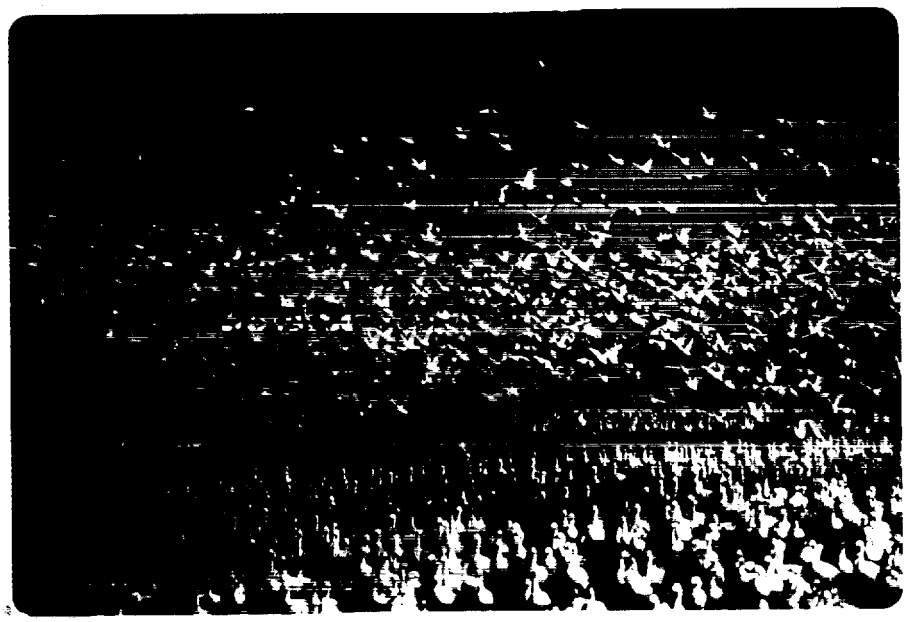
SALTON SEA NATIONAL WILDLIFE REFUGE

NARRATIVE REPORT

JANUARY - DECEMBER 1965

1965



U. S. FISH AND WILDLIFE SERVICE

BUREAU OF SPORT FISHERIES AND WILDLIFE

CALIPATRIA, CALIFORNIA

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Department of the Interior

U. S. Fish and Wildlife Service

Bureau of Sport Fisheries and Wildlife

Calipatria, California

REFUGE PERSONNEL

* * *

Robert R. Prather	Refuge Manager
Samuel E. Henson Transferred to Malhuer JCCC May 9 - returned to Salton Sea Dec.5.	Foreman I
José Barros	Tractor Operator
Raymond B. Ybarra	Tractor Operator
Michael J. Stewart Resigned April 9 to accept position at Delta N. W. R.	Irrigator
Lawrence L. Laisure	Irrigator
Fred A. Bruce April 13 - Dec. 17	Maintenanceman I
Nathaniel Carrothers Sept. 7 - Dec. 31	Irrigator
Nestor R. Gonzales Aug. 31 - Nov. 5 Dec. 20 - 31	Maintenanceman I
E. Jeanette Stewart Resigned April 9 to accept position at Delta N. W. R.	Clerk (part-time)
Marilyn Gorman Appointed April 27	Clerk (part-time)

SALTON SEA NATIONAL WILDLIFE REFUGE

NARRATIVE REPORT

January - December 1965

I. GENERAL

A. Weather Conditions

The following weather data was provided by the Imperial Irrigation District, Imperial, California:

MONTH	TEMPERATURES Max. 1965	Max. Ave.	Min. 1965	Min. Ave.	PRECIPITATION 1965	50 yr. Ave.
January	77	80	30	29	0.01	0.40
February	80	84	32	33	0.38	0.36
March	91	91	36	38	none	0.19
April	101	99	44	45	0.72	0.12
May	105	105	52	51	none	0.02
June	105	113	57	57	none	none
July	113	114	69	66	none	0.07
August	111	113	70	66	none	0.40
September	110	110	58	58	none	0.40
October	105	102	53	47	none	0.23
November	90	89	41	36	0.24	0.14
December	80	81	36	31	1.89	0.57
Total Precipitation					3.24	2.90

Although extreme temperatures ware near normal for the year -the lone;, hot summer was broken by short periods of relatively "cool" temperatures in the 90's. We have no measure of humidity but it seamed somewhat Power than last year, resulting in less oppressive conditions. The usual break of the extreme summer temperatures occurred in mid-September as expected. Temperatures remained in the 90's most of the month however, and excellent growth in tha early planted barley fields resulted.

The most notable weather condition was the rain of November and December. Any rain in the Imperial Valley is dreaded by the local farmers as there is usually some crop in a critical condition which is damaged. This year it was the cotton which suffered. Refuge operations were little affected as most of the field work had been completed. Same barley irrigation water was saved. At the end of the year it looks like only two barley Irrigations will be required rather than the usual four.

B. Habitat Condition5

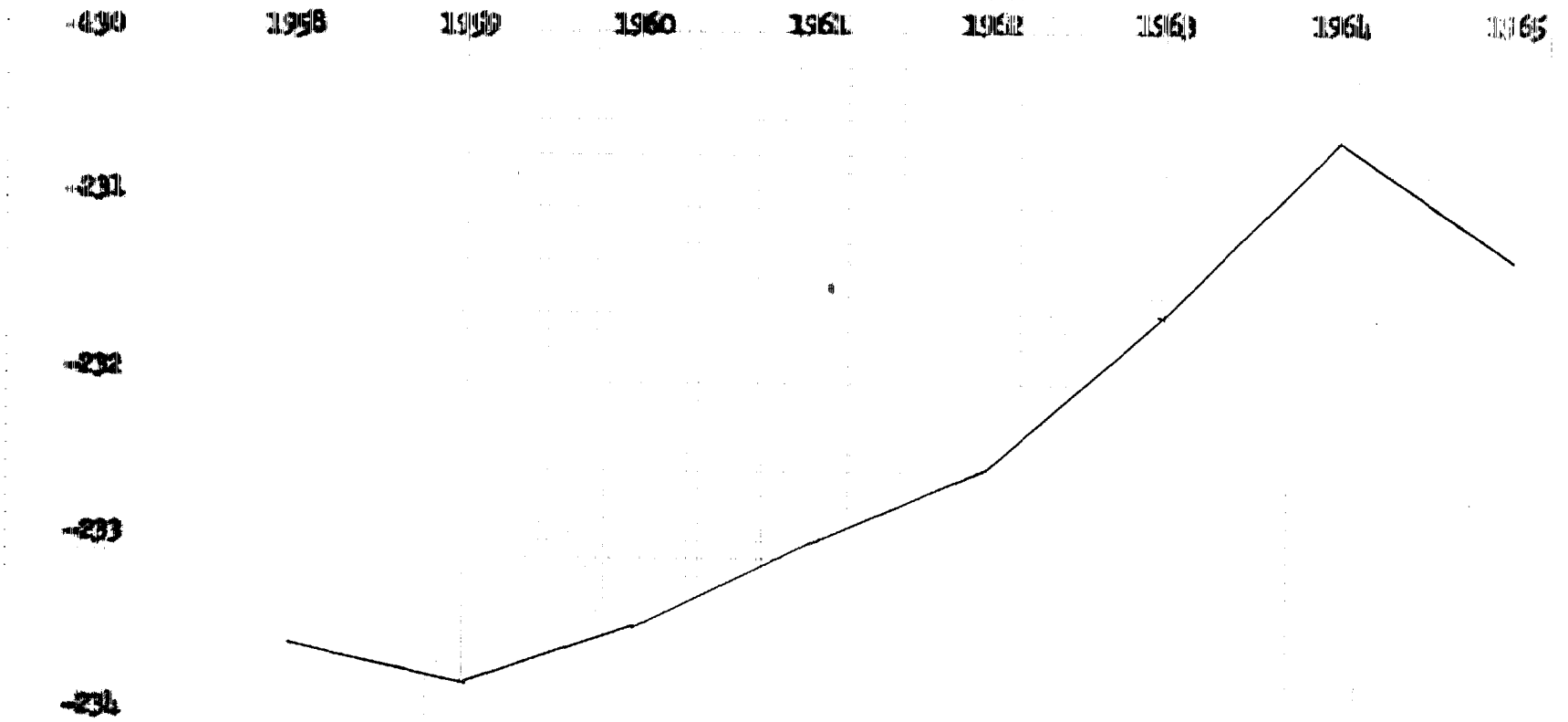
1. Water

The level of the Salton Sea continued the downward trend which began in July of 1964. At the beginning of the period, the elevation was -231.85 feet below sea level, a drop of 0.65 feet from January 1964. The normal winter and spring rise amounted to .60 feet and peaked in Nay at -231.25. A drop of 1.20 feet occurred between May and October to bring the level down to -232.45, the lowest since February 1963. Unusually heavy rains in November and December together with extensive subbing of lettuce and sugar beets in October and a low evaporation rata, brought the Sea back up to the -232.00 feet elevation at the end of the year. This is a total drop of only 0.15 feet during the year as compared to a drop of 0.65 feet in 1964.

The long range prospects for a continued lowering of the Sea look good. The Imperial Irrigation District would like to have the level lowered to make for more efficient drainage of the thousands of acres of potentially productive farmland which borders the south end of the sea.

The Colorado River Water Quality Control Board also has an interest in maintaining the salinity at its present level, approximately the same as the ocean, and at the same time lowering tha level. The results and recommendations of a

PEAK SAIPOH SEA ELECTIONS 1958 — 1965



study made by a private firm under contract to the Board will be published in February 1966. One of the proposed desalinization projects, involving solar evaporation and pumping, was outlined in the 1964 narrative report. Another possibility is injection of concentrated brine into wells. This method of disposal is currently being used successfully by the Imperial Thermal Products Co. to dispose of the bittern from steam well operations.

Irrigation water, supplied solely by the Imperial Irrigation District, has been in adequate supply. A delay of about three days has beome normal on all water orders. A total of 4,429.2 acre feet of water was used during the year as compared to 4,753 acre feet in 1964.

2. Food and Cover

Waterfowl food in the Imperial Valley has been present in adequate amounts during the year. At the beginning of the year all of the bulrush and barley on the refuge had been utilized except for approximately 80 acres of bulrush in tract 1-2, Unit II. On January 6, the entire valley population of about 22,000 snow geese started feeding in this field. By January 22, the field was stripped of all bulrush and cattail(see photos) after nightly feeding for 17 days for a total of 374,000 use-days. At this rate one acre of bulrush provided food for 4,675 geese for one day. Not bad considering the quality of our land. As in the previous year the snows showed a definite preference for bulrush throughout the wintering period and were rarely seen on the green barley fields. When the refuge supply had been fully utilized the geese moved to the State's Wister Area and the bulrush that was available in their hunting area.

The green barley on the refuge was completely utilized by Canada geese by the beginning of the year and they too shifted to the state land. The 170 acres farmed by the Bureau on the State's Hazard Area and 160 acres on the Wister Area also received heavy use. Enough barley was present on the state and federal lands conbined to enable some of that on state lands to reach maturity. Approximately 30 acres on the Hazard Area produced a good seed crop.

Ducks fared quite wall with the "gravy train" beginning on January 11 and the doling out of 150 tons of surplus milo. This operation continued until March 9 when we exhausted the supply of grain. As a result of this operation depredation on alfalfa by widgeon was kept to a minimum.

During the fall and winter of 1965 waterfowl foods were in abundant supply for the below average numbers of ducks and geese early in the season. The late arrival of the Canada geese expecially favored the production of green barley, as many of the fields had stands up to 18 inches high before they were utilized. It is hoped that because of the size of the plants at the time of grazing that regrowth will occur and a mature crop will be produced in the spring of 1966.

Alkali bulrush production was adequate for the snow geese in the fall with tracts 7-14 and 1-2, Unit II receiving the heaviest use. The poor stand of bulrush on tract 2-B, Unit I fed the first arrivals for about two weeks but use then shifted to Unit II and the State's Wister Area. Bulrush ponds were heavily utilized by pintails and green-winged teal after the snow geese, The value of this food plant for widgeon is still questionable as no definite instances of serious feeding by this species have been noted,

A change Of lessees in the area east Of Unit I resulted in the planting of an estimated 2,000 acres of lettuce in November. Apparently the new tenant did not regard the presence of a fairly large population of widgeon as a menace to his lettuce crop. No serious damage has been reported at this writing but the potential is there. Damage has been reported to one field of lettuce immediately south of Unit I. Perhaps after a few years of relatively light damage by widgeon, the local farmers have forgotten what they can do.

II. WILDLIFE

A. Migratory Birds

1. Ducks

The January-April period showed the greatest duck use of the year with a total of 7,327,215 use days. The population reached a peak of 138,040 during the last week of January. This peak population 'was made up of an estimated. 75,000 pintails, 45,000 widgeon and 8,000 green-winged teal and lesser numbers of other species. These three most important species were attracted and held by the supplementary feeding program from January 11 to March 9. By the end of the feeding program the population was down to 95,000 ducks but the following week tuok a drastic drop to 27,500. Again we ask ourselves if the drop was due to normal northward migration or had we been holding the birds which would normally have left earlier if it hadn't been for

the feeding program. We suspect the latter of being the case.

Total duck use for the period exceeded the previous year and the 5-year average by nearly 2 million use days. The peak population however, was down about 54,000 birds from 1964. This was primarily due to the lower population of ruddy ducks which reached a peak of 6,000 as compared to 45,000 in 1964.

Diving ducks were somewhat low as indicated by the ruddy duck population. Canvasback peaked et 600, and scaup at only 100.

The Hey-August population was at its normal low for the hot summer period. The mid-summer population averaged about 200 ducks. These were mostly ruddies with a few teal. About 6 pairs of redheads found the bulrush and cattail in tract 3, Unit I attractive and produced an estimated 20 young. The fulvous tree duck population was down from previous years with an estimated 15 pairs producing 40 young. The tree ducks reached a peak of 95 at the and of the period because of birds from outlying areas moved into the open waters of the refuge. Total duck use for the period amounted to 63,392 use-days as compared to the 5-year average of 190,000.

Waterfowl numbers began building up again in mid-August when about 2,000 pintails arrived. This was however, a temporary situation as there was a drop back down to 800 pintails the following week. The population again began building up in mid-November, about 3 weeks later than normal. A peak population for the September-December period was reached the last week of November with 63,000 ducks present. This number wae made up primarily of 25,000 pintail, 15,000 widgeon and 20,000 ruddy ducks. Widgeon however, reached a peak of 29,000 as compared to 38,000 in 1964. The pintail population was similar to 1964 but dropped off during December to about 16,000.

Unit I again received the heaviest use by ducks for the year. This is due to the open water impoundments, alkali bulrush ponds, feeding program and the sheltered bay to the north.

Of unusual occurrence were the two wood ducks taken at the Wister Area during the hunting season. Previously there had been only two sight records in the entire valley.

The cooperative waterfowl banding program, with the California Department of Fish and Game, was conducted after the close of the hunting season in January. A total of 909 pintail, 999 green-winged teal, 106 cinnamon teal and 1,000 widgeon was banded.

Most of these birds were captured with a cannon-net at the supplementary feeding site and the remainder in wire traps at Unit I and the Wister Area.

2. Geese

The goose use again exceeded the 5-year average with 874,000 use-days during the January-April period as compared to the average of 541,000. This was due entirely to the large snow goose numbers which peaked at about 21,000. Use would have been much higher had there been more food available. When the refuge supply was exhausted at the end of January, the geese went to the State area and finished out the wintering season there. The bulk of the snow geese left the valley during the second week of March,

The Canada goose population reached a high of around 2,000 with a total valley population of 4,730 tallied during the mid-winter inventory. This is the highest number In recent years. Use by the honkers was also determined by availability of green barley and when the refuge supply was exhausted use shifted to the State's Hazard and Wister areas, including acreage farmed by the refuge.

Most of the Canadas had left the valley by the first week in March. A small flock of about 50 white-fronted geese was present most of the Printer at Unit II end the Hazard area.

No blue-geese, or black brant were observed this winter. The Ross' goose survey in February did show about 200 present with the large flock of snows.

No geese were present during the May-August period.

The first geese to arrive in the fall were the white-fronts which began showing up during the last week of September. A peak of 250 was reached in mid-October with only 20 or 30 remaining throughout the period,

Snow geese were first seen on October 22 and gradually reached a peak of around 20,000 at the end of the year. The snow goose population figures are of concern to us as the state has been making bi-weekly aerial counts and usually come up with 1/3-1/2 as many geese In the entire Salton Sea area as we count from the ground on the refuge. On the occasions when we have flown with the state personnel they have counted 5,000 snows while we estimated 20,000. They then compromised at 10,000. So how many were there?

All species of geese followed their usual feeding habits with the Canadas staying on green barley exclusively and the snows in the bulrush and cattail. At the end of the year the snow geese had shifted to the State's dry barley. The snows were extremely wary this year and fed almost entirely during the night, regardless of weather or moonlight, and spent the days rafted up out in the Sea. Harvest of this species was very low.

A few Ross' geese have been seen with the snow geese and we estimate a total of about 200 present,

Goose use for the September-December period amounted to 649,439 usedays, down slightly from the 5-year average of 760,000.

WATERFOWL USE-DAYS

Geese	Jan-Apr.	May-Aug.	Sept.-Dec.	Total
1965	874,181	0	649,439	1,523,620
5-yr. Ave.	541,220	395	759,931	1,301,546
Ducks				
1965	7,327,215	63,392	2,782,094	10,172,701
5-yr. Ave.	5,606,573	190,986	2,892,575	8,690,135
Coots				
1965	323,540	45,080	400,820	769,440
5-yr. Ave.	705,005	105,804	329,767	1,140,576

3. Water and Marsh Birder

The refuge coot population was lower than usual with a total of 770,000 use-days for the year as compared to the 5-year average of 1,140,500. The peak populations were 4,500 in January and 9,000 in December with a summer population of about 400. Few broods were observed.

White pelicans were first seen on March 22 but never exceeded 250 at any one time, although many more no doubt migrated through to the north. The fall migration was also unspectacular with only a few stragglers seen.

A brown pelican was seen on July 10 and September 2. Eared grebes were present in their usual large numbers with probably over

80,000 on the sea during the winter months. A group of 7 western grebes was seen in the sea at Unit I on August 19 and remained in the areaabout two weeks, The pied-billed grebe was first seen on September 20 and never reached 8 population of more than 20. Twelvedouble-crested cormorants were near the mouth of the New River on September 24 and were seen repeatedly for the next three weeks. Small groups of 3-5 birds have been seen occasionally through the winter.

Common and snowy egrets were present throughout the year with the largest numbers present in the winter. Peaks of 100 common and 150 snowys were reached in November. No evidence of nesting by the summering population of about 50 of each species was observed. The first record of cattle egrets in the valley was made on January 2 when Foreman Henson saw one with a flock of gulls east of the Vail ranch. A diligent watch by refuge personneland local birders resulted In a sighting of 5 birds on February 27 and 6 on March 21. Nonehavebeen seen since that time.

Great blue herons were present in large numbers, for thisspecies, with up to 75present in mid-September. It was not unusual to find 20-30 in a flock feeding in the bulrush Impoundments. A few sightings of green herons and least bittern were made throughout the year, Black-crowned night herons were present in the spring with up to 100 present in the New River delta area. They were last seen in mid-July.

White-faced ibis have been unusually low in numbers with never more than 40present at any one time. Numbers were quite low during the winter and no known nesting occurred this summer. Wood ibis were also low in numbers this summer reaching a peak of only 800 as comparedto 2,000 in 1964.

Sandhill cranes were observed twice in the valley this fall. Seven were seen in tract 7-14on October 22 andanother 12 were reported about 6 miles south of therefuge on the same date.

4. Shorebirds, Gulls and Terns

Black-necked stilts produced a good crop of young with an estimated 10,000 present during most of thesummer. Again at least one pair of avocets nested althoughmanyhundreds of these birds were present during the nesting season. This is only the second year Mat nesting has been observed.

Other shorebirds were present in normal numbers as indicated on NR-1A. No unusual observations of this group were made. Gulls end terns were also present in expected numbers. Black terns were especially numerous in the early summer during the cricket season. No gull-billed terns were observed this year. A few laughing gulls were seen in the late summer and one nest with young was reported in the New River delta area by local Birders.

5. Dwee

Mourning doves seemed to be present in normal numbers on the refuge with an estimated wintering popula tion of 2,000 and nesting population of 500 pairs. This, however, was not the case in the valley in general, The very poor dove season has 'been blamed on the loss of nesting habitat due to the "clean" farming practices. There just aren't enough trees and bushes left and ground nesting is unsuccessful due to the intensive cultivation and irrigation practices. Band returns have shown that most of" the doves harvested in the Imperial Valley are locally raised. One local sportsman's group Launched a tree planting campaign butt little has resulted.

The refuge did its pert with good nesting success from the ground nesters on the fallow or stubble barley fields. An experimental project consisting of nesting baskets placed in the trees around headquarters was tried. Use of properly placed baskets (see photo section) was good and nesting success was excellent with four and five broods produced In some of the baskets. This project will be expanded next year.

White-winged doves were present in small numbers during September and early October. No more than 50 used the refuge.

Mexican ground doves were also present in small numbers but seem to be becoming more common. An estimated 10[illegible] pairs were present.

B. Upland Game Birds

Gambel's quail are abundant and apparently had a good nesting season.

ding-necked pheasant remain practically non-existant with none

seen on the refuge, however, one was heard crowing near headquarters in October.

c. Big Game Animals

None present.

D. Fur Animals, Predators, Rodents and other Mammals

Muskrats have become less of a problem with a change In the location of ponds. The proposed late flooding of volunteer stands of bulrush will further solve the muskrat problem.

Coyotes are seen and heard infrequently, mostly at Unit I. The refuge population is estimated at 4 to 6.

Striped skunks have become rather numerous, especially in the headquarters area when the dates are ripe. As many as five have been seen in the headquarters yard at night.

Raccoons are abundant but rarely seen. Black-tailed jackrabbits, Audubon's cottontail and round-tailed ground squirrels also remain abundant. Mo control of any of the above mentioned species hats been undertaken.

E. Hawks, Eagles and Owls

Sparrow and marsh hawks are common winter residents. A peregrine falcon was seen at Unit II on August 20. A prairie falcon was observed several times from Rock Hill in late August and early September.

The only eagle record of the year was an immature! bald eagle first seen at Rock Hill on October 12. This is a rather unusual record for this area. The bird remained in the vicinity for about 3 weeks. An immature bald eagle was also reported at the Wister area in late December and was observed on the January 4 mid-winter Inventory.

Burrowing owls seem less common with about 20 pairs in the vicinity of the refuge. A few short-eared owls winter in the area.

F. Other Birds

Two species have been added to th5 refuge bird list this year. These are the cattle egret, previously mentioned, and

the calliope hummingbird which was observed et headquarters on March 27.

Observations of Interest were: a vermilionflycatcher on October 17, the first in several years; a golden-crowned sparrow on April 1 and the curve-billed thrasher, reported in 1964, which remained until January 27. The sighting of the curve-billed thrasher was reported in the "Condor".

Maintenance of a few mist nets around the manager's residence resulted in the banding of the following species:

Ash-throated Fly catcher	1	MacGillivray's Warbler	2
WesternFlycatcher	5	Wilson's Warbler	22
Empidonax sp.	1	Bullock's Oriole	7
Western Wood Pewee	7	Brown-headed Cowbird	1
Verdin	3	Western Tanager	56
Mockingbird	1	Black-headed Grosbeak	3
Swainson's thrush	10	Blue Grosbeak	1
Phainopepla	1	Lazuli Bunting	1
LoggerheadShrike	1	House Finch	1
Warbling vireo	9	Green-Tailed Towhee	1
Yellow Warbler	5	Abert's Towhee	1
Audubon'sWarbler	33	Lark Sparrow	i
		White-crowned Sparrow	117
		Total	291

In addition, 13 nestling redwinged blackbirds and 2 nestling mourning doves were banded.

G. Fish

Fishing In the Salton Sea is staying at the high level of the last three years with the limit on corvina raised from 6 to 9. The sargo perch is the next most important game fish and the gulf croaker has also been added to the list of game fish in the sea.

H. Reptiles and Amphibians

Reports of three rattlesnakes exceeding seven feet in length being killed or captured in the Westmorland area have been received. One of these hae been verified as it was on display in town. Ye always hear these reports butthis is the first time the size has been confirmed . Several smaller rattlers (2-3 feet) were killed by the irrigators. No sidewinders have been observed this year.

There has been no noticeable change in the status of other reptiles and amphibians on the refuge.

I. Disease

Botulism losses were light again this fall withan estimated 400 waterfowl and a smaller number of shorebirds lost on the refuge shoreline, primarily in the Mew River delta area.

No cases of pesticide poisoning or fowl cholera have been reported.

III REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development

With the predicted 'lowering of the sea level notamounting to enough to expose much of the inundated lands, we were pretty well marking time as far as development projects were concerned.

Development work at Unit I consisted of dividing the 160 acre tract C into two 80 acre fields and building contour borders in the north half for bulrush In the spring of 1966. Thia field has been a problem due to the steep fall and resulting irrigation problems. Salt has accumulated rapidly due to poor irrigation and leaching is now necessary. Water control structures were also Installed in the contoured portion of tract C.

Tract 1A had been ponded for three years and was rotated back to barley. Construction of 3/4 of a mile of head ditch and installation of control boxes was accomplished.

A soil and moisture project was initiated this year with the reclamation of tract 6, Unit II, Approximately 3/4 of the field had been flooded by sea water in 1963 and 1964. The drop of the sea level this summer enabled us to get equipment in on this nearly level field and build a dike to prevent flooding again this winter. A road was built on this dike on the north border of the field and tied into Rock Hill. This could be made into an excellent observation route in 1966. The entire field dried out sufficiently to disk, landplane and construct contour borders and install irrigation facilities. Soil samples were taken before work was begun, however, they have not been tested for salinity yet. Bulrush will be planted in this tract in 1966.

Tract 2-B also required extensive development work to put it back into shape after the washouts and complete loss of water control in 1964. All of tha borders were rebuilt extra wide, because of the sandy soil, and flattened and widened further by running the D-4 up and down them. This worked, as no washouts occurred this year. The head ditch on the east side of the tract was also removed and new water control structures installed as needed.

The only dragline work done during the year, due to shortness of labor, not lack of need, was the ½ mile head ditch for tract f-2, Unit 11.

In addition to the normal vehicle, equipment and grounds maintenance the following activities were completed:

Fainted the exterior of Q-7.

Installed fiberglass roof on patio of Q-7.

Poured concrete slab for heat-pump installed in Q-7.

Built several routed signs for hunting access areas and public roads through the refuge.

Planted a lawn, trees and shrubs around the office in connection with the Beautification Program.

Disposed of all the accumulated junk at Unit I by sale, burning and burying.

Dismantled generator house, wash rack and vehicle ramada at Unit I and salvaged the materials.

Painted Dodge weapons carrier and 1959 3 ton Dodge stake truck acquired from surplus.

B. Plantings

1. Aquatics and Marsh Plants

A total of 560 acres of alkali bulrush (Scirpus robustus) was grown in 1965. Of this total, 210 acres were volunteer crops from previous years plantings and an additional 350 acres were newly planted this spring.

The newly planted fields were tracts 2-B, 27 and 7-14. Planting dates were somewhat later this year with tract 2-B seeded on April 27 and tracts 27 and 14 on May 7. Also, on April 27, tract 3, Unit I was reseeded in an attempt to strengthen the crop which was present from the year before. Seed was applied at the rate of 20 lbs./Ac.

All of the fields produced excellent crops of bulrush with the exception of tract 2-B. Further contour border work is necessary for better water control. It is estimated that only about 30% of this field produced an acceptable stand of bulrush.

The seed was acquired from Koda Bros. in South Doe Palos, California again this year. A high percentage of millet seed was present and a surprisingly good stand of this important food plant grew and produced a very heavy seed crop.

The volunteer bulrush was in tracts 1-2, in it's second year, and tract 4 in it's third year. Tract 1-A was followed after three years of bulrush. These fields were flooded in May end water maintained on them for the rest of the year, with the exception of the west half of tract 1-2. Water was not applied to this field until mid-August. Response to watering, after extreme drying conditions

through the summer, was immediate and beyond expectations. Within 60 days the plants were heading out and forming seed. All of ths growth was from tubers which had been literally baked in clay.

Late watering of volunteer bulrush crops will be extended to all of the second ond third year ponds next year end result in a considerable saving of water costs. With about 300 acres of newly planted bulrush each spring, adequate nesting habitat for the small numbers of fulvous tree ducks will be available.

Tract 4, Unit I, again produced an excellent crop of bulrush. This is the third year for this field and the stand is getting denser each year and use has fallen off correspondingly, It appears that some means of thinning and opening up the field, such as burning or light disking would be advisable.

Utilization of all of the bulrush impoundments has been good with preference for the newly planted fields. The most surprising of the bulrush fields was tract 27, Unit I. This field had been contoured some ten years previously and aba-ndoned as unproductive. A dense stand of arroweed, salt cedar and mesquite had invaded the best soil in the field with the rest developing into black alkali slicks, Since the field was already contoured all that was necessary was mowing of the brush, disking and corrugating.

The field was seeded on May 7 and not only was a good. crop of bulrush produced but the millet seed mixed in with the bulrush seed, germinated and produced an excellent seed crop. Use by early arriving pintails was good but by the end of the year no geese had been in this field.

2. Trees and shrubs

The following trees and shrubs were planted in headquarters area as part of the President's Beautification Program:

4 Fan palms	2 Australian bottle trees
2 Bottle-brush trees	6 Bottle-brush shrubs

3. Upland Herbaceous Plants

Nothing to report.

4. Cultivated Crops

For the first time in several years at this station, a portion of the barley crop was brought to maturity. Approximately 40 acres in the Hazard Area produced a good seed crop from the fall planting of 1964. Twelve acres in tract H-2 were harvested and averaged 1½ tons per acre. The remainder of the mature crop in H-1 was disked under to experiment with volunteering.

A total of 570 acres were planted in barley in the fall to provide a green browse crop for Canada geese. Again this year some lands on the State's Hazard and Wister areas were leased for this purpose as shown on the accompanying map.

Planting dates were well spaced and growing conditions were excellent. Tracts C and 1-A, Unit I were the first fields planted and were irrigated by early October. Tract C was split in half as previously mentioned and only the south half was planted. The field was corrugated and irrigated with a 1½" siphon in each corrugation. This is the first time this system has been tried at this station and it proved successful In reducing the effect of salts, Last year the fields were corrugated but only alternate rows were watered. Reliance on subbing also meant accumulated salts on the surface. Corrugations were used in tract 3, Unit II and tract S22 at the Wister Area. This system requires more work for the irrigators but thewater is more evenly distributed, better penetration results and leas water is required to do the job than in flooding 50 foot lands,

With the unusually warm temperatures in October the early planted barley really got a jump on the late arriving Canada geese. Their favorite field, tract 3 Unit II, had barley 12"-18" high when they arrived and constant and intense grazing still left 6" stubs which showed good recovery and regrowth with each irrigation.

the 172 acres in the Hazard Area were seeded and irrigated by mid-November and again produced an excellent crop, even better than last year. At the end of the year use was complete but good regrowth was occurring. The 160 acre tract S22 on the Wister Unit produced a good crop also by mid-December but at this writing had received very little use by geese. The Hazard and Wister fields were of course included in the State's hunting area and use was somewhat limited by this activity.

When the total acreage of green barley on the State and Federal areas is considered, it appears that the Canadas have more than an adequate supply of green browse, especially in view of the fact that the State brings 2 or 3 160 acre fields to maturity each year. This is especially true since the development of alkali bulrush and the preference snowgeese have shown toward it. This leaves the honkers as the sole users of green barley whereas, they used to have to share it with the snow geese. As the green barley acreage increases on the refuge due to rotation from bulrush and reclamation of lands from the Sea, it would appear unnecessary for the refuge to continue farming the 160 acre tract on the Wister Area after the 1966 season. The proximity of the Hazard Area, however, and the excellent crop of barley we have been producing on it, would lend it to better management under a long-term lease or agreement.

C. Collections and Receipts

1. Seed or other Propagules

A total of 50,770 lbs. of mariout barley seed was received during the period. Of this amount, 23,320 lbs. was harvested from the Hazard Area and 27,450 lbs. was transfered from the Sacramento refuge. The seed was all cleaned and treated locally by the W. J. Vogel Company.

Five tons of alkali bulrush seed was again purchased from Koda Bros. in South Dos Palos, California. A high percentage of millet seed was present, but proved to be beneficial.

One hundred and fifty tons of milo was again purchased from the Agricultural Stabilization and Conservation Service for supplementary feeding of widgeon and pintail. This grain was received from the California Milling Corporation at Riverside, California.

2. Specimens

Three American avocets and two long-billed dowitchers were collected under special permit for analysis by the California Department of Fish and Game's pesticide research study.

3. Control of vegetation

Mechanical control of salt cedars (Tamarix gallica) and cattail was accomplished on ½ mile of ditch on the south border of tract 1-2. Experimental use of a 5-bottom disc-plow shows some promise for salt cedar control on contour borders in the bulrush impoundments.

A proposal for application of Silvex along roadsides and ditchbanks for control of salt cedar has been submitted for approval.

E. Planned Burning

No burning was done during the year, however, it appears this may be an effective way of opening up dense stands of bulrush and cattail and putting them in a more palatable condition for snow geese.

F. Fires

None during the year.

IV RESOURCE MANAGEMENT

A. Grazing
There is no grazing on this refuge.

B. Haying
None

C. Fur Harvest
None --

D. Timber Removal
None

E. Commercial Fishing
A special use permit was issued to Mr. George Widman for trapping mudsuckers along the refuge shoreline for sale as bait.

F. Other Uses
None --

V FIELD INVESTIGATION OR APPLIED RESEARCH

No special research or study projects are underway at this refuge.

VI PUBLIC RELATIONS

A. Recreational Use

A total of 1,100 recreational visits, other than for hunting, is estimated. Most of this is by bird watchers, photographers and sight-seers,

Access to observation points or possible tour routes is difficult because of eroded roads and dikes due to wave action. The Rock Hill area remains the most popular observation point.

B. Refuge Visitors

1/2 Wm. Anderson, Biologist, California Dept. of Fish snd Game--Waterfowl banding.

1/4 Harold MacKinney, Biologist, California Dept. of Fish andGame--Waterfowl banding.

1/9 Class from San Diego StateCollege, Imperial Valley Campus--Tour of refuge.

1/16 Buena Vista Audubon Society, Santa Ana, Calif.--Tour of refuge.

1/16 San Diego Audubon Society--Tour of refuge

1/21 Roadrunner section of The Garden Clubs of California --Tour of refuge.

1/24 Orange County Bird Club, Sante Ana, Calif.--Tour of refuge.

1/30 Pasadena Bird Club, Pasadena, Calif.--Tour of refuge.

2/6 Science Club, Clexlco Junior High School,--Tour of refuge.

2/17 G. E. Bassett, Personnel Officer, Portland--Inspection

2/18 Ray Glahn, Pilot-Biologist, Portland,--Ross' goose census and aerial photographs.

2/27 Classes from Imperial Valley College and The College of the Desert, Palm Springs, Calif.--Tour of refuge.

3/17 Vernon W. Proctor, Student, Texas Tech., Lubbock, Texas--Studies on Chars Spp.

3/22 Ronald A. 'Thompson, Supervisor, Animal Control Biologist--Visit

3/28 Mr. and Mrs. Patrick N. Humphrey's, Veterinarian, British Wildfowl Trust, England--Reviewing operation5 and bird watching.

4/28 Robert Sheldon, Imperial Irrigation District--ditch right of ways.
Hugh Manessier, San Bernardino--Recreation Guide.

5/4 Class from Borrego Springs Elementary School --Tour of refuge.

10/12 Vernon Ekedahl, Regional Refuge Supervisor, Portland --Inspection of refuge and steam wells.

10/28 Pank E. Defendorf, Appraiser, Portland--Quarters Appraisal.

11/3 Harold Hardesty, Regional Transport Driver--Transfer of equipment.

The following persons were frequent refuge visitors:

Richard Weaver, Manager, CF & G, Imperial Waterfowl Management Area
Wm. P. Sproul, Game Manager I, CF & G, Calipatria, Calif.
Robert N. Peery, Warden, CF & G, Calipatria, Calif.
Charles Wingo, Warden, CF & G, Brawley, Calif.
John Romasett, Warden Captein, CF & G, San Diego, Calif.
Carl Bumgarner, Warden, CF & G, Holtville, Calif.
A. W. Elder, USGMA, Pasadena, Calif.
Holger Larson, USGMA, Pasadena, Calif.
Wesley K. Moholt, USGMA, San Diego, Calif.
R. Guy McCaskie, Birder, San Diego, Calif.

C. Refugeipation

1/13 Prather attended post-season waterfowl meeting at the Imperial Waterfowl Management Area.

1/29 Prather attended annual meeting of the California-Nevada
-30 Section of the Wildlife Society, Davis, California.

2/18 Prather and Henson presented a slide talk to the Calipatria PTA meeting.

5/27 Prather presented a slide talk to the Calexico Jr. High Science Club at Calexico.

7/19-Prather attended the Civil Service Commission's course
23 "Supervision and Group Performance" at Santa Monica, California.

11/8 Prather presented aslide talk to the Wildlife Conservation class at San Diego State College, Imperial Valley Campus, Calexico, Calif.

12/8 Prather attended State Senate hearing on geothermal development in California, at Palm Springs, Calif.

D. Hunting

Waterfowl hunting on the refuge was conducted in cooperation with the California Dept. of Fish and Game as in previous years. A total of about 420 acres on the refuge were open& for permit holders three days a week, weekends and Wednesdays, except holidays, for a fee of $3.50, which was collected by the state.

This year's season ran from October 23, 1965 to January 5, 1966 for duck snd from October 23, 1965 to January 9, 1966 for geese except Canada geese which closedon December 26. The limit was 5 ducks per day and 10 in possession but no more than 3pintails or mallards could be included in the daily bag. Six geese were permitted, no more than three dark geese and only one Canada.

Hunting was generally rated as fair on the hunting area as awhole, including the 2,500 acre State's Wister Area.

The refuge hunting area was composed of tracts 7-14, 8-13 and 15-22. Only tract 7-14 had a crop in it and was hunted heavily. Opening weekend started out fair but success dropped off sharply for the next 4 weeks with no birds being taken.

The snow geese started feeding in 7-14 the end of November and opened the dense bulrush up and hunting success picked up considerably and remained good for the rest of the season. 1964 and 1965 and compared in the table below.

Year	No. of hunters	Ducks bagged	Geese bagged	Coots bagged	Total Waterfowl	Ave. birds per hunter
64-65	175	464	40	2	506	2.8
65-66	156	281	30	0	311	2.0

The unattached hunter around the refuge did very poorly, Very few Canada geese were taken due to their late arrival and abundant feed on the refuge. Snow geese were hardly harvested at all, due to their night feeding habits and unavailability while they rafted up in the Sea during the day.

Hunting results on the Imperial Waterfowl Management Ares, including refuge figures are shown in the following table.

Year	No. of hunters	Ducks bagged	Geese bagged	Coots bagged	Total Waterfowl	Ave. birds per hunter
64-65	6,704	10,534	1,468	172	12,474	1.9
65-66	5,665	10,357	394	336	11,087	2.0

As can be seen, use dropped off by nearly 1,000 hunters and more than 1,000 fewer geese were taken this year for a comparable overall average to the previous year. The lower number of hunters is probably due to the discouraging results for the first helf of the season.

Dove hunting was also rated as only fair this year in contrast to the usual excellent success. Possible reasons for this are presented in the Wildlife Section of this report. For the first time a split season on doves was tried in California. The first portion of the season ran from September 4 to October 3 with an additional ten days from December 10-19. Very few doves were availablefor the December season and pressure and success were both extremely low.

E. Violations

The following citations were Issued by Prather during the hunting season:

William Virgil Ridgway	Hunting on refuge--fined $35.00
Albert Arthur Valentine	Loaded gun in vehicle--Pined $35.00
Leonard James Bosinski	Trepass--fined $35.00
Richard Marcelles Jones	Trespass--fined $35.00

All patrolwas done by Manager Prather with excellent assistance and cooperation from local game management agents and state wardens.

F. SAFETY

Monthly staff and SAFETY meetings were held at which SAFETY material such as memorandums, circulars, pamphlets and SAFETY graphs were presented and discussed,

The station SAFETY record as of December31, 1965, stands at 2,311 days. No lost time or other accidents occurred during the year.

No major SAFETYmeasures were taken during the year.

VII OTHER ITEMS

A. Personnel

The full course of personnel. actions was taken during the year from hiring and firing to transfers, promotions and retirement.

The year started off with the resignations of Mike and Jeanette Stewart on April, Mike was an intermittent employee with an irrigator's position and Jeanette was the part-time clerk-typist. The resignations were made

so they could move to Louisiana with former Refuge Manager Nowak and assume full-time permanent positions at the Delta Refuge as Maintenanceman and Clerk.

Long time irrigator Leo E. Cox went on a disability retirement in March. Pewee, as he was known by the crew, had developed a bad case of emphysema and was unable to continue with the rather strenuous irrigator's job. He also felt that the chemical sprays in the valley further aggravated his condition.

In April, Foreman I, SamuelE. Henson, answered the call end reportedfor duty with the Job Corps et the MalheurRefuge. Fortunately for us, things didn't work out for him as he expected and when the weather turned cool he had to come back to the Imperial Valley. He resumed his duties as Foreman I in December and has a considerable backlog of projects to catch up on.

Marilyn L. Gorman replaced Jeanette Stewart as Clerk-typist on April 27 and has takena keen Interest in refuge activities and her duties as part-timeclerk. In addition, she is a full time student at the Imperial Valley Campus of San Diego State College where she is serving as Student Body President. She also has completed a course in wildlife conservation.

Mr. Fred A. Bruce was hired as a Maintenanceman I on an intermittant appointment on April 13. On August 28 Mr. Bruce suffered a mild heart attack and was off duty until November 1. Unfortunately, it wets necessary to terminate him in December due to alchohol problems and being AWL,

Mr. Lee Laizure received his permanent appointment as irrigator in July after three years as an intermittent employee. The Laizure's also became the proud parents of a baby girl in December, their first.

B. Items of Interest

Of primary interest in the Imperial Valley has been the geothermalexploration and development on lands adjacent to refuge Unit II,

After several wells have proved successful, development

has turned to generation of electricity and extraction of chemicals from the brine. The principle developers have been Imperial Thermal Products, a subsidiary of Morton Salt. A steam generator has been installed at their pilot plant near the Alamo River bridge and some electricity has been generated and sold to the Imperial Irrigation District. Development of a source of power however, has become secondary since a tremendous reservoir of potash has been discovered in the brine. Extraction of this valuable fertilizer and other minerals now seems to have become Morton's primary objective. We understand that 5 square miles of solar evaporation ponds will be constructed along the east shore of the Sea north of the Alamo River. One of their biggest problems is disposal of their bitterns. They seem convinced that re-injection of these wastes back into the ground will be the best method of disposal.

Development of this project will be followed with great interest as applications have been made for drilling on submerged refuge lands. The effects of the evaporation ponds on waterfowl will also be interesting. Thus far, no waterfowl losses have been attributed to the 12 acres of ponds in operation.

C. Credits

This report was prepared by Refuge Manager Prather and typed and assembled by Marilyn Gorman, refuge clerk.

D. Photographs

Photos were taken by Prather and Henson with personal equipment.

SIGNATURE PAGE

Submitted by:

_____
(Signature)

Refuge Manager
(Title)

Date: January 27, 1966

Approved, Regional Office:

Date: _____

_____
(Signature)

_____
(Title)

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

WATERFOWL

REFUGE _____ MONTHS OF _____ TO _____, 19 65

(1) Species	(2) Weeks of reporting period 1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada	1,200	2,000	1,700	2,000	1,500	600	500	300	250	250
Cackling										
Brant										
White-fronted	30	50	200	50	50	70	150	50		
Snow	21,000	20,000	22,000	20,000	15,000	2,000		12,000		
Blue										
Other [illegible]	22,000	22,000	21,000	22,000	17,000	2,000	600	12,000	250	250
Ducks:										
Mallard	50	50	200	200	200	50	50	50	10	10
Black										
Gadwall	1	50	50	25	50	50				
Baldpate	15,000	25,000	25,000	45,000	35,000	30,000	30,000	35,000	32,000	30,000
Pintail	2,000	30,000	35,000	75,000	70,000	60,000	60,000	60,000	47,000	45,000
Green-winged teal	4,000	6,000	7,500	5,000	3,500	2,000	2,000	1,500	1,500	1,000
Blue-winged teal							5			
Cinnamon teal	50	100	100	50	100	40	100	100	70	70
Shoveler	3,000	4,000	3,000	4,000	3,000	2,500	2,500	1,500	1,000	1,000
Wood										
Redhead										
Ring-necked										
Canvasback	300	500	600	500	500	200	100	100	200	100
Scaup	50	50	70	50	100	100	100	50	70	70
Goldeneye	30	50	25	50	50	50	50	50	50	50
Bufflehead	20	30	50	40	50	20	50	20	20	20
Ruddy	2,000	4,000	3,000	3,000	3,000	1,000	1,000	500	1,350	1,000
Other										
[illegible]	45,000	70,000	70,000	130,000	127,000	11,000	115,000	115,000	90,000	90,000
Coot:	2,000	1,000	1,500	1,000	2,000	2,000	3,000	2,000	1,000	1,000

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Cont. NR-1
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WATERFOWL
(Continuation Sheet)

REFUGE SALTON SEA MONTHS OF [illegible] TO [illegible], 19 52

(1) Species	(2) Weeks of reporting period: 3/14-20 (11)	3/21-27 (12)	3/28-4/3 (13)	4/4-10 (14)	4/11-17 (15)	4/18-24 (16)	4/25-5/1 (17)	(18)	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada	70	46	6	5	2	2	2		78,831		
Cackling											
Brant											
White-fronted									4,340		
Snow									791,000		
Blue											
Other Total Geese	70	46	6	5	2	2	2		874,181		
Ducks:											
Mallard	20	20	20	10	10	10	10		6,360		
Black											
Gadwall									2,275		
Baldpate	8,200	2,600	510	250	50	20	10		2,145,360		
Pintail	10,300	550	270	50	30	10			3,633,600		
Green-winged teal	1,200	760	610	350	320	170	110		591,080		
Blue-winged teal									35		
Cinnamon teal	500	600	700	400	400	450	360		72,870		
Shoveler	2,800	3,000	2,000	1,200	1,030	200	210		365,750		
Wood											
Redhead							20		140		
Ring-necked				5	5				70		
Canvasback	200	200	50	50	10	10	30		29,260		
Scaup	40	40	30	20	20	20	10		5,740		
Goldeneye	20	30	30	10	10				3,150		
Bufflehead	20	5	5	10	5				2,625		
Ruddy	4,300	4,300	4,300	3,700	4,000	700	1,000		463,130		
Other Pulveus Tree Duck							10		70		
TOTAL DUCKS	27,500	12,105	8,925	6,055	5,890	1,590	1,760		7,327,215		
Coot:	2,800	2,500	2,500	2,700	1,800	500	550		383,540		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans			
Geese	874,181	22,230	
Ducks	7,327,215	138,040	
Coots	323,540	4,500	

SUMMARY

Principal feeding areas _____

_____

Principal nesting areas _____

_____

Reported by _____

INSTRUCTIONS (See Secs.7531 through 7534, Wildlife Refuges Field Manual)

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

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

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

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

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WATERFOWL

REFUGE [illegible] MONTHS OF [illegible] TO [illegible], 19[illegible]

(1) Species	(2) Weeks of reporting period: 1 (5/2-8)	2 (5/9-15)	3 (5/16-22)	4 (5/23-29)	5 (5/30-6/5)	6 (6/6-12)	7 (6/13-19)	8 (6/20-26)	9 (6/27-7/3)	10 (7/4-10)
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada										
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
Ducks:										
Mallard	10	10	10	10	10	2	2			
Black										
Gadwall										
Baldpate	10	10								
Pintail			5	2	2	2	2	2	2	2
Green-winged teal	30	20	20	20	10 [illegible]	[illegible]				
Blue-winged teal										
Cinnamon teal	100	100	70	70	40	40	40	40	40	50
Shoveler	20	10								
Wood										
Redhead	20	25	15	15	15	10	10	10	5	10
Ring-necked										
Canvasback	10									
Scaup	10									
Goldeneye						2	2	2	2	2
Bufflehead										
Ruddy	500	500	500	500	250	200	50	50	50	100
Other Fulvous tree duck	10	20	20	20	10	30	30	30	30	30
Total Ducks	1,250	1,145	1,000	637	357	286	136	134	129	134
Coot:	450	400	170	100	150	200	300	350	350	350

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(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Salton Sea MONTHS OF May TO August, 1965

(1) Species	(2) Weeks of reporting period: 7/11-17 (11)	7/18-24 (12)	7/25-31 (13)	8/1-7 (14)	8/8-14 (15)	8/15-21 (16)	8/22-28 (17)	(18)	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada											
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other											
Ducks:											
Mallard									378		
Black											
Gadwall											
Baldpate									140		
Pintail						70	40		903		
Green-winged teal						250	200		3,350		
Blue-winged teal											
Cinnamon teal	50	50	50	30	100	400	250		11,200	5	50
Shoveler						40	30		700		
Wood											
Redhead	10	20	40	40	40	40	20		2,415	3	20
Ring-necked											
Canvasback				1					77		
Scaup									70		
Goldeneye	2	2	2	5	2	2	2		199		
Bufflehead											
Ruddy	100	150	150	150	200	350	350		38,500		
Other (Fulvous W. D.)	40	50	50	75	75	75	95		4,970	6	40
Total Ducks	202	272	292	301	417	1,227	987		63,392		
Coot:	450	450	650	520	550	550	450		45,080	2	50

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans			
Geese			
Ducks	63,392	1,250	110
Coots	45,080	450	50

SUMMARY

Principal feeding areas Salton Sea shoreline, fresh water impoundments.

Principal nesting areas

Reported by Robert [illegible]. Prather

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

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

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

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

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

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WATERFOWL

REFUGE Salton Sea National Wildlife Refuge MONTHS OF September TO December, 1965

(1) Species	(2) Weeks of reporting period: 1 (8/29-9/4)	2 (9/5-11)	3 (9/12-18)	4 (9/19-25)	5 (9/26-10/2)	6 (10/3-9)	7 (10/10-16)	8 (10/17-23)	9 (10/24-30)	10 (10/31-11/6)
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada										
Cackling										
Brant										
White-fronted					5	25	250	250	100	95
Snow								1	20	120
Blue										
Other										
Ducks: Total Geese					5	25	250	251	120	215
Mallard	10					10		20	10	20
Black										
Gadwall								10		10
Baldpate				10	10			10	10	100
Pintail	860	960	1050	885	340	2,080	850	350	820	1,100
Green-winged teal	220	360	350	180	130	950	950	770	945	1,000
Blue-winged teal										
Cinnamon teal	600	380	400	190	600	600	250	390	420	750
Shoveler	50	160	200	130	540	640	400	710	900	1,220
Wood										
Redhead					10		30	30	40	40
Ring-necked							60			
Canvasback	5									50
Scaup										
Goldeneye	2									
Bufflehead										
Ruddy	200	320	400	1,350	2,800	8,500	2,700	7,100	6,800	7,000
Other Fulvous tree duck	110	80	40	40	20					
Total Ducks	2,057	2,260	2,440	2,835	4,450	12,780	5,240	9,390	9,945	11,290
Coot:	470	480	550	800	1,190	1,610	1,100	2,620	2,840	2,900

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(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Salton Sea Refuge MONTHS OF September TO December, 1965

(1) Species	(2) Weeks of reporting period: 11/7-13 (11)	11/14-20 (12)	11/21-27 (13)	11/28-12/4 (14)	12/5-11 (15)	12/12-18 (16)	12/19-25 (17)	12/26-1/1 (18)	(3) Estimated waterfowl days use	(4) Production: Broods seen	(4) Production: Estimated total
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada				550	660	810	1,350	980	30,450		
Cackling											
Brant											
White-fronted	20	20	30	20	10	10	23	23	6,167		
Snow	45	3,100	7,000	12,000	5,010	20,000	20,000	20,000	611,072		
Ross'			10	10	10	10	10	200	1,750		
Other											
Total Geese	65	3,120	7,040	12,580	5,690	20,830	21,383	21,203	649,439		
Ducks:											
Mallard	20	20	40	50	50	50	70	70	3,080		
Black											
Gadwall									140		
Baldpate	140	510	2,020	15,000	24,600	28,000	20,500	20,500	779,870		
Pintail	2,610	1,135	1,830	25,000	6,900	9,000	16,500	16,670	682,580		
Green-winged teal	4,260	3,210	2,150	2,200	3,700	3,500	800		185,325		
Blue-winged teal											
Cinnamon teal	650	470	460	500	200	200	20	20	49,700		
Shoveler	2,080	480	550	550	750	1,500	1,400	700	91,070		
Wood											
Redhead			80	100	130	40			3,500		
Ring-necked									420		
Canvasback				200	220	800	200	200	7,525		
Scaup	20	30	80	50	150	50	100	100	4,060		
Goldeneye			10	20	80	50	20	20	1,414		
Bufflehead				10	70	50	20	20	1,190		
Ruddy	14,000	10,000	19,000	20,000	12,000	15,000	10,000	10,000	1,030,190		
Other: Fulvous tree duck									2,030		
Total Ducks	23,780	15,855	26,220	63,680	48,850	57,640	49,630	49,100	2,782,094		
Coot:	2,050	2,350	3,000	5,000	6,300	7,000	8,000	9,000	400,820		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans			
Geese	649,439	21,383	
Ducks	2,782,094	63,680	
Coots	400,820	9,000	

SUMMARY

Principal feeding areas Bulrush impoundments and green barley fields.

Principal nesting areas

Reported by Robert R. Prather

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

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

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

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

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

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

MIGRATORY BIRDS
(other than waterfowl)

Refuge SALTON SEA Months of JANUARY to APRIL 1961

(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:										
Eared Grebe	Previous period		4,000	4/1						10,000
White Pelican	50	3/12								500
Great Blue Heron	Previous period									25
Common Egret	"	"								10
Snowy Egret	"	"								30
Black-crowned Night Heron	"	"								100
American Bittern	"	"								20
White-faced Ibis	"	"								50
Common Gallinule	"	"								150
II. Shorebirds, Gulls and Terns:										
Semi-palmated Plover	1	4/8								50
Black-bellied Plover	Previous period		200	2/15						400
Long-billed Curlew	"	"								2,000
Whimbrel	3	3/27								200
Western Willet	Previous period									200
Greater Yellowlegs	"	3/[illegible]	"							300
Lesser Yellowlegs	2	3/29								10
Long-billed Dowitcher	Previous period									3,000
Least & Western Sandpiper	"	"								4,000
Marbled Godwit	"	"								300
American Avocet	"	"	6,000	3/1						10,000
Black-necked Stilt	1	3/22	1,000	4/30						2,000
Ring-billed Gull	Previous period									5,000
Bonaparte's Gull	2	4/12								10
Caspian Tern	2	3/9								20
Black Tern	3	4/24								400

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. Doves and Pigeons:					
Mourning dove	Previous Period				4,000
White-winged dove	" "				25
IV. Predaceous Birds:					
Golden eagle	1 3/18				1
Duck hawk					
Horned owl					
Magpie					
Raven					
Crow					
Sparrow hawk	Previous period				200
Burrowing owl	Resident				500

Reported by Robert R. Prather

INSTRUCTIONS

1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2 First Seen: The first refuge record for the species for the season concerned.

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

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

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

INT.-DUP. SEC., WASH., D.C. 36104

3-1751
Form 8-131-A
(Nov 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Salton Sea Months of May to August 1946

(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	Estimate Number
I. Water and Marsh Birds:										
Western Grebe	7	8/19	10							10
Brown Pelican	1	7/10	10							10
Great Blue Heron	Previous period		50							50
Common Egret	Previous period		75							100
Snowy Egret	Previous period		25							50
Black-crowned Night Heron	Previous period		100			mid-July				200
Least Bittern	1	5/3								10
White-faced Ibis	Previous period		15							50
Wood Ibis	4	6/24	300	8/19						400
Common Gallinule	Previous period		25							50
II Shorebirds, Gulls and Terns:										
Black-bellied Plover	Previous Period			Build-up of all						500
Long-billed Curlew	"			Shorebird Species occurred						1000
Whimbrel	"			in mid-August						100
Western Willet	"									50
Greater Yellowlegs	"									200
Lesser Yellowlegs	"									50
Long-billed Dowitcher	"									10,000
Least & Western Sandpipers	"									15,000
Marbled Godwit	"									3,000
Black-necked Stilt	"									10,000
American Avocet	"									12,000
Ring-billed Gull	"									8,000
Laughing Gull	4	8/1	4	8/1						4
Caspian Tern	Previous period									400
Black Tern	"									3,000

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. Doves and Pigeons:					
Mourning dove	Previous Period				2,000
White-winged dove	2	5/6			50
IV. Predaceous Birds:					
Golden eagle					
Duck hawk	1	8/20			1
Horned owl					
Magpie					
Raven					
Crow					
Sperrow Hawk	1	8/11			3
Marsh Hawk	1	8/13			1
Turkey Vulture	3	8/10			10
Burrowing Owl	Resident				100

Reported by Robert R. Prather

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and Piciformes 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.

Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Salton Sea Months of January to April 1965

(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:										
Eared Grebe	Previous period		4,000	4/1						10,000
White Pelican	50	3/12								500
Great Blue Heron	Previous period									25
Common Egret	"	"								10
Snowy Egret	"	"								30
Black-crowned Night Heron	"	"								100
American Bittern	"	"								20
White-faced Ibis	"	"								50
Common Gallinule	"	"								150
II. Shorebirds, Gulls and Terns:										
Semi-palmated Plover	1	4/8								50
Black Bellied Plover	Previous period		200	2/15						400
Long-billed Curlew	"	"								2,000
Whimbrel	3	3/27								200
Western Willet	Previous period									200
Greater Yellowlegs	"	"								300
Lesser Yellowlegs	2	3/29								10
Long-billed Dowitcher	Previous period									3,000
Least & Western Sandpiper	"	"								4,000
Marbled Godwit	"	"								300
American Avocet	"	"	6,000	3/1						10,000
Black-necked Stilt	1	3/22	1,000	4/30						2,000
Ring-billed Gull	Previous period									5,000
Bonaparte's Gull										

(over)

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

MIGRATORY BIRDS
(other than waterfowl)

Refuge Salton Sea Months of September to December 1965

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Reproduction			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number of Nests	Total # Young		Estimated Number
I. Water and Marsh Birds:										
Western Grebe	Previous period		10							10
Pied-billed Grebe	1	Sept.20								20
Double Crested Cormorant	12	Sept.24	100	Nov.1						15
Common Egret	Previous period		150	Sept.15						300
Great Blue Heron	"	"								150
Snowy Egret	"	"	75	"						150
Green Heron	"	"	4							4
White-faced Ibis	"	"	40	Oct.1	1	Nov. 15				80
American Bittern	"	"	5							10
Wood Ibis	"	"	800	Sept.15						1,000
Sandhill Crane	7	Oct. 22								7
Common Gallinule	Previous period									50
II. Shorebirds, Gulls and Terns:										
Black-bellied Plover	Previous period		300							500
Common Snipe	1	Oct.22	800							10
Long-billed Curlew	Previous period		500							800
Whimbrel	Previous period		20							100
Western Willet	"	"	50							150
Greater Yellowlegs	"	"	50							100
Lesser Yellowlegs	"	"	10							20
Long-billed Dowitcher	"	"	3,000							5,000
Least & Western Sandpiper	"	"	10,000							15,000
Marbled Godwit	"	"	300							800
Black-necked Stilt	"	"	3,000							8,000
American Avocet	"	"	5,000							15,000
Ring-billed Gull	"	"	6,000							15,000
Caspian Tern	"	"	150							500
Black Tern	"	"	500							2,000

(over)

(1)	(2)		(3)	(4)		(5)	(6)
III. Doves and Pigeons:							
Mourning dove	Previous period			Nov. 15			10,000
White-winged dove	"	"		Oct. 15			50
Mexican Ground dove	"	"					20
IV Predaceous Birds:							
Golden eagle							
Duck hawk	Previous period						2
Horned owl							
Magpie							
Raven							
Crow							
Bald eagle	1	Oct. 12		1	Oct. 31		1
Pigeon hawk	1	Nov. 13					2
Sparrow hawk	Previous period						50
Marsh hawk	Previous period						20
Burrowing owl	Previous period						100

Reported by Robert R. Prather

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

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

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

5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

INT.-DUP. SEC., WASH., D.C.

36104

3-1750b
Form NR-1B
(Rev. Nov. 1957)

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge Salton Sea — For 12-month period ending August 31, 1965

Reported by Robert R. Prather — Title Refuge Manager

(1) Area or Unit Designation	(2) Habitat Type	(2) Habitat Acreage		(3) Use-days	(4) Breeding Population	(5) Production
I	mops	160	Ducks	9,085,914	60	80
	Upland	650	Geese	837,725		
	Marsh	500	Swans			
	Water		Coots	297,610	15	30
	Total	1310	Total	10,221,249		
II (Including Hazard Area)	Crops	240	Ducks	1,037,771	20	30
	Upland	640	Geese	998,523		
	Marsh	240	Swans			
	Water	250	coot s	185,395	10	20
	Total	1370	Total	2,215,689		
B	Crops		Ducks			
	Upland	140	Geese			
	Marsh		swans	No Management or utilization due to partial flooding by salt water		
	Water		Coots			
	Total	140	Total			
Total All Units	Crops	400	Ducks	10,122,685	80	110
	Upland	1430	Geese	1,836,248		
	Marsh	740	swans			
	Water	250	Coots	483,005	25	50
	Total	2820	Total	12,435,938	105	160
	Crops		Ducks			
	Upland		Geese			
	Marsh		swans			
	Water		coots			
	Total		Total			
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		coots			
	Total		Total			
	Crops		Ducks			
	Upland		Geese			
	Marsh		swans			
	Water		coots			
	Total		Total			

Note: Acreage listed above includes current leased acreage only. Regular waterfowl counts not made on refuge lands inundated by Salton Sea.

(over)

INSTRUCTIONS

All tabulated information should be based on the best available techniques for obtaining these data. Estimates having no foundation in fact must be omitted, Refuge grand totals for all categories should be provided in the spaces below the last unit tabulation. Additional forms should be used if the number of units reported upon exceeds the capacity of one page. This report embraces the preceding 12-month period, NOT the fiscal or calendar year, and is submitted annually with the May-August Narrative Report.

(1) Area or Unit: A geographical unit which, because of size, terrain characteristics, habitat type and current or anticipated management practices, may be considered an entity apart from other areas in the refuge census pattern. The combined estimated acreages of all units should equal the total refuge area. A detailed map and accompanying verbal description of the habitat types of each unit should be forwarded with the initial report for each refuge, and thereafter need only be submitted to report changes in unit boundaries or their descriptions.

(2) Habitat: Crops include all cultivated croplands such as cereals and green forage, planted food patches and agricultural row crops; upland is all uncultivated terrain lying above the plant communities requiring seasonal submergence or a completely saturated soil condition a part of each year, and includes lands whose temporary flooding facilitates use of non-aquatic type foods; marsh extends from the upland community to, but not including, the water type and consists of the relatively stable marginal or shallow-growing emergent vegetation type, including wet meadow and deep marsh; and in the water category are all other water areas inundated most or all of the growing season and extending from the deeper edge of the marsh zone to strictly open-water, embracing such habitat as shallow playa lakes, deep lakes and reservoirs, true shrub and tree swamps, open flowing water and maritime bays, sounds and estuaries. Acreage estimates for all four types should be computed and kep% as accurate as possible through reference to available maps supplemented by periodic field observations. The sum of these estimates should equal the area of the entire unit.

(3) Use-days: Use-days is computed by multiplying weekly waterfowl population figures by seven, and should agree with information reported on Form NR-1.

(4) Breeding Population: An estimate of the total breeding population of each category of birds for each area or unit,

(5) Production: Estimated total number of young raised to flight age,

Interior Duplicating Section, Washington, D. C. 27380

3-1750c
Form NR-1C
(Sept. 1960)

WATERFOWL HUNTER KILL SURVEY

Refuge Salton Sea

Year 1965

(1) Weeks of Hunting	(2) No. Hunters Checked	(3) Hunter Hours	(4) Waterfowl Species and Nos. of Each Bagged	(5) Total Bagged	(6) Crippling Loss	(7) Total Kill	(8) Est. No. of Hunters	(9) Est. Total Kill
10/23-29	19	57	White-front(9), Green-winged Teal(7), Cinnamon Teal(6), Pintail(4), Shoveler(2)	28	9	37	19	37
10/30-11/5	6	18	None	0	0	0	6	0
11/6-12	0	0	None	0	0	0	0	0
11/13-19	2	6	None	0	0	0	2	0
11/20-26	1	4	None	0	0	0	1	0
11/27-12/3	17	51	Pintail(12), Green-winged Teal(4), Cinnamon Teal(3), White-fronted Goose(3) Snow Goose(2), Shoveler(1), Canada Goose(1)	26	8	34	17	34
12/4-10	31	93	Green-winged Teal(18), Pintail(11), Ruddy(6), Shoveler(3), Canada Goose(3), Snow Goose(2), Bufflehead(1),	44	12	56	31	56
12/11-17	20	60	Pintail(17), Widgeon(5), Snow Goose(3), Shoveler(2), Green-winged Teal(1), Canada Goose(1)	29	9	38	20	38
12/18-24	20	60	Pintail(14), Green-winged Teal(11), Widgeon(8), Snow Goose(5), Shoveler(3), Bufflehead(1), Gadwall(1), Cinnamon Teal(1)	44	12	56	30	56
12/25-31	17	41	Pintail(39), Green-winged Teal(13) Shoveler(11), Widgeon(5), Cinnamon Teal(3), Scaup(3), Canada Goose(1)	75	25	100	17	100
1/1-17	18	54	Pintail(20), Green-winged Teal(19), Shoveler(14), Cinnamon Teal(6), Widgeon(6)	65	22	87	18	87

(over)

INSTRUCTIONS

(1) The first week of hunting begins with opening day and ends at the close of hunting 6 days later. Successive weeks follow the same pattern.

(2) The goal is to survey a minimum of 25 percent of refuge hunters each week and to record data only from those who have completed their day's hunting. This information should be collected during each day of the week and in each area hunted in relative proportion to the hunter effort expended. When the 25 percent goal cannot be achieved, particular care should be taken to collect representative data.

(3) Record the total number of hours the hunters spent hunting on the refuge.

(4) List waterfowl species in decreasing order of numbers bagged. Sample entry: Mallard (61), Pintail (36), Redhead (16), Gadwall (11), Widgeon (6), Coot (4), Canada Goose (3), Green-winged Teal (1).

(5) Record total numbers of waterfowl bagged.

(6) Record total numbers of waterfowl reported knocked down but not recovered.

(7) Total of Columns 5 and 6.

(8) Estimate the total number of hunters who hunted on the refuge during the week, including hunters checked (Column 2).

(9) Kill sample projected to 100 percent. Column 9 = $\frac{\text{Column 8}}{\text{Column 2}}$ x Column 7.

3-1750c
Form NR-1C
(Sept. 1960)

WATERFOWL HUNTER KILL SURVEY

Refuge Salton Sea

Year 1965

(1) Weeks of Hunting	(2) No. Hunters Checked	(3) Hunter Hours	(4) Waterfowl Species and Nos. of Each Bagged	(5) Total Bagged	(6) Crippling Loss	(7) Total Kill	(8) Est. No. of Hunters	(9) Est. Total Kill
1/8-10	5	10	None(Season open on geese except Canadas)	65	22	87	18	87
Total	156	454	Pintail(117), Green-winged Teal(73), Shoveler(36), Widgeon(24), Cinnamon Teal(19), White-fronted Goose(12), Snow Goose(12), Canada Goose(6), Ruddy(6), Scaup(3), Bufflehead(2), Gadwall(1) Average Waterfowl bagged per hunter-2.0	311	97	408	156	408

(over)

INSTRUCTIONS

(1) The first week of hunting begins with opening day and ends at the close of hunting 6 days later. Successive weeks follow the same pattern.

(2) The goal is to survey a minimum of 25 percent of refuge hunters each week and to record data only from those who have completed their day's hunting. This information should be collected during each day of the week and in each area hunted in relative proportion to the hunter effort expended. When the 25 percent goal cannot be achieved, particular care should be taken to collect representative data.

(3) Record the total number of hours the hunters spent hunting on the refuge.

(4) List waterfowl species in decreasing order of numbers bagged. Sample entry: Mallard (61), Pintail (36), Redhead (16), Gadwall (11), Widgeon (6), Coot (4), Canada Goose (3), Green-winged Teal (1).

(5) Record total numbers of waterfowl bagged.

(6) Record total numbers of waterfowl reported knocked down but not recovered.

(7) Total of Columns 5 and 6.

(8) Estimate the total number of hunters who hunted on the refuge during the week, including hunters checked (Column 2).

(9) Kill sample projected to 100 percent. Column 9 = $\frac{\text{Column 8}}{\text{Column 2}}$ x Column 7.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge SALTON SEA Months of JANUARY to APRIL, 19 65

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Gambel's Quail	An estimated 400 acres of habitat as previously described has been lost due to flooding by the Salton Sea.		None		Unknown	NONE			In excess of 1,000	No systematic census method has been used. Estimates are based upon day to day observations.
Ring-necked Pheasant									None	

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES: Use correct common ♦♀♋♋ •

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Salton Sea Months of May to August, 19 65

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Gambel's Quail	440 acres of desert scrub, roadsides and field edges.	.33	many		Unknown	X	0	X	1320	No systematic census methods have been used. Estimates are based on day to day observations.

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES: Use correct common name.

(2) DENSITY : Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

3-1752
Form NR-2
(April 1946

UPLAND GAME BIRDS

Refuge Salton Sea Months of September to December, 19 65

(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.
Gambe Quail	440 acres of desert scrub, roadsides and field borders.	.50			unknown	N	O N		880	No systematic census methods have been used. Estimates are based solely on day to day observations

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

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4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each gory removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7 REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

3-1753
Form NR-3
(June 1945)

BIG GAME

uge Salton Sea Ca Year 1965

(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	
NONE														

Remarks:

Reported by Robert R. Prather

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.

F [illegible]
(June 1945)

SPACE [illegible]

Refuge [illegible] Year ending April 30, [illegible]

(1) Species	(2) Density		(3) Removals					(4) Disposition of Furs						(5)
								Share Trapping						
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator Control*	For Restocking	For Research	Permit Number	Trappers Share	Refuge share	Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	Total Population
[illegible]	River bottom [illegible] Tamarisk [illegible] est. 800 acres		N	C										Common Abundant Common
				R E M A R K S										
[illegible] Bobcat Black-tailed Jack Rabbit Antelope Cottontail Badger Antelope Ground Squirrel	Undeveloped desert, abandoned and marginal farmlands. est. 500 acres.													Uncommon Rar. Abundant Abundant Common Common

* List removals by Predator Animal Hunter

REMARKS:

No systematic census methods have been used. Estimates are based upon routine field observations.

Reported by Robert L. Prather

3-1755
Form NR-5
60701

DISEASE

Refuge Salton Sea Year 1965

Botulism

Period of outbreak Oct. 10 - Nov. 15

Period of heaviest losses Oct. 15 - 23

Losses:

	Actual Count	Estimated
(a) Waterfowl	105	400
(b) Shorebirds	6	30
(c) Other		

Number Hospitalized	No. Recovered	% Recovered
(a) Waterfowl	None	
(b) Shorebirds	None	
(c) Other		

Areas affected (location and approximate acreage)
Shoreline of Salton Sea east of New River Delta. Approximately 4 miles of shoreline were effected.

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

Condition of vegetation and invertebrate life
No vegetation present other than aquatics which wash down the river. Condition of invertebrate life unknown.

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

FR 6 — Bureau of Sport Fisheries and Wildlife

PUBLIC RELATIONS

(See Instructions on Reverse Side)

Refuge [illegible] — Calendar Year [illegible]

State [illegible]

a. Hunting [illegible] — b. Fishing [illegible] — c. Miscellaneous 1 (2) — d. TOTAL VISITS 6,32[illegible]

1. Hunting (on refuge lands)

TYPE	VISITS	ACRES	MANAGED BY
Waterfowl	325	420	State & Fed
Upland Game			
Big Game			
Other			

Number of permanent blinds: None

Man-days of bow hunting included above: None

Estimated man-days of hunting on lands adjacent to refuge: 4,800

2. Fishing (areas open to fishing on refuge lands) None

TYPE OF AREA	ACRES	MILES
Ponds or Lakes		
Streams and Shores		

3. Miscellaneous Visits

Recreation 1,100 — Official 15

Economic Use None — Industrial None

2. Refuge Participation (groups)

TYPE OF ORGANIZATION	On Refuge: NO. OF GROUPS	On Refuge: NUMBER IN GROUPS	Off Refuge: NO. OF GROUPS	Off Refuge: NUMBER IN GROUPS
Sportsmen Clubs				
Bird and Garden Clubs	5	121		
Schools	6	121	7	148
Service Clubs	1	40		
Youth Groups	-	-		
Professional-Scientific				
Religious Groups				
State or Federal Govt.				
Other				

3. Other Activities

TYPE	NUMBER	TYPE	NUMBER
Press Releases	1	Radio Presentations	None
Newspapers (P.R.'s sent to)	None	Exhibits	None
TV Presentations	None	Est. Exhibit Viewers	None

3-1756
(Rev. 4/63)

3-1758
Form NR-8
(Rev. Jan. 1956)

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge [redacted] County [redacted] State [redacted]

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Waterfowl Browsing Crops Type and Kind	Total Acreage
			Harvested		Unharvested				
	Acres	Bu./Tons	Acres	Bu./Tons	Acres	Bu./Tons			
[redacted]					570	855 Tons	570	[redacted]	* 570
[redacted] (From Previous years planting)			12	11.6 Tons					
								Fallow Ag. Land	None

No. of Permittees: Agricultural Operations [redacted] Haying Operations [redacted] Grazing Operations [redacted]

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	GRAZING	Number Animals	AUM'S	Cash Revenue	ACREAGE
[redacted]				1. Cattle	[redacted]			
				2. Other	[redacted]			
				1. Total Refuge Acreage Under Cultivation				570
Hay - Wild	[redacted]			2. Acreage Cultivated as Service Operation				570

* [redacted]

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only the number of acres utilized by the permittee for his own benefit should be shown underthe 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. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested - Show the acreage and number of bushels harvested for the Government of crops produced by permittees *or* refuge personnel. Unharvested - Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvested column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops - Specify the acreage, kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting.

Total Refuge Acreage Under Cultivation - Report total land area devoted to agricultural purposes during the year.

INT.-DUP. SEC., WASH., D.C.91767

3-1570
NR-8a

REFUGE GRAIN REPORT

fu

Months of January through December, 1955

(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
Japanese Millet	200	0	200		14	4	18	82			
Hybrid Sudan	207	0	207		172		172	35	35		
Barbout Barley	0	1,015	1,015		995		995	20	20		
Milo	0	4,908	4,908			4,908	4,908	0			

(8) Indicate shipping or collection points Calexico, California

(9) Grain is stored at Refuge Headquarters

(10) Remarks Milo received from surplus sources for use in waterfowl depredation program.

*See instructions on back.

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.

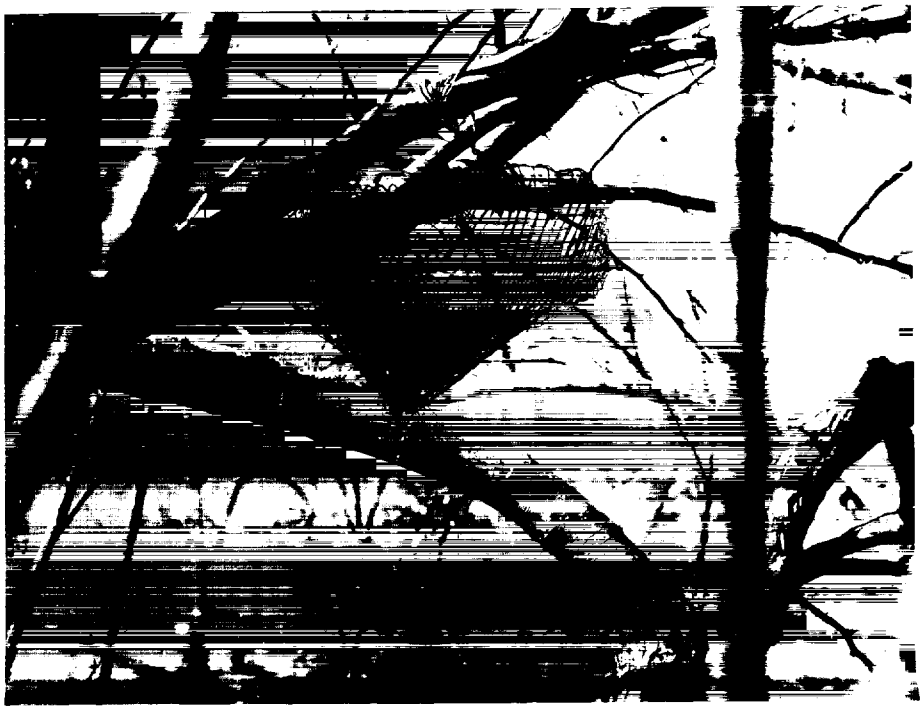
(7) This is a proposed breakdown by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.

(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.

INT.-DUP. SEC., WASH., D.C. 59323



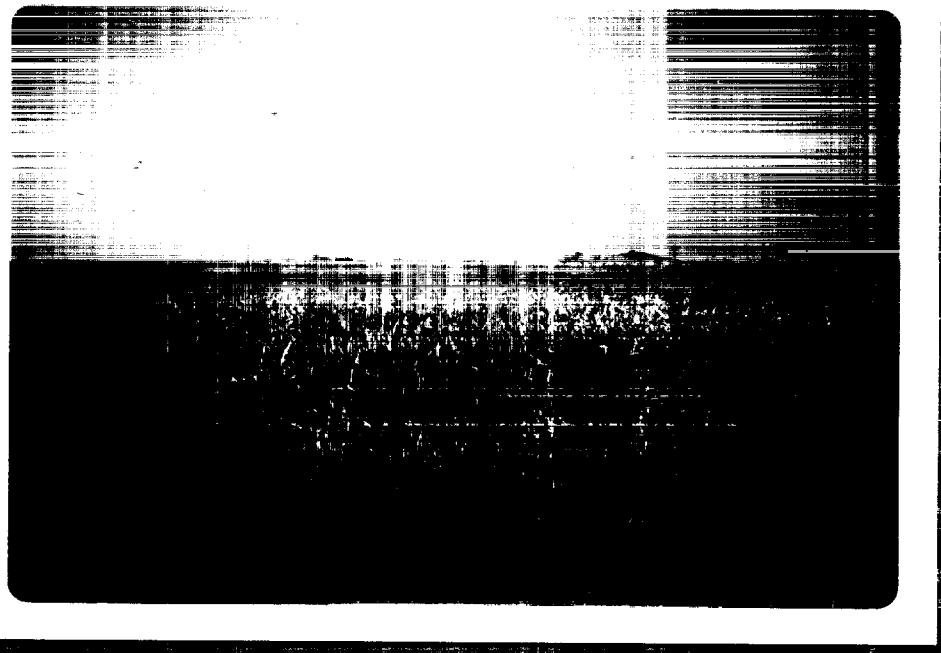


Fig. 1. Photo transect #7 showing development of bulrush [illegible] in December 1961.

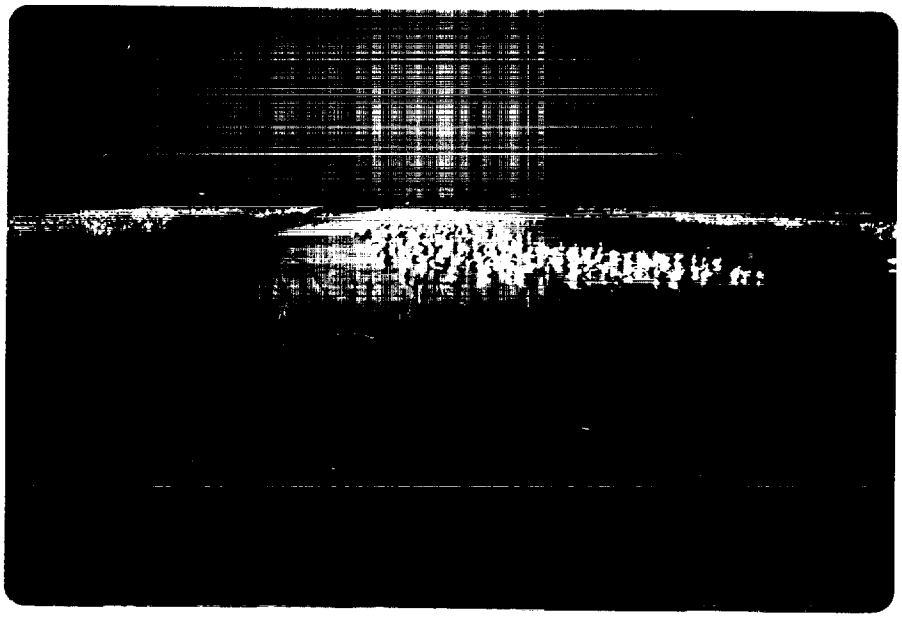
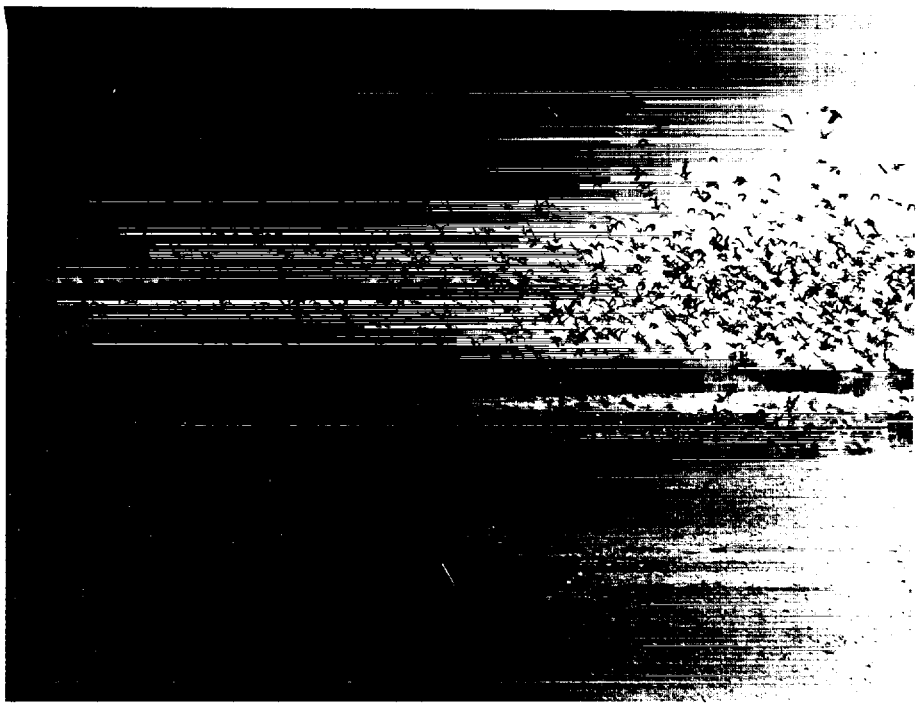


Fig. 2. Photo transect #7 showing extent of utilization [illegible] in January 1962.

Group of four cattle egrets south of refuge Unit II. This is the first year these birds have been seen in any numbers in California.



Concentration of widgeon and pintail at supplementary [illegible] tons of milo were fed to a peak [illegible]