage cut down were made. At least 150 acres of tule stems lay strewn on the development area alone, where the greatest percentage of Baldpates, Green-winged Teal and Pintail spent considerable time feeding with the geese. It is not known just how much of the cattail stems are taken by ducks, but they definitly are attracted to the areas while Snows and Whitefronts, to a lesser extent, are cutting. After the fields of wild millet or watergrass were mature, ducks appeared to take but a small amount of the crop as long as the green cattails and alkali Bulrush were available.

Late December and early January frost killed most of the cattails on the development area and as a result the Snow geese moved to the river deltas where the tender growths of Scirpus and cattail had survived frost. Whitefronted geese remained on the area to utilize the green barley crop.

Complaints of depredations were widly spotted over Imperial Valley, perhaps due to the fact that farmers who have lived in the country for many years are aware of the birds and occasional damages encountered in alfalfa crops. For almost two years we have heard complaints from precisely the same individuals. Before and after hunting season complaints are rather common - so are parties of night hunters out to "protect" crops. Service permit issuance for killing has caused no end of excitement on the part of the unattached hunters and the problem of overcoming this practice may require years of enforcement and public relations work. About 8 days were spent in Imperial Valley on depredations work by Messrs Horn and Lostetter.

Approximately ~~70~~ 100 acres of lettuce was planted in Tracts 5 and 8, Unit I, to provide green feed for ducks. The lack of adequate equipment resulted in too late planting. This, coupled with cold inclement weather, resulted in a rather poor crop until after December, In addition to supplying green feed which could be utilized many times, lettuce is excellent for leaching alkali minerals from saline soils.

Before sea planes from coastal waters visited the Salton Sea during wartime manuevers, barnacles (Balanus sp.) were unknown here. Now the Salton Sea shorelines and fringe vegetation is lined and coated with the crustaceous organisms. Fishermen and hunters are plagued by sharp shells against nets and boats in shallow areas. On the beneficial side of the ledger this appears to be developing into an item of food for diving ducks. Canvasbacks, Redheads, Scaup and Ruddys concentrate where tail ditches meet the salt waters of the sea and barnacles are abundant. Stomachs examined strongly indicate that the barnacle is of no small importance in winter.

5. Diseases

No known disease among birds in the area.

B. Upland Game Birds

1. Population And Behavior

The quail take by hunters in surrounding areas was shocking. Considering the great amount of pressure and the influx of hunters during dove and waterfowl seasons, it is truly remarkable that the species survives anywhere but in the surrounding desert hills.

Pheasants on the area varied but little in numbers, but in surrounding areas where hunters persued them they were all but el iminated.

2. Food And Cover

No change over previous period.

The only suitable habitat for pheasants in the entire valley would appear to be the areas now under the jurisdiction of the Service and the State wildlife organizations.

C. Big Game Animals

No big game animals on the area

D. Fur Animals, Predators, Rodents And Other Animals

The status of animals under this heading remained about the same as of previous report.

Muskrats annually move into the refuge contoured lands after wild millet and cattails become rank in growth. The small holes or runways through the contours have inconvenienced operations only to a slight degree in the past. When the lands are dried each spring, muskrats return to the irrigation canals and drains adjacent to the area. Mortality runs high at times of intensive ditch burning by the Irrigation District. The practice of preceeding the burner with a fuel oil sprayer leaves the canals and drains laden with oil. Coots, grebes and gallinules have all been observed dead, in addition to muskrats.

Each canal and drain is burned regularily summer and winter. Along the New River where the dense growths of bulrush (Scirpus sp.) have become established, the small fur-bearers repeatedly cut down all stems during fall and winter months.

During December Mr. George O'Shay from Holtville, California trapped muskrats adjacent to the area.

Along the lower reaches of one drainage ditch 38 muskrats were taken in a quarter-mile distance. In dense growths of cattails the area yielded 3.6 rats per acre.

A total of 159 rats were sexed. There were 82 males and 77 females. Only 10 kits were taken.

E. Fish

Fishing along the boundary of Unit I where the desilted New River waters are clear was to our knowledge the most popular fishing place in Imperial Valley, same for the Colorado River.

Nightly, two to eight automobiles could be found parked along the narrow Trifolium No. 1 drain ditch dike. Catfish, Bass, and Carp delighted many a fisherman and catches were fair to good.

In mid-October Salton Sea mullet started their annual run up the Alamo River and a few open drainage ditches. Spawning to our knowledge never has actually taken place in the muddy stream and the headwaters are impossible for the fish to reach with dams and obstructions along the way to block upstream passage. Still like some species of trout they leave the briny waters of the Salton Sea and enter the muddy streams.

Fishermen take advantage of the "run" and many hundreds of the vegetarian fish are snagged with hooks, taken by dip nets or captured by hands and gaff in shallow water. The limit is six and usually fishing is good.

The "run" appeared over by early November after which mullet reportedly go back to the open waters of Salton Sea. On December 15th commercial fishermen, active here for over 35 years went out in quest of the mullet. One fisherman sold 25 tons through December. Some years the catch is poor, other years are good. The best record is 1918 when a total of 91,000 pounds were taken by commercial fishermen with thousand foot nets.

In recent years fishermen have found a ready market for Salton Sea mullet which when canned in coast markets appears on grocery shelves as "Silver Mullet." It is reported that mullet when put up in oil, compares favorably with tuna and salmon.

III. REFUGE DEVELOPEMENTS AND MAINTENANCE

A. Physical Developements

During the period erection work on the office building progressed to the point of complete electrical wiring throughout, installation of cooler ducts and completion of the interior walls with insolation and celotex- masonite finish. In the meantime the office work continues to be handled in the hot filthy, noisy spare room of Westmorland's Post Office building.

Along the entrance road a metal-constructed gate was installed to eliminate passage through the area at such times as personnel were not on active duty.

Some 30 large date palm trees were moved two miles to headquarters from an old farm site which was being cleared. In addition a number of desertthorn shrubs (Lycium) were transplanted at headquarters for hedge purposes.

Around the office building the land was leveled, graded and several loads of good top soil hauled in for a lawn.

Two miles of patrol and entrance road was graded and floated to afford a presentable road for visitors and refuge patrol.

Some six miles of boundary line was posted with refuge signs.

B. Cultivated Crops

The loaned HD-7 Allis Chalmers tractor from Region 2 has helped substantially in the progress of the farming of the development area.

Service tractors assigned to the Salton Sea operated more than 700 hours in preparing and planting the food plot areas. Despite the limited personnel and funds, there was considerable more acreage prepared and farmed than at any previous time. (See progress map).

The burseem clover crop planted in early October started out as only a fair crop. A soaking rain which occured just after irrigation of the crop seemed to kill out the young tender growth.

Early frosts killed most of the lettuce planted and Snow geese kept the remainder of the crop clipped short throughout the period.

C. Collections

During November a carload of barley was received from Tule Lake Refuge for use in supplementary feeding of waterfowl and seeding the food plots.

IV. PUBLIC RELATIONS

A. Recreational Uses

No recreation facilities in existance at present.

B. Visitors

Some 30 bird enthusiasts, sportsmen and interested individuals visited and toured the area during the period.

C. Official Visitors

Name	Date(s)	Organization	Purpose
Shelton	9/10-11	Imperial Irrigation Dist.	Spray Cattails
John Brownell	9/10-11	" " "	" "
E. E. Horn	9/16	State Fish & Game	Tour
A. W. Elder	9/29-12/12	Service	"
C. Leichhardt	9/29	"	"
K. F. MacDonald	10/5	"	Inspection
Wm. Yeager	10/15-11/15	"	Tour
Laurance Rubke	11/10 (etc)	State Fish & Game	Birdbanding
C. Lostetter	12/16	Service	Tour
J. Reynolds	12/12 (etc)	State Fish & Game	Law Enforcement

D. Violations

The crocodile tears and sweat shed over the same period a year ago as trespass after trespass took place, were replaced this season with a few Form 3-300's.

When the end of December rolled around 19 refuge cases were turned over to the Game Management Agent and a dozen other cases, made along the boundary, on early and late shooting, unplugge d guns, etc represents our participation with the California State wardens working the vicinity.

XXXXXXXXXXXXXX

Date submitted ..... December 31, 1949

Edward J. O'Neill
Refuge Manager

Approved: _____

_____

WATERFOWL

Refuge [redacted] Months of [redacted] to [redacted] 194[redacted]

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

3-1750
(July 1946)

(over)

Form NR-1

SUMMARIES

Total Production:

Geese_____

Ducks_____

Coots_____

Total waterfowl usage during period [redacted]

Peak waterfowl numbers [redacted]

Areas used by concentrations [redacted]

Principal nesting areas this season_____

Reported by [redacted]

INSTRUCTIONS

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

(2) First Seen: The first refuge record for the species during the season concerned in the reporting period, and the number seen. This column does not apply to resident species.

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

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

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

(6) Total: Estimated total number of the species using the refuge during the period. This figure may or may not be more than that used for peak concentrations, depending upon the nature of the migrational movement.

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

2338

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

1613

Refuge Salton Sea Refuge Months of September to December, 194 8

(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.
Pheasant	previous reports					none			100	
Quail	" "								200	

3-1753
Form NR-3
(June 1945)

BIG GAME

Refuge Salton Sea Refuge Calendar Year 1948

(1) Species	(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	
		No Big Game Animals On Area.												

Remarks:

Reported by _____

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 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 total number of young produced on refuge.

(4) REMOVALS: 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 <u>each</u> <u>species</u> on the refuge at period of its greatest abundance and also as of Dec. 31.

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

116008

3-1755
Form NR-5
60701

DISEASE

Refuge Salton Sea Refuge & Development Area Year 1940

Botulism

Period of outbreak

Period of heaviest losses

Losses:

	Actual Count	Estimated
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

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

Areas affected (location and approximate acreage)

Water conditions (average depth of water in sickness areas, reflooding of exposed flats, etc.

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

3-1756
Form NR-6
(April 1946)

FISH

Refuge Salton Sea Nat'l Wildlife Refuge Year 1948

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 area - resource undeveloped.						

REMARKS:

3-1757
Form NR-7
(April 1946)

PLANTINGS
(Marsh - Aquatic - Upland)

Refuge Salton Sea Refuge & Development Area Year 1948

Species	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount & Nature of Propagules	Date of Planting	Survival	Cause of Loss	Remarks
Barley (Hensbum)	Unit I	1 bu. per acre	285 acres		Oct. to Dec.	good		
" "	" "	2 bu. per acre	40 acres		Dec.	good		
[illegible]		[illegible]	30 [illegible]		OCT.	POOR.	climatic	
[illegible]	"	8 lbs per Acre	100 [illegible]		Nov.	FAIR	"	

TOTAL ACREAGE PLANTED:

Marsh and aquatic.....
Hedgerows, cover patches.....
Food strips, food patches 325 acres 475
Forest plantings.....

3-1570
NR-8a

REFUGE GRAIN REPORT

Refuge Salton Sea Refuge & Development Area Months of September thru December 1948.

(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 USE		
				TRANS-FERRED	SEEDED	FED	TOTAL		SEED	FEED	SURP.
Barley	1600	153½	313½	-	425	1266 lbs	1691	1143	800	643	
Milo maize	10	-	10	-	-	-	-				
Bursoem	2	-	2	-	-	-	-				
Wild millet	2400	-	2400	-	-	-	-				

(8) Indicate shipping or collection points Brawley, California

(9) Grain is stored at Property of Mr. James H. Hall, Westmorland, California

(10) Remarks

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 lbs., Corn (ear)--70 lbs., Wheat--60 lbs., Barley--50 lbs., Rye--55 lbs., Oats--30 lbs., Soy Beans--60 lbs., Millet--50 lbs., Cowpeas--60 lbs., and Mixed--50 lbs. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

(1) List each type of grain separately: Corn, wheat, proso millet, etc. 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.

(8) Nearest railroad station for shipping and receiving.

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

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

3-1759
Form NR-9
(April 1946)

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

Refuge Salton Sea Refuge & Developement Area Year 1948

Species	Collections				Receipts		Total Amounts on Hand	Amount Surplus
	Amount	Date or Period or Collection	Method	Unit Cost	Amount	Source		
		- NONE -						

3-1 760
Form NR-10
(April 1946)

HAYING AND GRAZING

Refuge Salton Sea Nat'l Wildlife Refuge Year 1948

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
			No Economic Use or Haying during year.						

Totals:

Acreage grazed..... Animal use months..... Total income Grazing.....

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

ERRATA SHEET — NARRATIVE REPORTS

(1) PROGRESS MAP ——— AUG. 1950 — SHOWS 400 AC. MILO MILLET SHOULD BE ~~400~~ 600 AC.