U. S. Fish and Wildlife Service
Northern Prairie Wildlife Research Center
Arcata Field Station
c/o Humboldt State University
Arcata, California

Population, Distribution and Ecology of Aleutian Canada Geese on Their Migration and Wintering Areas, 1983-84

by

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ABSTRACT

The 10th annual wintering ground study of the endangered Aleutian Canada goose (Branta canadensis leucopareia) was conducted from 22 October 1983 to 11 May 1984. Migration and wintering areas near Crescent City, Colusa, El Sobrante, Modesto, and Los Banos, California were monitored. The peak fall count was 3,800, which may have been high due to the presence of cackling Canada geese (B. c. minima). Approximately 3,150 Aleutians were counted in the spring at Crescent City. Three hundred twenty-nine color-marked geese were seen 4,950 times. Of the marked geese transplanted to Agattu Island in 1983, 82 percent of the adults but only 32 percent of the hatching year young were observed. Sixty-six Aleutians were known to have died during the study. Forty-three of these drowned, then were washed up on the ocean beach near Crescent City. Of the other 23 birds, 22 were shot (7 in closed areas). Eighty-nine new birds were banded in the spring near Crescent City.

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INTRODUCTION

Thorough accounts of the known distribution, breeding range, migration, wintering areas, and mortality of the endangered Aleutian Canada goose have been reported previously (Springer et al. 1978, Woolington et al. 1979, Beall 1980, Umland and Springer 1981, Pomeroy and Springer 1982, Yparraguirre 1982 and 1983).

Restoration efforts in effect since 1971 have focused on the reintroduction of hand-reared birds and transplanted birds to fox-free Aleutian islands (U. S. Fish and Wildlife Service 1982). Because wintering ground observations have shown transplants of wild birds to be more effective than reintroduction of hand-reared birds (Umland and Springer 1981, Pomeroy and Springer 1982, Yparraguirre 1983), the last of the hand-reared birds and their wild and foster parents were released on Agattu Island in summer 1982, along with 138 transplanted wild geese from Buldir Island. In 1983, 108 wild geese were transplanted from Buldir to Agattu.

Hunting closures previously established by the state wildlife commissions in California (Figure 1) and Oregon for protection of the Aleutians remained in effect for the 1983-84 waterfowl season.

OBJECTIVES

1. Continue to monitor the movements of Aleutians on the migration and wintering areas.
2. Document population levels and mortality.
3. Survey other potential use areas.
4. Assess the success of transplants and releases of wild and captive-reared birds.
5. Capture and band wild birds.

METHODS

Known migration and wintering areas (Woolington et al. 1979, Beall 1980, Umland and Springer 1981, Pomeroy and Springer 1982, Yparraguirre 1979 and 1983), potential use areas, and reports of other sightings of actual or presumed Aleutian Canada geese were investigated from 22 October 1983 to 11 May 1984. Methods of population estimation and band observation, as well as the inherent problems involved, have been documented previously (Yparraguirre 1983). Analysis of color-marker sightings included only individuals seen two or more times.

As in past annual reports on Aleutian Canada geese (Yparraguirre 1983) the term "released" geese refers to birds held in captivity for longer than 1 year. "Transplanted" geese are those moved from Buldir to Agattu without being held longer than 2 weeks.

U. S. Fish and Wildlife Service (USFWS) Biological Technician Eric Nelson worked full-time on the project from 31 October 1983 to 11 May 1984. P. F. Springer of the Arcata Field Station, Northern Prairie Wildlife Research Center, USFWS, supervised the study, provided necessary equipment, assisted in

Figure 1. Canada goose hunting closure zones in California, 1983-84.

field observations and report writing, interviewed hunters who had shot banded birds, and served as a clearing house for reports from Oregon and other areas. D. Yparraguirre, Biological Technician for Humboldt Bay National Wildlife Refuge (NWR), provided invaluable advice to the study, and assisted in field observations and trapping.

ACKNOWLEDGEMENTS

Assistance in field observations was provided by L. Barnes and P. Hofmann, partly while working on a tower study in the Crescent City area funded by the U. S. Coast Guard and partly while under contract with the California Department of Fish and Game (CDFG) through the Humboldt State University Foundation. Additional assistance in observations or other aspects of the study was provided by G. Mensik, E. Ambrosini, L. Robinson, D. Watters, F. Lindeman, and F. Paveglio of the USFWS; W. Rienecker, J. Beam, L. Howard, A. Cleveland, J. Johnson, R. LeDonne, G. Strait, and H. King of the California Department of Fish and Game (CDFG); and D. Scott, K. Morse, and R. Goss of the California Department of Parks and Recreation (CDPR). J. Rhea, former CDFG warden, and N. Phillips provided valuable information in the Modesto area, whereas S. Serpa assisted in field observations and counts in the Newman area. W. Henry (1984) of the U. S. Forest Service (USFS) monitored areas in Tillamook County, Oregon, J. Cornely of the USFWS conducted aerial surveys along the northern coast of Oregon, and J. Collins and P. Perrin of the Oregon Department of Fish and Wildlife monitored known use areas in southern Oregon and investigated reports from residents there. Other individuals provided information from various areas.

The Mendocino National Forest provided a travel trailer for Nelson for most of the year. Humboldt Bay NWR and the California Department of Forestry provided housing for study personnel in the Crescent City area. The Faith Ranch provided trailer space from December to March. J. Kastler typed the report.

RESULTS

Fall Migration Areas

Washington and Oregon

An adult Aleutian banded in 1980 on Buldir and two unbanded birds were shot out of a flock of 14 geese on the Willapa NWR near Ilwaco in southwestern Washington, just north of the mouth of the Columbia River, on 22 October. This is the first confirmed record of an Aleutian at that location although several color-banded and unbanded birds that could have been Aleutians have been reported there in past years.

Small Canada geese that probably were Aleutians were first reported in Oregon on 21 October. These consisted of a flock of 65 birds flying over pastures near Langlois, the site of Aleutian goose use in previous years. Additional fall observations of probable Aleutians in the Langlois area included flights of 70 geese on 25 October and 20-25 on 9 November. A flock of nine Aleutians was observed with the flock of intermediate Aleutian-Taverner's Canada geese in the pastures near Pacific City, Oregon, on 17 November. One of the nine birds bore a new metal band on which some of the numbers could be read, indicating that it apparently was a wild Aleutian

banded on Buldir in July. Other fall observations of Aleutians in Oregon consisted of six seen on Island Rock near Port Orford on 21 November, and a captive-reared bird released on Agattu in August 1982 and shot out of a flock of eight on 27 November on Sauvie Island Wildlife Area (WA) near Portland, Oregon. The latter is the first record for that location.

The first observed intermediate Aleutian-Taverner's Canada geese were 35-38 on Three Arch Rocks NWR on 23 October (Henry 1984). These were followed by about 50 near Pacific City, 20 miles south, on 29 October. The flock there rose to a peak of 78 on 5 November, then dropped to 76 on 9 December. Color bands observed on 10 individuals indicated that they were birds nesting in the Semidi Islands. The geese roosted on Haystack Rock, a part of the Oregon Islands NWR, and fed in pasture on the mainland near Pacific City.

Crescent City

A single Aleutian was noted at Castle Rock NWR (Figure 2) on 14 October (Table 1). The first flock, consisting of approximately 35 Aleutians, was noted 6 days later. The number of geese continued to increase throughout the month, reaching 640 by the 30th. Several flocks of Aleutians were noted moving through the northcoast area without stopping. Over 1,000 Aleutians were present from 3-17 November, with a peak number of 2,450 being counted on the 13th. By 2 December the number of Aleutians had declined to about 240, and by the 7th, to 22. These birds were not seen after being flushed by gun shots on 18 December. The main use area were the pastures on the Bliss Ranch section of the Lake Earl WA between Lake Earl and Lake Talawa.

Colusa

Aleutians in two flocks totalling 79 birds were first observed on 24 October (Table 1) in the 833 Reclamation District field (Figure 3) and flying over Sutter NWR. Numbers of geese increased throughout late October and all of November. By late November and into the second week of December over 3,000 Aleutian Canada geese were present in the Butte Sink area. Exact counts were hindered by large numbers of cackling Canada geese and the use of areas with tall vegetation, principally rice.

The presence of at least 2,000 Aleutians during the second week of December caused CDFG to extend the Canada goose hunting closure in a core of the original closure zone within the Butte Sink past the scheduled opening on 15 December.

The number of Aleutians within the Butte Sink dropped to approximately 200 birds using Wilbur Farms by 19 December. An aerial survey of the area the following day revealed only the same flock of birds on Wilbur Farms. This flock moved out of the Colusa area 2 days later, allowing the closure to be lifted by 24 December. However, a single Aleutian was shot on 8 January on a hunting club 10 miles north of Wilbur Farms. On 4 January two blue-collared Canada geese were reported to have been shot on the Richmond Gun Club adjacent to the Colusa NWR, but as of yet no bands have been reported to the Bird Banding Laboratory.

As in the past the main use areas were agricultural areas centered around the confluence of Butte Creek and the Sacramento River. The birds fed in

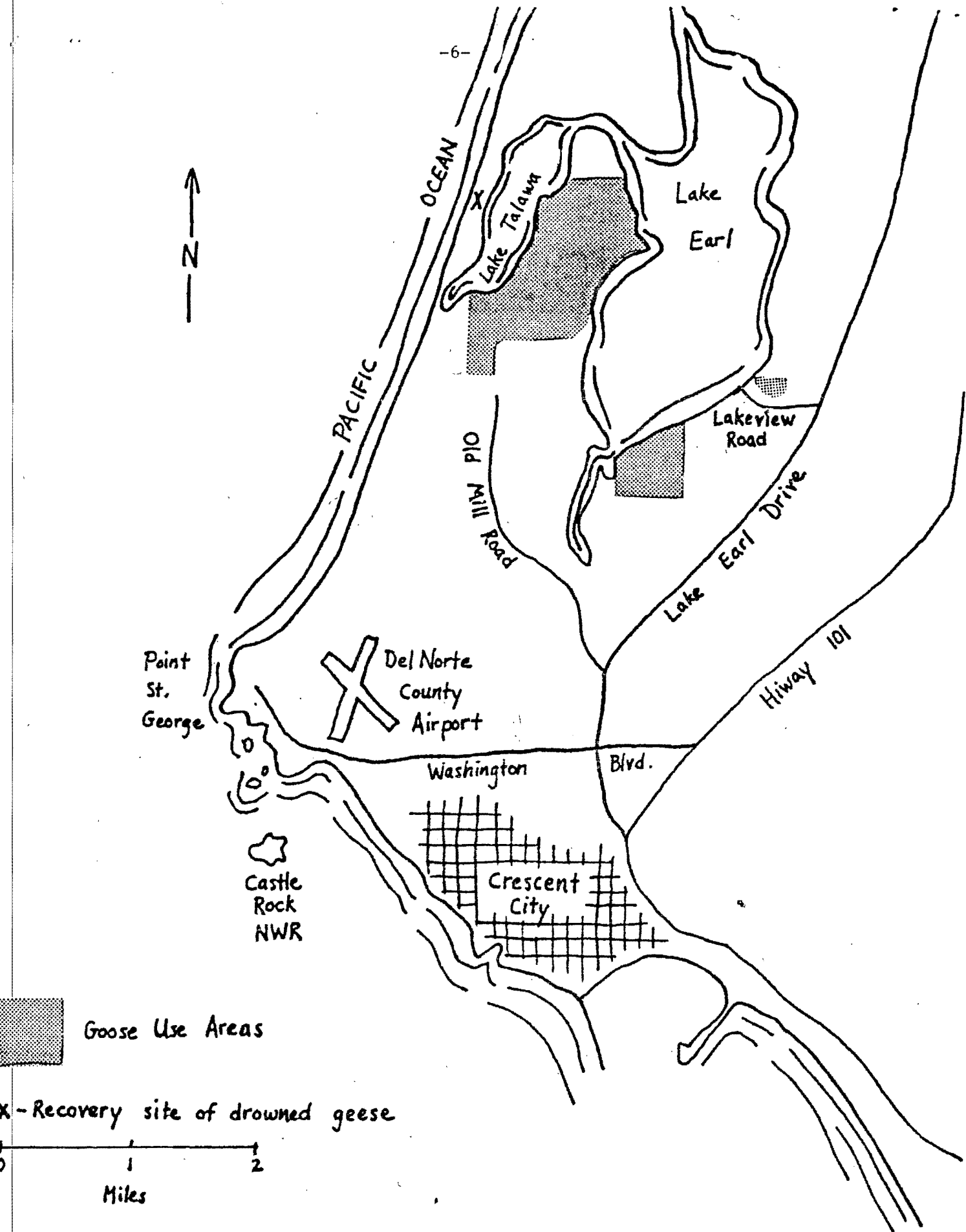

Figure 2. Aleutian Canada goose use areas near Crescent City, California, 1983-84.

Table 1. Peak weekly counts of Aleutian Canada geese in the principal known migration and wintering areas, 1983-84.[a,b]

Date	Area				
	Crescent City (Fall)	Colusa	Modesto-Los Banos	El Sobrante	Crescent City (Spring)
October					
1-7	-	-	-	-	-
8-14	1	-	-	-	-
15-21	35	-	-	-	-
22-31	640	450	-	-	-
November					
1-7	2,100	1,300	-	-	-
8-14	2,450	1,400	-	-	-
15-21	1,900	2,400	50	-	-
22-30	700	2,800	70	-	-
December					
1-7	240	2,500	300	28	-
8-14	22	3,000	300	65	-
15-21	22	2,300	1,600	93	-
22-31	0	1	[c]	97	-
January					
1-7	-	0	3,000	101	-
8-14	9	1	3,000	90	-
15-21	-	-	[c]	97	-
22-31	9	-	[c]	93	-
February					
1-7	-	-	3,000	67	9
8-14	-	-	[c]	0	23
15-21	-	0	3,000	1	28
22-29	-	1	2,000	0	1,800
March					
1-7	-	-	520	-	1,850
8-14	-	-	220	-	2,850[d]
15-21	-	-	-	-	2,900[d]
22-31	-	-	18	-	3,150[d]
April					
1-7	-	-	-	-	3,100[d]
8-14	-	-	-	-	2,250
15-21	-	-	-	-	400
22-30	-	-	-	-	150
May					
1-7	-	-	-	-	19

[a]Counts more than 1,000, rounded to nearest 50; between 100 and 999, rounded to nearest 10; less than 100, reported as counted.
[b]Daily population estimates are provided in the monthly reports.
[c]Present; no count due to poor visibility or large number of Canada goose subspecies present.
[d]Approximately 50 cackling geese present.

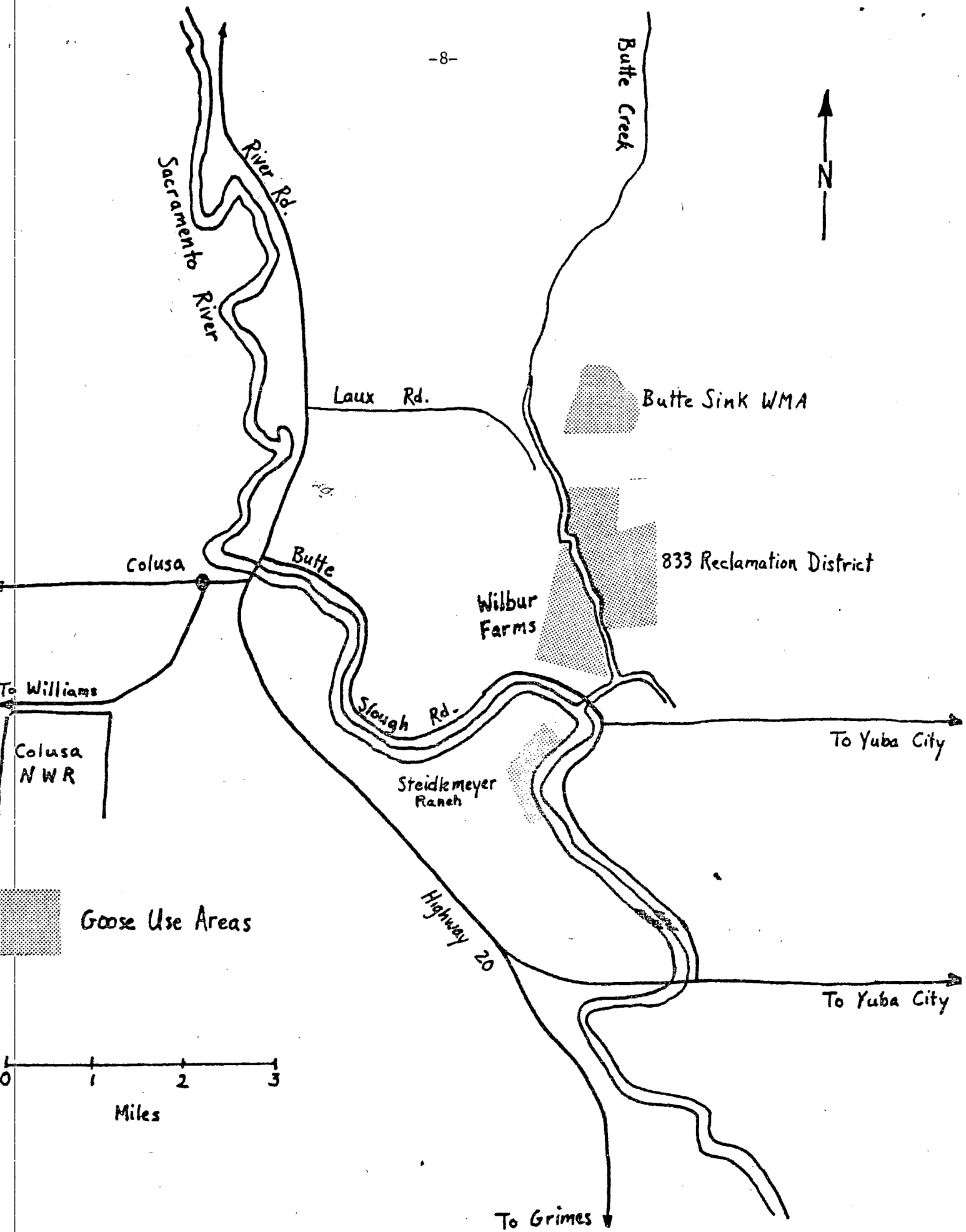

Figure 3. Aleutian Canada goose use areas near Colusa, California, 1983-84.

harvested bean fields on Wilbur Farms and in rice fields on areas adjacent to Wilbur Farms on the east and west sides. When this area became flooded, the geese used plowed rice fields across the river at the Steidlemeyer Ranch. Zon guns were placed in a winter wheat field at Steidlemeyer's to discourage foraging there. The geese roosted in flooded portions of the Butte Sink Wildlife Management Area (formerly referred to as the Beanpatch), and the 833 Reclamation District.

Sacramento-San Joaquin Delta

Two banded Aleutians were reported shot out of a flock of 30-40 coming into a harvested corn field on Bouldin Island on 7 December. No other records of Aleutians were obtained there or on the Grizzly Island WA where birds have been reported in the past.

Wintering Areas

Modesto-Los Banos

The first Aleutians seen in the Modesto area were a flock of 50 reported flying over the Faith Ranch on 18 November (Table 1). The number of geese increased slowly through late November and early December, and by mid-December at least 1,600 Aleutians were present. By late December the great majority of the Aleutian goose population was in the area. From November to March the birds used several agricultural areas adjacent to the San Joaquin River (Figure 4). Main use areas were the Bogetti and Mapes ranches at the confluence of the San Joaquin and Tuolumne Rivers, and the Serpa Ranch just northeast of where the Merced River joins the San Joaquin River.

An Aleutian was shot out of a flock of 10 on 17 December on the Mendota WA, about 30 miles southeast of the usual wintering terminous near Los Banos.

During late December the birds used the Bogetti Ranch, both for daytime feeding in the fallow fields, and roosting on a flooded section of the ranch. In past years the areas of the Bogetti and Mapes ranches used by the geese had been in harvested corn and/or beans; however this year the fields were fallow.

The month of January was one of much movement and fluctuation for the birds between Bogetti-Mapes and Serpas. The geese were often in two separate flocks, one using the Bogetti-Mapes ranches both diurnally and nocturnally, the other group feeding at Serpa's by day and flying to the South Grasslands Water District southeast of Los Banos to roost. On at least three occasions both groups merged at Bogetti's. Feeding also occurred in fallow fields at the corner of Jennings and West Main Road, and at the intersection of Carpenter and Crows Landing Roads. The Modesto Sewer Ponds were an infrequent roost site.

On 24 January the Bogetti Ranch was sprayed with Roundup, a commercial herbicide, which killed off most of the fallow vegetation by the end of the month. Over 500 Aleutians were seen there on 1 February, the last sighting of birds in the Bogetti-Mapes area for the season.

The Serpa Ranch was the main use area from late January to late February. The birds roosted in the South Grasslands Water District until mid-February when a new roost site was discovered in the North Grasslands Water District, about 5 miles southeast of Gustine. The birds developed a pattern which they

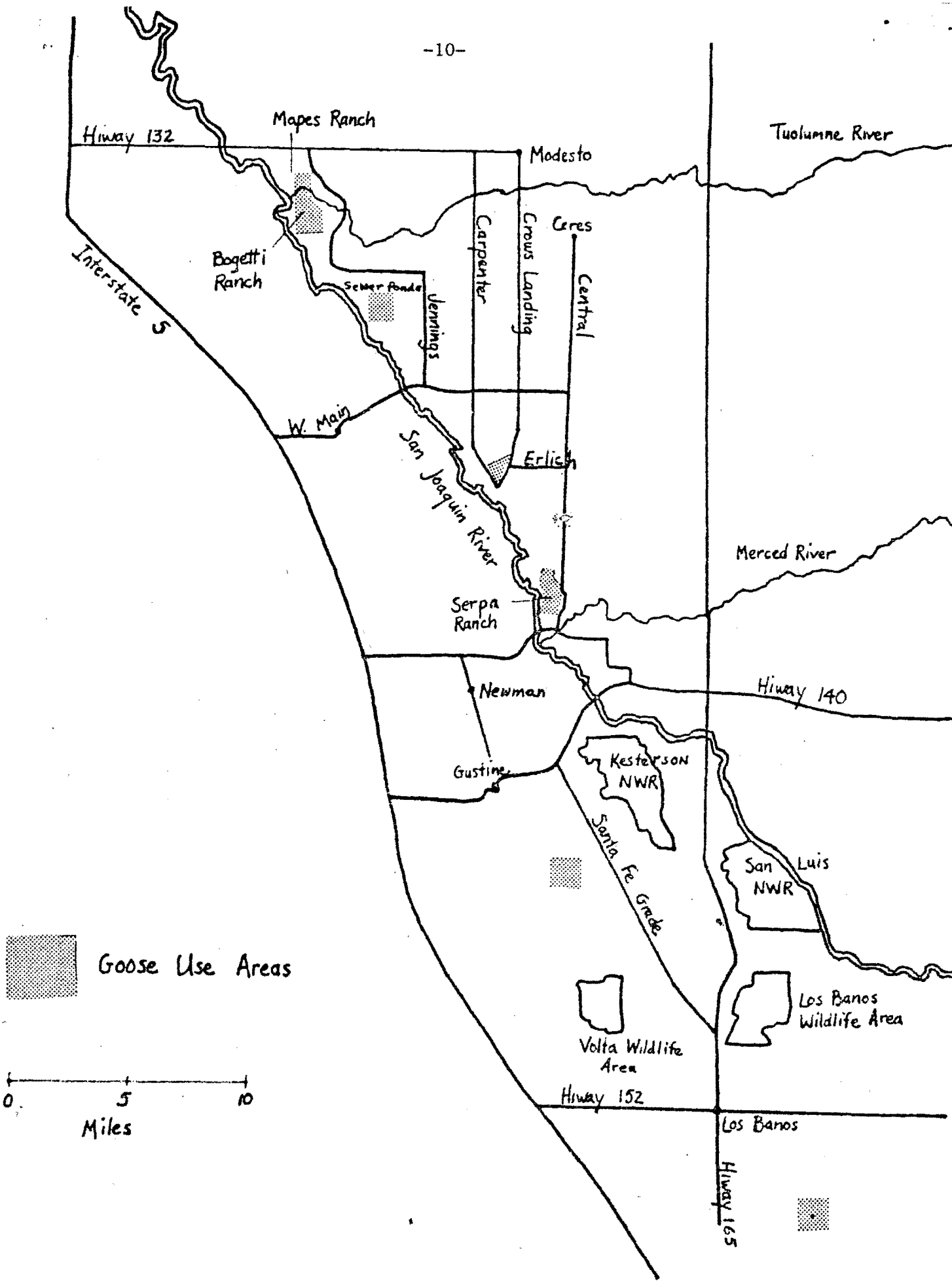

Figure 4. Aleutian Canada goose use areas in the San Joaquin Valley, California, 1983-8

followed fairly regularly, especially on warmer days. They would arrive at Serpa's at approximately 0700, feed until 0900-1100, loaf from 1000-1200, and then fly to the North Grasslands area, presumably for water. Between 1500-1700 they would return to Serpa's for feeding and then depart for their roost around dusk.

For most of January the preferred feeding location of the geese at Serpa's was in an 80-acre field of shredded corn. In February the birds fed in newly disked cornfields almost exclusively. They consumed both waste corn and fallow vegetation in these fields. An alfalfa field that began sprouting in early February adjoined the most heavily used cornfield; however, it was known to be visited only once by the geese.

The majority of Aleutians used Serpa's through 26 February. On 27 February, 600 Aleutians were present at Serpa's, down from 2,000 on the day before. Personnel at the Los Banos WA counted up to 1,700 small Canadas flying over the area daily from 3-7 March, some of which were thought to be Aleutians. The number of Aleutians at Serpa's dwindled to just over 100 by 14 March. The last record of Aleutians in the San Joaquin Valley was on 26 March when 18 birds were seen near the intersection of Erlich and Crows Landing roads.

El Sobrante

A small group of Aleutians overwintered near El Sobrante on pasturelands of the East Bay Municipal Utility District (EBMUD), which is off limits to hunting. Twenty-eight Aleutians were observed initially on 1 December 1983, the first time the area was surveyed this winter (Table 1). The number of birds increased to 94 by late December and reached a peak of 101 on 5 January. Seventy-eight were present on 29 January, but by 9 February only one Aleutian was observed in the area.

Oregon

The 76 intermediate Aleutian-Taverner's Canada geese remained in the Pacific City area through the winter.

Spring Migration Areas

Colusa

A single Aleutian was seen at Steidemeyer's on 27 and 28 February.

Crescent City

Nine Aleutians were observed on CDPR property just south of the mouth of Smith River, 10 miles north of Crescent City, on 10, 12, and 13 January and may have wintered in the area. Presumably the same birds were reported on Hunter Rock just north of the mouth of the Smith River on 12 January, and on Castle Rock NWR on 31 January. The count at Castle Rock increased gradually to approximately 150 birds by 23 February, when they were first observed feeding on the Lake Earl WA. The number of birds increased to 1,800 on 29 February, which corresponded with a reduced number of Aleutians at Serpa's in the San Joaquin Valley. As in the past, roosting occurred on Castle Rock NWR.

As the number of Aleutians increased they began using pastures on both the west (former Bliss Ranch) and south (former Lofton Ranch) sides of Lake Earl (Figure 2). Use of both areas continued well into April. An area near the end of Lakeview Road on the southeast side of Lake Earl was used by as many as 1,500 geese for about a week until flooded on 19 March. The number of Aleutians increased steadily until a peak spring count of 3,150 was reached on 29 March. Counts of approximately this number continued until 4 April.

Over 1,300 geese departed between 10-12 April and by the afternoon of the 19th the number of birds had dwindled to 160. This was also the last day that birds were seen feeding on the mainland. By 30 April only 14 birds could be seen on Castle Rock NWR. The last birds observed were 10 on 7 May.

As many as 50 cackling Canada geese associated with the Aleutians for most of the spring. Two snow geese (Chen caerulescens) and one Ross' goose (Chen rossii) were also present during this period.

Oregon

Observations of probable Aleutians included a flock of 400 on 7 April on Face Rock near Bandon, flocks of 30 and 60 on 10 April and 200 on 11 April over Langlois, a flock of 30-35 that lit in pastures at Langlois on 14 April, and flocks of 29 and 3 on 20 and 25 April, respectively, on Table Rock near Bandon. Both Face Rock and Table Rock are within the Oregon Islands NWR.

In the latter part of March most of the flock of intermediate Aleutian-Taverner's Canada geese started to use Three Arch Rocks some of the time. The last birds seen there were 54 on 13 April.

Alaska

A report was received that 24 possible Aleutian Canada geese were observed on 23 April flying with a flock of black brant (Branta bernicla nigricans) over Kalsin Bay on Kodiak Island.

Four Aleutians were reported on 5 May at Clam Lagoon on Adak Island.

Other Surveys and Sightings

Two areas where Aleutian geese have been sighted or reported previously were surveyed, but no birds were observed. One was on 23 November in the foothills west of Willows near Stony Gorge, Black Butte, and East Park reservoirs. Another was on 15 December near Lincoln, 40 miles southeast of Colusa, where a banded Aleutian was shot in January 1983 and a landowner reported seeing small Canada geese with blue neck collars in past years.

A flock of Aleutians was present in the Lone Pine-Owens Lake area from at least 9 to 24 December.

During January and February, surveys were made of many reservoirs in the San Francisco Bay area. Visited were the San Pablo Reservoir proper, Briones, Upper San Leandro, Upper and Lower Crystal Springs, San Antonio, Calaveras, Anderson, Calero, New Almaden, Guadalupe, Lexington, and Stevens Creek reservoirs and Lake Chabot. No Aleutians were observed.

Clear Lake in Lake County was surveyed for Aleutian Canada geese on 24 January and 10 February, but only larger subspecies of Canada geese, principally, Taverner's (B. c. taverneri) or possibly lesser Canada geese (B. c. parvipes), were observed. Also checked on the 10th was Madera Reservoir. Cacklers and white-fronted geese (Anser albifrons) were present at the latter location, but no Aleutians were seen.

Trapping

Trapping operations started on 8 March with the setting of two cannon nets on the Lofton Ranch portion of the Lake Earl WA. Biologist W. E. Rienecker of CDFG arrived on 19 March and directed trapping for 2 weeks. Eight netting attempts were made between 21 March and 11 April, including two with a rocket net not previously used in Aleutian trapping efforts. One hundred seven birds were caught including six cacklers, and one lesser Canada goose (Table 2).

Table 2. Summary of Aleutian goose trapping, 1984.

Date	Site	Males		Females		Aleutian recaptures	Other subspecies	Total geese caught
		SY	ASY	SY	ASY			
3/21	Lofton #1	10	4	5	6	1	-	26
3/24	Lofton #1	11	2	6	2	2	1 Cackler 1 Lesser	25
3/30	Lofton rocket net	-	-	-	-	-	-	-
3/30	Bliss #2	2	6	3	6	2	1 Cackler	20
4/1	Lofton #1	2	4	3	4	-	1 Cackler	14
4/6	Lofton rocket net	2	1	2	1	2	-	8
4/10	Lofton #1	1	1	-	-	3	3 Cacklers	8
4/11	Bliss #3	2	-	2	1	1	-	6
Total		30	18	21	20	11	7 { 6 Cacklers 1 Lesser	107

Eighty-nine birds were banded with USFWS and color leg bands. Eleven birds were retrapped, including two birds with metal bands only, which were given color bands, and a bird whose old color band was replaced. Seventy-seven percent of the geese color-marked this year were seen after banding. No capture myopathy was observed.

Peak Counts

The peak fall count of 3,800 was reached twice. On 13 November an estimated 2,450 Aleutians were present in the Crescent City area, while 1,350 were counted in the Colusa area. Three days later 1,900 were counted in both the Crescent City and Colusa areas. Conditions in the San Joaquin Valley severely limit accurate estimates; however, many counts exceeding 3,000 Aleutians were made.

In the spring the highest count was 3,207 birds on 29 March. Deleting the cackling Canada geese leaves a peak of approximately 3,150 Aleutians. Several independent counts by individual observers revealed the generally close agreement among counts during the period of peak occurrence (Table 3).

Table 3. Comparison of independent morning fly-off counts from Castle Rock during the period of peak goose occurrence, 1984.[a]

Date	Number	Observer[b]	Date	Number	Observer[b]
18 March	2,798	DRY	1 April	3,165	PSH
	2,696	ETN		3,083	ETN
				3,062	JGM
22 March	3,095	ETN		3.059	DRY
	2,848	DRY			
			5 April	3,031	DRY
23 March	3,172	ETN		2,926	ETN
	3,085	DRY			
			6 April	2,805	ETN
27 March	3,165	ETN		2,728	DRY
	3,010	DRY			

[a]Approximately 50 cackling Canada geese included in these counts.
[b]Observers: DRY = Dan R. Yparraguirre; ETN = Eric T. Nelson; PSH - Paul S. Hofmann; JGM - J. Greg Mensik.

Band Observations

From October 1983 through April 1984, 329 color-marked geese were resighted 4,950 times in migration and wintering areas (Table 4).

Sightings of Reintroduced and Transplanted Geese

Of the 105 newly banded geese that were transplanted from Buldir to Agattu in July-August 1983 (Dienes and Zeillemaker 1983), 46 percent were seen (Table 5). These consisted of 82 percent (23/28) of the adults but only 32 percent (25/77) of the hatching-year geese.

In 1982, 286 geese were released on Agattu, of which 50 were seen in 1982-83, but only 19 were seen this year (Table 6). One hundred thirty-five color-marked geese were transplanted in 1982, with 94 of those being sighted on the wintering grounds during 1982-83, and 50 being seen this winter.

Table 4. Color-marker observations in the known principal use areas, 1983-1984.

Area	Band Status	Number of Marked Individuals Sighted							Total	
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	Individuals	Sightin
Crescent City (Fall)	wild		81	10					81	210
	79 transplant		5	1					5	19
	80 release		1	0					1	1
	80 transplant		10	1					10	29
	81 release		4	0					4	12
	82 release		13	1					13	60
	82 transplant		33	3					33	138
	83 transplant		41	2					41	125
Colusa	wild	6	98	24					101	245
	79 transplant		5	2					5	21
	80 release		2	1					2	3
	80 transplant			3					13	27
	81 release		2						1	4
	82 release		7	3					7	19
	82 transplant		28	8					27	79
	83 transplant		20	9		1			26	49
Modesto-Los Banos	wild			18	115	141	21		152	796
	79 transplant			3	5	6	2		7	112
	80 release				1	3			3	12
	80 transplant			1	13	18	4		18	100
	81 release			1	8	7	3		8	66
	82 release			3	11	12	2		13	74
	82 transplant			5	33	41	16		43	325
	83 transplant			3	29	33	11		36	275
Crescent City (Spring)	wild					37	151	107	151	1,030
	79 transplant					3	7	6	7	71
	80 release						3	2	3	35
	80 transplant					4	17	14	19	150
	81 release					2	9	8	9	81
	82 release					3	13	12	13	81
	82 transplant					12	42	34	43	421
	83 transplant					5	31	28	31	220
El Sobrante	wild			1	1	1			1	17
	81 release			3	3	3			3	43
Yearly Totals	wild								172	2,298
	79 transplant								7	223
	80 release								3	51
	80 transplant								20	306
	81 release								11	206
	82 release								18	234
	82 transplant								50	963
	83 transplant								48	669
Grand Total									329	4,950

Table 5. Sightings and/or recoveries of Aleutian Canada geese transplanted on Agattu Island in July-August 1983.

Geese transplanted			Number and percentage sighted and recovered 10/83-4/84
28 Adults[a]	12 males		9 (75%)
	16 females		14 (88%)
77 1983-hatched young		37 males	13 (35%)
		40 females	12 (30%)[b]
105 Total transplanted geese		Total	48 (46%)

[a]Does not include three previously banded birds also used in the 1982 transplant.

[b]One bird was shot.

Table 6. Sightings and/or recoveries of Aleutian Canada geese released or transplanted on Agattu Island in July-August 1982.

			Number and percentage sighted and recovered 10/82-4/83	10/83-4/84
Geese released on Agattu on August 6, 1982				
46 captive breeding group	21 males		2 (10%)	
	25 females		2 (8%)	
41 paired birds (non-foster parents)	20 wild males 21 captive-reared females		7 (35%)	2 (5%)
44 paired birds (foster parents)	20 wild males 1 captive-reared male 23 captive-reared females		5 (40%)[a]	4 (20%)[b]
155 1982-hatch goslings reared with wild male and captive-reared female foster parents.				
Reared at Northern Prairie				
13-23 days old when released[b]	6 males		2 (33%)	1 (17%)
	7 females		1 (14%)	
29-44 days old when released	34 males		11 (32%)	6 (18%)
	33 females		7 (21%)	1 (3%)
49-59 days old when released	28 males		1 (4%)	1 (4%)[b]
	38 females		1 (3%)[b]	
Reared at Patuxent				
44 days old when released	1 male		1 (100%)	
	1 female		1 (100%)	1 (100%)
63-78 days old when released	5 males		4 (80%)	2 (40%)
	2 females		2 (100%)	1 (50%)
286 Total released geese[c]		Total	50 (17%)	19 (7%)
Geese transplanted from Buldir to Agattu on July 29-August 4, 1982				
27 adults	10 males		9 (90%)	5 (50%)
	16 females		13 (81%)	10 (63%)
	1 unsexed		1 (100%)	1 (100%)
108 1982-hatched young	49 males		33 (67%)[e]	15 (31%)
	59 females		38 (64%)[f]	19 (32%)
135 Total transplanted geese[d]		Total	94 (70%)	50 (37%)

[a] Two birds were shot.

[b] One bird was shot.

[c] Does not include five goslings with metal leg bands only.

[d] Does not include two previously color-banded adult birds and one metal-banded young bird transplanted at the same time.

[e] One other bird died on Agattu, probably in 1982 after the transplant.

[f] Three birds were shot.

Of the 10 birds from the 1981 release on Nizki Island that were seen in California during 1982-83 (in addition, one was shot and one was found dead in fall 1982), six were seen this year (Table 7). Also five birds from that release that were not sighted on the wintering grounds in 1982-83, were sighted this year. However, all five were seen in winter 1981-82 or on Nizki and/or Agattu in May 1982 or May/June 1983.

Sightings and/or recoveries of geese released or transplanted on the Aleutian Islands in 1980 totalled 21 birds, down from 25 birds last year (Table 8).

Of the 29 wild guide birds released on Agattu and the 15 hatching-year young transplanted from Buldir to Agattu in 1979, five and two birds, respectively, were seen this winter.

Of 11 banded birds observed on Agattu in May/June 1983 (Dragoo and Deines 1983), two that were released on nearby Nizki Island in 1981 were also seen on Nizki and Agattu in May 1982 but have never been seen on the wintering grounds, three released on Agattu in 1982 have never been seen on the wintering grounds, but six others also released on Agattu in 1982 were seen on the wintering grounds in both 1982-83 and 1983-84.

Migration

The majority of the color-marked birds that were observed this year were initially sighted in the Crescent City area, especially the Aleutians from the 1983 transplant (Table 9). The second highest number of birds was first seen in the Colusa area. Only 8 percent of the birds were first seen in the Modesto-Los Banos area.

The largest percentage of color-marked birds seen throughout the migration and wintering period was in the Modesto-Los Banos area, followed closely by the Crescent City area in the spring (Table 10).

Ninety-three percent of the marked geese observed at Crescent City were seen from 27 March to 4 April, during which time it was thought that at least 3,150 Aleutian Canada geese were present.

Sixteen percent of the marked birds observed were not seen at Crescent City in the spring (Table 11). The greatest loss was birds last seen at Crescent City in the fall (7 percent), followed by losses of 4 percent, respectively, of birds last seen at Colusa and Modesto-Los Banos.

Mortality

Sixty-six Aleutians were known to have died between October 1983 and May 1984 (Table 12). Forty-three drowned in a localized incident, 22 were shot, and one died of unknown cause. In addition, a crippled bird that could not fly was seen on the Bliss Ranch section of the Lake Earl WA between 12 November and 1 December. Presumably the same bird was seen several times in February, at which time it could fly only a short distance. Possibly this bird had been wounded by gunshot. Also, among the 22 Aleutians last seen feeding on the Lofton Ranch section of the Lake Earl WA in December were five that were moderately to severely crippled, perhaps by gunshot, but could fly. Possibly the nine birds seen in January near the Smith River and at Castle

Table 7. Sightings and/or recoveries of Aleutian Canada geese released on Nizki Island on August 16, 1981.[a]

		Number and percentage sighted and recovered		
		11/81-4/82	10/82-4/83	10/83-4/84
15 Older wild-caught "golden" males		9 (60%)	3 (20%)	4 (27%)
15 Older captive-reared "golden" females		2 (13%)		
80 1981-hatched "golden" birds released with parents or foster parents	38 males[b]	4 (11%)[c]		
	42 females	7 (17%)[d]	1 (2%)	
1 Older wild-caught male - Buldir and Amchitka				
1 Older wild-caught female - Crescent City		1 (100%)		
103 Patuxent-reared 1981-hatched birds	51 males	13 (25%)[d]	3 (6%)[e]	1 (2%)
	52 females	12 (23%)[c]	2 (4%)	2 (4%)
51 Northern Prairie-reared 1980-hatched birds	30 males		1 (3%)	3 (10%)
	21 females	1 (5%)	1 (5%)	1 (5%)
69 Patuxent-reared 1980-hatched birds	47 males 22 females			
11 Older Northern Prairie-reared birds	6 males 5 females			
9 Older Patuxent-reared birds	6 males 3 females			
7 Older Amchitka-reared birds	3 males 4 females			
362 Total	Total	49 (14%)[f]	11 (3%)	11 (3%)

[a]The 103 Patuxent-reared 1981-hatched birds were shipped from the Patuxent Wildlife Research Center; all the rest of the birds were shipped from the Northern Prairie Wildlife Research Center.

[b]One more bird (not included in total) was found dead on Nizki after being released.

[c]Two birds were shot.

[d]Three birds were shot.

[e]One bird was shot

[f]Ten known banded birds were shot. In addition, four or more birds whose band numbers are not known were shot.

Released Geese		Number and percentage sighted and recovered 11/80-4/81	11/81-4/82	10/82-4/83	10/83-4/84
May 20, 1980 release at Amchitka					
45 Patuxent-reared 1979 hatch	39 males 6 females				
46 Amchitka-reared 1979 hatch	24 males 22 females	1 (4%) 1 (5%)			
25 Northern Prairie-reared 1979 hatch	11 males 14 females				
2 Wild-caught females					
August 12, 1980 release at Agattu Island of 1980-hatched birds reared at Amchitka					
33 "Golden" birds released with parents or foster parents	9 males 24 females	5 (56%)[a] 8 (33%)[b]	2 (22%)	1 (11%)	
7 Females released without parents or foster parents		4 (57%)[a]	1 (14%)	1 (14%)	2 (29%)
August 12, 1980 release at Agattu Island of parents or foster parents (golden birds) to 33 young					
3 Older wild-caught males 3 Older Patuxent-reared females		1 (33%)	1 (33%)	1 (33%)	
August 12, 1980 release at Agattu Island of two (2) 1979-hatched Patuxent-reared females		1 (50%)			
August 21, 1980 release at Buldir Island of birds from Amchitka					
12 Amchitka-reared 1980 hatch males		6 (50%)	2 (17%)	1 (8%)	1 (8%)
8 Older Patuxent-reared males		1 (13%)			
186 Grand Total released geese	Grand Total	28 (15%)	6 (3%)	4 (2%)	3 (2%)
Transplanted Geese					
August 15-17, 1980 transplant of birds from Buldir Island to Agattu Island					
49 1980-hatched young	22 males 27 females	15 (68%)[a] 21 (78%)	9 (41%) 14 (52%)	8 (36%) 12 (44%)	7 (32%)[a] 9 (33%)
8 Adult females		5 (63%)[a]	5 (63%)	4 (50%)	4 (50%)
3 Adult males		3 (100%)[a]	1 (33%)	1 (33%)	1 (33%)
60 Total transplanted geese	Total	44 (73%)	29 (48%)	25 (42%)	21 (35%)

[a] Bird was shot.

[b] Four birds were shot.

Table 9. Number of color-marked geese by location of first sighting, 1983-84.[a]

Area	Wild	1979 Transplant	1980 Release	1980 Transplant	1981 Release	1982 Release	1982 Transplant	1983 Transplant[b] Juv.	1983 Transplant[b] Ad.	Total
Crescent City Fall	81 (47)	5 (71)	1 (33)	10 (50)	4 (36)	13 (72)	33 (66)	19 (76)	22 (96)	188 (57)
Colusa	74 (44)	1 (14)	1 (33)	9 (45)	1 (9)	3 (17)	16 (32)	5 (20)		110 (34)
El Sobrante	1 (1)				3 (27)					4 (1)
Modesto-Los Banos	14 (8)	1 (14)	1 (33)	1 (5)	3 (27)	2 (11)	1 (2)	1 (4)	1 (4)	25 (8)
Crescent City Spring	2 (1)									2 (1)
Total	172	7	3	20	11	18	50	25	23	329

[a]Percentages are in parentheses following numbers of geese.

[b]Does not include three previously banded birds also used in the 1982 transplant.

Table 10. Number of color-marked geese seen in migration and wintering areas, 1983-84.[a]

Area	Wild	1979 Transplant	1980 Release	1980 Transplant	1981 Release	1982 Release	1982 Transplant	1983 Transplant[b] Juv.	1983 Transplant[b] Ad.	Total
Crescent City Fall	81 (49)	5 (71)	1 (33)	10 (50)	4 (36)	13 (72)	33 (66)	19 (76)	22 (96)	188 (57)
Colusa	101 (59)	5 (71)	2 (67)	13 (65)	1 (9)	7 (39)	27 (54)	15 (60)	11 (48)	182 (52)
El Sobrante	1 (1)				3 (27)					4 (1)
Modesto-Los Banos	152 (88)	7 (100)	3 (100)	18 (90)	8 (73)	13 (72)	43 (86)	17 (68)	19 (83)	280 (85)
Crescent City Spring	151 (88)	7 (100)	3 (100)	19 (95)	9 (82)	13 (72)	43 (86)	15 (60)	16 (70)	276 (84)
Total	172	7	3	20	11	18	50	25	23	329

[a]Percentages are in parentheses following numbers of geese.

[b]Does not include three previously banded birds also used in the 1982 transplant.

Table 11. Number of color-marked geese by location of last sighting, 1983-84.[a]

Area	Wild	1979 Transplant	1980 Release	1980 Transplant	1981 Release	1982 Release	1982 Transplant	1983 Transplant[b] Juv.	1983 Transplant[b] Ad.	Total
Crescent City Fall	6 (3)			1 (5)		3[c] (17)	4 (8)	5[d] (20)	4 (17)	23 (7)
Colusa	7[e] (4)					2 (11)	1 (2)	3 (12)	1 (4)	14 (4)
El Sobrante	1 (1)				1 (9)					2 (1)
Modesto-Los Banos	7 (4)				1 (9)		2 (4)	2 (8)	2 (9)	14 (4)
Crescent City Spring	151[f] (88)	7 (100)	3 (100)	19 (95)	9 (82)	13 (72)	43 (86)	15[g] (60)	16 (70)	276 (84)
Total	172	7	3	20	11	18	50	25	23	329

[a]Percentages are in parentheses following numbers of geese.

[b]Does not include three previously banded birds also used in the 1982 transplant.

[c]Two birds shot near Lone Pine, CA.

[d]One bird shot at Robbins, CA.

[e]One bird shot on Bouldin Island, CA.

[f]Four birds died in Crescent City drowning.

[g]Two birds died in Crescent City drowning.

Table 12. Known Aleutian Canada goose mortality, 1983-84.

Date	Number of Birds	Location	Band Status	Cause
22 Oct. 1983	1	Willapa NWR, Wash.	1127-01058, Buldir 1980	shot
" " "	1	" " "	unbanded	"
" " "	1	" " "	unbanded	"
6 Nov.	1	Lake Earl WA, CA	unbanded	" illegally
8 Nov.	1	" " " "	unknown	" "
4-7 Nov.	1	" " " "	Blue 324, transplant 1980	" "
" "	1	" " " "	unbanded	" "
" "	1	" " " "	unbanded	" "
8 Nov.	1	Verona, CA	1067-10141, Cr. City spring 1982	"
26 Nov.	1	Mapes Ranch, CA	897-12886, Buldir 1974	"
" "	1	" " "	unbanded	"
27 Nov.	1	Sauvie Island WA, OR	unbanded	"
" "	1	" " " "	Blue 872, release 1982	"
4 Dec.	1	Robbins, CA	Blue E38, transplant 1983	"
7 Dec.	1	Bouldin Island, CA	Red 89, Cr. City spring 1981	"
" "	1	" " "	997-14489, Cr. City spring 1981	"
9 Dec.	1	Lone Pine, CA	Blue X24, release 1982	"
10 Dec.	1	Owens Lake, CA	unbanded	"
17 Dec.	1	Mendota WA, CA	unbanded	"
18 Dec.	1	Colusa, CA	unbanded	" illegally
24 Dec.	1	Lone Pine, CA	Blue 829, release 1982	"
8 Jan. 1984	1	Colusa, CA	unbanded	"
27 Jan.	1	Serpa Ranch, CA	unbanded	" illegally
2 Mar.	1	" " "	unbanded	unknown
8 April	43	Near Lake Talawa, CA	35 unbanded	drowning
" "		" " " "	997-14422 Cr. City spring 1980	"
" "		" " " "	997-14450 " " " 1981	"
" "		" " " "	Red 254 " " " "	"
" "		" " " "	" 346 " " " 1983	"
" "		" " " "	" 373 " " " "	"
" "		" " " "	" 384 " " " "	"
" "		" " " "	Blue C71 transplant 1983	"
" "		" " " "	" E43 " "	"

Rock were from this group. Lastly, an Aleutian with a bloody wound by one leg was observed in the El Sobrante area on 27 December.

Between 8-10 April, 43 Aleutian Canada geese were found dead on a 3/4-mile stretch of ocean beach 1/2 mile north of the opening of Lake Talawa (Figure 2). The preliminary diagnosis as to the cause of death by federal and state wildlife health laboratory officials was drowning associated with severe storm conditions during the night of 7 April. No weather data are available from the Crescent City area for that time; however, data from the Weather Bureau at Eureka (75 miles south of Crescent City) showed minimum peak gusts of 31 knots (36 mph) and swells of 16 feet at 1:30 a.m. on 8 April, when geese were heard flying excitedly during the storm.. Of the 43 birds, eight were known to have been banded.

Of the 22 birds shot, seven were taken illegally within Canada goose hunting closure zones. Ten of the 22 birds were banded, six of which were color-marked. Four of the six color-marked birds were seen at Crescent City or Colusa in the fall before being shot. The two other birds were recovered without having been sighted previously this year; one was shot at Lake Earl, the other was shot at the Sauvie Island WA near Portland, Oregon.

An outbreak of avian cholera involving mostly American coots (Fulica americana) was noted on the Lake Earl WA from 29 November to 9 December. Dead birds were removed daily and no known Aleutian mortality occurred.

On 16 January, five dead tundra swans (Cygnus columbianus) were found on the Mapes Ranch, near the Aleutians use area. The swans were examined by the USFWS Wildlife Health Laboratory and found to have died from avian cholera. Zon guns were put out without much effect; however, the small number of geese present remained for just a short time, using an area removed from the swans. The area was monitored closely, and no Aleutians were known to have perished there.

DISCUSSION

The use of migration and wintering areas identified in previous studies (Woolington 1980, Beall 1980, Umland and Springer 1981, Pomeroy and Springer 1982, Yparraguirre 1983) continued in 1983-84. Some factors thought to cause temporal or locational shifts by the geese in the past include changes in crop abundance and availability, weather, and hazing following crop depredation complaints or disease outbreaks. The geese have been feeding less in pasture and more in cornfields as the study has progressed, especially in the San Joaquin Valley. Feeding areas and roosts have continued to be highly traditional sites.

Crescent City (Fall)

The date of initial fall sighting of Aleutians this year was 9 days later than that of last year. The peak number of birds present at Crescent City this fall was over three times as large as that in 1982 and more than twice as large as that in 1981 (Table 13). The number of color-marked Aleutians seen at Crescent City this fall compared to the total marked birds observed this year (57 percent) was higher than that in 1982 (38 percent) (Yparraguirre 1983). The 57-percent figure was only slightly lower than the peak number of birds (both marked and unmarked) that were observed at Crescent City in the

fall in relation to the peak population of all birds observed on the wintering grounds this year (64 percent). Because of the large number of birds in the area, their scattered distribution, and relatively short duration of stay, it is believed that some marked birds were not observed.

Table 13. Peak counts of Aleutian Canada geese, overall and at major known use areas.[a]

Year	Overall	Crescent City (Fall)		Colusa		Modesto-Los Banos		Crescent City (Spring)	
1975-76	900	200	(22)	230	(26)			900	(100)
1976-77	1,250	370	(30)	1,250	(100)	1,000	(80)	1,150	(92)
1977-78	1,500	210	(14)	1,500	(100)	1,300	(87)	1,150	(77)
1978-79	1,600	120	(8)	1,500	(94)	1,500	(94)	1,250	(78)
1979-80	1,700	220	(13)	1,700	(100)	1,600	(94)	1,500	(88)
1980-81	2,000	630	(32)	1,500	(75)	1,650	(83)	1,950	(98)
1981-82	2,700	1,050	(39)	1,650	(61)	2,700	(100)	2,250	(83)
1982-83	3,500	740	(21)	2,900	(83)	3,200	(91)	2,650	(74)
1983-84	3,800	2,450	(64)	2,800	(74)	>3,000[b]	(>79)	3,150	(83)

[a]Figures in parentheses are percentages of the overall counts.
[b]Precise peak count not obtained because of presence of other subspecies.

Colusa

Aleutians were sighted 2 days later this year than in 1982. Because of the large number of Aleutians that stopped at Crescent City this fall, the number of color-marked birds first seen at Colusa in relation to all color-marked birds seen during the years (34 percent) was considerably less than that during last year (55 percent) (Yparraguirre 1983). Also, despite the larger overall population of Aleutians flying south, the peak number observed at Colusa was 100 less than that last year, suggesting that some birds passed by without stopping. The possibility of inaccuracy in the counts also exists. Because of the birds' use of flooded rice fields, the number of color-marked geese that were observed at Colusa compared to the total marked birds observed on the wintering grounds (52 percent) was considerably lower than the peak number of birds seen at Colusa in relation to the peak population seen on the wintering grounds (74 percent).

For the third year in the last four the presence of a large number of Aleutians in the area on 15 December caused CDFG to extend the hunting closure again.

El Sobrante

In 1982-83, up to 100 Aleutians were seen at El Sobrante, including 20 color-marked birds (Yparraguirre 1983), of which only two were observed in the area this year. Interestingly, these two birds were seen only here for the past two winters and springs. Of the other 18 banded birds seen in 1982-83, 10 were seen at traditional wintering areas this year, but not at El Sobrante. The other eight were not seen this year. Additionally, two banded birds were observed for the first time at El Sobrante this year. Both birds were released on Nizki Island in the summer of 1981 and seen there again in May

1982. Only one of the birds was observed in the winter of 1981-82 in traditional use areas. These two geese were seen at Crescent City in spring 1984.

Modesto-Los Banos

Geese were reported in the area west of Modesto 5 days earlier than last year. The Lower Mapes-Bogetti ranches have been the main use areas in the northern San Joaquin Valley since at least the 1978-79 season. As in 1982-83, no known use of areas north of Highway 132 was noted in the winter.

As the birds moved south from the Mapes-Bogetti ranches in January their main use area switched to the Serpa Ranch, a site which was first known to be frequented last year. Although the Serpa Ranch was the southernmost known regular feeding area this year, the geese roosted at night in areas ranging from 6 miles south to 10 miles northwest of Los Banos. Several areas around Los Banos have been used diurnally in past years of the study (Woolington et al. 1979, Beall 1980, Yparraguirre 1983). Some geese may have used the area around Mendota for part of the winter inasmuch as in mid December a report was received of a flock of 10 birds from which one banded Aleutian was shot.

Crescent City (Spring)

Large numbers of geese began to return to the Crescent City area almost 2 weeks later than in the spring of 1983. As then, some geese used an area near the end of Lakeview Road. No geese were observed feeding near the Del Norte County airport this spring.

The peak spring count of 3,150 Aleutians was about 500 more than the peak last spring. As many as 50 cacklers were noted in the flock, considerably more than in other years. As in past years of the study, most of the geese had departed by mid-April.

The number of color-marked Aleutians seen at Crescent City compared to the total number of marked birds seen on the wintering grounds (84 percent) was identical with that recorded last year (Yparraguirre 1983) and nearly identical with the peak number of birds observed at Crescent City in the spring in relation to the peak number observed on the wintering grounds (83 percent). Because the birds use the Crescent City area for a considerable period of time and the intensity of observation is greatest then, this suggests that the proportion of use of the area each spring is consistent and that the marked birds are representative of the entire population using the area.

Oregon

Most of the known use of the Langlois area in the fall and spring was by passing flocks. Several groups were observed in the spring in the Bandon area. Nine apparent Aleutians were recorded at Pacific City on 17 November. The only other observation of Aleutians in this area was of a flock of 18-23 from 13-21 November 1981.

The peak of 78 intermediate Aleutian-Taverner's Canada geese in the Pacific City area (Henry 1984) was up from the peak of 69 the previous year but still lower than the peak of 85 observed in the fall of 1980 (Table 14).

Table 14. Number of intermediate Aleutian-Taverner's Canada geese observed in the Pacific City-Three Arch Rocks area, Oregon (Data from W. G. Henry).

Year	Population	
	Fall	Spring
1979-80	80	63
1980-81	85	66
1981-82	60	53
1982-83	69	61
1983-84	78	76

As in previous years the intermediate birds used primarily the Pacific City area, roosting on Haystack Rock and feeding during the day in the Carl Hurliman pastures on the mainland. Particularly during the latter part of their stay in the spring, they sometimes used the Three Arch Rocks NWR as they did in 1983.

The present goose hunting closure area includes the Pacific City area but not the Netarts Bay area, 5 miles south of Three Arch Rocks NWR, where the intermediate geese have been observed a few times. The flock size decreased by only two between the beginning and end of the birds' stay this wintering season. It is possible that these birds were shot inasmuch as a crippled bird was noted in the flock thereafter. Prior to the establishment of the closure in the 1982-83 season, goose hunting was allowed, and it is known that some intermediate birds were shot.

Transplanted Birds

Only 32 percent (25/77) of the goslings transplanted from Buldir to Agattu in 1983 were observed on the wintering grounds in 1983-84 (Table 5). This is much lower than first-winter resighting rates of 73 percent (36/49) and 66 percent (71/108) from the transplants of goslings in 1980 and 1982, respectively (Tables 8 and 6). First-winter resighting rates of adults transplanted in 1980, 1982, and 1983 were 73, 86, and 82 percent, respectively. In the summer of 1983, 57 of the 77 goslings handled were aged by field personnel (Deines and Zeillemaker 1983), making comparison of resightings of known-age birds possible. Only 22 percent (4/18) of the goslings handled between 10-20 days were resighted, compared to 54 percent (21/39) of the goslings which were older than 21 days when handled. This difference in resighting rates may be attributable to higher band loss and/or higher mortality of the younger birds.

Additionally, four birds from the 1983 transplant that were retrapped or recovered in spring 1984 at Crescent City exhibited definite signs of deformation of the primary feathers associated with handling during periods of feather development (F. Lee pers. comm). Two of the birds that were handled at 16 and 22 days, respectively, exhibited breakage of the shaft and vanes. The other two goslings, handled at 21 and 43, days respectively, showed less serious damage. In addition, an adult male transplanted at the same time was seen alone at Colusa on 27-28 February, the only Aleutian observed there this spring, at which time it had noticeably frayed primaries. It was not observed subsequently at Crescent City. It had been seen previously in the fall at Crescent City and until 16 February at the Serpa Ranch.

Mortality

There were 66 known mortalities in 1983-84 compared to 26 known deaths and one crippling in 1982-83. However, 43 of the dead geese this year died in an unusual, albeit natural event. The number of birds shot this year was similar to that in past study years, as was the number of geese shot illegally in closed hunting zones. Known mortality has not increased proportionately with the overall population throughout the years of the wintering ground study (Woolington 1977, Beall 1980, Umland and Springer 1981, Pomeroy and Springer 1982, Yparraguirre 1978, 1979, 1983). However, the large number of Aleutians present in the Crescent City area in the fall was the object of the apparent increased amount of poaching that occurred or was suspected.

Peak Counts

The peak 1983 fall count of 3,800 geese was 300 birds above the peak fall count of 3,500 in 1983 (Yparraguirre 1983), and 650 birds above the peak spring count of 3,150 this year. This is the second consecutive year that there has been a difference of more than 500 birds between fall and spring peak counts. Possible explanations for these differences are erroneous counts, higher mortality on the wintering grounds than has previously occurred, or an unbanded segment of the population that is bypassing Crescent City in the spring. The difficulties in obtaining accurate peak counts in the fall have been discussed previously (Yparraguirre 1983). These problems will probably increase with an expanding population.

Band observations from 1976 through 1983 (Pomeroy and Springer 1982, Yparraguirre 1982, 1983) indicate that only 17 birds that were not seen in the spring at Crescent City were seen the following fall, with nine of these occurring in 1981 (Pomeroy and Springer 1982). Six birds that were not observed at all last winter were seen this year. However, of these six, five were birds from the 1981 release on Nizki Island that were observed there in May 1982 and/or May/June 1983 or on the wintering grounds in 1981-82. Eighty-seven percent of the 319 color-marked birds seen in 1983-84 and not known to have died were seen in the spring at Crescent City compared to 86 percent of the 294 color-marked birds in 1982-83. These birds were probably the great majority of the surviving color-marked geese because only three of the 42 color-marked birds seen earlier in the 1982-83 season but not seen in the Crescent City area in spring 1983 were seen this year. Thus, most of the marked birds not seen in the spring apparently did not represent geese bypassing the spring staging area, but, instead, these "missing" marked birds were probably dead. If, instead, the large difference in recent years between the peak fall and spring counts is due to geese bypassing the Crescent City area, these geese are not represented by color-marked individuals, and a banding program to identify these birds is needed. Additionally, among the color-banded birds seen during the entire spring at Crescent City in 1983 and 1984, 97 percent (Yparraguirre 1983) and 93 percent, respectively, were seen during the period of peak counts. Thus, it appears that almost all these banded birds pass through the Crescent City area in the spring at the same time.

RECOMMENDATIONS

1) Continue the existing Canada goose hunting closures in Oregon with the following modifications recommended by Henry (1984):

a. Reduce southern and eastern boundaries in Tillamook County.

b. Add Netarts Bay and adjoining sand spit.

2) Continue the existing Canada goose hunting closures in California with the following modifications recommended by Yparraguirre (1983):

a. Create a subunit in the Sacramento Valley closure zone that would remain closed to hunting if the geese remain past mid-December.

b. Divide the San Joaquin Valley closure zone into a northern part that would be closed from late November through the end of the waterfowl hunting season and a southern part consisting of the remainder of the current zone plus a southern addition, all of which would be closed from mid-December through the end of the waterfowl hunting season.

3) Initiate a banding and color-marking program in the fall at Colusa in an effort to determine if a segment of the population is staging elsewhere than, or bypassing, Crescent City in the spring.

4) Continue winter ground monitoring and spring banding and color-marking.

5) Initiate a study of the feeding ecology of the geese at the Lake Earl WA to develop management recommendations for preferred forage.

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