Bird Survey of Ballona Wetland, Playa del Rey, CA 1990-1991

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Introduction

From April 1990 to April 1991, bi-monthly bird surveys of the Playa Vista Project Area were conducted with a view to make comparisons to Ralph Schreiber's surveys from 1979-1981. Differences between the two surveys reveal changes in species richness over time at the wetland. My own survey results reveal bird species that may be impacted by the wetland restoration project and which may require special attention throughout the restoration process. Brief impact analyses are given for some of these species.

Project Area

The proposed Playa Vista project site is an asymmetrical area located south of Marina del Rey and the Marina Freeway, west of the San Diego Freeway, north of Los Angeles International Airport, and east of the community of Playa del Rey.

The site is along the southern margin of the historic Ballona Creek floodplain. The southern border of the floodplain is the Westchester/Playa del Rey bluff system. The system of bluffs are approximately 300 feet in height; Cabora Road is located along and about one-third up the bluffs' face. The road was used to establish approximately the irregular southern boundary of the project site.

For planning purposes, the site has been divided into four areas. These areas, labeled A, B, C, and D, are divided by the Ballona Flood Control Channel (Ballona Channel) on an easterly-westerly axis and by Lincoln Boulevard on a northerly-southerly axis. Area A is located immediately adjacent to Marina del Rey and is within the County of Los Angeles. Area B, C, and D are in the City of Los Angeles. Area B is immediately south of Area A; Area C is immediately east of Area A and Area D is southeast of Area A. Table 1 provides the acreage associated with each area.

Table 1. Acreage in each area

AREA	ACREAGE
Area A	138.6
Area B	337.9
Area C	66.3
Area D	462.0

Area A

Area A is bounded by Marina del Rey to the north and west, the Ballona Channel to the south, and Lincoln Boulevard to the east. The topography of the site is largely the result of anthropogenic activities. The naturally occurring topography of this site was altered by the disposal of dredge material during the construction of the Ballona Flood Control Channel in the 1930's and Marina del Rey in the 1960's (Schreiber, 1981). The area is now largely vacant. Oil wells are located in the southwest corner, a parking lot is located along the northwest margin and a drainage ditch is located along northeast margin. The drainage ditch is tidally influenced. The site is criss-crossed by off-road vehicle roads and pedestrian trails. A bike path/access road borders the southern margin of the site. This path is on the northern levee of the Ballona Channel. The Ballona Channel drains a total of approximately 76,700 acres of urban areas largely within the City of Los Angeles (Chambers Group, 1991). The channel is tidally influenced within the boundaries of the Playa Vista project area. Tidal margins within the channel approximate that found along the open coast (Lockhart, 1990).

Area B

Area B is bounded by the Ballona Channel to the north, the community of Playa del Rey to the west, the Playa del Rey Bluffs to the south and Lincoln Boulevard to the east. It is the least disturbed on the four areas. The natural topography of the site is largely intact. This area is also largely vacant.

Jefferson and Culver Boulevard cross the central portion of the area. A gas company staging area is located along the south central margin of the area at the base of the Playa del Rey Bluffs. Centinela Ditch is also located at the base of the Playa del Rey Bluffs. Jefferson Drain empties into the area southeast of the Jefferson/Culver Boulevards intersection. Oil production and gas storage facilities are scattered in the northwest portion of the site. The eastern portion of the site was farmed until the mid-1980's. An access road borders the northern margin of the site. This road is the southern levee of the Ballona Channel.

The area contains the largest contiguous wetland. The main tidal channels into the wetland have been cut-off from tidal flows by the installation of four tide-gated structures in the south levee of the Ballona Channel. A hydrologically insignificant amount of salt water does enter the northwest corner of the wetlands through these flap gates. Tidal amplitude has been reduced by approximately 63% (Bolland and Zedler, 1991). Salinity of the waters in the tidal channel near the tidegates, nevertheless, is approximately that of seawater (35ppt) (Boland and Zedler, 1991). Culverts under Culver Boulevard provide a hydrologic link between the wetlands to the north and south of this roadway. The channels south of Culver Boulevard contain freshwater (0 ppt) (Boland and Zedler, 1991).

Area C

Area C is bounded by commercial/residential development to the north, Lincoln Boulevard to the west, the Ballona Channel to the south and the Marina Freeway to the east. Like area A, this area is largely the result of anthropogenic activities. The naturally occurring topography of this site was also altered by the disposal of dredge material during the construction of the Ballona Flood Control Channel in the 1930's and Marina del Rey in the 1960's. The area is dissected by Culver Boulevard. The area north of Culver Boulevard is largely vacant. A small drainage ditch flows from the middle of the side to the norhtwest and into Area A. This ditch

usually does not contain standing water. Baseball fields are located south of Culver Boulevard.

Area D

Area D is bounded by Lincoln Boulevard to the west, the Westchester Bluffs to the south, commercial/industrial parcels to the east and Jefferson Boulevard and the Ballona Channel to the north. It is the most developed of the four areas. It is the site of the offices and manufacturing facilities occupied by MacDonald Douglas and Hughes Aircraft Company. These facilities are located in the south eastern portion of the site. The south western portion of the site contains Centinela Ditch and a debris basin. Centinela Ditch is and intermittent freshwater stream carrying urban runoff. An abandoned airstrip is located in the central section of the site. Stockpiles of material are located along the northern margin. The Playa Vista site offices are located on the northwest portion of the parcel.

Methods

Surveys were conducted by myself on a bi-monthly basis, and were started within 1/2 hour after sunrise and curtailed by 1200-1400 hours. My survey routes through areas A, B, C, and D are more expansive and all encompassing than survey routes for the 1979-81 censuses. All birds seen or heard using the wetlands along the survey routes were recorded. Aerial birds ("flyovers") were noted but not officially counted unless they were observed using the wetland. At the beginning of each survey I started in a different area to equally distribute the "prime" early morning counts as the last area surveyed on a given day did not commence until 1000 to 1100 hours. Surveys were not scheduled for particular tide levels, but several different tide levels occurred when censusing Area B; the area most affected by tidal fluctuation.

Results

Below is a complete list of 80 species observed on the general surveys from April 1990 to April 1991. Under each species heading are comments on abundance and location of sightings. Birds are ordered as described in the A.O.U. Checklist of north American Species (1983). As shown in Table 1., Area B contained the greatest species diversity.

Table 1. Total number of species observed per area.

Area A	Area B
40	58
Area C	**Area D**
15	49

S = summer, W = winter, M = migrant, R = resident,
* = confirmed breeder

Ciconiiformes

Great Blue Heron (*Ardea herodias*) W/R
One or two birds regularly observed in the salt flats/pickleweed areas of Area A. In Area B, an average of 10 (n = 18) were seen residing on the northern saltflats and the southern Ballona Creek dike. Many (1-9) were often seen roosting in the largest cottonwood tree in the dune section of Area B.

Great Egret (*Casmerodius albus*) W/R
One to 10 individuals often observed roosting with the Great Blue Herons in the northern saltflats of Area B from October through April 1990/91.

Also observed hunting along the tidal channels here.

Snowy Egret (*Egretta thula*) W
Two individuals seen along the tidal channels in the northern section of Area B in February 1991.

Green-backed Heron (*Butorides striatus*) W/R
Regularly observed along the tidal channel (creek) in Area A. Occasionally seen in the *Eucalyptus* along Fiji Way bordering Area A.

Black-crowned Night Heron (*Nycticorax nycticorax*) W/R
One individual observed along Centinela Ditch in Area D. In Area B, one individual observed along the tidal channels north of Culver Blvd. and one south of Culver Blvd. One individual in Area A in October 1990.

Anseriformes

Mallard (*Anas platyrhynchos*) W
Observed occasionally in tidal channels and small puddles of Area B during winter 1990/91.

Cinnamon Teal (*Anas cyanoptera*) R/M
A group of eight individuals was observed in the tidal channel adjacent to the dunes of Area B in February 1991.

Falconiformes

Turkey Vulture (*Cathartes aura*) M
A single individual observed circling low over Area A in February 1991.

Osprey (*Pandion haliaetus*) R/M
One individual seen circling overhead in Area B in summer 1990.

Black-shouldered Kite (*Elanus leucurus*) W/R
Occasionally observed hunting and perching in Area B. Observed hunting once in Area D.

Cooper's Hawk (*Accipiter cooperii*) W/M
One individual observed hunting small birds in the willows in the southeastern section of Area B in February 1991.

Red-shouldered Hawk (*Buteo lineatus*) R
A single individual was observed perched in Area C overlooking the playing field while being mobbed by crows in October 1990.

Red-tailed Hawk (*Buteo jamaicensis*) W/R*
Observed in flight and perched in all areas. Often seen perching in pairs in Area D.

American Kestrel (*Falco sparverius*) R*
Often observed perched/hunting on the saltflats and coastal sage scrub of Area A, on the large dirt mound and bluff of Area D and in the northeastern section of Area B. As many as 6 seen hunting at one time over agricultural fields of Area B. One pair nested in a drain pipe in the largest building of Area D.

Charadriiformes

Black-bellied Plover (*Pluvialis squatarola*) W
Two individuals observed in May and June 1990 using the salt flats in Area B.

Killdeer (*Charadrius alexandrinus*) R*
Occasionally seen in saltflat/grassy areas of Area B and in open areas of Area D. One nest with 4 eggs was found in May 1990 on saltflat of Area B. Also observed once in Area A.

Willet (*Cataptrophorus semipalmatus*) W
One individual in May and 4 in February were observed in the pickleweed and along the tidal channels of Area B.

Spotted Sandpiper (*Actitis macularia*) W
One individual observed in April 1990 along the tidal channel in Area A. One also observed along a tidal channel in the northwestern section of Area B in February.

Whimbrel (*Numenius phaeopus*) W
Eleven birds observed in the pickleweed wetlands and the pickleweed transition areas in Area A in April 1990.

Least Sandpiper (*Calidris minutilla*) W/M
Seven individuals observed along a tidal channel in the northern section of Area B in October 1990.

Dowitcher (*Limnodromus sp.*) W
One individual in June and one individual in February was observed along the tidal channels of Area B.

Columbiformes

Rock Dove (*Columba livia*) R
Occasionally seen within Area D.

Spotted Dove (*Streptopelia chinensis*) R
Two individuals observed in the oleanders bordering Area A and another two observed in Area D during April 1990.

Mourning Dove (*Zenaida macroura*) R
Large numbers observed using areas A and D (20 - 50 per area per count). Fewer birds observed in Areas B and C.

Strigiformes

Burrowing Owl (*Athene cucicularia*) R
A single individual was observed on the Westchester Bluffs near the LMU sign in April 1990. Nesting was not confirmed.

Apodiformes

Vaux's Swift (*Chaetura vauxi*) M
A single individual observed in Area B in May 1990. Several observed in Area D in May and June 1990. All were feeding overhead.

White-throated Swift (*Aeronautes saxatalis*) R
Fifteen individuals observed in Area B in May 1990 and 140 in March 1991. Fewer birds also observed in area D. All were feeding overhead.

Anna's Hummingbird (*Calypte anna*) R*
Three or more individuals regularly observed using all the habitat types in Area A. Also seen along the gas company service roads in Area B and in

several habitats in Area D. One to three individuals were regularly seen in Area C. Nested in areas A and D.

Allen's Hummingbird (*Selasphorus sasin*) S
One to three individuals observed on the dunes in Area B in Spring 1990. An average of three individuals observed in the cattails, pampas grass and willows at the base of the Playa Del Rey Bluff in Area B in Spring/Summer 1990.

Coraciiformes

Belted Kingfisher (*Ceryle alcyon*) W
Occasionally seen on the fence (above the tide gates) overlooking the tidal channel in Area B. Seen once overlooking this same channel near Culver Blvd. in Area B. Occassionally observed on fence overlooking stream in Area A.

Piciformes

Northern Flicker (*Colaptes auratus*) R
One to 2 individuals regularly observed in the most woody sections of each area from late summer 1990 through winter 1990/91.

Passeriformes

Willow Flycatcher (*Empidonax traillii*) S/M
A single individual was observed in the willows surrounding the fresh water marsh in Area B in September 1990.

Western Flycatcher (*Empidonax difficilis*) S
One individual was observed in the willows along the Westchester Bluffs in Area D in April 1990. One individual was observed in the willows surrounding the fresh water marsh in Area B in September 1990.

Black Phoebe (*Sayornis nigricans*) R
A single individual was seen in the dune area of Area B in October 1990.

Say's Phoebe (*Sayornis saya*) W
Occasionally seen throughout Area B in the fall.

Ash-throated Flycatcher (*Myiarchus cinerascens*) S
In Area A, three individuals were observed in April, One individual in August, and one in September 1990. In Area D, Two individuals were observed along the Teale Rd. fence in April 1990. In Area B, one individual was observed near the fresh water marsh in September 1990.

Western Kingbird (*Tyrannus verticalis*) S
A single individual observed on fence along Teale Road in Area D in May, June, August, and September 1990.

Rough-winged Swallow (*Stelgidopteryx ruficollis*) S
Two individuals observed in flight over former agricultural fields in Area B in May 1990 and March 1991; two individuals observed in Area D in June 1990.

Cliff Swallow (*Hirundo pyrrhonota*) S
Irregularly observed in aerial displays over the salt flats in Areas A and B and in aerial displays over Area D.

Barn Swallow (*Hirundo rustica*) S
Irregularly observed in aerial displays over the salt flats in Areas A and B and in aerial displays over Area D.

Scrub Jay (*Aphelocoma coerulescens*) R*
Up to 5 Jays at one time occasionally seen in the dunes of Area B. One jay was occasionally seen in the *Eucalyptus* grove in Area B. The willow/freshwater marsh section of Area B occasionally had 1-3 jays. One to 6 jays were regularly observed in the southwestern section of Area D. One pair in Spring 1990 was a confirmed breeder here. One to 3 jays were regularly seen in Area C. Jays were rarely observed in Area A.

Common Raven (*Corvus corax*) R
Irregularly observed along the southern edge of Area D. Two individuals observed foraging on the southern Ballona Creek dike in Area B in February 1991.

Bushtit (*Psaltriparus minimus*) R
Common in Areas A, B and D in summer, fall and winter of 1990/1991 in coastal sage scrub and willow areas. Occasionally observed in Area C during this same time. Less common in spring 1990 : Five individuals

observed along the bluffs in the coastal sage scrub habitat in Area B in May; two individuals observed in Area D in April.

House Wren (*Troglodytes aedon*) S/R
One individual observed in the dunes of Area B in October 1990. Two individuals seen south of Teale Rd. in Area D in coastal sage scrub and piles of debris in February 1991.

Marsh Wren (*Cistothorus palustris*) W
One observed along the tidal creek in Area A in February 1991. One also regularly observed in the pickleweed section of north-central Area B in November and December of 1989 (before the general surveys began).

Ruby-crowned Kinglet (*Regulus calendula*) W
One individual observed in the willows at the base of the Playa del Rey Bluffs in Area B in December and February 1990/91. One individual observed south of Teale Rd. in willows along Centinela Ditch in February 1991 in Area D.

Blue-gray Gnatcatcher (*Polioptila caerulea*) W
One to 5 individuals regularly observed in Area D, particularly in coastal sage scrub south of Teale Rd. from October to February 1990/91. One to 2 individuals regularly observed in Areas A and C in the coastal sage scrub and mulefat habitats from October to February 1990/91. Never observed in Area B.

Northern Mockingbird (*Mimus polyglottos*) R*
Regularly observed in oleanders along Fiji Way throughout the surveys. Also observed in the vegetation on the dunes in Area B, along the bluffs and in the willows in Area B and in the willows near Teale Way in Area D. May be nesting in Area D. Nested in oleanders on Fiji Way bordering Area A and in the dune vegetation in Area B. Also regularly observed in Area C.

American Pipit (*Anthus spinoletta*) W
Five individuals observed in Area A in February 1991. Many other individuals observed flying over Area B in the winter of 1990/91.

Loggerhead Shrike (*Lanius ludovicianus*) R*
Single individual observed in Area A in June, July, Aug, and October 1990.

Observed throughout Areas B and D over entire survey period. One individual seen in Area C in Both December, 1990 and February, 1991. Nested in Area B.

European Starling (*Sturnus vulgaris*) R
Second most common bird using all habitats in Area A. Over 120 individuals sighted during a single survey. Also common in all habitats in Areas B and D.

Warbling Vireo (*Vireo gilvus*) M
Two individuals observed in the coastal sage scrub and mulefat habitats in Area A in April 1990.

Orange-crowned Warbler (*Vermivora celata*) R/M
Three individuals observed in the mulefat habitats of Area A in September 1990. Two individuals seen in Area B in the Eucalyptus grove in September 1990.

Nashville Warbler (*Vermivora ruficapilla*) M
One individual observed in the willows at the base of the Playa Del Rey Bluffs in Area B in September 1990.

Yellow-rumped Warbler (*Dendroica coronata*) W
A single individual observed in the coastal sage scrub and eucalyptus trees in Area A in April 1990. Two individuals observed using the pampas grass at the base of the bluffs in Area B during this same period. During fall and winter of 1990, regularly observed in small numbers in Area A, B and D. A single individual observed once in Area C in December 1990.

MacGillivray's Warbler (*Oporornis tolmiei*) M
A single individual observed in the willows along the Westchester Bluffs in Area D in April 1990.

Common Yellowthroat (*Geothlypis trichas*) R*
A single individual observed in the mulefat habitat in Area A in April and October 1990. One individual observed along the dry tidal creekbed in Area C in October 1990. Also regularly observed in the freshwater marsh and willow communities in Areas B and D. Nesting confirmed in Area D and probable in Area B.

Wilson's Warbler (*Wilsonia pusilla*) M
Three individuals observed in the willows along the Westchester Bluffs in Area D in April 1990. One individual observed in willows at the base of the Playa Del Rey Bluffs in September 1990, and one individual in Area A in April, 1990.

Western Tanager (*Piranga ludoviciana*) M
One individual observed in Area D in April 1990.

Black-headed Grosbeak (*Pheucticus melanocephalus*) S/M
Two individuals observed in the mulefat habitat in Area A in April 1990. Also observed in the freshwater marsh and willow communities in Areas B and D.

Blue Grosbeak (*Guiraca caerulea*) S/M
A single individual observed in the willows at the base of the Playa del Rey Bluffs in Area B in July 1990.

Lazuli Bunting (*Passerina amoena*) S/M
A single individual observed in the willows at the base of the Westchester Bluffs in Area D in April 1990.

Rufous-sided Towhee (*Pipilo erythrophthalmus*) R
One individual observed in the dunes area in October 1990.

Brown Towhee (*Pipilo crisallis*) R
Up to five individuals observed in the coastal sage scrub habitat on the bluffs in Area B throughout the survey. Up to eight individuals seen regularly along the bluffs in Area D. May nest in both of these areas.

Lark Sparrow (*Chonsestes grammacus*) W
Two individuals were observed in scrub at the base of the Westchester Bluff in Area D in February 1991.

Savannah Sparrow (*Passerculus sandwichensis*)

P.s. beldingi R* : 1- 30 observed regularly in Area B throughout the year. From October to February 1990/91, up to 7 were observed occasionally in Area A. During fall and winter 1990, B.S.S. often occurred in mixed flocks with P. s. nevadensis in Areas A and B. Note: all non-Belding's Savannah Sparrows were lumped into nevadensis.

P.s. nevadensis W : This subspecies was most commonly observed in dry grassy areas in Area A through D from October, 1990 to March, 1991. Flocks up to 15 were observed in A and B.

Fox Sparrow (*Passerella iliaca*) W
Two individuals were observed in scrub at the base of the Westchester Bluff in Area D in February 1991.

Song Sparrow (*Passerella melodia*) R
One or two individuals regularly observed in the pickleweed transition and mulefat communities in Area A and in the dunes of Area B. Birds also observed in the freshwater marsh community in Area B and along the fence in Area D. This species is a probable breeder in Areas B and D.

Lincoln's Sparrow (*Passerella lincolnii*) W
A single individual observed in Area D in April 1990. One individual observed in coastal sage scrub habitat in Area A in October 1990. One to 2 individuals regularly observed in the brush at the base of the Playa del Rey bluffs in December 1990 and February 1991. One individual observed in a dry brush pile in the north-central section of Area B in October 1990.

Golden-crowned Sparrow (*Zonotrichia atricapilla*) W
Two individuals observed at the base of the bluffs in Area D in April 1990. Two to 7 regularly seen at the base of the Westchester Bluffs in November and December 1990. Up to 20 seen in the same location in February 1991. Four individuals observed in the willow/pampas grass habitat in Area B at the base of the Westchester Bluffs in February 1991.

White-crowned Sparrow (*Zonotrichia leucophrys*) W
Five individuals observed using several habitats in Areas A and D during April 1990. Regularly observed throughout Areas A, C and D in fall and winter of 1990/1991. Up to 110 observed in Area A and 120 observed in Area D south of Teale Rd. during this same time. Ten to 25 observed in the

former agricultural fields of Area B from October to march 1990/1991. occasionally seen in the dune area in small numbers in winter of 1990/1991.

Red-winged Blackbird (*Agelaius phoeniceus*) R*
One or two individuals regularly observed in the freshwater marsh habitat in Area B in Summer 1990; up to 25 individuals observed in the pocket wetlands of Area D where nesting was confirmed. One individual observed in the former agricultural fields of Area B in October 1990. Sixteen males observed in territorial behavior in the pocket wetland just south of the large dirt mound in Area D in February 1991. Three males observed along Centinela Ditch in February 1991.

Western Meadowlark (*Sturnella neglecta*) R*
Flocks up to 50 birds observed in Area A, B, and D throughout Fall, Winter and Spring. Confirmed nester in Area A in spring 1991. May have nested in Area B.

Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*) S
Two individuals observed in Area A using the mulefat habitat in April 1990. Six were observed in Area A in April 1990 while not conducting an official survey.

Brown-headed Cowbird (*Molothrus ater*) S
A single individual observed in flight over Area A in April 1990.

Hooded Oriole (*Icterus cucullatus*) S
A single individual observed in the mulefat habitat in Area A in June 1990.

Northern Oriole (*Icterus galbula*) S*
Two birds regularly observed in the Eucalyptus grove at the base of the bluffs in Area B during Summer 1990; nesting confirmed. One individual observed in Area D in April 1990.

House Finch (*Carpodacus mexicanus*) R
Common throughout the study area. Up to 300 individuals observed during one census in Area D (most likely an underestimation).

Lesser Goldfinch (*Carduelis psaltria*) R
Two individuals observed in the willows along Teale Way in Area D in April 1990. Up to 15 individuals observed at one time in the willow habitats of Areas B and D during December through February 1990/91. Two individuals observed in Area A in mulefat habitat in February 1991.

House Sparrow (*Passer domesticus*) R
Two individuals regularly observed along the fence on the north side of the helicopter plant. Two individuals observed in flight over Area A in April 1990. One individual observed on the fence along Fiji Way bordering Area A in September 1990. Five individuals were observed in Area C in October 1990.

Birds observed outside of survey time periods:

White-faced Ibis (*Plegadis chihi*) M
Two individuals were observed in March 1990 circling overhead many times before attempting to land in the northern section of Area B. The landing attempt was aborted as they regained altitude and continued to fly east up Ballona creek.

Canada Goose (*Branta canadensis*) W
A group of 30 was observed flying low overhead in Area B in the fall of 1990. The group of birds circled twice before continuing south.

American Avocet (*Recurvirostra americana*) S/R
Four individuals observed on the mudflats of Area B in October 1989.

Common Snipe (*Capella gallinago*) W
Observed occasionally in the pickleweed wetlands in Area B in Fall 1989 while conducting Belding's Savannah Sparrow field work.

California Least Tern (*Sterna antillarum browni*) S
Occasionally observed flying low over the tidal channels in Area B in June and July 1989. They appeared to be hunting, but were never observed making a dive.

Legend For Species Analysis

A	Area A
B	Area B
C	Area C
D	Area D
ar	areal
pww	pickleweed wetlands
mf	mudflats, saltflats, tidal channels
ww	willow woodlands
fwm	freshwater marsh
d/aw	dune, alluvial wash, sandy habitats
css	coastal sage scrub
pw/t	pickleweed wetlands, transition habitats
c/pg	coyote bush/pampas grass
ag	former agricultural areas, disturbed areas, weedy fields
ips	ice plant stands
ls	landscaping

	A	B	C	D	ar	pww	mf	ww	fwmd/aw	css	pw/tc/pg	ag	ips	ls
BIRDS														
Ciconiiformes														
Great Blue Heron	X	X				x	x	x						
Great Egret		X					x							
Snowy Egret		X					x							
Green-backed Heron	X						x							
Black-crowned Night Heron	X	X		X			x		x					
Anseriformes														
Mallard		X					x							
Cinnamon Teal		X					x							
Falconiformes														
Turkey Vulture	X				x									
Osprey		X			x									
Black-shouldered Kite		X		X		x						x		
Cooper's Hawk		X						x						
Red-shouldered Hawk			X									x		
Red-tailed Hawk	X	X	X	X						x	x	x	x	x
American Kestrel	X	X		X			x			x	x	x	x	
Charadriiformes														
Black-bellied Plover		X					x							
Killdeer	X	X		X			x				x			
Willet		X				x								
Spotted Sandpiper	X	X					x							
Whimbrel	X										x			
Least Sandpiper		X					x							
Dowitcher		X					x							
					•									
Columbiformes														
Rock Dove				X								x		x
Spotted Dove	X			X								x		x
Mourning Dove	X	X	X	X						x	x	x		x
Strigiformes														
Burrowing Owl				X									x	
Apodiformes														
Vaux's Swift		X		X	x									
White-throated Swift		X		X	x									
Anna's Hummingbird	X	X	X	X				x		x	x	x		x
Allen's Hummingbird		X						x	x			x		

	A	B	C	D	ar	pww	mf	ww	fwmd/aw		css	pw/tc/pg		ag	ips	ls
Coraciiformes																
Belted Kingfisher	X	X					x									
Piciformes																
Northern Flicker	X	X	X	X				x								
Passeriformes																
Willow Flycatcher		X						x								
Western Flycatcher		X		X				x	x							
Black Phoebe		X								x						
Say's Phoebe		X				x				x		x				
Ash-throated flycatcher	X	X		X				x			x					x
Western Kingbird				X										x		
Rough-winged Swallow		X		X	x									x		
Cliff Swallow	X	X		X	x		x							x		
Barn Swallow	X	X		X	x		x							x		
Scrub Jay	X	X	X	X				x		x	x					
Common Raven				X										x		
Bushtit	X	X	X	X				x			x		x			
House Wren		X		X						x	x					
Marsh Wren	X	X					x					x				
Ruby-crowned Kinglet		X		X				x								
Blue-gray Gnatcatcher	X	X	X	X				x			x					
Northern Mockingbird	X	X	X	X				x		x						x
Water Pipit	X											x				
Loggerhead Shrike	X	X	X	X							x	x	x	x		
European Starling	X	X		X		x						x		x		x
Warbling Vireo	X										x					
Orange-crowned Warbler	X	X						x								x
Nashville Warbler		X						x								
Yellow-rumped Warbler	X	X	X	X				x			x		x			x
MacGillvray's Warbler				X				x								
Common Yellowthroat	X	X	X	X				x	x							
Wilson's Warbler	X	X		X				x								
Western Tanager				X				x								
Black-headed Grosbeak	X	X		X				x	x							
Blue Grosbeak		X						x								
Lazuli Bunting				X				x								
Rufous-sided Towhee		X								x	x					
Brown Towhee		X		X							x					
Lark Sparrow				X							x		x			

	A	B	C	D	ar	pww	mf	ww	fwm	d/aw	css	pw/t	c/pg	ag	ips	ls
Savannah Sparrow																
beldingi	X	X				x						x				
nevadensis	X	X	X	X		x					x	x		x		
Fox Sparrow				X							x		x			
Song Sparrow	X	X	X	X				x	x	x		x	x			
Lincoln's Sparrow	X	X		X							x		x			
Golden-crowned Sparrow		X		X				x			x		x			
White-crowned Sparrow	X	X	X	X						x	x	x	x	x		
Red-winged Blackbird		X		X					x					x		
Western Meadowlark	X	X		X		x					x	x		x		
Yellow-headed Blackbird	X								x		x					
Brown-headed Cowbird	X				x											
Hooded Oriole	X												x			
Northern Oriole		X		X				x								x
House Finch	X	X	X	X		x		x	x		x	x	x	x		x
Lesser Goldfinch	X	X		X				x								
House Sparrow	X		X	X										x		x

Table 1. Species observed during my 1990-91 survey that were not observed during the 1979-81 survey.

Falconiformes
Red-Shouldered Hawk
Columbiformes
Spotted Dove
Apodiformes
White-Throated Swift
Allen's Hummingbird
Passeriformes
Western Flycatcher
House Wren
Warbling Vireo
MacGillivray's Warbler
Black-Headed Grosbeak
Orange-Crowned Warbler
Nashville Warbler
Blue Grosbeak
Lazuli Bunting
Rufous-Sided Towhee
Golden-Crowned Sparrow
Northern Oriole
Hooded Oriole
Brown-Headed Cowbird
Fox Sparrow

Table 2. Species observed during the 1979-81 survey that were not observed during my 1990-91 survey.

Podicipediformes	Charadriiformes	Passeriformes
Eared Grebe	Semipalmated Plover	Western Wood Pewee
Western Grebe	American Golden Plover	Violet-Green Swallow
Pied Billed Grebe	Snowy Plover	Bank Swallow
	Ruddy Turnstone	
Pelecaniformes	Black Turnstone	
Brown Pelican	Long Billed Curlew	
Double Crested Cormorant	Greater Yellowlegs	
Magnificent Frigatebird	Lesser Yellowlegs	
	Red Knot	
Anseriformes	Baird's Sandpiper	
Brant	Dunlin	
Gadwall	Western Sandpiper	
Pintail	Marbled Godwit	
Blue Winged Teal	Sanderling	
(observed by PERL, 1990)	Black-Necked Stilt	
Green Winged Teal	Red Phalarope	
American Widgeon	Wilson's Phalarope	
Bufflehead	Northern Phalarope	
White Winged Scoter	Pomarine Jaeger	
Ruddy Duck	Glaucous-Winged Gull	
Red Breasted Merganser	Western Gull	
Shoveler	California Gull	
	Ring-Billed Gull	
Falconiformes	Bonapart's Gull	
Sharp-Shinned Hawk	Heermann's Gull	
Northern Harrier	Forster's Tern	
	Elegant Tern	
Galliformes		
California Quail	Strigiformes	
	Short Eared Owl	
Gruiformes	Long Eared Owl	
Virginia Rail		
American Coot		

Table 3. Species observed on the 1990/91 surveys at Ballona Wetland included on "warning" lists indicating a low population level or a decline in population levels. The lists of state endangered and threatened birds, and bird species of special concern are both provided by the California Department of Fish and Game (1990). Candidate listings for threatened or endangered species are provided by the U.S. Fish and Wildlife Service (1989), and the Blue List (Tate, 1986) is provided by the National Audubon Society.

Species	State Endangered or Threatened	Candidates for Endangered or Threatened	Special Concern	Blue List
White Faced Ibis		X (category 2)		
California Least Tern	X			
Osprey				X
Cooper's hawk			X	X
Red Shouldered Hawk				X
Burrowing Owl			X	
Willow Flycatcher	X			
Loggerhead Shrike				X
Belding's Savannah Sparrow	X			

Discussion

The overall diversity of birds observed at Ballona Wetland in 1990/91 (80 species) is down from Schreiber's survey in 1979-81(129 species). This may be greatly attributed to a change in the condition of the wetland caused by the current 5 year drought. Virtually no open or free standing water occurred during my survey period, and the "mudflats" were extremely dry. These dry conditions limit the ability of many types of birds to utilize the area. In contrast, Schreiber (1981) describes the former agricultural fields as being covered, in part, by open water and muddy conditions attracting a greater number of birds including Anseriformes, Charadriiformes and three orders not observed on my surveys; Podicipediformes, Pelecaniformes, and Gruiformes.

IMPACT ANALYSIS

Species using habitats that will be removed by development and not replaced by the restoration project may incur the most detrimental impacts by facing possible extirpation from the area. Species typically found in the habitats being restored or created (wetland/riparian) may benefit from potential nesting, foraging and roosting sites. Below is a description by area, by selected orders and species, and by communities which may be negatively or positively impacted.

Direct and Indirect Impacts

Area A

Forty species, half of all species observed at Ballona, occurred here. The three confirmed nesting species were Western Meadowlark, Anna's Hummingbird and Northern Mockingbird. The primary concern is with the Belding's Savannah Sparrow as it previously nested here and currently uses pickleweed areas for foraging during winter months (Corey and Massey, 1991). Under the current plan, these foraging areas and the potential to rehabilitate Belding's Savannah Sparrow nesting sites in Area A will be lost. Altering this area into a boat harbor will remove most current bird species with the possible exception of; Great Blue Heron, Belted Kingfisher, Rock Dove and the areal foragers (swallows).

Area B

Of 80 bird species observed at Ballona Wetland, 58 (73%) occurred here. Confirmed nesters include; Killdeer, Northern Mockingbird, Loggerhead Shrike, Belding's Savannah Sparrow, and Northern Oriole. Primary concern is with the Belding's Savannah Sparrow being disrupted by the restoration project during the nesting season (see Corey and Massey, 1991). Other sensitive species affected by the restoration project include the Great Blue Heron, Killdeer, Allen's Hummingbird, and Loggerhead Shrike.

Great Blue Heron:

Presently, this species uses the Ballona Wetland primarily as a roosting/loafing area on the salt flats in Area B and in the large cottonwood tree on the dunes. The salt flats will be significantly altered

under both mid and full-tidal plans. However, up to 24 Great Blue Herons have been observed along the rocks of Ballona Creek and on the adjacent dike opposite the planned bird island: It is possible that the Great Blue Herons will still use this area for roosting upon completion of the restoration project. The cottonwood tree roosting site will apparently be lost because of restoration of native dune habitat.

Killdeer:

The area of saltflats where Killdeer currently nest will be significantly reduced under the full tidal plan. Successful nesting of this species may be immediately lost, however, this species is highly adaptive in choosing nesting sites (Lennington and Mace, 1975).

Allen's Hummingbird:

This species was regularly seen during spring 1990 at the dunes and willow/pampas grass communities in Area B. Nesting was not confirmed but was possible because of observed male territorial disputes and courtship flights, and has been a confirmed breeder at Ballona in the past (Garrett and Dunn, 1981). The restoration project will significantly alter existing vegetation at the dunes and shift current willow areas to the fresh water marsh and riparian strip.

Loggerhead Shrike (on the Audubon Society's Blue List):

Currently, much of the Ballona Wetland is ideal for this bird which often breeds in open fields with scattered trees feeding primarily on large insects, and to a lesser degree birds, mice, and lizards (Bohall-Wood, 1987). The re-creation of a wetland and development of Areas A, C, and D may push the shrikes to perimeter areas including the bluffs and dunes or to a location away from the Ballona area.

Species using the former agricultural fields and other dry grassy portions of Area B will be negatively impacted primarily by losing a foraging area as these habitats are removed. These birds include the Western Meadowlark, Savannah Sparrow (nevadensis), Red-tailed Hawk (uses the area for hunting), American Kestrel (uses the area for hunting), Mourning Dove, and White-crowned Sparrow.

Area C

Fifteen out of 80 species (19%) occurred here. Anna's Hummingbird is a probable breeder. The most critical impacts here include a loss of foraging areas for the Red-tailed Hawk, Scrub Jay, Blue-gray Gnatcatcher, and Loggerhead Shrike as well as a possible breeding area for the Yellowthroat. Development here will also disrupt foraging patterns of the Mourning Dove, Anna's Hummingbird, Northern Flicker, and wintering species such as the White-crowned Sparrow.

Area D

Forty-nine out of 80 species (61%) occurred here. Confirmed breeders include the Red-tailed Hawk, American Kestrel, Anna's Hummingbird, Scrub Jay, Common Yellowthroat, and Red-winged Blackbird. Probable breeders include Northern Mockingbird and Brown Towhee.

Because of the complete restructuring of this area and loss of most current habitat, many species may be affected. Birds inhabiting pocket wetlands along Teal Rd. and just south of the large dirt mound (and north of the helicopter plant) will lose their nesting habitat. In spring 1990, up to 15 Red-winged Blackbird pairs and up to 5 Common Yellowthroat pairs nested here.

Other species using the open sections of Area D will primarily be impacted by losing valuable foraging areas. These species include the Red-tailed Hawk, American Kestrel, Killdeer, Scrub Jay, Mourning Dove, Ash Throated Flycatcher, Western Kingbird, Loggerhead Shrike, and various sparrows.

A primary concern in Area D is the Burrowing Owl (a species of special concern) of which one individual was observed below the LMU sign in April 1990 at the entrance to a burrow (no nesting confirmed). No direct impacts (destruction of the burrow) are foreseen in the restoration project, however, currently used or potential hunting/foraging sites in Area D will be lost. It is not known if Burrowing Owls forage along the bluffs, but traditionally Burrowing Owls hunt and nest in level, open, dry areas with low standing vegetation such as in open fields or desert areas (Grant, 1965). Their hunting range has been estimated at 4.8 to 6.5 hectares (Grant, 1965). A study on the population of Burrowing Owls at LAX may provide valuable information towards the possibility of establishing a stable population at Ballona.

Presently, this species may already be extirpated from Ballona, but

Burrowing Owls were described as a "fairly common resident" in the fields, dikes and bluff areas in 1979-81 (Schreiber, 1981). Possible reasons for its decline include:

1. Presence of the Red Fox as a potential predator.
2. A decline in prey base and foraging area
3. Increased human disturbance.
4. Lack of adequate or available burrows.

Estuarine habitats

The primary concern will be the affect of flooding current Belding's Savannah Sparrow nesting areas with increased tidal flow (Corey and Massey, 1991). The Belding's Savannah Sparrow must successfully transfer to newly created areas of pickleweed, and more pickleweed area appears to be created by the mid-tidal plan. However, the amount of pickleweed habitat created by the full-tidal plan still appears to exceed the current nesting area of Belding's Savannah Sparrows. In either plan, quality of pickleweed habitat may improve over current conditions primarily because of tidal flushing. In other saltmarshes receiving tidal flushing, Belding's Savannah Sparrow territories are reportedly smaller than the results I obtained at Ballona (Corey and Massey 1990, Massey 1976). Once the saltmarsh at Ballona is fully restored, territory sizes may decrease.

Podicipediformes:

No species from this group were found at the wetland. Both mid and full-tidal plans will probably attract Eared Grebes as this species primarily feeds on aquatic insects and larvae and can be found in shallow water (Cramp and Simmons, 1977; Jehl, 1988). However, the larger Clark's and Western Grebes are primarily fish and aquatic invertebrate feeders (Ehrlich et al, 1988), and may require deeper water to forage in, maximized by the full tidal plan (Nuechterlein, 1981).

Anseriformes and Gruiformes:

Ducks rarely used the wetland during the 1990/91 surveys. The current restoration plan, however, should greatly increase the potential for attracting waterfowl.

The salt marsh restoration plan under the full-tidal scheme should

maximize potential use from duck species. The depth and width of the water will be greater under the full-tidal plan and will increase the chance of attracting diving ducks (Lesser Scaup, Greater Scaup, Ruddy Duck), and sea ducks (Bufflehead, Surf Scoter)(Bellrose, 1976). The shallow water areas under each plan may attract many types of dabbling ducks including Green-winged Teal (*Anas crecca*), Mallard, Northern Pintail (*Anas acuta*), Blue Winged Teal (*Anas discors*), Cinnamon Teal (*Anas cyanoptera*), Northern Shoveler (*Anas clypeata*), Gadwall (*Anas strepera*), and American Widgeon (*Anas americana*)(Corey, 1990).

The full-tidal plan also increases the remote possibility of introducing the Light Footed Clapper Rail (*Ralus longirostris levipes*) to the area (Massey, 1984).

Charadriiformes:

Absolute numbers of this group observed using Ballona Wetland were extremely low compared to other southern California salt marshes (Jurek, 1974). Mid and full-tidal restoration plans will greatly enhance the potential for attracting more shorebirds to forage, and "Bird Island" and the dikes connecting gas company structures should provide some area for roosting/loafing.

As mentioned earlier, however, birds presently or potentially nesting/foraging on the salt flats may be negatively affected. The western race of the Snowy Plover (*Charadrius alexandrius nivosus*) is under serious consideration for threatened or endangered status (currently category 2) which nests in open areas including beaches and salt flats (Page 1981, U.S. Fish and Wildlife Service 1989). This species has not been recorded at Ballona recently, and is doubtful whether it will return to nest. At Bolsa Chica wetland in Orange County, Snowy Plovers have consistently nested on the man made tern islands (Page 1981, Massey, pers. comm.) however, the proposed island at Ballona is smaller and not adjacent to open salt flats.

The endangered California Least Tern has a realistic possibility of nesting on "bird island" as a large colony of Least Terns currently nests on nearby Venice Beach. The Elegant Tern (*Sterna elegans*) (a category 2 species) and the Black Skimmer (*Rhynchops niger*) currently nest together with Least Terns on man-made islands at Bolsa Chica and are potential but improbable nesters on "bird island".

Falconiformes:

A species not observed during my surveys but which may be attracted to the restored wetland is the Northern Harrier (on the Audubon Society's Blue List). The Northern Harrier is basically an open country species and is highly adapted to hunt in dense vegetation such as tall grass prairies and marsh lands (Johnsgard, 1990). Perhaps the Northern Harrier is currently unable to compete with the Kestrel and Red-tailed Hawk in the bare fields at Ballona, and may return only when its specialty of locating prey by sound can be used to outcompete other diurnal birds of prey once the wetland is restored.

Willow community

More species (mostly migrants) were observed in this community than any other. The replacement of willows along the new riparian strip and fresh water marsh should compensate for any loss incurred to present willow stands. However, to greatly improve upon existing riparian habitat, willow stands should be allowed to mature and undergrowth should not be "manicured".

Freshwater marsh

The freshwater marsh located on the south-central edge of Area B was mostly lacking in free-standing water throughout the survey period. However, Common Yellowthroats and Song Sparrows are probable nesters here. The pocket wetlands in Area D are even less moist and have many weeds growing throughout, however, common Yellowthroats and Red-winged Blackbirds are confirmed nesters while Song Sparrows are probable nesters. The proposed freshwater marsh in Area B should compensate for loss of these areas by providing new nesting habitat. However, removal of the existing freshwater marshes before the new one is "functional" may cause temporary extirpation of the Common Yellowthroat and Red-winged Blackbirds as nesting species.

Terrestrial habitats

Birds dependent on terrestrial areas at Ballona will be the most negatively impacted as Areas A, C, and D are developed and Area B is restored into a healthy wetland. Selected species using virtually all

available terrestrial habitat at Ballona are discussed below.

Falconiformes:

This group of birds is particularly important and have been described as indicator species because of their top rank in the food chain. The most common species are the Red-tailed Hawk and American Kestrel which both have wide tolerances for habitat variation (Johnsgard, 1990). However, the Kestrel mostly prefers open, dry areas, and the Red-tailed Hawk depending on the season and sex, prefers open pasture, grassland, marsh-shrub, fields and open hardwood forests (Johnsgard, 1990). The loss of open areas will likely decrease the absolute numbers of these species, although the bluffs and perimeter areas may sustain stable populations.

Loggerhead Shrike (see Area B)

Savannah Sparrow (*nevadensis*):

This species is a common winter migrant along the coast of southern California in most open grassy fields (Garrett and Dunn, 1981). Remnants of the current population may still occur along the dikes and dryer portions of the saltmarsh after development and restoration are completed.

Coastal sage scrub

This habitat produced the second largest species diversity. The California Gnatcatcher (*Polioptila melanura californica*), a species representative of this community was not observed on my surveys. Currently this species can be found nearby at various coastal sage scrub locations on the Palos Verdes Peninsula.

Phase 1

Phase 1 of the development will contribute mostly to the loss of foraging areas for species found in open fields and disturbed areas (see Direct Impacts). Species forced out of the phase 1 development area may move to other parts of Ballona where similar habitats occur and

temporarily increase competition for space. This may disrupt nesting of some species in Areas A, B, and C during the spring.

No immediate extirpation of any bird should occur assuming the Burrowing Owl is already absent from the area.

CUMULATIVE IMPACTS

Undeveloped open fields within urban Los Angeles do provide habitat for many bird species as indicated above. Although most birds inhabiting these areas are considered common, continuous net loss of open fields will have a diminishing effect on local bird populations, cumulatively decreasing overall populations of "open field birds".

The restored Ballona saltmarsh, however, will possibly contribute to an increase in the local Belding's Savannah Sparrow population. Healthy saltmarsh habitat in L.A. County is extremely rare and the restoration of Ballona will be a valuable addition to the Pacific Flyway where shorebirds and ducks can stop to forage and loaf. Similarly, the freshwater marsh and riparian zones will be a stopover for many terrestrial migrants, and will provide nesting habitat rarely occurring in the urbanized areas of Los Angeles.

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Appendix One

This section contains the raw data collected in the survey. Each number represents the mean number of birds seen per month.

APPENDIX ONE

	Apr, '90				May, '90				Jun, '90				Jul, '90				Aug, '90				Sep, '90				Oct, '90				Nov, '90				Dec, '90				Jan, '91				Feb, '91				Mar, '91				Apr, '91			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
SPECIES																																																			
Ciconiiformes																																																		
Great Blue Heron	2			1		2				6				8				9			1	12				16				18				14			5	17							1				7			
Great Egret		1																								1				1								9							3							
Snowy Egret																																										2										
Green-backed Heron	1				1				1				1								1												1																			
Black-crowned Night Heron										1				1		1									1																											
Anseriformes																																																		
Mallard																																		2				2				4				2						
Cinnamon Teal																																																		
Falconiformes																																										1									
Turkey Vulture																		1												1												1									
Osprey															1																			1																
Black-shouldered Kite																																																		
Cooper's Hawk																																																		
Red-shouldered Hawk																																																		
Red-tailed Hawk	1	1				2		1				2		1		1		1		2		2	1	1				1			1			2		1		2		3				2		1			1		1
American Kestrel		1			1			1	1			3	1	1		3	1			2		2		2	1				1	4						1	1	1		1				2				2		1
Charadriiformes																																																		
Black-bellied Plover						1				1																																4			1			1				
Killdeer		1		6		1												1								1												1												
Willet						1																																1												
Spotted Sandpiper	1																																																	
Whimbrel	11																																																	
Least Sandpiper																										4																								
Dowitcher										1																																								

APPENDIX ONE.

	Apr, '90				May, '90				Jun, '90				Jul, '90				Aug, '90				Sep, '90				Oct, '90				Nov, '90				Dec, '90				Jan, '91				Feb, '91				Mar, '91				Apr, '91			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
Columbiformes																																																			
Rock Dove								3												3																						5											
Spotted Dove	2			2																																								1							
Mourning Dove	10	2		10	40	17		11	10	5		15	20	4		12	25			18	12	8		2	11	7	16	12	30	3	11	16	15		3	16			11	8			9	5	21	6		11	7	5	13
Strigiformes																																																		
Burrowing Owl				1																																													
Apodiformes																																												70							
Vaux's Swift						1		5				1																														6	4	3	3		4	3	2	1
White-throated Swift						15		5				6				4																																		
Anna's hummingbird	3			4		5		1	3	3		3	4	2		2	3	2	2	4	6	4			4	2	3	3	1	1	2	4	3		2	2	2	5	1	7					3				4			
Allen's hummingbird						5				4				7				4																																	
Coraciiformes																																						1	1						1							
Belted kingfisher																		1				1			1	1				1																					
Piciformes																										2	1	1			2		1	1	2		1		1			1				1					
Northern Flicker																																																		
Passeriformes																						.5																												
Willow Flycatcher																						.5																												
Western Flycatcher				1																						.5																							
Black Phoebe																														1				2				1										
Say's Phoebe																	1				1	1																									1			1
Ash-throated Flycatcher	3			2																1				1																									
Western Kingbird								1				1																																					
Rough-winged Swallow						2						2																																					
Cliff Swallow	7					40		10	1			4				3		4																														
Barn Swallow	15	8			7	8		10			7		10	4			13	7		4		6																										
Scrub Jay				1		2		1		1		1						2		1	1					5	2	2		2	1	1			2			4	2	1			1		5		2	1				1
Common Raven								1				3								2																														

APPENDIX ONE

	Apr, '90				May, '90				Jun, '90				Jul, '90				Aug, '90				Sep, '90				Oct, '90				Nov, '90				Dec, '90				Jan, '91				Feb, '91				Mar, '91				Apr, '91			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
Bushtit				2		5												7				9				10											5	16	6	6					2	9			1			
House Wren																									.5																	.5										
Marsh Wren																																									.5										
Ruby-crowned kinglet																																		1								1		.5								
Blue-gray Gnatcatcher																									1		2				1	3	1		2	4				3			2							
Northern Mockingbird	6	1		3	10	7		4	9	8		2	10	10		2	5	3	2	4	5	9	3	2	7	3	4	5	8	2	2	1	7	1		1	3	1	2	2	2				5	3	4	1	3	5	1	1
American Pipit																									4																3											
Loggerhead Shrike		2		1		2		2	1	4		1	1	5		1	1	4		1		3			1	2		1		2		1		1	1			3		1		2	1	1	1	2				1			
European Starling	20			1	120	220		8	65			1	15			15	5	10	33		25					5				75		2				20	13		20		26	40	11	4	6					4		60
Warbling Vireo	2																																																		
Orange-crowned Warbler																					2	1			1																											
Nashville Warbler																						1																														
Yellow-rumped Warbler	1	2																							3	3			4	2		1	3	1		4				5	3				5	15			2			2
MacGillvray's Warbler				1																																														
Common Yellowthroat	1			2		5		1		5		2		6		2		5				6			1		1	1		2		1		3		1							3					2		1
Wilson's Warbler	1			3																	1																														
Western Tanager				1																																														
Black-headed Grosbeak	2			2						1																																									
Blue Grosbeak														1																																				
Lazuli Bunting				1																																													
Rufous-sided Towhee																										.5																									
Brown Towhee		1		2		5		2		2		4		1		4						2						3													2					5		3					
Lark Sparrow																																															1						
Savannah Sparrow						12																																														
P.s. beldingi		1				12				12				12								4				11			4				2					1			6					5						
P.s. nevadensis	4	1		8																					9	1	1		7				6					8			9				7	4						
Fox Sparrow																																															1						
Song Sparrow	2	3		4	2	5		1	1	3		4		2		1				2	1	2			1	1	1	1	1	1					3			2		2				6	3	4			1		1
Lincoln's Sparrow				1																					1	.5										1								2	1	1					
Golden-crowned Sparrow				2																										5				3					7		16			97	22		14			4		
White-crowned Sparrow	3			2																					53	27	45	80	75	2	30	15	35	14	10	67		9	20	62						2		13				16
Red-winged Blackbird	1			10		2		25				20				2		1								1				1				2																	

APPENDIX ONE

	Apr, '90				May, '90				Jun, '90				Jul, '90				Aug, '90				Sep, '90				Oct, '90				Nov, '90				Dec, '90				Jan, '91				Feb, '91				Mar, '91				Apr, '91			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
Western Meadowlark	10				10	11			5	6			4	5			10					5			9	11												37		2				19	13	2								
Yellow-headed Blackbird	2																																																			
Brown-headed Cowbird	1																																																			
Hooded Oriole									1																																							1				
Northern Oriole		2		1		2				2																																										
House Finch	50	4		6	150	44		15	70	4		80	100	13		25	90	2	11	170	30	90		9		89	15	20	11	6		35	40	12	8	15	30		18	80	120	2	60	161	8	7	5		19	1	21	3
Lesser Goldfinch				2																							3				1				3					2											
House Sparrow	2			2				2				2								1	1																								1			2				2