The 2013 Annual Report of the Monitoring Avian Productivity and Survivorship (MAPS) Program in Yosemite National Park

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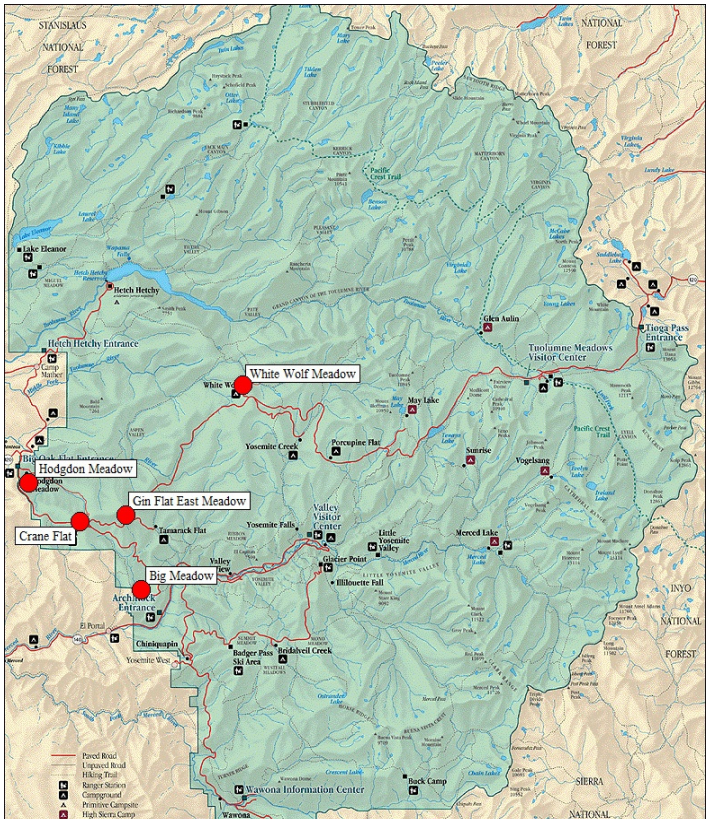

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Introduction

Landbirds are excellent bioindicators of habitat quality and environmental change in terrestrial ecosystems due to their rapid metabolism, high body temperature, and high ecological position on most food webs. Additionally, their relative abundance and diversity in nearly every terrestrial ecosystem, along with their mostly diurnal nature, make them relatively easy and cost-efficient to observe and monitor. Over the past 2 decades, landbird and Neotropical migrant population declines have led to the creation of avian monitoring programs, such as the North American Breeding Bird Survey and MAPS (Monitoring Avian Productivity and Survivorship) program. Over time, these monitoring efforts have proven effective in aiding land managers reach their management and conservation goals (Rich et al. 2004, DeSante 2008).

While presence-absence surveys like the North American Breeding Bird Survey provide land managers with useful data regarding relative abundance and species richness of a particular area, they do not provide much insight on the driving forces behind regional population trends (DeSante et al. 2005, Saracco et al. 2008). The MAPS program, through the application of standardized constant-effort mist netting and modern capture-recapture analytical techniques, can impart critical information regarding specific life stages or demographic groups that may be most strongly affected by population stressors (DeSante et al. 2005). 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). Additionally, through the network of MAPS operators (>300 in North America in 2013), the MAPS program 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).

While climate change, habitat destruction, habitat fragmentation, poisonous pollution and the continuous growth of urban landscapes challenge avian populations each year, national parks act as their sanctuary. Neotropical migratory landbirds rely on these safeguarded areas not only during the breeding season, but also during migration as stopover sites (Finch 1991). The long-term operation of constant-effort stations has been a main objective of the MAPS program, especially in large protected areas, such as national parks, which can additionally act as reference sites for assessing the effects of land use and land cover changes on populations. National Parks and other protected areas can shed light on 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).

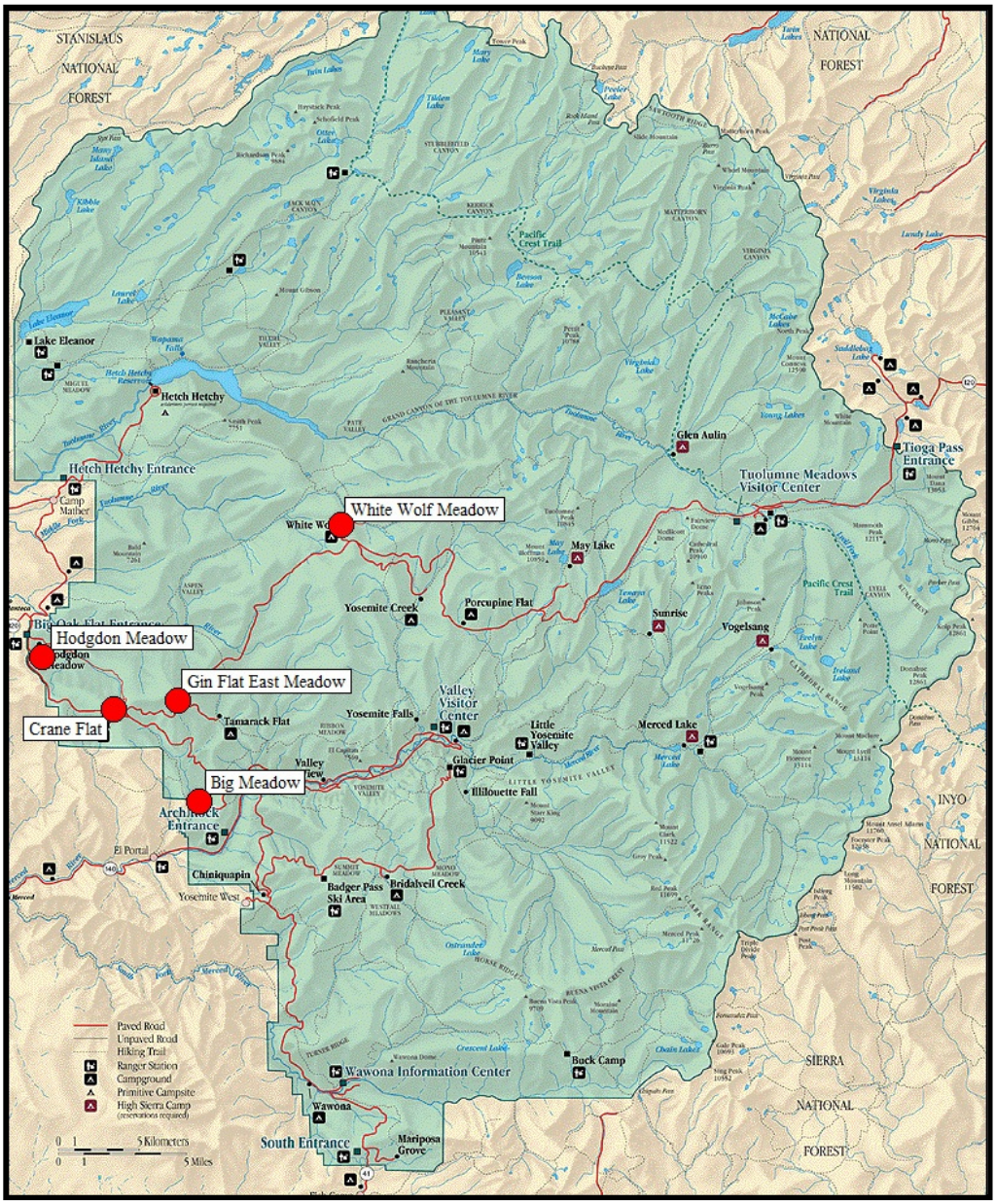
Yosemite National Park is the home of some of the longest-running MAPS stations in the country, several of which have been active now for over twenty years. Here we report summary monitoring results from the MAPS program in Yosemite in 2013.

Methods

Establishment and operation of stations

Five MAPS stations were re-established and operated in Yosemite National Park in 2013, 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 2013.

Through the efforts of two IBP field biologist interns (Erin Johnston and Teresa Ely) and Yosemite NP field technician Mary Clapp, trained and supervised by IBP Biologist Jessica Reese and Yosemite Wildlife Biologist Sarah Stock, these five MAPS banding stations were operated during 2013 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 2013, 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 2013 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 1,825.0 net-hours was accumulated at the five MAPS stations operated in Yosemite National Park in 2013 (Table 1). Data from 1,672.8 of these net-hours could be compared directly to the previous year's data in a constant-effort manner.

2013 Indices of Adult Population Size and Post-Fledging Productivity

We present the 2013 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 2,348 captures of 61 species was recorded during the summer of 2013. Newly banded birds comprised 75.25% of the total captures. The greatest number of total captures (827) was recorded at the Hodgdon Meadow station and the smallest number of total captures (178) was recorded at the Big Meadow station. The highest species richness occurred at Hodgdon Meadow (43 species) and the lowest species richness occurred at White Wolf Meadow (21 species).

The 2013 capture rates (per 600 net-hours) of individual adult and young birds and the 2013

Table 1. Summary of the 2013 operation of the five MAPS stations in Yosemite National Park.

Station						2013 operation		
Name	Code	No.	Major Habitat Type	Latitude-longitude	Avg Elev. (m)	Total number of net-hours[1]	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	339.0 (293.3)	7	6/05 - 8/04
Gin Flat East Meadow	GFEM	11980	Wet montane meadow, mixed fir forest	37°45'59"N,-119°45'37"W	2073	321.7 (310.3)	7	6/03 - 8/03
Crane Flat	CRFL	11907	Wet montane meadow, willow/ aspen thickets, mixed coniferous forest	37°45'20"N,-119°48'13"W	1875	363.3 (317.5)	8	5/25 - 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	500.0 (474.8)	8	5/24 - 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	301.0 (276.8)	8	5/22 - 7/30
ALL STATIONS COMBINED						1825.0 (1672.8)	8	5/22 - 8/04

[1] Total net-hours in 2013. Net-hours in 2013 that could be compared in a constant-effort manner to 2012 are shown in parentheses.

Table 2. Capture summary for the five individual MAPS stations rated in Yosemite National Park in 2013, and all stations pooled.
N = Newly Banded, U = Unbanded, R = Recaptures of banded birds.

	White Wolf Meadow			Gin Flat East Meadow			Crane Flat			Hodgdon Meadow			Big Meadow			All five stations combined		
Species	N	U	R	N	U	R	N	U	R	N	U	R	N	U	R	N	U	R
Mountain Quail					1												1	
California Quail														1			1	
Black-chinned Hummingbird											1						1	
Anna's Hummingbird					2			6			59			10			77	
Calliope Hummingbird								1			2						3	
Rufous Hummingbird		1			3			13			18			2			37	
Unident.Selasphorus Hum.					1			2			3						6	
Williamson's Sapsucker				2												2		
Red-breasted Sapsucker				5			8		1	33	1	15				46	1	16
Hairy Woodpecker				1												1		
White-headed Woodpecker				2			2			1					1	5		1
Olive-sided Flycatcher										3		1				3		1
Western Wood-Pewee				4			1			5		5	7			17		5
Willow Flycatcher													1			1		
Hammond's Flycatcher	1			3			3		1							7		1
Dusky Flycatcher	6			3		2	10		5	2						21		7
Western Flycatcher				8			3			25		1				36		1
Unidentified Empid. Flycatcher					4			2			4						10	
Black Phoebe													10			10		
Cassin's Vireo							4			8						12		
Warbling Vireo	2						10	1	5	14		1	6		4	32	1	10
Steller's Jay										2						2		
Mountain Chickadee	3		3	8			3		2	1						15		5
Chestnut-backed Chickadee										1						1		
Bushtit													3	1		3	1	
Red-breasted Nuthatch				3			6			3	1	1				12	1	1

Table 2 (continued). Capture summary for the five individual MAPS stations rated in Yosemite National Park in 2013, and all stations pooled.
N = Newly Banded, U = Unbanded, R = Recaptures of banded birds.

	White Wolf Meadow			Gin Flat East Meadow			Crane Flat			Hodgdon Meadow			Big Meadow			All five stations combined		
Species	N	U	R	N	U	R	N	U	R	N	U	R	N	U	R	N	U	R
Brown Creeper	9		2	10		1	12			7					1	38		4
Bewick's Wren													1			1		
House Wren				2	1		9	1	1	8				1		19	3	1
Pacific Wren							1			10		1				11		1
Unidentified Wren								1			1						2	
Golden-crowned Kinglet	36		2	70	1	1	56	2	3	3						165	3	6
Wrentit													5			5		
Hermit Thrush	2						1			2						5		
American Robin	3			1	1		2		2	6		4	2			14	1	6
Orange-crowned Warbler	10	1		67	2	1	62	1	7	167	2	27	10		2	316	6	37
Nashville Warbler	4			24	4		8			22		2	3	1	3	61	5	5
MacGillivray's Warbler	1			7	1		20	1	8	29	1	49	3		1	60	3	58
Yellow Warbler							1			1			9		2	11		2
Yellow-rumped Warbler	20		2	157	1	2	28		5	22		1				227	1	10
Black-throated Gray Warbler				1						1						2		
Townsend's Warbler	1															1		
Hermit Warbler	15			26			15		2	24	2	1				80	2	3
Wilson's Warbler	1			1	1	1	2	1		1			1			6	2	1
Green-tailed Towhee				3	1	1										3	1	1
Spotted Towhee							1		2	5		3	9	1	1	15	1	6
Chipping Sparrow	3						6	1	2	2			4			15	1	2
Lark Sparrow													1			1		
Black-throated Sparrow													1			1		
Fox Sparrow				5												5		
Song Sparrow				1		1	4			38	1	29	2	1	3	45	2	33
Lincoln's Sparrow	5		2	14		20	29		23	9	1	21				57	1	66

Table 2 (continued). Capture summary for the five individual MAPS stations rated in Yosemite National Park in 2013, and all stations pooled.
N = Newly Banded, U = Unbanded, R = Recaptures of banded birds.

	White Wolf Meadow			Gin Flat East Meadow			Crane Flat			Hodgdon Meadow			Big Meadow			All five stations combined		
Species	N	U	R	N	U	R	N	U	R	N	U	R	N	U	R	N	U	R
Dark-eyed Junco	59	3	18	57	5	14	81	3	31	37	1	11				234	12	74
Unidentified Sparrow					1			3									4	
Western Tanager				3			3		2	1			4			11		2
Black-headed Grosbeak				1			3		1	6		6	9	1		19	1	7
Lazuli Bunting	3						5			2			6			16		
Red-winged Blackbird										4		2				4		2
Brewer's Blackbird										2			2			4		
Bullock's Oriole													2			2		
Purple Finch					1		6	1		30		2	20		3	56	2	5
Cassin's Finch				1	1		1			1						3	1	
Unident. Carpodacus Finch											5						5	
Pine Siskin	1			4			2			3						10		
Lesser Goldfinch				1									13	1		14	1	
Lawrence's Goldfinch							1						3			4		
Unidentified Bird					1												1	
ALL SPECIES POOLED	185	5	29	495	33	44	409	40	103	541	103	183	137	20	21	1767	201	380
Total Number of Captures		219			572			552			827			178			2348	
Number of Species	20	3	6	31	15	10	35	12	18	39	12	20	26	10	10	55	29	32
Total Number of Species		21			35			38			43			32			61	

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 2013 was greatest at Crane Flat (246.1 adults/600 net-hours), followed closely by Hodgdon Meadow (246.0), Big Meadow (167.4), Gin Flat East Meadow (164.1), and White Wolf Meadow (86.7). The capture rate of young of all species pooled at each station in 2013 was highest at Gin Flat East Meadow (611.8 young/600 net-hours), followed by Crane Flat (351.7), Hodgdon Meadow (247.8), White Wolf Meadow (240.7), and Big Meadow (97.7). Reproductive index (the number of young per adult) at the five stations in 2013 was greatest at Gin Flat East Meadow (3.73), followed by White Wolf Meadow (2.78), Crane Flat (1.43), Hodgdon Meadow (1.12), and Big Meadow (0.58). The mean adult capture rate for the five stations combined was 189.0 per 600 net hours and the overall reproductive index was 1.66 in 2013.

In 2013 Orange-crowned Warbler was the most frequently captured species, followed by Dark-eyed Junco, Yellow-Rumped Warbler, Golden-crowned Kinglet, Lincoln's Sparrow, MacGillivray's Warbler, Hermit Warbler, Song Sparrow, Anna's Hummingbird, and Nashville Warbler (Table 2). Overall, the most abundant breeding species in 2013 (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, Lincoln's Sparrow, Yellow-rumped Warbler, Purple Finch, Warbling Vireo, Red-breasted Sapsucker, Song Sparrow, Hermit Warbler and Western Wood-Pewee. 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 2013 (see Table 3):

White Wolf Meadow
Dark-eyed Junco

Gin Flat East Meadow
Dark-eyed Junco
Yellow-rumped Warbler
Lincoln's Sparrow
Western Flycatcher

Crane Flat
Dark-eyed Junco
Lincoln's Sparrow
Yellow-rumped Warbler
Warbling Vireo
MacGillivray's Warbler
Dusky Flycatcher

Hermit Warbler
Golden-crowned Kinglet
Chipping Sparrow
Purple Finch

Hodgdon Meadow
MacGillivray's Warbler
Song Sparrow
Purple Finch
Red-breasted Sapsucker
Lincoln's Sparrow
Western Wood-Pewee
Yellow-rumped Warbler
Hermit Warbler
Black-headed Grosbeak
American Robin
Dark-eyed Junco

Big Meadow
Purple Finch
Yellow Warbler
Western Wood-Pewee
Warbling Vireo
Spotted Towhee
Lazuli Bunting
Chipping Sparrow
Western Tanager

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 2013.

	White Wolf Meadow			Gin Flat East Meadow			Crane Flat			Hodgdon Meadow			Big Meadow			All five stations combined		
Species	Ad.	Yg.	Prop. Yg.	Ad.	Yg.	Prop. Yg.	Ad.	Yg.	Prop. Yg.	Ad.	Yg.	Prop. Yg.	Ad.	Yg.	Prop. Yg.	Ad.	Yg.	Prop. Yg.
Williamson's Sapsucker				3.7	0.0	0.00										0.7	0.0	0.00
Red-breasted Sapsucker				7.5	1.9	0.25	3.3	9.9	3.00	19.2	24.0	1.25				7.2	8.9	1.23
Hairy Woodpecker				0.0	1.9	und.[1]										0.0	0.3	und.[1]
White-headed Woodpecker				0.0	3.7	und.	3.3	0.0	0.00	1.2	0.0	0.00	2.0	0.0	0.00	1.3	0.7	0.50
Olive-sided Flycatcher										4.8	0.0	0.00				1.3	0.0	0.00
Western Wood-Pewee				0.0	7.5	und.	1.7	0.0	0.00	10.8	1.2	0.11	14.0	0.0	0.00	5.6	1.6	0.29
Alder Flycatcher													2.0	0.0	0.00	0.3	0.0	0.00
Hammond's Flycatcher	0.0	1.8	und.[1]	1.9	3.7	2.00	5.0	0.0	0.00							1.3	1.0	0.75
Dusky Flycatcher	7.1	3.5	0.50	5.6	3.7	0.67	13.2	6.6	0.50	2.4	0.0	0.00				5.6	2.6	0.47
Western Flycatcher				9.3	5.6	0.60	0.0	5.0	und.[1]	4.8	26.4	5.50				3.0	9.2	3.11
Black Phoebe													2.0	17.9	9.00	0.3	3.0	9.00
Cassin's Vireo							3.3	3.3	1.00	4.8	4.8	1.00				2.0	2.0	1.00
Warbling Vireo	1.8	1.8	1.00				18.2	1.7	0.09	7.2	10.8	1.50	12.0	0.0	0.00	7.9	3.6	0.46
Steller's Jay										2.4	0.0	0.00				0.7	0.0	0.00
Mountain Chickadee	5.3	3.5	0.67	1.9	13.1	7.00	5.0	3.3	0.67	0.0	1.2	und.[1]				2.3	3.9	1.71
Chestnut-backed Chickadee										0.0	1.2	und.				0.0	0.3	und.
Bushtit													4.0	2.0	0.50	0.7	0.3	0.50
Red-breasted Nuthatch				0.0	5.6	und.	0.0	9.9	und.	4.8	0.0	0.00				1.3	3.0	2.25
Brown Creeper	7.1	10.6	1.50	1.9	18.7	10.00	0.0	19.8	und.	1.2	7.2	6.00	2.0	0.0	0.00	2.3	11.2	4.86
Bewick's Wren													0.0	2.0	und.[1]	0.0	0.3	und.
Pacific Wren							0.0	1.7	und.	2.4	7.2	3.00				0.7	2.3	3.50
Golden-crowned Kinglet	1.8	61.9	35.00	1.9	128.7	69.00	11.6	84.2	7.29	0.0	3.6	und.				3.0	51.9	17.56
Wrentit													2.0	8.0	4.00	0.3	1.3	4.00
Hermit Thrush	1.8	1.8	1.00				1.7	0.0	0.00	1.2	1.2	1.00				1.0	0.7	0.67

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 2013.

	White Wolf Meadow			Gin Flat East Meadow			Crane Flat			Hodgdon Meadow			Big Meadow			All five stations combined		
Species	Ad.	Yg.	Prop. Yg.	Ad.	Yg.	Prop. Yg.	Ad.	Yg.	Prop. Yg.	Ad.	Yg.	Prop. Yg.	Ad.	Yg.	Prop. Yg.	Ad.	Yg.	Prop. Yg.
American Robin	1.8	3.5	2.00	1.9	0.0	0.00	6.6	0.0	0.00	8.4	0.0	0.00	4.0	0.0	0.00	4.9	0.7	0.13
Nashville Warbler										3.6	24.0	6.67	6.0	0.0	0.00	2.0	6.6	3.33
MacGillivray's Warbler	0.0	1.8	und.	7.5	5.6	0.75	16.5	21.5	1.30	46.8	21.6	0.46	4.0	4.0	1.00	18.1	12.2	0.67
Yellow Warbler							0.0	1.7	und.	1.2	0.0	0.00	15.9	2.0	0.13	3.0	0.7	0.22
Yellow-rumped Warbler	7.1	30.1	4.25	31.7	261.1	8.23	26.4	21.5	0.81	10.8	15.6	1.44				15.1	60.2	3.98
Black-throated Gray Warbler				0.0	1.9	und.				0.0	1.2	und.				0.0	0.7	und.
Hermit Warbler	0.0	26.5	und.	5.6	41.0	7.33	13.2	11.6	0.88	10.8	18.0	1.67				6.6	19.4	2.95
Wilson's Warbler	0.0	1.8	und.	3.7	0.0	0.00	0.0	3.3	und.	1.2	0.0	0.00	0.0	2.0	und.	1.0	1.3	1.33
Green-tailed Towhee				5.6	1.9	0.33										1.0	0.3	0.33
Spotted Towhee							0.0	1.7	und.	3.6	3.6	1.00	10.0	8.0	0.80	2.6	2.6	1.00
Chipping Sparrow	5.3	0.0	0.00				8.3	1.7	0.20	2.4	0.0	0.00	8.0	0.0	0.00	4.6	0.3	0.07
Lark Sparrow													0.0	2.0	und.	0.0	0.3	und.
Black-throated Sparrow													0.0	2.0	und.	0.0	0.3	und.
Fox Sparrow				1.9	7.5	4.00										0.3	1.3	4.00
Song Sparrow				1.9	0.0	0.00	0.0	6.6	und.	21.6	37.2	1.72	6.0	4.0	0.67	7.2	12.2	1.68
Lincoln's Sparrow	1.8	8.8	5.00	29.8	9.3	0.31	29.7	31.4	1.06	16.8	4.8	0.29				16.1	10.8	0.67
Dark-eyed Junco	42.5	79.6	1.88	31.7	80.2	2.53	49.5	99.1	2.00	8.4	37.2	4.43				25.6	58.8	2.30
Western Tanager				1.9	3.7	2.00	6.6	1.7	0.25	0.0	1.2	und.	8.0	0.0	0.00	3.0	1.3	0.44
Black-headed Grosbeak				0.0	1.9	und.	5.0	0.0	0.00	9.6	1.2	0.13	6.0	12.0	2.00	4.6	2.6	0.57
Lazuli Bunting	1.8	3.5	2.00				5.0	3.3	0.67	1.2	1.2	1.00	10.0	2.0	0.20	3.3	2.0	0.60
Red-winged Blackbird										4.8	2.4	0.50				1.3	0.7	0.50
Brewer's Blackbird										2.4	0.0	0.00	4.0	0.0	0.00	1.3	0.0	0.00
Bullock's Oriole													4.0	0.0	0.00	0.7	0.0	0.00
Purple Finch							8.3	1.7	0.20	21.6	15.6	0.72	25.9	14.0	0.54	11.8	6.9	0.58

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 2013.

	White Wolf Meadow			Gin Flat East Meadow			Crane Flat			Hodgdon Meadow			Big Meadow			All five stations combined		
Species	Ad.	Yg.	Prop. Yg.	Ad.	Yg.	Prop. Yg.	Ad.	Yg.	Prop. Yg.	Ad.	Yg.	Prop. Yg.	Ad.	Yg.	Prop. Yg.	Ad.	Yg.	Prop. Yg.
Cassin's Finch				1.9	0.0	0.00	1.7	0.0	0.00	1.2	0.0	0.00				1.0	0.0	0.00
Pine Siskin	1.8	0.0	0.00	5.6	1.9	0.33	1.7	0.0	0.00	2.4	1.2	0.50				2.3	0.7	0.29
Lesser Goldfinch				0.0	1.9	und.							10.0	15.9	1.60	1.6	3.0	1.80
Lawrence's Goldfinch							1.7	0.0	0.00				6.0	0.0	0.00	1.3	0.0	0.00
ALL SPECIES POOLED	86.7	240.7	2.78	164.1	611.8	3.73	246.1	351.7	1.43	246.0	274.8	1.12	167.4	97.7	0.58	189.0	314.0	1.66
Number of Species	13	15		21	23		24	23		32	26		23	15		46	44	
Total Number of Species		17			28			32			37			27			52	

[1] 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 recapture records of individual birds. Longevity records within the 24-year Yosemite MAPS dataset were assessed again this year to include 2013 recaptures, and some amazing results were found, a few of which are highlighted in Table 4.

Longevity values from the Yosemite data in excess of North American longevity records posted by the USGS Bird Banding Laboratory (BBL) now include the Red-breasted Sapsucker, in addition to the Western Wood-Pewee, MacGillivray's Warbler, Lincoln's Sparrow and Cassin's Finch. Recaptures from 2013 indicate several additional birds with notably advanced (though not record-breaking) ages: Olive-sided Flycatcher, Golden-crowned Kinglet, Green-tailed Towhee, and Black-headed Grosbeak (which surpasses the BBL's second oldest record for a Black-headed Grosbeak in North America, with an minimum age of 10 years and 11 months).

Table 4. Longevity records from the Yosemite MAPS data for individual birds of selected species. Green highlighting indicates records that exceed previous North American longevity records posted by the Breeding Bird Laboratory.

Species	Band Number	First year captured	Last year captured	Minimum age at last capture[1]
Red-breasted Sapsucker	184127360	2009	2013	7 years, 0 months
White-headed Woodpecker	168149403	2001	2008	8 years, 1 months
Olive-sided Flycatcher	193180478	2009	2013	5 years, 2 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
Golden-crowned Kinglet	231058250	2011	2013	4 years, 0 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
Green-tailed Towhee	184142185	2009	2013	5 years, 1 months
Song Sparrow	186118184	2004	2012	9 years, 0 months
Lincoln's Sparrow	212155897	1993	2002	8 years, 11 months
Black-headed Grosbeak	168150734	2002	2013	10 years, 11 months
Cassin's Finch	153157414	1997	2003	8 years, 0 months

[1] 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 several species, an example of information that can only be gained through sustained, long-term monitoring.

Another 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 notable for the crew to capture an adult female Willow Flycatcher with a receding brood patch at the end of the breeding season in Big Meadow this year. Much like last year's Willow Flycatcher capture in Hodgdon Meadow, the bird almost certainly did not breed in the vicinity of the MAPS station, as Willow Flycatchers have conspicuous songs and the crew spent a great deal of time in the meadow throughout the breeding season. It is likely that this Willow Flycatcher was only moving through Yosemite National Park after she had bred elsewhere. Visitation to Hodgdon Meadow and Big Meadow by two Willow Flycatchers in two consecutive years suggests that there is potential for recolonization of the species in Yosemite National Park meadows.

Education and Outreach

The Yosemite MAPS program includes an education and outreach component, led by Sarah Stock, that allows park visitors, interpretive rangers, local school groups and volunteers to visit the MAPS stations throughout the season. Eight banding demonstration days were organized with Yosemite National Park Staff, the visiting public, Seventh Hills Middle School, and Yosemite Conservancy Staff in 2013. Overall, 119 visitors spent time at one of the five MAPS stations in Yosemite National Park in 2013 – the most visitors in a single season thus far. High School students Eliza Amstutz and Maya Canapary, who volunteered over 100 hours of their time to the MAPS program in 2012, returned in June of 2013 to continue to shadow IBP Biologists in the field. 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. 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.

An option for facilitating Willow Flycatcher restoration in the park

Catching a post-breeding Willow Flycatcher in a Yosemite meadow for the second year in a row raises questions about the potential for restoring this species as a breeder in the park. One option park managers might consider for facilitating recolonization into one or more meadows in the park by Willow Flycatchers is conspecific attraction through automated broadcasting of calls. Many territorial birds aggregate their territories near conspecifics (others of the same species). Populations may fail to reestablish even after otherwise successful habitat restoration, simply because the necessary cues to breed at a location (other singing birds) are absent. Willow Flycatchers have been extirpated from much of their range in California. In some locations this may be a response to decreased habitat quality but where otherwise successful meadow restoration has occurred, it may be a result of a behavioral unwillingness to settle in currently unoccupied meadows despite dramatic improvements in habitat condition. In 2007 IBP Biologist Helen Loffland and colleagues conducted a small pilot study which suggested a positive response of Willow Flycatchers to song broadcasts (Helen Loffland, *personal communication*).

Knowing that Willow Flycatchers visit Yosemite meadows with some regularity during the post-breeding period suggests that such a strategy might work in the park, where wandering post-breeding birds would have a chance of encountering the broadcast songs. Implementing a similar trial at Yosemite could thus test a novel restoration technique, and possibly restore breeding Willow Flycatchers to the park.

Looking forward: a study of Black-headed Grosbeak migration connectivity

One of the challenges of understanding the drivers of population change in Neotropical migratory landbirds is that the birds utilize habitats in farflung places during different portions of their life-cycle, including breeding grounds, wintering areas, and in some species, migratory stopover sites. It has consequently been difficult to ascribe observed population changes definitively to climate or other environmental conditions on the breeding grounds, because such changes could also be driven by processes or conditions on the wintering grounds or at migratory stopover sites, and the specific wintering or stopover sites used by any particular breeding population have historically been unknown.

Recent technological advances in ornithology are increasingly allowing the elucidation of 'migratory connectivity' for individual populations – that, is understanding where within a

species' overall winter range a particular breeding populations actually spends the winter. Detailed information about migratory connectivity is a powerful tool for better understanding migratory birds' population dynamics and conservation needs, in part because it allows scientists to account for climate and other environmental conditions during multiple parts of a population's life-cycle. Understanding migratory connectivity of specific populations has consequently become an important goal of the MAPS program (Rundel et al. 2013, Rushing et al. 2013).

The Black-headed Grosbeak is a colorful, charismatic Neotropical migrant whose migration route is poorly understood. The birds breed as far north as Central British Columbia and winter as far south as Mexico City, but we do not know what route they take or whether or not they require the use of multiple stopover sites. What we know about their wintering grounds is also somewhat limited. Black-headed Grosbeaks tend to winter in lowland habitats and prefer areas of high canopy cover, but were also considered habitat generalists due to their omnivorous feeding habits (Whitmore 1977; Hutto 1980). Additionally, some long-distance migrants seen in Mexico were thought to prefer disturbed second-growth habitat, which would likely have less canopy cover than old-growth habitat (Hutto 1989). More study is needed on the distribution of migrants on their wintering grounds to understand their habitat preferences and what they require to make it back to their breeding grounds safely each spring.

During the 2014 breeding season, we are planning to apply archival GPS units to approximately ten Black-headed Grosbeaks that we capture at Yosemite MAPS stations. The units will store highly accurate (within tens of meters) positional location for the marked birds during sampling events throughout the annual life cycle. If we are able to recapture some of the marked birds and recover their GPS units in 2015, we may learn exactly where Yosemite's Black-headed Grosbeaks spend the winter, and the migration routes they use between their wintering grounds and Yosemite.

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Appendix I. Numerical listing (in AOU 2012 checklist order) of all the species sequence numbers, species alpha codes, and species names for all species banded or encountered during the 24 years, 1990-2013, 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

SSN	SPEC	SPECIES NAME	White Wolf (WHWO)	Gin Flat East Meadow (GFEM)	Crane Flat (CRFL)	Hodgdon Meadow (HODG)	Big Meadow (BIME)	Tamarack Meadow (TAME)
550	MALL	Mallard		O		O	O	
940	COME	Common Merganser					T	
1140	MOUQ	Mountain Quail	O	U	O	U	U	
1170	CAQU	California Quail				O	O	
1500	DUGR	Dusky Grouse	T	T	O	O		
1510	SOGR	Sooty Grouse	O					
1550	WITU	Wild Turkey				T	T	
2660	GBHE	Great Blue Heron					T	
2980	TUVU	Turkey Vulture	T	T	T	T	T	
3020	OSPR	Osprey					T	
3180	NOHA	Northern Harrier					T	
3240	SSHA	Sharp-shinned Hawk		T		T	T	
3250	COHA	Cooper's Hawk	T	T	T	O	T	
3280	NOGO	Northern Goshawk	T	T		T		
3290	UAHA	Unidentified Accipiter Hawk				?	?	
3420	RSHA	Red-shouldered Hawk	T		T	T	T	
3510	RTHA	Red-tailed Hawk	T	O	T	U	O	
3570	GOEA	Golden Eagle					T	
3610	UNHA	Unidentified Hawk				?	?	
3710	AMKE	American Kestrel					O	
3790	PEFA	Peregrine Falcon					M	
3910	VIRA	Virginia Rail				T		T
3970	SORA	Sora				M		
4340	KILL	Killdeer					T	
4480	SPSA	Spotted Sandpiper	O					
6100	BTPI	Band-tailed Pigeon	T	T	T	O	T	
6240	MODO	Mourning Dove		T	T	O	O	
7360	WESO	Western Screech-Owl				T		
7490	GHOW	Great Horned Owl	T		T	O	T	

Appendix I, continued.

SSN	SPEC	SPECIES NAME	WHWO	GFEM	CRFL	HODG	BIME	TAME
7520	NOPO	Northern Pygmy-Owl		T		O	T	
7630	SPOW	Spotted Owl				O		
7670	GGOW	Great Gray Owl	T	O	O	O		
7740	NSWO	Northern Saw-whet Owl				T		
8060	BLSW	Black Swift					T	
8140	VASW	Vaux's Swift				T	T	
8270	WTSW	White-throated Swift	T	O		T	T	
9370	BCHU	Black-chinned Hummingbird			T	T	T	
9400	ANHU	Anna's Hummingbird	T	O	O	U	U	T
9410	COHU	Costa's Hummingbird					T	
9420	CAHU	Calliope Hummingbird	T	O	O	O	O	T
9460	RUHU	Rufous Hummingbird	M	M	M	M	M	M
9470	ALHU	Allen's Hummingbird	M	M	M	M	M	
9510	USHU	Unidentified Selasphorus Hummingbird	?	?	?	?	?	
9520	UNHU	Unidentified Hummingbird	?	?	?	?	?	
9860	BEKI	Belted Kingfisher			T	T	U	
10140	LEWO	Lewis's Woodpecker					M	
10180	ACWO	Acorn Woodpecker	T	T	T	O	U	
10320	WISA	Williamson's Sapsucker	U	O	T	T		
10360	RBSA	Red-breasted Sapsucker	O	B	B	B	O	O
10370	UNSA	Unidentified Sapsucker	?					
10410	NUWO	Nuttall's Woodpecker				T	T	
10420	DOWO	Downy Woodpecker	T	T	T	O	U	T
10430	HAWO	Hairy Woodpecker	U	U	U	U	U	B
10470	WHWO	White-headed Woodpecker	O	B	B	B	O	B
10490	BBWO	Black-backed Woodpecker	T	T	T			U
10580	NOFL	Northern Flicker	T					
10600	NFIN	Northern Flicker Intergrade	T			T		
10610	RSFL	Red-shafted Flicker	U	B	U	B	B	U
10670	PIWO	Pileated Woodpecker	O	U	U	U	T	O
11190	UNWO	Unidentified Woodpecker	?					
12190	OSFL	Olive-sided Flycatcher	T	U	O	B	O	B
12230	WEWP	Western Wood-Pewee	U	U	O	B	B	B
12340	WIFL	Willow Flycatcher		T	T	U	O	T
12380	HAFL	Hammond's Flycatcher	O	U	U	U	T	O
12390	HDFL	Hammond's/Dusky Flycatcher		?	?	?		
12400	GRFL	Gray Flycatcher	M		M	M	M	
12410	DUFL	Dusky Flycatcher	U	B	B	U	T	B
12430	PSFL	Pacific-slope Flycatcher	T	O	O	U	O	T

Appendix I, continued.

SSN	SPEC	SPECIES NAME	WHWO	GFEM	CRFL	HODG	BIME	TAME
12440	WEFL	Western Flycatcher	T	O	O	U	O	T
12490	UEFL	Unidentified Empidonax Flycatcher	?	?	?	?	?	
12500	BLPH	Black Phoebe	O	O	T	O	B	
12520	SAPH	Say's Phoebe		T			T	
12640	ATFL	Ash-throated Flycatcher					O	T
12930	WEKI	Western Kingbird	T			T	T	
13000	UNFL	Unidentified Flycatcher	?	?	?	?	?	
13590	CAVI	Cassin's Vireo	T	O	B	B	U	U
13620	HUVI	Hutton's Vireo		T	O	O		
13640	WAVI	Warbling Vireo	U	U	B	B	B	B
13670	REVI	Red-eyed Vireo			M	M		
13960	STJA	Steller's Jay	B	B	B	B	U	B
14000	WESJ	Western Scrub-Jay	T			T	O	
14040	CLNU	Clark's Nutcracker	T	T		T		
14080	AMCR	American Crow		M		M		
14200	CORA	Common Raven	U	U	U	B	U	O
14330	TRES	Tree Swallow		T		T	O	T
14360	VGSW	Violet-green Swallow		T		T	O	T
14410	NRWS	Northern Rough-winged Swallow				T	O	
14440	CLSW	Cliff Swallow					T	
14460	BARS	Barn Swallow				T	O	
14480	UNSW	Unidentified Swallow			?	?	?	
14520	MOCH	Mountain Chickadee	B	B	B	U	U	B
14540	CBCH	Chestnut-backed Chickadee	T	T	T	O		T
14590	OATI	Oak Titmouse					O	
14640	BUSH	Bushtit		T	T	O	U	T
14650	RBNU	Red-breasted Nuthatch	B	B	B	B	O	B
14660	WBNU	White-breasted Nuthatch	T	O	O	O	O	O
14670	PYNU	Pygmy Nuthatch		T				
14690	BRCR	Brown Creeper	B	B	B	B	U	B
14990	BEWR	Bewick's Wren	T	T		T	O	
15010	HOWR	House Wren	A	A	A	A	U	A
15070	PAWR	Pacific Wren	T	T	O	O	O	T
15180	UNWR	Unidentified Wren			?	?	?	
15210	BGGN	Blue-gray Gnatcatcher				T	T	
15290	AMDI	American Dipper					O	
15320	GCKI	Golden-crowned Kinglet	B	B	B	B	T	U
15330	RCKI	Ruby-crowned Kinglet	O			T		
15420	WREN	Wrentit					U	
15680	WEBL	Western Bluebird		T		O	U	

Appendix I, continued.

SSN	SPEC	SPECIES NAME	WHWO	GFEM	CRFL	HODG	BIME	TAME
15710	TOSO	Townsend's Solitaire	T	O	O	O	T	
15940	SWTH	Swainson's Thrush	T	T		O		
15950	HETH	Hermit Thrush	B	O	U	U	T	T
16150	AMRO	American Robin	B	B	B	B	B	B
16470	EUST	European Starling				O	O	
16630	CEDW	Cedar Waxwing				M	M	
16840	NOWA	Northern Waterthrush					M	
16960	OCWA	Orange-crowned Warbler	A	A	A	A	A	A
16990	NAWA	Nashville Warbler	A	A	A	B	U	A
17050	MGWA	MacGillivray's Warbler	T	B	B	B	U	B
17130	COYE	Common Yellowthroat				M		
17190	HOWA	Hooded Warbler				M		
17200	AMRE	American Redstart				M		
17240	NOPA	Northern Parula					T	
17300	YEWA	Yellow Warbler	O	T	O	U	B	T
17400	YRWA	Yellow-rumped Warbler		T	T		T	
17420	AUWA	Audubon's Warbler	B	B	B	B	O	B
17510	BTYW	Black-throated Gray Warbler	T	T	T	O	O	T
17520	TOWA	Townsend's Warbler	M	M	M	M		M
17540	HEWA	Hermit Warbler	U	B	B	B	T	U
17660	WIWA	Wilson's Warbler	T	O	U	U	O	B
17740	YBCH	Yellow-breasted Chat				T	T	
17790	UNWA	Unidentified Warbler			?	?	?	
18820	GTTO	Green-tailed Towhee		U	T	T	T	
18830	SPTO	Spotted Towhee		O	O	O	U	
18940	CALT	California Towhee					T	
19070	CHSP	Chipping Sparrow	U	O	U	U	U	B
19140	LASP	Lark Sparrow					T	
19160	BTSP	Black-throated Sparrow					T	
19170	SAGS	Sage Sparrow					T	
19190	SAVS	Savannah Sparrow				M	M	
19230	GRSP	Grasshopper Sparrow					M	
19350	FOSP	Fox Sparrow	T	U	O	T	T	O
19360	SOSP	Song Sparrow	O	O	U	B	B	O
19370	LISP	Lincoln's Sparrow	B	B	B	B	O	B
19440	MWCS	Mountain White-crowned Sparrow	T			T		
19540	ORJU	Oregon Junco	B	B	B	B	U	B
19720	UNSP	Unidentified Sparrow	?	?	?	?	?	
19770	WETA	Western Tanager	O	B	B	B	U	B
19940	RBGR	Rose-breasted Grosbeak				M		

Appendix I, continued.

SSN	SPEC	SPECIES NAME	WHWO	GFEM	CRFL	HODG	BIME	TAME
19950	BHGR	Black-headed Grosbeak	O	O	U	B	B	O
20020	LAZB	Lazuli Bunting	T	T	U	O	B	T
20040	INBU	Indigo Bunting			M	M		
20110	RWBL	Red-winged Blackbird	T	T	T	B	O	O
20200	WEME	Western Meadowlark					O	
20210	YHBL	Yellow-headed Blackbird					M	
20250	BRBL	Brewer's Blackbird	U	O	O	B	B	
20350	BHCO	Brown-headed Cowbird	O	T	O	U	U	
20550	BUOR	Bullock's Oriole		T		O	U	T
20940	PIGR	Pine Grosbeak	U	T	T			
20960	PUFI	Purple Finch	O	O	U	B	U	O
20970	CAFI	Cassin's Finch	U	O	O	O	O	O
20980	HOFI	House Finch			T	T	O	
20990	UCFI	Unidentified Carpodacus Finch		?	?	?	?	
21000	RECR	Red Crossbill	O	T	T	O	O	
21070	PISI	Pine Siskin	B	B	U	U	O	U
21130	LEGO	Lesser Goldfinch	T	O	T	O	B	T
21140	LAGO	Lawrence's Goldfinch		T	T	T	O	T
21150	AMGO	American Goldfinch				M	M	M
21220	EVGR	Evening Grosbeak	O	T	T	T	O	T
21560	HOSP	House Sparrow					T	