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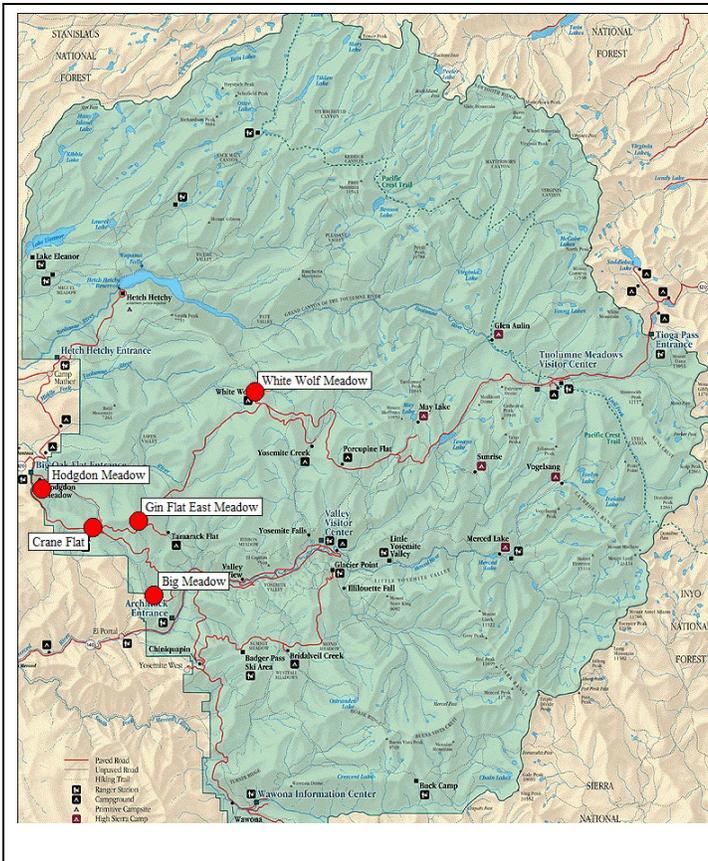
## The 2012 Annual Report of the Monitoring Avian Productivity and Survivorship (MAPS) Program in Yosemite National Park

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## Table of Contents

Introduction.....	1
Methods.....	2
Establishment and operation of stations .....	2
Figure 1. Locations of ongoing Monitoring Avian Productivity and Survivorship (MAPS) bird banding stations at Yosemite National Park. ....	2
Data collection .....	3
Computer data entry and verification.....	4
Data analysis .....	5
Adult population index and productivity analyses.....	6
Results.....	6
2012 Indices of Adult Population Size and Post-Fledging Productivity.....	6
Table 1. Summary of the 2012 operation of the five MAPS stations in Yosemite National Park. ....	7
Table 2. Capture summary for the five individual MAPS stations rated in Yosemite National Park in 2012, and all stations pooled. ....	8
Table 3. Numbers of aged individual birds captured per 600 net-hours and proportion of young in the catch at the five individual MAPS stations, and all stations pooled, operated in Yosemite National Park in 2012. ....	13
Longevity Records .....	16
Table 4. Longevity records from the Yosemite MAPS data for individual birds of selected species. ....	16
Recaptures of Banded Birds Outside Yosemite.....	17
An Unexpected Willow Flycatcher Capture .....	17
Figure 2. Adult Female Willow Flycatcher captured at Hodgdon Meadow in 2012. ....	18
Education and Outreach.....	18
Discussion.....	19
Acknowledgments.....	19
Literature Cited .....	20
Appendix I. Numerical listing (in AOU checklist order) of all the species sequence numbers, species alpha codes, and species names for all species banded or encountered during the 23 years, 1990-2012, of the MAPS Program on the six stations ever operated in Yosemite National Park. ....	22

## Introduction

National Parks act as a haven for Neotropical migratory landbirds and the birders that follow their movements. Over the last twenty years, landbird declines have fueled much interest not only in land management strategies and avian conservation, but in birding and citizen science as well. Two hundred million people in North America now venture outdoors each year to search for these mystical and sometimes extremely elusive creatures (Cordell and Herbert 2002). Landbirds' relative abundance and diversity in nearly every terrestrial ecosystem, along with their mostly diurnal nature, make them relatively easy to observe and monitor. Additionally, their rapid metabolism, high body temperature, and high ecological position on most food webs, make them excellent bioindicators of habitat quality and environmental change in terrestrial ecosystems.

The North American Breeding Bird Survey, the Christmas Bird Count, eBird, and other count-based monitoring programs are widely used to determine songbird population trends and relative abundance; these programs have helped land managers identify conservation targets over the years (Rich et al. 2004). Through eBird alone, citizen-based science has and continues to contribute two to three million new species-date-location records each month around the world, with a majority of the data coming from North America (Hochachka et al. 2011).

Count-based data, however useful, are less effective in determining the causes of observed population trends and identifying particular life stages or demographic groups within populations that may be most strongly affected by population stressors (DeSante et al. 2005). The application of standardized constant-effort mist netting and modern capture-recapture analytical techniques provides land managers with information on population trends and demographic rates of many landbird species at a variety of spatial and temporal scales simultaneously (DeSante et al. 2004, Robinson et al. 2009, Saracco et al. 2009). In particular, avian mark-recapture studies can provide critical indices and estimates of the survival, productivity, and recruitment rates of bird populations, which can be used to identify environmental as well as demographic causes of population changes (Nott et al. 2002, Saracco et al. 2008, Saracco et al. 2009).

Constant-effort mist-netting stations operated during the breeding season in North America typically follow protocols established by the Monitoring Avian Productivity and Survivorship (MAPS) program (DeSante and Kaschube 2009). The long-term operation of stations has been a main objective of the MAPS program, especially in large protected areas, such as national parks, which can act as reference sites for assessing the effects of land use and land cover changes on populations. National Parks and other protected areas can illuminate how land management practices in these areas are impacting birds, without the confounding factors of local changes in land-use practices (Simmons et al. 1999).

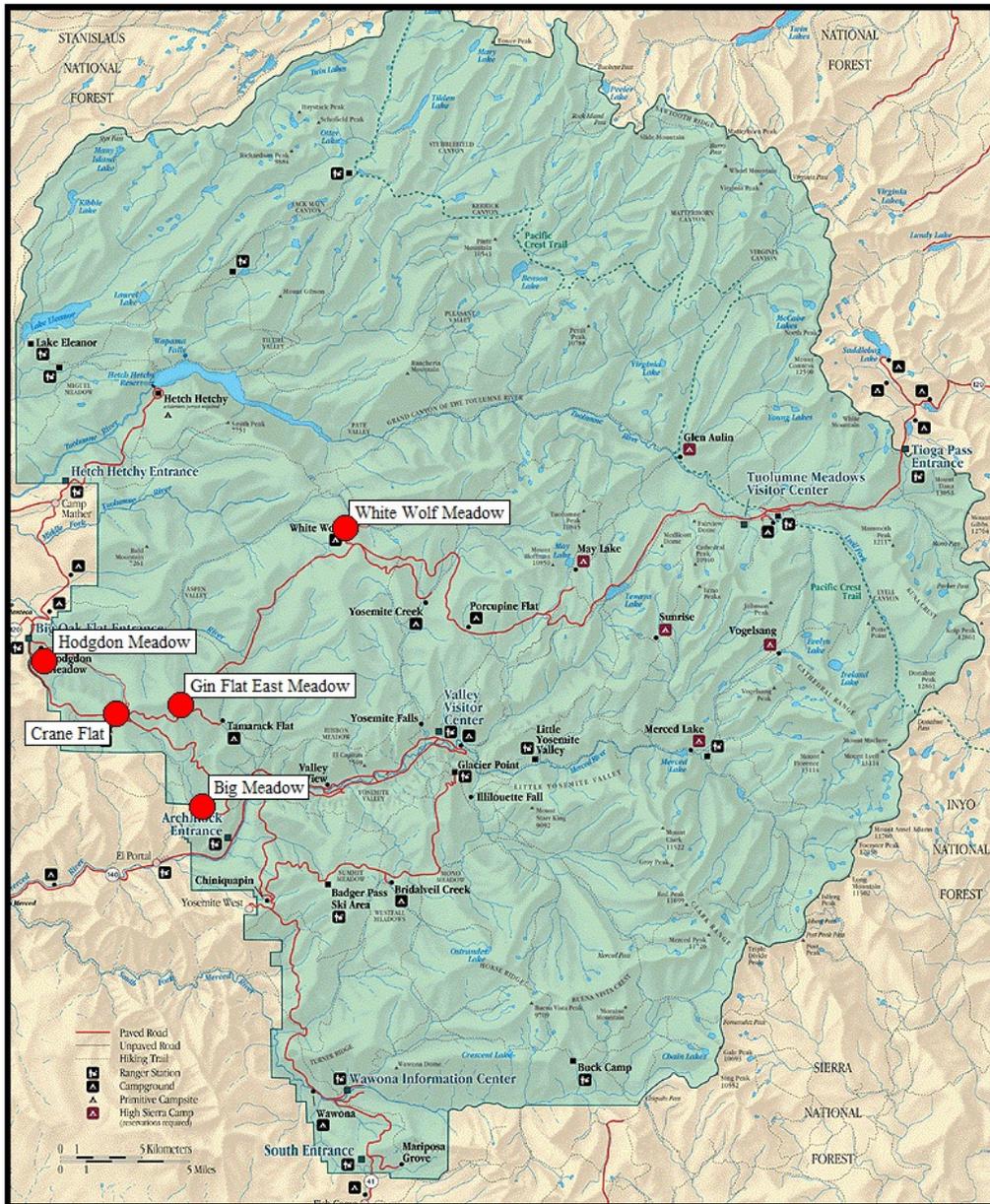
Yosemite National Park is the home of some of the longest-running MAPS stations in the country, several of which have been active now for over twenty years. Here we report summary monitoring results from the MAPS program in Yosemite in 2012.

## Methods

### Establishment and operation of stations

Five MAPS stations were re-established and operated in Yosemite National Park in 2012, at the same locations they were operated in previous years (Fig. 1).

**Figure 1.** Locations of ongoing Monitoring Avian Productivity and Survivorship (MAPS) bird banding stations at Yosemite National Park.



The five stations, located along an elevation gradient from highest to lowest, were:

- White Wolf Meadow (WHWO), set in a wet montane meadow surrounded by mixed red fir and lodgepole pine forest at 2,402 m elevation.
- Gin Flat East Meadow (GFEM), located in a wet montane meadow surrounded by mixed red fir and lodgepole pine forest at 2,073 m elevation.
- Crane Flat Meadow (CRFL), located in a wet montane meadow with willow and aspen thickets, surrounded by mixed conifer forest at 1,875 m elevation.
- Hodgdon Meadow (HODG), located in a wet montane meadow with willow and dogwood thickets, surrounded by mixed conifer forest and a patch of California Black Oak woodland at 1,408 m elevation.
- Big Meadow (BIME), located in riparian willows and mixed conifer forest (largely consumed by a stand-replacing fire in 1990) in an open, dry meadow at 1,311 m elevation.

The Hodgdon Meadow station was established and first operated according to the standardized MAPS protocol in 1990, followed by White Wolf Meadow, Crane Flat, and Big Meadow in 1993, and Gin Flat East Meadow in 1998. See Table 1 for details of habitats and operation of each station in 2012.

Through the efforts of two IBP field biologist interns (Katelyn Blakemore and Jessica Reese) and Yosemite NP field technician David Wolfson, trained and supervised by IBP Biologist Erin Rowan and Yosemite Wildlife Biologist Sarah Stock, these five MAPS banding stations were operated during 2012 in accordance with the standardized bird-banding protocol developed for the MAPS Program throughout North America (DeSante et al. 2009).

Ten net sites (14 sites at the Hodgdon Meadow station) were re-established at each of the stations in 2012, at the exact same locations where they were established and operated in each of the preceding years. One 12-m-long, 30-mm-mesh, nylon mist net was erected at each of the ten net sites at four of the stations on each day of operation. At Hodgdon Meadow, seven of the 14 net sites were operated on one day with the remaining seven net sites operated on a second day. Each of the stations was operated for six morning hours per day (beginning at about local sunrise) during one day (two days for Hodgdon Meadow) in each of eight consecutive 10-day periods between May 21 and August 8 or, for the two higher-elevation stations (White Wolf Meadow and Gin Flat East Meadow), for one day in each of seven periods between May 31 and August 8 (see Table 1). The operation of all stations occurred on schedule in 2012 during each of the ten-day periods.

### **Data collection**

With few exceptions, all birds captured at MAPS stations were identified to species, age, and sex.

If unbanded, the birds were banded with USGS/BRD numbered aluminum bands. Birds were released immediately upon capture and before being banded or processed if situations arose where bird safety was compromised. Such situations could involve exceptionally large numbers of birds being captured at once, or the sudden onset of adverse weather conditions such as high winds or rainfall. The following data were collected from all birds captured, including recaptures:

- capture code (newly banded, recaptured, band changed, unbanded);
- band number
- species
- age and how aged
- sex (if possible) and how sexed (if applicable)
- extent of skull pneumaticization
- breeding condition of adults (i.e., extent of cloacal protuberance or brood patch)
- extent of juvenal plumage in young birds
- extent of body and flight-feather molt
- extent of primary-feather wear
- presence of molt limits and plumage characteristics
- wing chord
- fat class and body mass
- date and time of capture (net-run time)
- station and net site where captured
- any pertinent notes

Effort data (i.e., the number and timing of net-hours on each day of operation) were also collected in a standardized manner. In order to allow constant-effort comparisons of data, the times of opening and closing the array of mist nets and of beginning each net check were recorded to the nearest ten minutes. The breeding (summer residency) status (confirmed breeder, likely breeder, non-breeder) of each species seen, heard, or captured at each MAPS station on each day of operation was recorded using techniques similar to those employed for breeding bird atlas projects.

For each of the five stations, simple habitat maps prepared in previous years (indicating extent and location of major habitats, as well as structures, roads, trails, and streams) were checked and updated where necessary. The pattern and extent of cover of each of four major vertical layers of vegetation (upperstory, midstory, understory, and ground cover), in each major habitat type, were classified into one of twelve pattern types and eleven cover categories according to guidelines in the MAPS Habitat Structure Assessment Protocol (Nott et al. 2003).

### **Computer data entry and verification**

The computer entry of all banding data was completed by John W. Shipman of Zoological Data Processing, Socorro, NM. The critical data for each banding record (capture code, band number, species, age, sex, date, capture time, station, and net number) were proofed by hand against the raw

data and any computer-entry errors were corrected. Computer entry of effort and vegetation data was completed by IBP biologists using custom data entry programs. All banding data were then run through a series of verification programs as follows:

- Clean-up programs to check the validity of all codes entered and the ranges of all numerical data.
- Cross-check programs to compare station, date, and net fields from the banding data with those from the summary of mist netting effort data.
- Cross-check programs to compare species, age, and sex determinations against degree of skull pneumaticization, breeding condition (extent of cloacal protuberance and brood patch), and extent of body and flight-feather molt, primary-feather wear, and juvenal plumage.
- Screening programs which allow identification of unusual or duplicate band numbers or unusual band sizes for each species.
- Verification programs to screen banding and recapture data from all years of operation for inconsistent species, age, or sex determinations for each band number.

Any discrepancies or suspicious data identified by any of these programs were examined manually and corrected if necessary. Wing chord, weight, station of capture, date, and any pertinent notes were used as supplementary information for the correct determination of species, age, and sex in all of these verification processes.

## Data analysis

We classified the landbird species captured in mist nets into six groups based upon their breeding or summer residency status. Each species was classified as one of the following:

- a regular breeder (B) if we had positive or probable evidence of breeding or summer residency within the boundaries of the MAPS station *during all years* that the station was operated.
- a usual breeder (U) if we had positive or probable evidence of breeding or summer residency within the boundaries of the MAPS station *during more than half but not all of the years* that the station was operated.
- an occasional breeder (O) if we had positive or probable evidence of breeding or summer residency within the boundaries of the MAPS station *during half or fewer of the years* that the station was operated.
- a transient (T) if the species was *never* a breeder or summer resident at the station, but the station was within the overall breeding range of the species.

- an altitudinal disperser (A) if the species breeds only at lower elevation than that of the station but disperses to higher elevations after breeding.
- a migrant (M) if the station was not located within the overall breeding range of the species.

Data for a given species from a given station were included in productivity analyses if the station was within the breeding range of the species; that is, data were included from stations where the species was a breeder (B, U, or O), or transient (T), but not where the species was an altitudinal disperser (A) or a migrant (M).

### Adult population index and productivity analyses

The proofed, verified, and corrected banding data from all sixteen years were run through a series of analysis programs that calculated for each species:

- the numbers of newly banded birds, recaptured birds, and birds released unbanded.
- the numbers and capture rates (per 600 net-hours) of first captures (in a given year) of individual adult and young birds.
- the reproductive index. Following the procedures pioneered by the British Trust for Ornithology (BTO) in their CES Scheme (Peach et al. 1996), we used the number of adult birds captured as an index of adult population size. For each species each year, we calculated a yearly reproductive index as the number of young divided by the number of adults.

## **Results**

A total of 2,135.8 net-hours was accumulated at the five MAPS stations operated in Yosemite National Park in 2012 (Table 1). Data from 1,608.5 of these net-hours could be compared directly to the previous year's data in a constant-effort manner.

### **2012 Indices of Adult Population Size and Post-Fledging Productivity**

We present the 2012 numbers of newly-banded, unbanded, and recaptured birds for each species at each of the five stations individually and for all stations combined in Table 2. A total of 2,164 captures of 66 species was recorded during the summer of 2012. Newly banded birds comprised 69.4% of the total captures. The greatest number of total captures (920) was recorded at the Hodgdon Meadow station and the smallest number of total captures (239) was recorded at the White Wolf Meadow station. The highest species richness occurred at Hodgdon Meadow (48 species) and the lowest species richness occurred at White Wolf Meadow (22 species).

The 2012 capture rates (per 600 net-hours) of individual adult and young birds and the 2012

Table 1. Summary of the 2012 operation of the five MAPS stations in Yosemite National Park.

Station		No.	Major Habitat Type	Latitude-longitude	Avg Elev. (m)	2012 operation		
Name	Code					Total number of net-hours <sup>1</sup>	No. of periods	Inclusive dates
White Wolf Meadow	WHWO	11904	Wet montane meadow, red fir/ lodgepole pine forest	37°52'10"N,-119°39'08"W	2402	364.0 (193.7)	7	6/06 - 8/04
Gin Flat East Meadow	GFEM	11980	Wet montane meadow, mixed fir forest	37°45'59"N,-119°45'37"W	2073	394.0 (249.5)	7	6/04 - 8/03
Crane Flat	CRFL	11907	Wet montane meadow, willow/ aspen thickets, mixed coniferous forest	37°45'20"N,-119°48'13"W	1875	391.8 (299.7)	8	5/24 - 8/02
Hodgdon Meadow	HODG	11107	Wet montane meadow, willow/ dogwood thickets, mixed oak and coniferous forest	37°47'41"N,-119°51'50"W	1408	596.3 (529.7)	8	5/22 - 8/01
Big Meadow	BIME	11905	Riparian willows, mixed coniferous forest (largely consumed by a stand-replacing fire in 1990), open dry meadow	37°42'16"N,-119°45'07"W	1311	389.7 (336.0)	8	5/21 - 7/30
ALL STATIONS COMBINED						2135.8 (1608.5)	8	5/21 - 8/04

<sup>1</sup> Total net-hours in 2012. Net-hours in 2012 that could be compared in a constant-effort manner to 2011 are shown in parentheses.

Table 2. Capture summary for the five individual MAPS stations rated in Yosemite National Park in 2012, and all stations pooled.  
 N = Newly Banded, U = Unbanded, R = Recaptures of banded birds.

Species	White Wolf Meadow			Gin Flat East Meadow			Crane Flat			Hodgdon Meadow			Big Meadow			All five stations combined			
	N	U	R	N	U	R	N	U	R	N	U	R	N	U	R	N	U	R	
Mountain Quail								2										2	
California Quail														1				1	
Anna's Hummingbird					1			1			46			16				64	
Calliope Hummingbird		1			1			2			3			1				8	
Rufous Hummingbird		2			2			7			16			4				31	
Unident. Sela. Hummingbird		2			1			3			3			1				10	
Acorn Woodpecker													1					1	
Williamson's Sapsucker	1			4	1	1											5	1	1
Red-breasted Sapsucker	1			9		3	3	1	1	17	2	16	5	1	1	35	4	21	
Downy Woodpecker										1			1					2	
Hairy Woodpecker			1	1			1		1				1					3	2
White-headed Woodpecker							1					1	1					2	1
Northern Flicker	1						1			2								4	
Olive-sided Flycatcher										1								1	
Western Wood-Pewee				1						4	2	5	9		1	14	2	6	
Willow Flycatcher										1								1	
Hammond's Flycatcher				2			6	1	2	1						9	1	2	
Dusky Flycatcher				4	1		14		3	6		1				24	1	4	
Western Flycatcher					1					10		1				10	2	1	
Unident. Empidonax Flycat.		1								3		5						9	
Black Phoebe													2		1	2		1	
Ash-throated Flycatcher													1			1			
Cassin's Vireo				1						8		1	1			10		1	
Warbling Vireo							11		10	23		5	6		1	40		16	
Steller's Jay										3						3			

Table 2 (continued). Capture summary for the five individual MAPS stations rated in Yosemite National Park in 2012, and all stations pooled. N = Newly Banded, U = Unbanded, R = Recaptures of banded birds.

Species	White Wolf Meadow			Gin Flat East Meadow			Crane Flat			Hodgdon Meadow			Big Meadow			All five stations combined		
	N	U	R	N	U	R	N	U	R	N	U	R	N	U	R	N	U	R
Mountain Chickadee	3		2	4		1	2		2							9		5
Chestnut-backed Chickadee										1						1		
Oak Titmouse													2			2		
Bushtit				3						1		12				15	1	
Red-breasted Nuthatch	3			3			7		1	12		2				25		3
Brown Creeper	7		2	8	2	2	5	1		12	2					32	5	4
Bewick's Wren													1			1		
House Wren	2	1		7			15	1	1	6			9	1	2	39	3	3
Pacific Wren				1						7	1					8	1	
Golden-crowned Kinglet	1			18	8		11		2	33	2					63	10	2
Ruby-crowned Kinglet	1															1		
Western Bluebird													2			2		
Hermit Thrush	2		1													2		1
American Robin	2	1	1	2		3	1		1	8		3	4			17	1	8
Wrentit													4			4		
Orange-crowned Warbler	8		1	4	1	1	29	3	1	88	4	9	27		1	156	8	13
Nashville Warbler	7			1	2		14	3		20	1	5	18		2	60	6	7
Yellow Warbler										6			3			9		
Yellow-rumped Warbler	57	4	6	29		2	38	1	2	60		3	3			187	5	13
Black-throated Gray Warbler							1			1			1			3		
Hermit Warbler	5			1	4		14	1	1	25		1				45	5	2
MacGillivray's Warbler				8		1	19		10	83	2	53	6			116	2	64
Wilson's Warbler							2	4	2	4			3			9	4	2
Yellow-breasted Chat										1						1		
Western Tanager				1			3			3	1		3			10	1	

Table 2 (continued). Capture summary for the five individual MAPS stations rated in Yosemite National Park in 2012, and all stations pooled. N = Newly Banded, U = Unbanded, R = Recaptures of banded birds.

Species	White Wolf Meadow			Gin Flat East Meadow			Crane Flat			Hodgdon Meadow			Big Meadow			All five stations combined		
	N	U	R	N	U	R	N	U	R	N	U	R	N	U	R	N	U	R
Green-tailed Towhee				1			1			1						3		
Spotted Towhee										2			12	1	1	14	1	1
Chipping Sparrow	1						4						1			6		
Fox Sparrow							1			2						3		
Song Sparrow							6	2	12	70	2	49	11	1	10	87	5	71
Lincoln's Sparrow	7		4	23	1	24	37	4	32	12	1	24				79	6	84
Dark-eyed Junco	65	5	28	35	1	8	53	5	25	50	1	10				203	12	71
Unidentified Sparrow					1				7			9						17
Black-headed Grosbeak										5		6	17	4	1	22	4	7
Lazuli Bunting							4						21		1	25		1
Red-winged Blackbird										2		1	1			3		1
Brewer's Blackbird										3			8	1		11	1	
Brown-headed Cowbird										1			1			2		
Bullock's Oriole											1							1
Purple Finch							2			10	1	5	21			33	1	5
Cassin's Finch							3									3		
Unident. Carpodacus Finch											2							2
Pine Siskin	2			5			4			4						15		
Lesser Goldfinch										2			2	1		4	1	
Lawrence's Goldfinch													4			4		
ALL SPECIES POOLED	176	17	46	176	28	46	313	53	109	611	108	201	225	33	22	1501	239	424
Total Number of Captures		239			250			475			920			280			2164	
Number of Species	19	6	9	25	13	10	31	17	18	42	18	20	36	11	11	60	33	32
Total Number of Species		22			29			36			48			40			66	

reproductive index (number of young birds per adult) are presented for each species and for all species pooled at each station and all stations combined in Table 3. We present capture rates (captures per 600 net-hours) rather than absolute numbers of birds in this table so that the data can be compared among stations which, because of the vagaries of weather and other factors, can differ from one another in effort expended (see Table 1). These capture indices suggest that the total adult population size in 2012 was greatest at Crane Flat (269.5 adults/600 net-hours), followed in descending order by Hodgdon Meadow (241.5), Big Meadow (189.4), Gin Flat East Meadow (140.1), and White Wolf Meadow (107.1). The capture rate of young of all species pooled at each station in 2012 was highest at Hodgdon Meadow (348.1 young/600 net-hours), followed by White Wolf Meadow (194.5), Crane Flat (170.0), Gin Flat East Meadow (137.1), and Big Meadow (123.2). Reproductive index (the number of young per adult) at the five stations in 2011 was greatest at White Wolf Meadow (1.82), followed by Hodgdon Meadow (1.44), Gin Flat East Meadow (0.98), Big Meadow (0.65), and Crane Flat (0.63). The mean adult capture rate for the five stations combined was 195.5 per 600 net hours and the overall reproductive index was 1.07 in 2012.

In 2012 Dark-eyed Junco was the most frequently captured species, followed by Yellow-rumped Warbler, MacGillivray's Warbler, Orange-crowned Warbler, Lincoln's Sparrow, Song Sparrow, Golden-crowned Kinglet, Nashville Warbler, Anna's Hummingbird, and Red-breasted Sapsucker (Table 2). Overall, the most abundant breeding species in 2012 (as determined by the number of adults captured per 600 net-hours; Table 3), not including Orange-crowned Warbler (because most if not all of the individuals captured in Yosemite are dispersing upslope from lower-elevation breeding sites outside the park) and Anna's Hummingbird (because hummingbirds were not banded to determine the number of individual birds), in decreasing order, were Dark-eyed Junco, MacGillivray's Warbler, Yellow-rumped Warbler, Lincoln's Sparrow, Song Sparrow, Warbling Vireo, Purple Finch, Red-breasted Sapsucker, American Robin, Hermit Warbler and Lazuli Bunting. The following is a list of the most frequently captured species (captured at a rate of at least 8.0 adults per 600 net-hours), in decreasing order, at each station in 2012 (see Table 3):

**White Wolf Meadow**

Dark-eyed Junco  
Yellow-rumped Warbler  
Mountain Chickadee

**Gin Flat East Meadow**

Dark-eyed Junco  
Lincoln's Sparrow  
Yellow-rumped Warbler  
Red-breasted Sapsucker

**Crane Flat**

Dark-eyed Junco  
Yellow-rumped Warbler

Lincoln's Sparrow  
MacGillivray's Warbler  
Dusky Flycatcher  
Warbling Vireo  
Hermit Warbler  
Golden-crowned Kinglet  
Song Sparrow

**Hodgdon Meadow**

MacGillivray's Warbler  
Song Sparrow  
Lincoln's Sparrow  
Warbling Vireo  
Yellow-rumped Warbler  
Purple Finch  
Red-breasted Sapsucker  
American Robin  
Dark-eyed Junco  
Hermit Warbler  
Black-headed Grosbeak

**Big Meadow**

Lazuli Bunting  
Purple Finch  
Song Sparrow  
Spotted Towhee  
Western Wood-Pewee  
Black-headed Grosbeak  
Brewer's Blackbird  
Warbling Vireo

Table 3. Numbers of aged individual birds captured per 600 net-hours and proportion of young in the catch at the five individual MAPS stations, and all stations pooled, operated in Yosemite National Park in 2012.

Species	White Wolf Meadow			Gin Flat East Meadow			Crane Flat			Hodgdon Meadow			Big Meadow			All five stations combined		
	Ad.	Yg.	Prop. Yg.	Ad.	Yg.	Prop. Yg.	Ad.	Yg.	Prop. Yg.	Ad.	Yg.	Prop. Yg.	Ad.	Yg.	Prop. Yg.	Ad.	Yg.	Prop. Yg.
Acorn Woodpecker													1.5	0.0	0.00	0.3	0.0	0.00
Williamson's Sapsucker	1.6	0.0	0.00	1.5	4.6	3.00										0.6	0.8	1.50
Red-breasted Sapsucker	1.6	0.0	0.00	10.7	4.6	0.43	3.1	1.5	0.50	11.1	9.1	0.82	4.6	4.6	1.00	6.7	4.5	0.67
Downy Woodpecker										0.0	1.0	und. <sup>1</sup>	0.0	1.5	und. <sup>1</sup>	0.0	0.6	und. <sup>1</sup>
Hairy Woodpecker	1.6	0.0	0.00	1.5	0.0	0.00	1.5	0.0	0.00				1.5	0.0	0.00	1.1	0.0	0.00
White-headed Woodpecker							1.5	0.0	0.00				1.5	0.0	0.00	0.6	0.0	0.00
Northern Flicker	0.0	1.6	und. <sup>1</sup>				0.0	1.5	und. <sup>1</sup>	0.0	2.0	und.				0.0	1.1	und.
Olive-sided Flycatcher										1.0	0.0	0.00				0.3	0.0	0.00
Western Wood-Pewee				1.5	0.0	0.00				6.0	1.0	0.17	13.9	0.0	0.00	4.5	0.3	0.06
Willow Flycatcher										1.0	0.0	0.00				0.3	0.0	0.00
Hammond's Flycatcher				0.0	3.0	und. <sup>1</sup>	7.7	1.5	0.20	1.0	0.0	0.00				1.7	0.8	0.50
Dusky Flycatcher				6.1	0.0	0.00	16.8	4.6	0.27	1.0	5.0	5.00				4.5	2.2	0.50
Western Flycatcher										3.0	5.0	1.67				0.8	1.4	1.67
Black Phoebe													1.5	3.1	2.00	0.3	0.6	2.00
Ash-throated Flycatcher													0.0	1.5	und.	0.0	0.3	und.
Cassin's Vireo				0.0	1.5	und.				6.0	3.0	0.50	1.5	0.0	0.00	2.0	1.1	0.57
Warbling Vireo							15.3	4.6	0.30	16.1	8.0	0.50	9.2	0.0	0.00	9.0	3.1	0.34
Steller's Jay										3.0	0.0	0.00				0.8	0.0	0.00
Mountain Chickadee	8.2	0.0	0.00	6.1	1.5	0.25	6.1	0.0	0.00							3.7	0.3	0.08
Chestnut-backed Chickadee										1.0	0.0	0.00				0.3	0.0	0.00
Oak Titmouse													1.5	1.5	1.00	0.3	0.3	1.00
Bushtit				0.0	4.6	und.							4.6	13.9	3.00	0.8	3.4	4.00
Red-breasted Nuthatch	1.6	3.3	2.00	1.5	3.0	2.00	0.0	10.7	und.	5.0	8.0	1.60				2.0	5.3	2.71
Brown Creeper	6.6	6.6	1.00	4.6	7.6	1.67	3.1	4.6	1.50	1.0	11.1	11.00				2.8	6.5	2.30

Table 3 (continued). Numbers of aged individual birds captured per 600 net-hours and proportion of young in the catch at the five individual MAPS stations, and all stations pooled, operated in Yosemite National Park in 2012.

Species	White Wolf Meadow			Gin Flat East Meadow			Crane Flat			Hodgdon Meadow			Big Meadow			All five stations combined		
	Ad.	Yg.	Prop. Yg.	Ad.	Yg.	Prop. Yg.	Ad.	Yg.	Prop. Yg.	Ad.	Yg.	Prop. Yg.	Ad.	Yg.	Prop. Yg.	Ad.	Yg.	Prop. Yg.
Bewick's Wren													0.0	1.5	und.	0.0	0.3	und.
House Wren													3.1	10.8	3.50	0.6	2.0	3.50
Pacific Wren				0.0	1.5	und.				2.0	5.0	2.50				0.6	1.7	3.00
Golden-crowned Kinglet	0.0	1.6	und.	4.6	22.8	5.00	13.8	6.1	0.44	2.0	31.2	15.50				3.9	14.3	3.64
Ruby-crowned Kinglet	1.6	0.0	0.00													0.3	0.0	0.00
Western Bluebird													0.0	3.1	und.	0.0	0.6	und.
Hermit Thrush	4.9	0.0	0.00													0.8	0.0	0.00
American Robin	4.9	0.0	0.00	6.1	0.0	0.00	3.1	0.0	0.00	10.1	1.0	0.10	4.6	1.5	0.33	6.2	0.6	0.09
Wrentit													4.6	1.5	0.33	0.8	0.3	0.33
Nashville Warbler										1.0	19.1	19.00	7.7	20.0	2.60	1.7	9.0	5.33
Yellow Warbler										2.0	4.0	2.00	1.5	3.1	2.00	0.8	1.7	2.00
Yellow-rumped Warbler	19.8	84.1	4.25	16.8	30.5	1.82	36.8	23.0	0.63	14.1	46.3	3.29	4.6	0.0	0.00	18.0	37.1	2.06
Black-throated Gray Warbler							0.0	1.5	und.	0.0	1.0	und.	0.0	1.5	und.	0.0	0.8	und.
Hermit Warbler	0.0	8.2	und.	1.5	0.0	0.00	15.3	7.7	0.50	10.1	15.1	1.50				5.9	7.0	1.19
MacGillivray's Warbler				6.1	6.1	1.00	16.8	18.4	1.09	50.3	54.3	1.08	6.2	3.1	0.50	19.4	20.2	1.04
Wilson's Warbler							3.1	0.0	0.00	2.0	2.0	1.00	3.1	1.5	0.50	1.7	0.8	0.50
Yellow-breasted Chat										1.0	0.0	0.00				0.3	0.0	0.00
Western Tanager				1.5	0.0	0.00	4.6	0.0	0.00	2.0	1.0	0.50	3.1	1.5	0.50	2.2	0.6	0.25
Green-tailed Towhee				1.5	0.0	0.00	0.0	1.5	und.	1.0	0.0	0.00				0.6	0.3	0.50
Spotted Towhee										1.0	1.0	1.00	15.4	3.1	0.20	3.1	0.8	0.27
Chipping Sparrow	1.6	0.0	0.00				6.1	0.0	0.00				0.0	1.5	und.	1.4	0.3	0.20
Fox Sparrow							1.5	0.0	0.00	0.0	2.0	und.				0.3	0.6	2.00
Song Sparrow							9.2	6.1	0.67	28.2	57.4	2.04	15.4	6.2	0.40	12.4	18.3	1.48
Lincoln's Sparrow	4.9	6.6	1.33	27.4	19.8	0.72	32.2	35.2	1.10	16.1	6.0	0.38				16.3	12.9	0.79

Table 3 (continued). Numbers of aged individual birds captured per 600 net-hours and proportion of young in the catch at the five individual MAPS stations, and all stations pooled, operated in Yosemite National Park in 2012.

Species	White Wolf Meadow			Gin Flat East Meadow			Crane Flat			Hodgdon Meadow			Big Meadow			All five stations combined		
	Ad.	Yg.	Prop. Yg.	Ad.	Yg.	Prop. Yg.	Ad.	Yg.	Prop. Yg.	Ad.	Yg.	Prop. Yg.	Ad.	Yg.	Prop. Yg.	Ad.	Yg.	Prop. Yg.
Dark-eyed Junco	44.5	82.4	1.85	33.5	25.9	0.77	52.1	41.3	0.79	10.1	42.3	4.20				26.1	38.2	1.46
Black-headed Grosbeak										9.1	1.0	0.11	12.3	15.4	1.25	4.8	3.1	0.65
Lazuli Bunting							6.1	0.0	0.00				24.6	7.7	0.31	5.6	1.4	0.25
Red-winged Blackbird										3.0	0.0	0.00	1.5	0.0	0.00	1.1	0.0	0.00
Brewer's Blackbird										3.0	0.0	0.00	10.8	1.5	0.14	2.8	0.3	0.10
Brown-headed Cowbird										1.0	0.0	0.00	1.5	0.0	0.00	0.6	0.0	0.00
Purple Finch							3.1	0.0	0.00	11.1	4.0	0.36	20.0	12.3	0.62	7.3	3.4	0.46
Cassin's Finch							4.6	0.0	0.00							0.8	0.0	0.00
Pine Siskin	3.3	0.0	0.00	7.6	0.0	0.00	6.1	0.0	0.00	3.0	1.0	0.33				3.9	0.3	0.07
Lesser Goldfinch										2.0	0.0	0.00	1.5	0.0	0.00	0.8	0.0	0.00
Lawrence's Goldfinch													6.2	0.0	0.00	1.1	0.0	0.00
ALL SPECIES POOLED	107.1	194.5	1.82	140.1	137.1	0.98	269.5	170.0	0.63	241.5	348.1	1.44	189.4	123.2	0.65	195.5	209.3	1.07
Number of Species	14	8		18	14		24	16		36	29		29	24		53	44	
Total Number of Species		17			22			28			40			35			59	

<sup>1</sup> Reproductive index (young/adult) is undefined because no adults of this species were captured at this station in this year.

## Longevity Records

The primary purpose of the long-term mark-recapture study of birds in Yosemite National Park is to understand population-level demographics and how they respond to climate and habitat changes. However, sometimes interesting information can also be gleaned from looking at the capture records of individual birds. This year, longevity records within the 23-year Yosemite MAPS dataset (1990-2012) were assessed and some amazing results were found, a few of which are highlighted in Table 4.

Records of longevity in excess of records posted by the USGS Bird Banding Laboratory (BBL) were determined for the following species: Red-breasted Sapsucker, Western Wood-Pewee, MacGillivray's Warbler, Lincoln's Sparrow and Cassin's Finch. The BBL currently has no posted longevity records for the White-headed Woodpecker or Cassin's Vireo, both of which were recaptured at 8 years and 1 month of age. A Mountain Chickadee recaptured in 2011 has the same minimum age as the posted BBL record for that species. Many longevity records obtained for additional species from the Yosemite dataset that are exceeded by BBL longevity records from elsewhere, but are nonetheless notable, include those for Willow Flycatcher, Dusky Flycatcher, Brown Creeper, American Robin, Yellow Warbler, and Song Sparrow.

Table 4. Longevity records from the Yosemite MAPS data for individual birds of selected species.

Species	Band Number	First year captured	Last year captured	Minimum age at last capture <sup>1</sup>
Red-breasted Sapsucker	230113541	2007	2012	6 years, 0 months
White-headed Woodpecker	168149403	2001	2008	8 years, 1 months
Western Wood-Pewee	232007501	2003	2011	8 years, 1 months
Willow Flycatcher	190041600	1992	1999	8 years, 0 months
Dusky Flycatcher	230030911	2004	2010	8 years, 1 months
Cassin's Vireo	185120312	2004	2011	8 years, 1 months
Mountain Chickadee	232007215	2003	2011	10 years, 1 month
Brown Creeper	233094553	2006	2011	6 years, 1 months
American Robin	114238182	2001	2009	10 years, 1 month
Yellow Warbler	188087165	1990	1998	9 years, 2 months
MacGillivray's Warbler	231026279	2004	2012	9 years, 1 months
Song Sparrow	186118184	2004	2012	9 years, 0 months
Lincoln's Sparrow	212155897	1993	2002	8 years, 11 month
Cassin's Finch	153157414	1997	2003	8 years, 0 months

<sup>1</sup> Note that 1) ages are minimums, as all birds were released alive at the time of their last capture, and 2) some birds were determined by plumage characteristics to be more than 1 year old at the time of first capture.

The long-term Yosemite MAPS data have thus yielded new *national* longevity records for at least 8 species, an example of information that can only be gained through sustained, long-term monitoring.

### **Recaptures of Banded Birds Outside Yosemite**

Only a miniscule proportion of the world's songbirds are banded, so recaptures of banded migratory birds away from the region where they were originally banded are exceedingly rare. This year, the national database maintained by the BBL was reviewed to find out whether any of the birds banded in Yosemite National Park have been recaptured elsewhere, outside the park. A noteworthy result, and our only out-of-state recapture, was an Orange-crowned Warbler banded at Hodgdon Meadow during the 1996 breeding season that was recaptured 2.5 years later, in January of 1999, wintering near Victoria, Texas, approximately 1,500 miles away.

Records like this provide valuable information about migratory connectivity – our understanding of where specific breeding populations spend the winter.

### **An Unexpected Willow Flycatcher Capture**

Willow Flycatcher populations have declined throughout the Sierra Nevada, including Yosemite National Park, for the last half century. Within the Yosemite MAPS dataset Willow Flycatcher capture rates declined steadily in the 1990's (Siegel et al. 2008). An extensive survey effort subsequently revealed that despite the apparent presence of high-quality riparian habitat, Willow Flycatchers no longer breed in Yosemite National Park (Siegel et al. 2008). The causes for Willow Flycatcher decline throughout the Sierra Nevada are not well understood, but factors that have been suggested include degradation of meadow habitat within the Sierra Nevada, as well as possible stressors on wintering grounds or along migration routes. More recently, Mathewson et al. (2012) found that the reduced breeding season length due to climatic variation, and the quality of habitat in the meadows of the Sierra Nevada have contributed to lower reproductive success and continued population declines in the portions of the greater Sierra Nevada region where the species still persists.

It was therefore quite a surprise for the crew to capture an adult female Willow Flycatcher with a receding brood patch at the end of the breeding season in Hodgdon Meadow this year (Figure 2). Simply because the female had a brood patch does not mean that she bred within the boundaries of the park. In fact, females have been captured with brood patches in the Mono Basin in nest plots where they apparently did not breed (Siegel et al. 2008). The bird almost certainly did not breed in Hodgdon Meadow, as Willow Flycatchers have conspicuous songs and the crew spent a great deal of time in the meadow throughout the breeding season. It is possible that this Willow Flycatcher was only moving through Yosemite National Park after she had bred elsewhere. Regardless, visitation of Hodgdon Meadow by a Willow Flycatcher implies that the habitat was of relatively high-quality and merits further study of the meadow and its inhabitants.



**Figure 2.** Adult Female Willow Flycatcher captured at Hodgdon Meadow in 2012.

## Education and Outreach

The Yosemite MAPS program includes an education and outreach component, allowing park visitors, interpretive rangers, local school groups and volunteers to visit the MAPS stations throughout the season. Five banding demonstration days were organized with local Audubon members, a middle school class, and Yosemite National Park and Yosemite Conservancy Staff members in 2012. Overall, 84 visitors spent time at one of the five MAPS stations in Yosemite National Park during the 2012 breeding season. Additionally, the MAPS program welcomed assistance from two high school volunteer interns this year, who devoted 108 hours of service to the MAPS banding effort over the course of the season.

On July 16<sup>th</sup> a school group of 15 enthusiastic 8<sup>th</sup> graders joined the banding crew at the Lower Hodgdon Meadow banding station:

*“It was such an incredible day. We were busy from the moment we opened our nets and the students had an opportunity not only to see a Calliope Hummingbird (the smallest bird in North America) in the hand, but a much larger Red-Breasted Sapsucker. They were amazed by the species diversity in Hodgdon Meadow and asked inquisitive questions all morning. Sarah Stock was wonderful and allowed us to put our attention on banding when we got busy, taking the students’ focus out to the active meadow. Everything went so smoothly, we thought that our capture rate for the day had been somewhere around 70 birds. What a surprise when the total ended up being 104 birds! Great teamwork, great day!” – Erin Rowan, IBP Field Biologist.*

Eliza Amstutz and Anna Medema, two high school volunteers, worked with the banding crew for one month. They were given more responsibility and more training each day, which only enhanced their interest and excitement. After spending part of their summer vacation with songbirds, learning the intricacies and details of data collection, the care required to set-up and take down mist-nets, and the opportunity to see birds in the hand, they'll never look at birds the same way again. Not only did Eliza and Anna gain a renewed sense of meaning and confidence in the importance of science in conservation, but they learned the importance and power of passion that

fuels scientists and a project like the MAPS program for decades.

*“I had an incredible time bird banding with you. It was truly life changing and I will never think of birds the same way. I’ve not only learned about birds from you, but also how to be an exceptional biologist and how to be passionate about your job...With thanks, Eliza Amstutz.”*

Educating the surrounding community, National Park Service staff, and park visitors about avian conservation and the importance of the MAPS program will enhance their experience in and around Yosemite National Park and may inspire the next generation of field biologists to pursue their dreams.

## **Discussion**

The MAPS Program in Yosemite continues to provide station-specific indices of adult population size and post-fledging productivity, park-wide estimates of annual survival rates of adults, and important information on annual changes and longer-term trends in these indices and estimates, for over 25 target species. This year, longevity records of specific individuals within the Yosemite MAPS dataset were investigated and provided new national longevity records for 8 species. The results in this and previous reports underscore the complexity of the population dynamics of Yosemite’s breeding birds, which can only be unraveled through long-term data collection.

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Appendix I. Numerical listing (in AOU checklist order) of all the species sequence numbers, species alpha codes, and species names for all species banded or encountered during the 23 years, 1990-2012, of the MAPS Program on the six stations ever operated in Yosemite National Park.

Cumulative breeding status for all years in which each station was operated are also included (**B** = Regular Breeder (all years); **U** = Usual Breeder (>½, not all, years); **O** = Occasional Breeder (<½ years); **T** = Transient; **M** = Migrant; **A** = Altitudinal Disperser; **?** = Uncertain Species ID

NUMB	SPEC	SPECIES NAME	White Wolf (WHWO)	Gin Flat East Meadow (GFEM)	Crane Flat (CRFL)	Hodgdon Meadow (HODG)	Big Meadow (BIME)	Tamarack Meadow (TAME)
01010	GBHE	Great Blue Heron					T	
01300	TUVU	Turkey Vulture	T	T	T	T	T	
01630	MALL	Mallard		O		O	O	
01980	COME	Common Merganser					T	
02020	OSPR	Osprey					T	
02170	NOHA	Northern Harrier					T	
02200	SSHA	Sharp-shinned Hawk		T		T	T	
02210	COHA	Cooper's Hawk	T	T	T	O	T	
02240	NOGO	Northern Goshawk	T	T		T		
02245	UAHA	Unidentified Accipiter Hawk				?	?	
02380	RSHA	Red-shouldered Hawk	T		T	T		
02460	RTHA	Red-tailed Hawk	T	O	T	U	O	
02510	GOEA	Golden Eagle					T	
02545	UNHA	Unidentified Hawk				?	?	
02630	AMKE	American Kestrel					O	
02700	PEFA	Peregrine Falcon					M	
03000	DUGR	Dusky Grouse	T	T	O	O		
03002	SOGR	Sooty Grouse	O					
03040	WITU	Wild Turkey				T	T	
03100	MOUQ	Mountain Quail	O	U	O	U	B	
03130	CAQU	California Quail				O	O	
03370	VIRA	Virginia Rail				T		T
03430	SORA	Sora				M		
03780	KILL	Killdeer					T	
04020	SPSA	Spotted Sandpiper	O					
05440	BTPI	Band-tailed Pigeon	T	T	T	O	T	
05570	MODO	Mourning Dove		T	T	O	O	
06670	WESO	Western Screech-Owl				T		
06800	GHOW	Great Horned Owl	T		T	O	T	

## Appendix I, continued.

NUMB	SPEC	SPECIES NAME	WHWO	GFEM	CRFL	HODG	BIME	TAME
06830	NOPO	Northern Pygmy-Owl		T		O	T	
06940	SPOW	Spotted Owl				O		
06970	GGOW	Great Gray Owl	T	U	O	O		
07040	NSWO	Northern Saw-whet Owl				T		
07330	BLSW	Black Swift					T	
07410	VASW	Vaux's Swift				T	T	
07530	WTSW	White-throated Swift	T	O		T	T	
08640	BCHU	Black-chinned Hummingbird			T	T	T	
08670	ANHU	Anna's Hummingbird	T	O	O	U	U	T
08680	COHU	Costa's Hummingbird					T	
08690	CAHU	Calliope Hummingbird	T	O	O	O	O	T
08730	RUHU	Rufous Hummingbird	M	M	M	M	M	M
08740	ALHU	Allen's Hummingbird	M	M	M	M	M	
08774	USHU	Unidentified Selasphorus Hummingbird	?	?	?	?	?	
08775	UNHU	Unidentified Hummingbird	?	?	?	?	?	
09110	BEKI	Belted Kingfisher			T	T	U	
09390	LEWO	Lewis's Woodpecker					M	
09430	ACWO	Acorn Woodpecker	T		T	O	U	
09570	WISA	Williamson's Sapsucker	U	O	T	T		
09600	RBSA	Red-breasted Sapsucker	O	B	B	B	O	O
09640	NUWO	Nuttall's Woodpecker				T	T	
09650	DOWO	Downy Woodpecker	T	T	T	O	U	T
09660	HAWO	Hairy Woodpecker	U	U	U	U	U	B
09690	WHWO	White-headed Woodpecker	O	B	B	B	O	B
09710	BBWO	Black-backed Woodpecker	T	T	T			U
09800	NFIN	Northern Flicker Intergrade	T			T		
09800	NOFL	Northern Flicker	T					
09800	RSFL	Red-shafted Flicker	U	B	U	B	B	U
09860	PIWO	Pileated Woodpecker	O	U	U	U	T	O
09915	UNWO	Unidentified Woodpecker	?					
11340	OSFL	Olive-sided Flycatcher	T	U	O	B	O	B
11380	WEWP	Western Wood-Pewee	U	U	O	B	B	B
11475	TRFL	Traill's Flycatcher		T	T	U	O	T
11475	WIFL	Willow Flycatcher		T	T	U	O	T
11510	HAFL	Hammond's Flycatcher	O	U	U	U	T	O
11515	HDFL	Hammond's/Dusky Flycatcher		?	?	?		
11520	GRFL	Gray Flycatcher	M		M	M	M	
11530	DUFL	Dusky Flycatcher	U	B	B	U	T	B
11555	PSFL	Pacific-slope Flycatcher	T	O	O	U	O	T
11555	WEFL	Western Flycatcher	T	O	O	U	O	T

## Appendix I, continued.

NUMB	SPEC	SPECIES NAME	WHWO	GFEM	CRFL	HODG	BIME	TAME
11595	UEFL	Unidentified Empidonax Flycatcher	?	?	?	?	?	
11600	BLPH	Black Phoebe	O	O	T	O	B	
11620	SAPH	Say's Phoebe		T			T	
11740	ATFL	Ash-throated Flycatcher					O	T
12020	WEKI	Western Kingbird	T			T	T	
12085	UNFL	Unidentified Flycatcher	?	?	?	?	?	
12710	CAVI	Cassin's Vireo	T	U	B	B	U	U
12740	HUVI	Hutton's Vireo		T	O	O		
12760	WAVI	Warbling Vireo	U	U	B	B	B	B
12790	REVI	Red-eyed Vireo			M	M		
12920	STJA	Steller's Jay	B	B	B	B	U	B
13110	WESJ	Western Scrub-Jay	T			T	O	
13150	CLNU	Clark's Nutcracker	T	T		T		
13190	AMCR	American Crow		M		M		
13300	CORA	Common Raven	U	U	U	B	U	O
13410	TRES	Tree Swallow		T		T	O	T
13440	VGSW	Violet-green Swallow		T		T	O	T
13490	NRWS	Northern Rough-winged Swallow				T	O	
13520	CLSW	Cliff Swallow					T	
13540	BARS	Barn Swallow				T	O	
13555	UNSW	Unidentified Swallow					?	
13580	MOCH	Mountain Chickadee	B	B	B	U	U	B
13600	CBCH	Chestnut-backed Chickadee	T	T	T	O		T
13640	OATI	Oak Titmouse					O	
13680	BUSH	Bushtit		T	T	O	U	T
13690	RBNU	Red-breasted Nuthatch	B	B	B	B	O	B
13700	WBNU	White-breasted Nuthatch	T	O	O	O	O	O
13710	PYNU	Pygmy Nuthatch		T				
13730	BRCR	Brown Creeper	B	B	B	B	U	B
14040	BEWR	Bewick's Wren	T	T		T	O	
14070	HOWR	House Wren	A	A	A	A	U	A
14109	PAWR	Pacific Wren	T	T	O	O	O	T
14205	UNWR	Unidentified Wren			?	?	?	
14210	AMDI	American Dipper					O	
14240	GCKI	Golden-crowned Kinglet	B	B	B	B	T	U
14250	RCKI	Ruby-crowned Kinglet	O			T		
14350	BGGN	Blue-gray Gnatcatcher				T	T	
14570	WEBL	Western Bluebird		T		O	U	
14590	TOSO	Townsend's Solitaire	T	O	O	O	T	
14810	SWTH	Swainson's Thrush	T	T		O		

## Appendix I, continued.

NUMB	SPEC	SPECIES NAME	WHWO	GFEM	CRFL	HODG	BIME	TAME
14820	HETH	Hermit Thrush	B	O	U	U	T	T
15000	AMRO	American Robin	B	B	B	B	B	B
15110	WREN	Wrentit					U	
15370	EUST	European Starling				O	O	
15550	CEDW	Cedar Waxwing				M	M	
15660	OCWA	Orange-crowned Warbler	A	A	A	A	A	A
15670	NAWA	Nashville Warbler	A	A	A	B	U	A
15730	NOPA	Northern Parula					T	
15750	YEWA	Yellow Warbler	O	T	O	U	B	T
15800	AUWA	Audubon's Warbler	B	B	B	B	O	B
15800	YRWA	Yellow-rumped Warbler		T	T		T	
15810	BTYW	Black-throated Gray Warbler	T	T	T	O	O	T
15840	TOWA	Townsend's Warbler	M	M	M	M		M
15850	HEWA	Hermit Warbler	U	B	B	B	T	U
16040	AMRE	American Redstart				M		
16090	NOWA	Northern Waterthrush					M	
16140	MGWA	MacGillivray's Warbler	T	B	B	B	U	B
16150	COYE	Common Yellowthroat				M		
16280	HOWA	Hooded Warbler				M		
16290	WIWA	Wilson's Warbler	T	O	O	U	O	B
16460	YBCH	Yellow-breasted Chat				T	T	
16495	UNWA	Unidentified Warbler			?	?	?	
16840	WETA	Western Tanager	O	B	B	B	U	B
17790	GTTO	Green-tailed Towhee		O	T	T	T	
17810	SPTO	Spotted Towhee		O	O	O	U	
17850	CALT	California Towhee					T	
18020	CHSP	Chipping Sparrow	U	O	U	U	U	B
18110	SAGS	Sage Sparrow					T	
18130	SAVS	Savannah Sparrow				M	M	
18140	GRSP	Grasshopper Sparrow					M	
18220	FOSP	Fox Sparrow	T	U	O	T	T	O
18230	SOSP	Song Sparrow	O	O	U	B	B	O
18240	LISP	Lincoln's Sparrow	B	B	B	B	O	B
18290	MWCS	Mountain White-crowned Sparrow	T			T		
18320	ORJU	Oregon Junco	B	B	B	B	U	B
18335	UNSP	Unidentified Sparrow	?	?	?	?	?	
18600	RBGR	Rose-breasted Grosbeak				M		
18610	BHGR	Black-headed Grosbeak	O	O	U	B	B	O
18660	LAZB	Lazuli Bunting	T	T	U	O	B	T
18670	INBU	Indigo Bunting			M	M		

## Appendix I, continued.

NUMB	SPEC	SPECIES NAME	WHWO	GFEM	CRFL	HODG	BIME	TAME
18730	RWBL	Red-winged Blackbird	T	T	T	B	O	O
18810	WEME	Western Meadowlark					O	
18820	YHBL	Yellow-headed Blackbird					M	
18860	BRBL	Brewer's Blackbird	U	O	O	B	B	
18960	BHCO	Brown-headed Cowbird	O	T	O	U	U	
19105	BUOR	Bullock's Oriole		T		O	U	T
19330	PIGR	Pine Grosbeak	U	T	T			
19350	PUFI	Purple Finch	O	O	U	B	U	O
19360	CAFI	Cassin's Finch	U	O	O	O	O	O
19370	HOFI	House Finch			T	T	O	
19375	UCFI	Unidentified Carpodacus Finch		?	?	?	?	
19380	RECR	Red Crossbill	O	T	T	O	O	
19430	PISI	Pine Siskin	B	B	U	U	O	U
19490	LEGO	Lesser Goldfinch	T	O	T	O	B	T
19500	LAGO	Lawrence's Goldfinch		T	T	T	O	T
19510	AMGO	American Goldfinch				T	T	M
19580	EVGR	Evening Grosbeak	O	T	T	T	O	T
19920	HOSP	House Sparrow					T	
20085	UNBI	Unidentified Bird	?	?	?	?	?	?