



Monitoring Breeding and Migration of Neotropical Migratory Birds at Point Loma, San Diego County, California

2010-2011 Annual Data Summary



Prepared for:

**Commander Navy Region Southwest
and
National Park Service, Pacific West Regional Office**

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY
WESTERN ECOLOGICAL RESEARCH CENTER

Monitoring Breeding and Migration of Neotropical Migratory Birds at Point Loma, San Diego County, California

By Melanie Madden-Smith, Suellen Lynn, and Barbara E. Kus

U.S. GEOLOGICAL SURVEY
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Prepared for:

Commander Navy Region Southwest
937 North Harbor Dr., 5th Floor
San Diego, CA 92132

and

National Park Service
Pacific West Regional Office
909 First Avenue, Seattle, WA 98104

San Diego Field Station
USGS Western Ecological Research Center
4165 Spruance Road, Suite 200
San Diego, CA 92101

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KEN SALAZAR, SECRETARY

U.S. GEOLOGICAL SURVEY
Marcia McNutt, Director

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For additional information, contact:

Center Director
Western Ecological Research Center
U.S. Geological Survey
3020 State University Drive East
Modoc Hall, Room 3006
Sacramento, CA 95819

Cover photographs: Melanie Madden-Smith

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EXECUTIVE SUMMARY

We operated a bird banding station on the Point Loma peninsula in western San Diego County, California, during Fall 2010 and Spring/Summer 2011. The station was established as part of a long-term monitoring program for neotropical migratory birds during migration (Fall and Spring) to ascertain whether weather surveillance radar (Next-Generation Radar or NEXRAD) could be used as a tool to observe bird migration in San Diego County and during the breeding season as part of the Monitoring Avian Productivity and Survivorship (MAPS) program.

During Fall 2010, we captured 253 individual birds, 89% of which were newly banded in Fall 2010 and 11% of which we released unbanded (six hummingbirds, one raptor, and ten other birds that escaped prior to banding). Four individuals were captured more than once in Fall 2010. Bird capture rate averaged 0.23 ± 0.12 captures per net hour (range 0.00-0.69 captures per net hour). Species richness per day averaged 4.00 ± 2.56 . Pacific-slope Flycatcher (*Empidonax difficilis*) was the most abundant Fall migrant captured, followed by Audubon's Warbler (*Setophaga coronata auduboni*) and Lesser Goldfinch (*Spinus psaltria*). Sixty-eight percent of individuals of known-sex were male and 32% were female. Eighty-five percent of known-age captures in the Fall were juveniles. The peak number of new species arrived on the first day of banding, 16 August 2010, when we captured six new migrant species. We did not find a significant correlation between the number of migrants captured per net hour and the density of echoes on the NEXRAD images in Fall 2010 ($r = 0.15$, $P = 0.39$).

During Spring 2011, we captured 453 individual birds, 89% of which were newly banded in Spring 2011 and 11% of which we released unbanded (42 hummingbirds and 6 other birds that escaped prior to banding). Six individuals were captured more than once in Spring 2011. Bird capture rate averaged 0.62 ± 0.22 captures per net hour (range 0.06-1.79). Species richness per day averaged 8.00 ± 4.43 . Wilson's Warbler (*Cardellina pusilla*) was the most abundant Spring migrant captured, followed by Warbling Vireo (*Vireo gilvus*) and White-crowned Sparrow (*Zonotrichia leucophrys*). Sixty-four percent of known-sex individuals were male and 36% were female. The peak number of new species arrived on the first day of Spring banding, 4 April 2011, when we captured six new migrant species. We found a significant correlation between the number of migrants captured per net hour and the density of echoes on the NEXRAD images in Spring 2011 ($r = 0.70$, $P < 0.001$).

We captured 468 individuals during the MAPS/breeding season in 2011, 83% of which were newly banded during this season (349) or had been banded prior to the establishment of our banding station (41). Of the 17% that were not banded, 68 were hummingbirds, 1 was a game bird, and 9 others were birds that escaped prior to banding. Bird capture rate averaged 1.01 ± 0.33 captures per net hour (range 0.53-2.54). Species richness per day averaged 14.00 ± 4.57 . Orange-crowned Warbler (*Oreothlypis celata*) was the most abundant breeding species captured, followed by Anna's Hummingbird (*Calypte anna*) and Bushtit (*Psaltiriparus minimus*). Fifty-three percent of known-sex captures were female and 47% were male. Thirty-eight percent of known-age captures were juveniles.

In the Fall, we captured the most birds and the widest variety of species during late September and early October. We also captured a high proportion of juveniles compared to adults, consistent with the “coastal effect” where a higher proportion of juveniles of migratory species travel along the coast. We caught fewer birds in the Fall than in the Spring, which may be attributable to weather, vegetative conditions, prey base, or a more dispersed migration in the Fall. During the Spring, we captured the highest number of birds and the widest variety of species in late April and early May. The number and timing of captures in the Spring suggest that our station has sufficient activity to establish long-term monitoring of Spring migrants and breeding birds, and that extending the more frequent banding schedule of migration monitoring into May may be warranted.

The density of echoes on the NEXRAD imagery was correlated with Spring migration captures but not with Fall captures. The San Diego NEXRAD is subject to clutter obstructing the radar beam and therefore the images of migratory over-flight are not shaped in the classic “donut” pattern of more open radar sites. Nevertheless, the images are useful in defining migratory periods and may be useful in identifying locations of migratory stopover habitat.

INTRODUCTION

Monitoring Avian Productivity and Survivorship (MAPS) is an international monitoring program which uses bird capture and banding data to compile basic demographic parameters of migratory species, many of which are imperiled regionally and even globally. Age- and sex-specific data on annual survival, reproduction, and recruitment can be gathered and compared across stations to identify population trends for species of interest and can be used to identify proximate factors responsible for trends, in particular negative trends. In turn, information obtained from long-term monitoring of bird populations can be used to guide management activities intended to maintain or re-establish viable populations throughout the species' ranges.

We established a MAPS station on the Point Loma peninsula, in western San Diego County, California. This station was established as part of a long-term monitoring program for neotropical migratory birds for Naval Base Point Loma (Department of Defense) and Cabrillo National Monument (National Park Service, Department of the Interior) and is being operated in a manner consistent with other banding stations participating in an effort to monitor birds worldwide.

This project is planned for five years, the minimum number of consecutive years necessary to obtain reliable productivity indices and survivorship estimates according to the MAPS program (DeSante et al. 2011). There are four objectives for this project: 1) to measure an index of sizes and trends of various neotropical migratory bird species populations, 2) to estimate demographic and survivorship parameters for neotropical migratory bird species, 3) to estimate annual productivity patterns for these species, and 4) to augment existing distributional information for "sensitive" avian species.

Understanding the factors that affect migratory bird populations during all phases of their life cycle is critical to species and ecosystem conservation planning. Bird migration studies are useful because they apply to species that occupy sites across a broad geographic range, and potentially a broad range of habitat types, during the different phases of their life cycles. Because migration provides a link between wintering and breeding phases of the life cycle, migration studies can elucidate the responses of species to diverse pressures affecting any of their life cycles, including habitat alteration and loss, diseases, environmental contaminants, and global climate change.

Studying birds during migration can also inform land managers about local factors that affect short-term migratory stopover habitat. High-quality migratory stopover habitat provides abundant resources to allow individuals to reestablish energy reserves in a short time-period with which to complete migration (Skagen et al. 2004). Identifying these stopover sites is the first step in conserving and potentially enhancing habitat to the benefit of the population.

Methods of studying migration can include traditional auditory or visual surveys, examination of museum specimens, constant-effort mist netting and banding, radio-telemetry (or satellite tracking), and more recently, radar tracking (Lincoln et al. 1998). Each method of study provides benefits for the efficient collection of specific data, and selection of the method depends

on the data required.

Radar has been used in the study of bird migration for over 60 years, since the discovery in the early 1940s that birds were responsible for some of the echoes (“angels” or “ghosts”) displayed on surveillance radar (Lack and Varley 1945). Radar is a tool that can provide information on bird movements for those species that are difficult to examine directly because they migrate at night or at high elevations and over large spatial extents (Diehl and Larkin 2005, O’Neal et al. 2010). Weather surveillance radar is especially useful because, when correlated with mist netting or other forms of direct observation of migrating birds, it can provide quantitative information on a broad geographic scale. The Weather Surveillance Radar-1998 Doppler (WSR-88D) or Next-Generation Radar (NEXRAD) is operated at 154 stations across the U.S.; archived imagery and metadata from NEXRAD are available from the National Oceanic and Atmospheric Administration (NOAA) on-line. For our study, we correlated the capture rate of migratory passerines from our banding station at Naval Base Point Loma and Cabrillo National Monument with NEXRAD data in Fall 2010 and Spring 2011.

This study was funded by Commander Navy Region Southwest and the National Park Service, Pacific West Regional Office.

METHODS

Bird Banding

We established a new bird banding station (Point Loma) on property managed by Naval Base Point Loma and Cabrillo National Monument in Fall 2010. The Point Loma peninsula (approximately 10 km long) runs north-south and forms the northwestern boundary of San Diego Bay (Fig. 1). Most of the peninsula is owned by the U.S. Navy but the National Park Service administers approximately 113 hectares near the southern tip (Kisner and Kus 2004). Vegetation at the station is a mix of maritime succulent scrub, Diegan coastal sage scrub, and southern maritime chaparral, and typical woody species include lemonade berry (*Rhus integrifolia*), toyon (*Heteromeles arbutifolia*), and California sagebrush (*Artemisia californica*). The Point Loma station overlaps a bird banding station that operated at Cabrillo National Monument from May 2006 through August 2010. Unless otherwise stated, any recaptures noted in this report were originally banded at the previous station (S. Lynn unpubl. data). Recaptures

Bird banding at the Point Loma banding station followed standardized MAPS protocol (DeSante et al. 1993) with modifications for migration (see below). Ten mist nets, placed 85-400 m apart, were erected in fixed locations chosen for their potential to capture birds moving through vegetation (Fig. 1, Table 1). Mist nets were made of 30 mm mesh black nylon and were 12 m long by 2.6 m high with four trammels (“pockets”) running the length of the net. Nets were suspended from vertical aluminum poles anchored by permanent rebar stakes and covered a vertical area ranging from approximately 0.25 m to 2.5 m above the ground. Nets were opened within 30 minutes of dawn and remained open for 5 hours during the breeding season, typically until between 1100 and 1200, and 3 hours during migration, typically between 0900 and 1000. Nets were not operated during inclement weather such as rain, extreme heat, or cold.

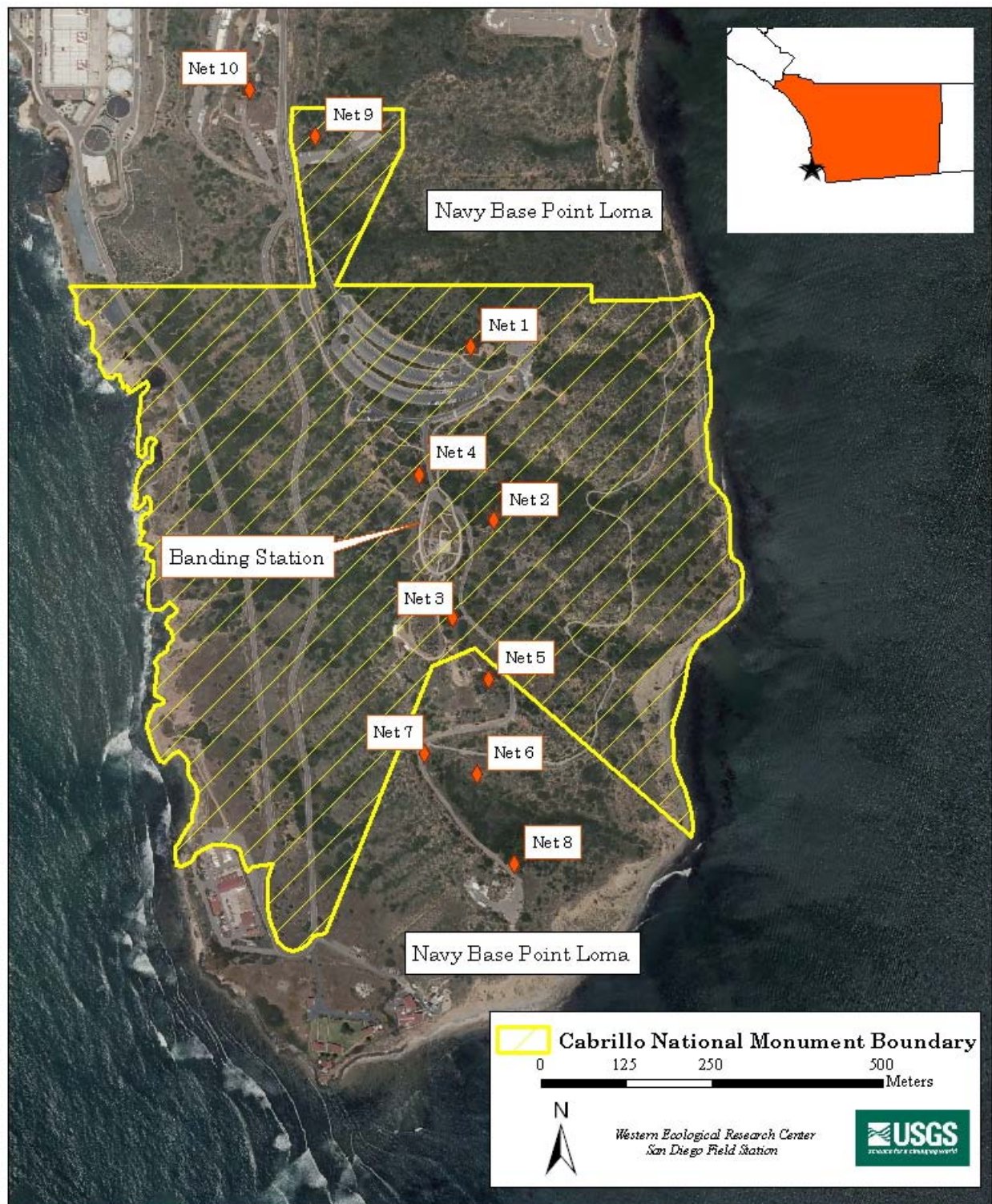


Fig. 1. Location of Point Loma bird banding station, San Diego, California.

Table 1. Locations of mist nets at the Point Loma bird banding station, San Diego, California. Coordinates are in WGS84.

Net Number	Longitude	Latitude
1	-117.24042	32.67466
2	-117.24005	32.67236
3	-117.24069	32.67106
4	-117.24122	32.67296
5	-117.24014	32.67026
6	-117.24030	32.66899
7	-117.24112	32.66926
8	-117.23971	32.66780
9	-117.24286	32.67743
10	-117.24389	32.67804

Nets were checked every 30-40 minutes by observers working circuits. Hummingbirds, game birds, and raptors were not banded but were identified to species, age, and sex when possible and released immediately at the capture site. All other birds were removed from nets, held in cloth bags labeled with the net number, and taken to a central processing location, where they were banded with federal numbered aluminum bands. Data recorded for each individual caught included age, sex, breeding condition, weight, wing chord, fat deposition, feather wear, and molt status. Birds were held for 5-60 minutes depending on the number of birds captured during one net run. After processing, juveniles, brooding females, and resident birds from the more distant nets were released in the vicinity of the net in which they had been captured, while all other birds were released at the processing station. Typically, four to five personnel operated the station.

Banding Schedule

Because we were interested in examining both breeding and migratory activity at the Point Loma banding station, we operated mist nets during three seasons: 1) Fall 2010 (migration), 2) Spring 2011 (migration), and 3) MAPS 2011 (breeding). During the first two seasons, we restricted our analyses to migratory birds (i.e., species that were not resident breeders at Point Loma). Because migration continued after the end of April, we included 2 banding days in May in both migratory and breeding season analyses.

In Fall 2010, the Point Loma bird banding station was operated 2 days per week starting 16 August (16, 19, 23, and 26), then every weekday and non-holiday, weather permitting, from 30 August through 15 October (36 days total). In Spring 2011, the bird banding station was operated every weekday and non-holiday, weather permitting, from 4 April through 29 April (20 days total). During MAPS 2011, the banding station was operated 1 day during every 10-day

netting period between 5 May and 3 August, following standard MAPS protocol (10 days total).

Radar Data

We retrieved archived Level II NEXRAD imagery for San Diego (KNKX) from the NOAA Satellite and Information Service website (<http://www.ncdc.noaa.gov/nexradinv/>). Level II data include reflectivity (a measure of radar echo intensity determined by the density and size of targets) and radial velocity (measured by Doppler echoes indicating direction and speed of the targets relative to the radar). NEXRAD radar sweeps a conical zone centered on the weather station at increasing angles, beginning at 0.5° and increasing up to approximately 20° under certain conditions. We used images collected at the lowest angle (0.5°) which is most useful for bird migration studies because it encounters low-flying targets (i.e., migrating passerines) at a greater distance than higher angle sweeps (Able 1970).

We selected and downloaded imagery from sunset to 4 hours after sunset the night prior to a banding day. This time-period encompasses exodus (approximately 30-45 minutes post-sunset when most nocturnal migrants take off) through peak over-flight (2-3 hours post-exodus; Able 1970). NEXRAD imagery typically shows a characteristic donut shaped “bloom” that begins at exodus when nocturnal migrants lift off and enter the radar beam. As more birds enter the beam and begin to move, the bloom intensifies to a peak when the density of birds flying overhead is highest (peak over-flight). This pattern has been identified and used in nocturnal migratory bird studies in the eastern and mid-western U.S. where open topography means fewer buildings or mountains that can block the radar beam, creating clutter and obscuring migratory patterns on the radar imagery.

Because San Diego is located in a basin with mountains directly east, radar imagery indicating nocturnal migration is likely to be most useful to the west (over the ocean) and along the coastal plain to the northwest and south. Therefore, we limited our inspection of radar imagery to these areas where clutter was minimized.

We used GRLevel2 software (Version 1.43, Copyright Gibson Ridge Software) to view NEXRAD imagery. We inspected NEXRAD images in three ways to verify that the echoes did not represent weather conditions.

1. We compared the velocity and direction of the echoes with ambient wind velocity and direction at the altitude of peak migration using radiosonde data (Bonter et al. 2008) to verify that the echoes were created by objects in powered flight (birds or bats). Radiosonde data were collected from static weather balloons at various altitudes and consequently were independent of NEXRAD data. Echoes with a radial velocity equal to ambient wind speed and direction similar to ambient wind direction (Bonter et al. 2008) were considered echoes of ambient weather conditions or insects and not of migrating birds.
2. We inspected GOES 11 satellite images (Unisys 2011) at 00:00 Greenwich Mean Time for each evening where we identified the characteristic migratory bloom in the NEXRAD images. We eliminated any images where cloud cover confounded the

- interpretation of the radar imagery.
3. We examined NEXRAD images from dates when we knew migration was not occurring (December) to verify that the images during migration were not a product of topographical or other types of permanent scatter. We also examined images from foggy days to verify that fog did not create an echo pattern resembling migratory birds.

Because our question related to the ability to detect migration through NEXRAD data in our region and was not quantitative, we did not attempt to correct for other organisms (e.g., bats) that may have been included in the imagery.

Six observers examined one reflectivity image of each evening when over-flight was at peak density (i.e., 4 hours after sunset). Images were visually ranked within each season in order of increasing echo density (1 being the least dense, 34 being the most dense). Ranks for all six observers were combined to obtain an average for that image.

To validate the visual estimation of NEXRAD echo density, we also quantified the density of echoes with geographic analysis. The selected reflectivity images were imported into ArcGIS Desktop 9.3 (copyright 1999-2008 ESRI Inc.) and trimmed to a radius of 100 km from the center of the radar. Any obvious storm clouds were filtered from the images. The reflectivity data was recorded in logarithmic units known as decibels of reflectivity (dBZ), which we converted to linear reflectivity (Z) for analysis (Randall et al. 2011) for each echo within the 100 km radius circle. We summed Z across all echoes for each 100 km radius circle to generate a single number representing the total reflectivity within the circle.

Data Analysis

Bird captures were quantified by species, age, sex, and number of captures for Fall migration, Spring migration and for MAPS. We used two categories of bird captures for our analyses: 1) total number of captures (includes all newly banded, recaptured, and unbanded birds) and 2) total number of individuals captured (includes only newly banded birds, unbanded birds, and first recaptures of birds banded during previous activities at the site). We used only the initial capture of a bird on each banding day in analyses (we did not record same day recaptures). A bird was considered a recapture on each unique day it was captured after its original banding. We used the total number of captures to calculate the overall capture rates per net and the overall capture rate of a species per 100 net hours. Species per 100 net hours is a standard measurement used for bird banding data. We used the total number of individuals to calculate: 1) species richness (the number of species captured at the site), 2) relative species abundance (the proportion of all individuals represented by a particular species), 3) sex and age ratios (to determine the structure of migrating and breeding populations), and 4) first and median arrival dates for each species. First and median arrival dates will be used to track possible future changes in the timing of migration associated with climate change.

Birds captured during migration were categorized as resident or migrant, according to behavior, breeding condition, and breeding status records for the site (not for the region as a

whole). Based on this categorization, species that were captured only during migration and are not known to breed at the site, such as Common Yellowthroat (*Geothlypis trichas*), were considered migrants even though they may breed nearby and are considered a resident species for the region. Only migratory individuals were included in our analyses of Fall and Spring migration and radar data. Both resident and migratory subspecies of Orange-crowned Warbler (*Oreothlypis celata*) were captured at the Point Loma banding station, although subspecies was not always noted. Therefore, Orange-crowned Warblers were not included in the migration analysis.

We calculated the number of migratory birds captured per net hour for each day in the Fall 2010 and Spring 2011 seasons. For each season, we calculated Pearson's product-moment correlation coefficient by correlating the number of migrant captures per net hour with the average NEXRAD echo density ranks and also the total reflectivity within 100 km of the radar. Correlations were considered significant if $P \leq 0.10$.

RESULTS

Fall 2010 Migration

Overview of Captures

In 1105 net hours during Fall 2010, we had a total of 257 migrant captures (Appendix B, Table 2). Of the 257 total captures, 232 were newly banded in Fall 2010, 4 were recaptures of birds that were newly banded in Fall 2010, and 17 were released unbanded (six hummingbirds, one raptor, and ten birds that escaped prior to banding), for a total of 253 individuals captured. We captured 40 species and 1 Townsend's x Hermit Warbler hybrid (*Setophaga townsendi* x *occidentalis*; Appendix B, Tables 2 and 3). We did not catch any birds that had been banded during previous banding activities at Point Loma. Ninety-eight percent of banded individuals (232/236; 31 species and 1 hybrid) were captured only once during Fall migration and 2% (4/236; 4 species) were captured twice (Appendix B, Table 4).

Captures Rates

Overall Fall capture rates by day averaged 0.23 ± 0.12 per net hour for all nets combined (range 0.00-0.69 captures per net hour (0–69 per 100 net hours); Appendix B, Table 3). Capture rates by net ranged from 0.13 to 0.52 captures per net hour with Net 8 being the most productive net (Appendix B, Fig. 6). The total number of captures was adjusted from 257 to 256 in Table 3 and Figure 6 to account for one bird that was recorded without a net number.

Species Richness

The number of Fall migrant species captured ranged from 0-12 per day (Appendix B, Table 5). Species richness among captures was highest in late September. Overall species richness for Fall 2010 averaged 4 ± 2.56 per day.

Relative Species Abundance

Pacific-slope Flycatcher (*Empidonax difficilis*) was the most abundant Fall migrant species with 62 individuals captured and 5.70 total captures per 100 net hours (Fig. 2; Appendix B, Tables 4 and 5). The second most abundant species was Audubon's Warbler (*Setophaga coronata*) with 29 individuals (2.62 total captures per 100 net hours). Lesser Goldfinch (*Spinus psaltria*) was the third most abundant species with 26 individuals (2.44 total captures per 100 net hours). Additional species accounting for at least 5% of all individuals captured included White-crowned Sparrow (*Zonotrichia leucophrys*; 18) and Swainson's Thrush (*Catharus ustulatus*; 12). Together, the above five species accounted for 58% of all Fall migrant individuals captured.

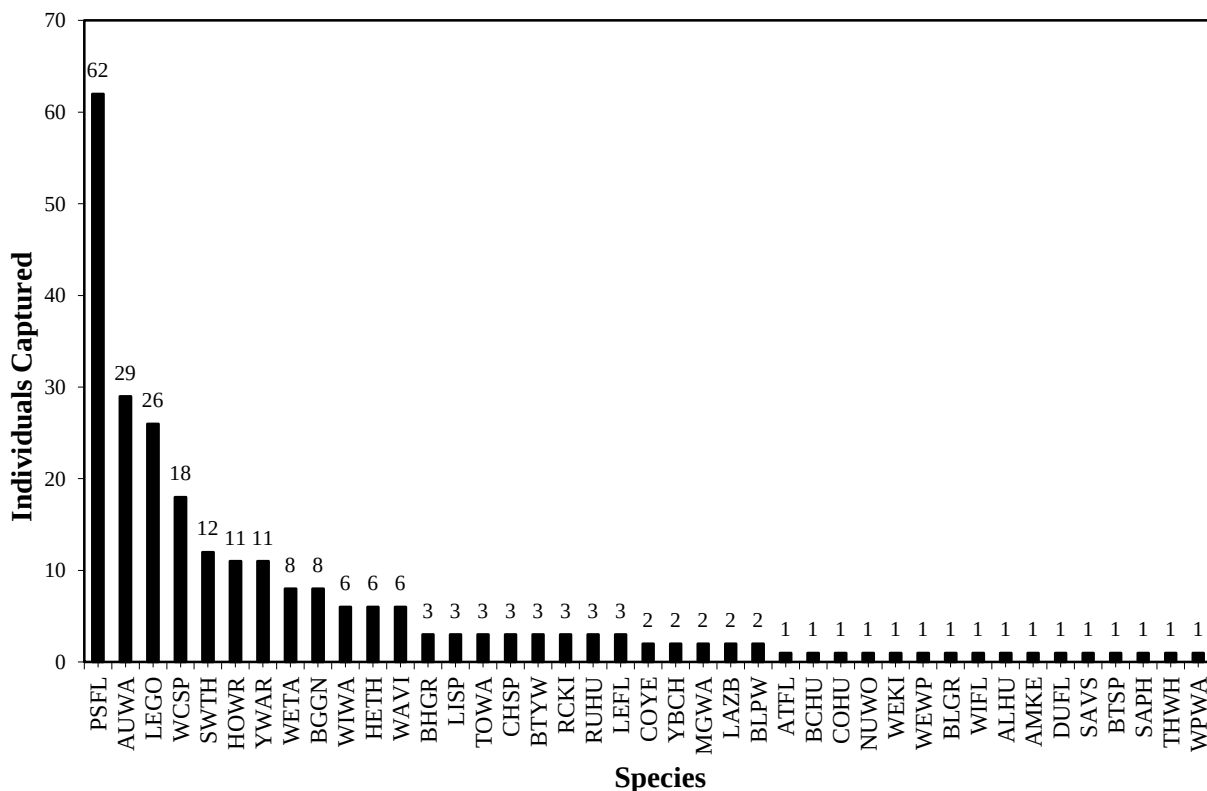


Fig. 2. Number of individuals captured per species, Point Loma, Fall 2010. See Appendix A for four-letter bird alpha codes.

Age and Sex Structure

Sixty-eight percent (45/66) of known-sex captures were male and 32% (21/66) were female during Fall 2010 (Appendix B, Table 6). Juveniles comprised 85% (170/199) of known-age captures. Juveniles of 33 species were captured. Most of the juveniles captured were Pacific-slope Flycatchers, contributing 33% to the total number of juveniles captured, followed

by Lesser Goldfinch (10%), Audubon's Warbler (8%), White-crowned Sparrow (5%) and Yellow Warbler (5%). Together, the above species accounted for 61% of all hatch year individuals captured during Fall 2010.

Arrival Dates

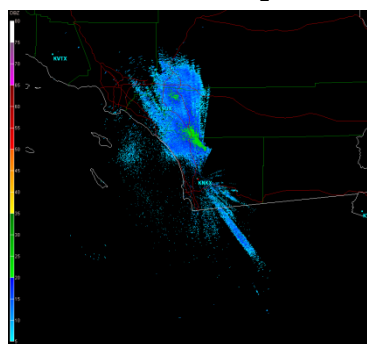
The peak number of new species arriving (captured) per day occurred on the first day of Fall banding, 16 August 2010 (Appendix B, Table 7). Six new migrant species were captured on this day: Allen's Hummingbird (*Selasphorus sasin*), Black-headed Grosbeak (*Pheucticus melanocephalus*), Lazuli Bunting (*Passerina amoena*), Lesser Goldfinch, Pacific-slope Flycatcher, and Warbling Vireo (*Vireo gilvus*). Four new species were captured on 23 September 2010 and 28 September 2010. The last new species to arrive was Western Prairie Warbler (*Setophaga discolor*), captured on 15 October 2010 (Appendix B, Table 7).

Radar Data

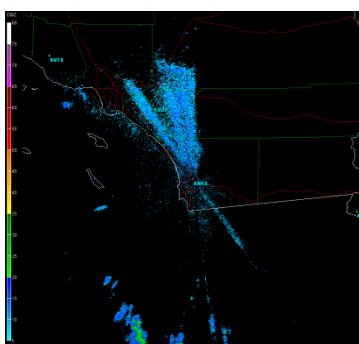
After eliminating 2 days where we were unable to discriminate between echoes created by weather and echoes created by migrating birds, we included 34 days with NEXRAD images from Fall 2010 in analyses. The number of migratory birds captured ranged from 0.00 to 0.69 per net hour for these 34 days (Appendix B, Table 3). The number of migratory birds captured was not significantly correlated with the echo density on the NEXRAD images ($r = 0.15$, $P = 0.39$; Fig. 3) or with the total reflectivity within 100 km of the radar ($r = -0.16$, $P = 0.34$).

On further examination of the NEXRAD images, much of what we considered echoes generated by migratory birds did not appear over the banding station, but rather farther inland. In particular, on the day corresponding to the image with the highest density ranking (7 September 2010; Fig. 3), we had the second lowest number of captures per net hour and the densest part of the image was approximately 17 km inland of the coast.

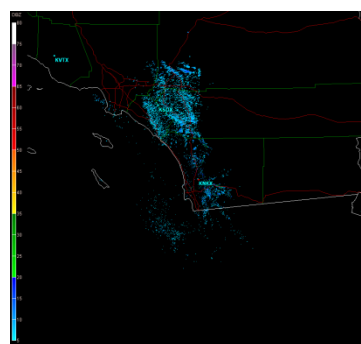
Fall 2010: Low Capture Days



7 September 2010:
0.03 captures/net hour

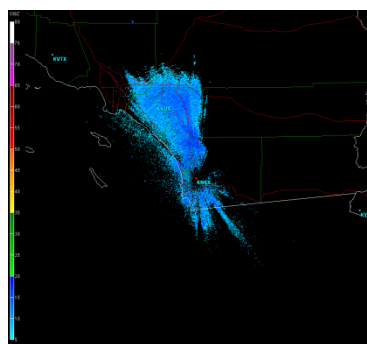


20 September 2010:
0.03 captures/net hour

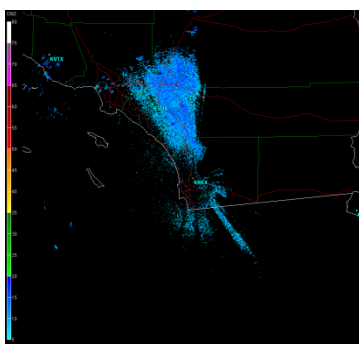


5 October 2010:
0.07 captures/net hour

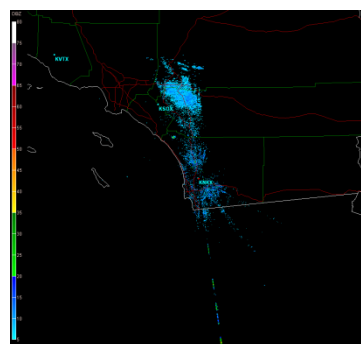
Fall 2010: High Capture days



8 October 2010:
0.69 captures/net hour



15 October 2010:
0.49 captures/net hour



9 September 2010:
0.40 captures/net hour

Fig. 3. A representative sample of NEXRAD images for Fall 2010 banding days with low capture rate and high capture rate, Point Loma banding station, San Diego, California.

Spring 2011 Migration

Overview of Captures

In 747 net hours during Spring 2011, we had a total of 459 migrant captures (Appendix C, Table 8). Of the 459 total captures, 399 were newly banded in Spring 2011, 6 were recaptures of birds that were newly banded in Spring 2011, and 48 were released unbanded (42 hummingbirds and 6 birds that escaped prior to banding), for a total of 453 individuals captured. We captured 38 species and 1 Townsend's x Hermit Warbler hybrid (Appendix C, Tables 8 and 9; unidentified species not included in species total). We did not catch any birds that had been banded during previous banding activities at Point Loma. Ninety-nine percent of banded individuals (399/405; 29 species and 1 hybrid) were captured only once during Spring migration and 1% (6/205; 5 species) were captured twice (Appendix C, Table 10).

Capture Rates

Overall Spring capture rates by day averaged 0.62 ± 0.22 per net hour for all nets combined (range 0.06-1.79 captures per net hour (6-179 per 100 net hours); Appendix C, Table 9). Capture rates by net ranged from 0.38 to 1.16 captures per net hour with Net 4 being the most productive net (Appendix C, Fig. 7). The total number of captures was adjusted from 459 to 458 in Table 9 and Figure 7 to account for one bird that was recorded without a net number.

Species Richness

The number of Spring migrant species captured ranged from 1-14 species per day (Appendix C, Table 11). Species richness among captures was highest in late April to early May. Overall species richness for Spring averaged 8 ± 4.43 per day.

Relative Species Abundance

Wilson's Warbler (*Cardellina pusilla*) was the most abundant Spring migrant species with 89 individual captures and 12.05 total captures per 100 net hours (Fig. 4; Appendix C, Tables 10 and 11). The second most abundant species was Warbling Vireo with 46 individuals (6.29 total captures per 100 net hours). White-crowned Sparrow was the third most abundant species with 36 individuals (4.95 total captures per 100 net hours). Additional species accounting for at least 5% of all individuals captured include Pacific-slope Flycatcher (35), Townsend's Warbler (*Setophaga townsendi*; 30), and Nashville Warbler (*Oreothlypis ruficapilla*; 22). Together, the above six species accounted for 57% of all Spring migrant individuals captured.

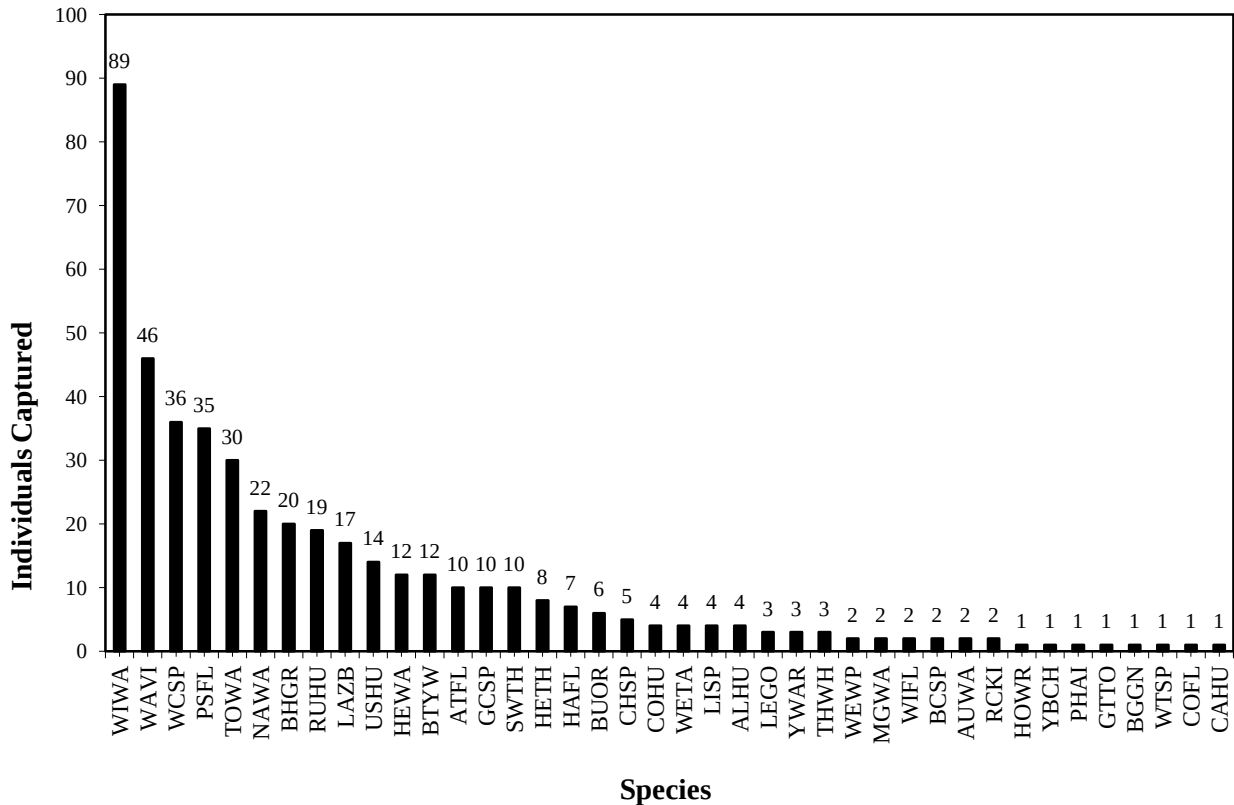


Fig. 4. Number of individuals captured per species: Point Loma, Spring 2011. See Appendix A for four-letter bird alpha codes.

Age and Sex Structure

Sixty-four percent (113/176) of known-sex captures were male and 36% (63/176) were female during Spring 2011 (Appendix C, Table 12). Because only migrant species were included in the analyses, and banding occurred prior to the breeding season of the migrants, no juveniles were captured.

Arrival Dates

The peak number of new species arriving (captured) per day occurred on the first day of Spring banding, 4 April 2011 (Appendix C, Table 13). Six new migrant species were captured on this day: Allen’s Hummingbird, Black-headed Grosbeak, Golden-crowned Sparrow (*Zonotrichia atricapilla*), Hermit Thrush (*Catharus guttatus*), Rufous Hummingbird (*Selasphorus rufus*), and White-crowned Sparrow. Four new species were captured on 6 April 2011 and 5 May 2011. The last new species to arrive was Cordilleran Flycatcher (*Empidonax occidentalis*), captured on 26 May 2011 (Appendix C, Table 13).

Radar Data

After eliminating 1 day where we were unable to discriminate between echoes created by weather and echoes created by migrating birds, we included 22 days from Spring 2011 in our analysis (Appendix C, Table 9). The number of migratory birds captured per net hour in the Spring was significantly correlated with the echo density on the NEXRAD images ($r = 0.70$, $P < 0.001$) and also with the total reflectivity within 100 km of the radar ($r = 0.66$, $P = 0.001$). Unlike in the Fall, the majority of the NEXRAD images showed echoes over the banding station.

Error in the correlation between bird captures and echo density in the NEXRAD images was associated with images that looked dense but few birds were captured (Fig. 5; 18 April).

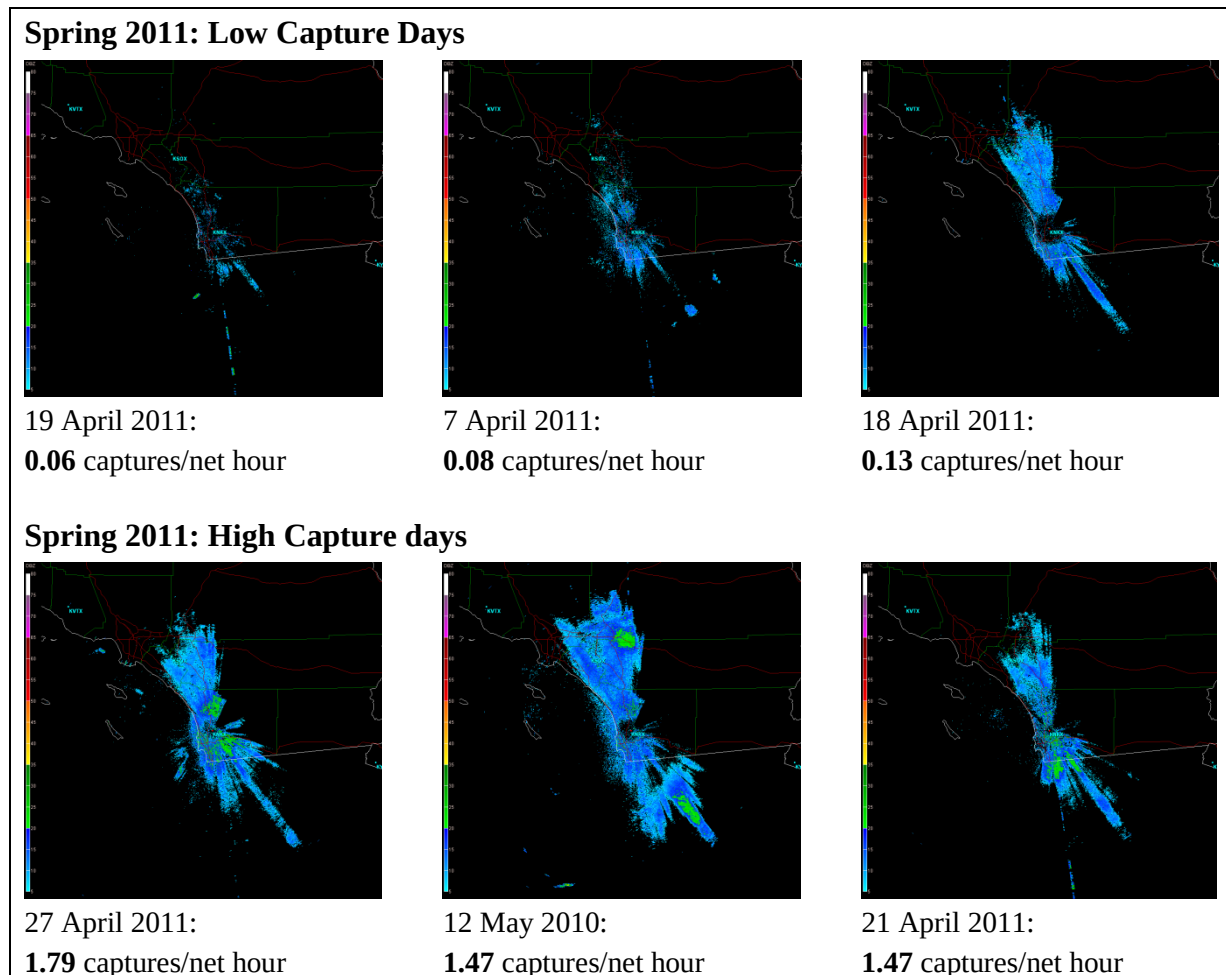


Fig. 5 A representative sample of NEXRAD images for Spring 2011 banding days with low capture rate and high capture rate, Point Loma banding station, San Diego, California.

MAPS 2011

Overview of Captures

In 486 net hours during the 2011 breeding season, we had a total of 490 captures (Appendix D, Table 14). Of the 490 total captures, 349 were newly banded during the MAPS season, 41 were first time recaptures from previous banding activities at Point Loma, 22 were recaptures of birds that were newly banded during the MAPS season, and 78 were released unbanded (68 hummingbirds, 1 game bird, and 9 birds that escaped prior to banding), for a total of 468 individuals captured. We captured 45 species and 1 Townsend's x Hermit Warbler hybrid (Appendix D, Tables 14 and 15; unidentified species not included in species total). Ninety-five percent of banded individuals (372/390; 33 species and 1 hybrid) were captured only once during the MAPS season, 5% (19/390; 4 species) were captured twice, and < 1% (2/390; 2 species) were captured three times (Appendix D, Table 16).

Capture Rates

Overall MAPS capture rates by day averaged 1.01 ± 0.33 per net hour for all nets combined (range 0.49-2.54 captures per net hour (49-254 per 100 net hours); (Appendix D, Table 15). Capture rates by net ranged from 0.56 to 1.51 captures per net hour with Nets 1,4,8,9 and 10 being the most productive nets (Appendix D, Fig. 8). The total number of captures was adjusted from 490 to 489 in Table 15 and Figure 8 to account for one bird that was recorded without a net number.

Species Richness

The number of species captured ranged from 8-20 per day (Appendix D, Table 17). Species richness among captures was highest in early to mid-May. Overall species richness averaged 14.00 ± 4.57 per day.

Relative Species Abundance

Orange-crowned Warbler was the most abundant MAPS species with 74 individual captures and 16.67 total captures per 100 net hours (Fig. 6; Appendix D, Tables 16 and 17). The second most abundant species was Anna's Hummingbird (*Calypte anna*) with 55 individuals (11.32 total captures per 100 net hours). Bushtit (*Psaltiriparus minimus*) was the third most abundant species with 46 individuals (10.91 total captures per 100 net hours). Additional species accounting for at least 5% of all individuals captured include Wilson's Warbler (43), California Towhee (*Melospiza crissalis*; 30), and Spotted Towhee (*Pipilo maculatus*; 27). Together, all six species accounted for 59% of all MAPS individuals captured.

Age and Sex Structure

Forty-seven percent (110/236) of known-sex captures were male and 53% (126/236) were female during MAPS (Appendix D, Table 18). Juveniles comprised 35% (152/433) of the

known-age population. Juveniles of 16 species were captured. Most of the juveniles captured were Anna's Hummingbird and Bushtit, each contributing 16% of the total number of juveniles captured, followed by Orange-crowned Warbler (11%), California Towhee (11%), Spotted Towhee (10%), Wrentit (*Chamaea fasciata*; 9%), Bewick's Wren (*Thryomanes bewickii*; 8%), and Hooded Oriole (*Icterus cucullatus*; 5%). Together, these eight species accounted for 85% of all hatch year individuals captured during MAPS. One of the 16 juvenile species captured was considered a migrant species for this site, Costa's Hummingbird (*Calypte costae*).

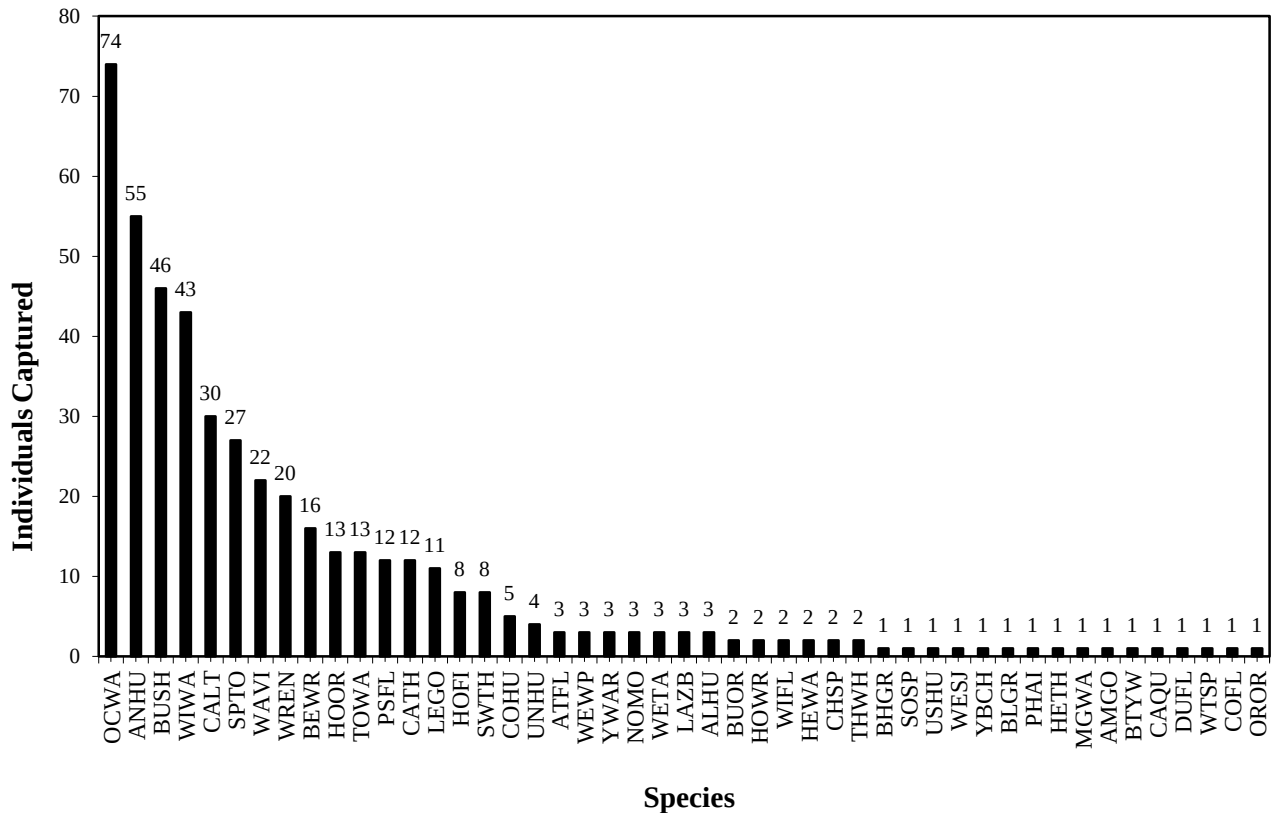


Fig 6. Number of individuals captured per species: Point Loma, MAPS 2011. See Appendix A for four-letter bird alpha codes.

DISCUSSION

Our monitoring results indicate that Point Loma provides stopover habitat during migration for 53 species over the course of the annual cycle, and breeding habitat for an additional 15 species. While many migratory species pass through Point Loma during both Fall and Spring migrations, 13 (25%) were present only in Fall, and 11 (21%) occurred only in Spring. Thus, Point Loma provides resources for three distinct assemblages of birds with multiple origins and varied life histories, not the least of which are the dozens of migratory species of conservation concern. At Point Loma, the most abundant of these latter species

include Orange-crowned Warbler, Wilson's Warbler, Warbling Vireo, Townsend's Warbler, Nashville Warbler, Hermit Warbler, Black-throated Gray Warbler (*Setophaga nigrescens*), Hooded Oriole, Pacific-slope Flycatchers Ash-throated Flycatcher (*Myiarchus cinerascens*), Swainson's Thrush, White-crowned Sparrow, Golden-crowned Sparrow, and Black-headed Grosbeak.

During Fall 2010, the highest capture rate and number of species detected per day occurred in late September to early October. This is consistent with the expected number and movement of Fall migrants through the site at this time of year. Additionally, we captured a much higher proportion of juvenile birds than adult birds during the Fall (85%). The high proportion of juveniles in the migrating population represents what is known as the "coastal effect," where the proportion of juveniles is much higher in coastal populations than in those migrating inland (Ralph 1971, 1981). In addition, we captured more males than females (68%). This may be because of differential migration between the sexes and more males tend to move through the Point Loma, however, more than one year of data collection will be necessary to determine if this is normal for this site. We also caught fewer migratory birds per 100 net hours in Fall 2010 than we did in Spring 2011. This may be attributable to a number of factors occurring during the Fall, including weather at our site (often cool, foggy, and/or windy), vegetative condition (most vegetation was dry and leafless), prey base (related to weather and vegetative condition), and a more dispersed pattern of migration during the Fall.

During Spring 2011, the highest capture rate and number of species detected per day occurred in late April to early May. This is consistent with the expected number and movement of Spring migrants through the site at this time of year. In addition, we captured more males than females (64%). This may be because of differential migration between the sexes, with more males moving through Point Loma; however, more than one year of data collection will be necessary to determine whether this pattern persists. Spring migrant species that may be abundant enough for long-term monitoring and trend analysis include Wilson's Warbler, Warbling Vireo, White-crowned Sparrow, Pacific-slope Flycatcher, Townsend's Warbler, and Nashville Warbler.

During MAPS in 2011, the highest capture rate and number of species detected per day occurred in early to mid-May when the Spring migration monitoring and MAPS season overlapped and can be attributed to the number of migrant species. Another smaller peak in captures occurred in early July and can be attributed to the number of juvenile birds found in the population at this time of year. Breeding species that may be abundant enough for long-term monitoring of population size and composition, survivorship, productivity and recruitment include Orange-crowned Warbler, Bushtit, California Towhee, and Spotted Towhee. Anna's Hummingbird may also have adequate numbers, but they are difficult to band and recapture and would require a concentrated effort beyond the scope of a MAPS station. Orange-crowned Warbler is one of the most abundant species caught at one of two riparian MAPS stations operated at Marine Corps Base Camp Pendleton, and Bushtit, California Towhee, and Spotted Towhee are abundant species at one or both stations (Rogne and Kus 2010), making feasible regional comparisons and evaluations of species of interest to Point Loma resource managers.

The number and timing of captures in the Spring and Summer suggest that our station has sufficient activity to establish long-term monitoring of Spring migrants and breeding birds. In addition, extending the more frequent banding schedule of migration monitoring through the end of May may be warranted.

The density of echoes in NEXRAD images in the Spring was strongly and positively associated with our bird capture rate at Point Loma, both by visual estimation and by geographic analysis. This suggests that NEXRAD imagery in San Diego may be useful in determining when spring migrants arrive at Point Loma, and also the relative abundance of these migrants, although determining which family the migrants belong to (passerines or non-passerines) would require more specialized equipment and analysis. Under good weather conditions, we may be able to roughly predict days when migrant birds are abundant by examining NEXRAD images during exodus and for the subsequent 2-3 hours the previous night.

We did not find a similar correlation between NEXRAD image density and bird captures in the Fall at our banding station. There were many NEXRAD images in the Fall and some images in the Spring that seemed consistent with dense over-flight when we did not catch a correspondingly high number of migratory birds. These “false” blooms can be attributed to non-passerine migrants (e.g., waterfowl or shorebirds that we were not likely to capture in our mist nets), over-flight of passerines that did not stop in the vicinity of our banding station, or weather conditions that were undetected during our initial NEXRAD screening.

The discrepancy between Spring and Fall results suggest that migration may differ between seasons. We caught fewer migratory birds per 100 net hours in the Fall than we did in the Spring. This alone suggests that Fall migration was not as concentrated along the coast as Spring migration. Supporting this, echoes in the NEXRAD imagery in the Fall tended to be further from the coast than in the Spring. Spring NEXRAD images more often than not covered Point Loma and the banding station and were generally more coastal. In the Spring, birds from Central America and Mexico may be following the west coast of Mexico and Baja northward while southbound migrants may be travelling farther inland. In addition, during the Fall, the southern portion of the NEXRAD images were less well developed than in the Spring, suggesting that while birds may approach northern San Diego County from directly to the north, they may veer inland to east of the coastal mountain range and disappear from the San Diego based radar.

Rather than demonstrating the characteristic donut pattern, the echoes attributed to migratory birds in San Diego were more linear, with a strong, expanding ray extending NNW and a more fragmented ray extending SSE. This fragmentation and a 90° arc to the east that was consistently blank in all images, indicate that the San Diego NEXRAD radar is blocked by permanent clutter (likely a landscape feature). Nevertheless, we observed a characteristic bloom in the NEXRAD images shortly after sunset, developing and extending over the next few hours, even though the shape of the bloom was fragmented.

A potential benefit of examining NEXRAD images during migration is that high density echoes may indicate locations within the range of the radar that have consistently high

concentrations of migrants. This information could be used to target other locations where on-the-ground migration monitoring would be worthwhile.

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APPENDIX A. Alpha codes, common names, scientific names, and Institute for Bird Populations (IBP) numeric codes for species captured 2010-2011, Point Loma, CA

Alpha Code ^a	Common Name	Scientific Name	IBP Code
AMKE	American Kestrel	<i>Falco sparverius</i>	02630
CAQU	California Quail	<i>Callipepla californica</i>	03130
BCHU	Black-chinned Hummingbird	<i>Archilochus alexandri</i>	08640
ANHU	Anna's Hummingbird	<i>Calypte anna</i>	08670
COHU	Costa's Hummingbird	<i>Calypte costae</i>	08680
CAHU	Calliope Hummingbird	<i>Stellula calliope</i>	08690
RUHU	Rufous Hummingbird	<i>Selasphorus rufus</i>	08730
ALHU	Allen's Hummingbird	<i>Selasphorus sasin</i>	08740
USHU	Unidentified <i>Selasphorus</i> Hummingbird species	<i>Selasphorus</i> spp.	08774
UNHU	Unidentified Hummingbird species	---	08775
NUWO	Nuttall's Woodpecker	<i>Picoides nuttallii</i>	09640
WEWP	Western Wood-pewee	<i>Contopus sordidulus</i>	11380
WIFL	Willow Flycatcher	<i>Empidonax traillii</i>	11475
LEFL	Least Flycatcher	<i>Empidonax minimus</i>	11500
HAFL	Hammond's Flycatcher	<i>Empidonax hammondi</i>	11510
DUFL	Dusky Flycatcher	<i>Empidonax oberholseri</i>	11530
PSFL	Pacific-slope Flycatcher	<i>Empidonax difficilis</i>	11555
COFL	Cordilleran Flycatcher	<i>Empidonax occidentalis</i>	11555
SAPH	Say's Phoebe	<i>Sayornis saya</i>	11620
ATFL	Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>	11740
WEKI	Western Kingbird	<i>Tyrannus verticalis</i>	12020
WAVI	Warbling Vireo	<i>Vireo gilvus</i>	12760
WESJ	Western Scrub-jay	<i>Aphelocoma californica</i>	13110
BUSH	Bushtit	<i>Psaltiriparus minimus</i>	13680
BEWR	Bewick's Wren	<i>Thryomanes bewickii</i>	14040
HOWR	House Wren	<i>Troglodytes aedon</i>	14070
RCKI	Ruby-crowned Kinglet	<i>Regulus calendula</i>	14250
BGGN	Blue-gray Gnatcatcher	<i>Poliophtila caerulea</i>	14350
SWTH	Swainson's Thrush	<i>Catharus ustulatus</i>	14810
HETH	Hermit Thrush	<i>Catharus guttatus</i>	14820
WREN	Wrentit	<i>Chamaea fasciata</i>	15110
NOMO	Northern Mockingbird	<i>Mimus polyglottos</i>	15150
CATH	California Thrasher	<i>Toxostoma redivivum</i>	15270
PHAI	Phainopepla	<i>Phainopepla nitens</i>	15590
OCWA	Orange-crowned Warbler	<i>Oreothlypis celata</i>	15660
NAWA	Nashville Warbler	<i>Oreothlypis ruficapilla</i>	15670
YWAR	Yellow Warbler	<i>Setophaga petechia</i>	15750
AUWA	Audubon's Warbler	<i>Setophaga coronata auduboni</i>	15800
BTYW	Black-throated Gray Warbler	<i>Setophaga nigrescens</i>	15810
TOWA	Townsend's Warbler	<i>Setophaga townsendi</i>	15840
THWH	Townsend's x Hermit Warbler Hybrid	<i>Setophaga townsendi</i> x <i>occidentalis</i>	15845
HEWA	Hermit Warbler	<i>Setophaga occidentalis</i>	15850
WPWA	Western Palm Warbler	<i>Setophaga palmarum palmarum</i>	15950
BLPW	Blackpoll Warbler	<i>Setophaga striata</i>	15970

Alpha Code ^a	Common Name	Scientific Name	IBP Code
MGWA	MacGillivray's Warbler	<i>Geothlypis tolmiei</i>	16140
COYE	Common Yellowthroat	<i>Geothlypis trichas</i>	16150
WIWA	Wilson's Warbler	<i>Cardellina pusilla</i>	16290
YBCH	Yellow-breasted Chat	<i>Icteria virens</i>	16460
WETA	Western Tanager	<i>Piranga ludoviciana</i>	16840
GTTO	Green-tailed Towhee	<i>Pipilo chlorurus</i>	17790
SPTO	Spotted Towhee	<i>Pipilo purious</i>	17810
CALT	California Towhee	<i>Melospiza crissalis</i>	17850
CHSP	Chipping Sparrow	<i>Spizella purious</i>	18020
BCSP	Black-chinned Sparrow	<i>Spizella atrogularis</i>	18070
BTSP	Black-throated Sparrow	<i>Amphispiza bilineata</i>	18100
SAVS	Savannah Sparrow	<i>Passerculus sandwichensis</i>	18130
SOSP	Song Sparrow	<i>Melospiza melodia</i>	18230
LISP	Lincoln's Sparrow	<i>Melospiza lincolni</i>	18240
WTSP	White-throated Sparrow	<i>Zonotrichia albicollis</i>	18270
WCSP	White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	18290
GCSP	Golden-crowned Sparrow	<i>Zonotrichia atricapilla</i>	18300
BHGR	Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	18610
BLGR	Blue Grosbeak	<i>Passerina caerulea</i>	18640
LAZB	Lazuli Bunting	<i>Passerina amoena</i>	18660
OROR	Orchard Oriole	<i>Icterus purious</i>	19040
HOOR	Hooded Oriole	<i>Icterus cucullatus</i>	19050
BUOR	Bullock's Oriole	<i>Icterus bullockii</i>	19105
HOFI	House Finch	<i>Carpodacus mexicanus</i>	19370
LEGO	Lesser Goldfinch	<i>Spinus psaltria</i>	19490
AMGO ^b	American Goldfinch	<i>Spinus tristis</i>	19510

^aSpecies in bold are treated as migrants in this study, based on their breeding status at Point Loma. Species not bolded are considered breeding.

^bAmerican Goldfinch is not known to breed at Point Loma and would have been grouped with the migrants, but it was only captured once during theMAPS season and was perhaps a late migrant or transient moving through the site.

APPENDIX B. Tables and additional figures,
Fall 2010, Point Loma, CA

Table 2. Number of birds captured and banded, Point Loma, Fall 2010.

Species ^a	IBP Code ^b	Total Captures ^c	Total Individuals ^d	New Individuals Banded
AMKE	02630	1	1	0
BCHU	08640	1	1	0
COHU	08680	1	1	0
RUHU	08730	3	3	0
ALHU	08740	1	1	0
NUWO	09640	1	1	1
WEWP	11380	1	1	1
WIFL	11475	1	1	1
LEFL	11500	3	3	3
DUFL	11530	1	1	1
PSFL	11555	63	62	61
SAPH	11620	1	1	1
ATFL	11740	1	1	1
WEKI	12020	1	1	1
WAVI	12760	6	6	6
HOWR	14070	12	11	8
RCKI	14250	3	3	3
BGGN	14350	8	8	7
SWTH	14810	12	12	11
HETH	14820	6	6	6
YWAR	15750	11	11	11
AUWA	15800	29	29	28
BTYW	15810	3	3	3
TOWA	15840	3	3	3
THWH	15845	1	1	1
WPWA	15950	1	1	1
BLPW	15970	2	2	2
MGWA	16140	2	2	2
COYE	16150	2	2	2
WIWA	16290	6	6	5
YBCH	16460	2	2	2
WETA	16840	8	8	8
CHSP	18020	3	3	3
BTSP	18100	1	1	1
SAVS	18130	1	1	1
LISP	18240	3	3	2
WCSP	18290	19	18	18
BHGR	18610	3	3	3
BLGR	18640	1	1	1
LAZB	18660	2	2	2

Species^a	IBP Code^b	Total Captures^c	Total Individuals^d	New Individuals Banded
LEGO	19490	27	26	25
Total		257	253	236

^a See Appendix A for bird species codes.

^b Institute for Bird Populations Species Number Code.

^c Includes multiple captures of some individuals.

^d Does not include multiple captures of individuals.

Table 3. Bird capture rate by net and date: Point Loma, Fall 2010.

Banding Day	Date		Net										Totals by DATE
			1	2	3	4	5	6	7	8	9	10	
1	8/16/2010	Net Hours	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:00	0:00	27:00
		Captures	1	1	0	1	0	0	0	2	2	0	7
		Captures/Net hour	0.33	0.33	0.00	0.33	0.00	0.00	0.00	0.67	0.67	0.00	0.26
2	8/19/2010	Net Hours	3:00	2:50	2:50	3:00	3:00	3:00	1:40	1:40	3:00	3:00	27:00
		Captures	0	0	0	0	0	0	1	0	2	0	3
		Captures/Net hour	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.67	0.00	0.11
3	8/23/2010	Net Hours	3:10	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:10	3:10	30:30
		Captures	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Captures/Net hour	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	8/26/2010	Net Hours	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:20	3:10	30:30
		Captures	1	0	0	3	0	0	0	2	0	0	6
		Captures/Net hour	0.33	0.00	0.00	1.00	0.00	0.00	0.00	0.67	0.00	0.00	0.20
5	8/30/2010	Net Hours	3:00	3:00	3:10	3:00	3:00	3:00	3:00	3:00	3:00	3:00	30:10
		Captures	0	1	0	0	0	0	0	3	1	0	5
		Captures/Net hour	0.00	0.33	0.00	0.00	0.00	0.00	0.00	1.00	0.33	0.00	0.17
6	8/31/2010	Net Hours	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:00	30:00
		Captures	0	4	0	1	0	0	1	2	0	0	8
		Captures/Net hour	0.00	1.33	0.00	0.33	0.00	0.00	0.33	0.67	0.00	0.00	0.27
7	9/1/2010	Net Hours	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:00	30:00
		Captures	0	0	0	1	0	0	1	0	0	1	3
		Captures/Net hour	0.00	0.00	0.00	0.33	0.00	0.00	0.33	0.00	0.00	0.33	0.10
8	9/2/2010	Net Hours	3:00	2:40	2:40	2:40	3:00	3:00	3:00	3:00	3:00	3:00	29:00
		Captures	0	0	0	0	0	0	0	0	2	1	3
		Captures/Net hour	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.33	0.10
9	9/3/2010	Net Hours	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:00	30:00
		Captures	0	0	0	0	0	0	0	0	0	1	1
		Captures/Net hour	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.03
10	9/7/2010	Net Hours	3:10	3:00	3:00	3:00	3:10	3:10	3:10	3:10	3:10	3:10	31:10
		Captures	1	0	0	0	0	0	0	0	0	0	1
		Captures/Net hour	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03

Banding Day	Date		Net										Totals by DATE
			1	2	3	4	5	6	7	8	9	10	
11	9/8/2010	Net Hours	2:00	3:00	3:00	3:00	3:00	3:10	3:00	3:00	3:10	3:10	29:30
		Captures	0	0	0	0	1	1	0	2	3	2	9
		Captures/Net hour	0.00	0.00	0.00	0.00	0.33	0.32	0.00	0.67	0.95	0.63	0.31
12	9/9/2010	Net Hours	3:00	2:50	3:00	3:00	3:00	3:00	3:00	3:10	3:00	3:00	30:00
		Captures	1	1	0	0	0	1	0	5	3	1	12
		Captures/Net hour	0.33	0.35	0.00	0.00	0.00	0.33	0.00	1.58	1.00	0.33	0.40
13	9/10/2010	Net Hours	3:10	3:10	3:00	3:30	3:00	3:00	3:00	2:50	3:10	3:10	31:00
		Captures	0	1	0	4	0	0	0	5	1	0	11
		Captures/Net hour	0.00	0.32	0.00	1.14	0.00	0.00	0.00	1.76	0.32	0.00	0.35
14	9/13/2010	Net Hours	3:10	3:20	3:10	2:50	3:00	3:00	3:00	3:00	3:10	3:00	30:40
		Captures	3	3	0	0	0	0	0	1	0	2	9
		Captures/Net hour	0.95	0.90	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.67	0.29
15	9/14/2010	Net Hours	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:00	30:00
		Captures	0	0	0	2	1	0	2	0	1	0	6
		Captures/Net hour	0.00	0.00	0.00	0.67	0.33	0.00	0.67	0.00	0.33	0.00	0.20
16	9/15/2010	Net Hours	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:00	30:00
		Captures	2	1	0	1	0	0	0	1	4	1	10
		Captures/Net hour	0.67	0.33	0.00	0.33	0.00	0.00	0.00	0.33	1.33	0.33	0.33
17	9/16/2010	Net Hours	3:30	3:10	3:20	3:20	3:00	3:10	3:20	3:10	3:20	3:30	32:50
		Captures	0	1	0	1	0	0	0	1	0	0	3
		Captures/Net hour	0.00	0.32	0.00	0.30	0.00	0.00	0.00	0.32	0.00	0.00	0.09
18	9/17/2010	Net Hours	3:00	2:40	2:50	2:50	3:10	3:10	3:10	3:10	3:10	3:10	30:20
		Captures	0	0	0	0	0	0	1	0	0	0	1
		Captures/Net hour	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.03
19	9/20/2010	Net Hours	3:10	3:10	3:00	3:00	3:00	2:50	2:50	3:10	3:10	3:10	30:30
		Captures	0	0	0	0	1	0	0	0	0	0	1
		Captures/Net hour	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.03
20	9/21/2010	Net Hours	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:00	2:50	29:50
		Captures	0	0	0	0	0	0	1	0	1	0	2
		Captures/Net hour	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.33	0.00	0.07

Banding Day	Date		Net										Totals by DATE
			1	2	3	4	5	6	7	8	9	10	
21	9/22/2010	Net Hours	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:00	30:00
		Captures	2	3	0	0	2	0	0	0	1	3	11
		Captures/Net hour	0.67	1.00	0.00	0.00	0.67	0.00	0.00	0.00	0.33	1.00	0.37
21	9/23/2010	Net Hours	4:00	4:00	4:00	4:00	4:00	4:00	4:00	4:00	4:00	4:00	40:00
		Captures	0	1	1	3	0	3	1	4	0	1	14
		Captures/Net hour	0.00	0.25	0.25	0.75	0.00	0.75	0.25	1.00	0.00	0.25	0.35
22	9/24/2010	Net Hours	4:10	4:00	4:10	4:10	3:50	3:50	3:50	3:30	4:10	4:10	39:50
		Captures	0	0	4	1	1	0	0	0	0	0	6 ^a
		Captures/Net hour	0.00	0.00	0.96	0.24	0.26	0.00	0.00	0.00	0.00	0.00	0.15
23	9/27/2010	Net Hours	3:00	3:00	3:00	2:50	2:50	3:00	3:00	2:50	3:00	3:00	29:30
		Captures	1	0	2	0	0	1	0	2	0	1	7
		Captures/Net hour	0.33	0.00	0.67	0.00	0.00	0.33	0.00	0.71	0.00	0.33	0.24
24	9/28/2010	Net Hours	3:20	3:00	3:00	3:10	3:00	3:00	3:10	3:10	3:20	3:30	31:40
		Captures	2	2	0	4	0	1	0	2	5	2	18
		Captures/Net hour	0.60	0.67	0.00	1.26	0.00	0.33	0.00	0.63	1.50	0.57	0.57
25	9/29/2010	Net Hours	3:00	3:10	2:50	2:50	2:50	3:00	2:50	3:00	2:50	2:50	29:10
		Captures	2	0	2	0	0	1	1	2	1	0	9
		Captures/Net hour	0.67	0.00	0.71	0.00	0.00	0.33	0.35	0.67	0.35	0.00	0.31
26	9/30/2010	Net Hours	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:00	30:00
		Captures	1	0	0	0	0	0	1	3	3	0	8
		Captures/Net hour	0.33	0.00	0.00	0.00	0.00	0.00	0.33	1.00	1.00	0.00	0.27
27	10/1/2010	Net Hours	3:10	3:20	3:00	3:00	3:10	3:00	3:00	2:50	3:00	3:10	30:40
		Captures	0	0	0	0	0	1	0	0	1	2	4
		Captures/Net hour	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.33	0.63	0.13
28	10/4/2010	Net Hours	2:20	1:40	2:00	2:10	2:00	2:20	2:20	2:00	2:20	2:20	21:30
		Captures	1	0	0	0	1	0	0	1	1	0	4
		Captures/Net hour	0.43	0.00	0.00	0.00	0.50	0.00	0.00	0.50	0.43	0.00	0.19
29	10/5/2010	Net Hours	3:00	3:10	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:00	30:10
		Captures	1	0	1	0	0	0	0	0	0	0	2
		Captures/Net hour	0.33	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07

Banding Day	Date		Net										Totals by DATE
			1	2	3	4	5	6	7	8	9	10	
		Net Hours	2:50	3:00	3:10	3:10	2:50	2:50	2:50	3:10	2:50	3:00	29:40
		Captures	0	1	0	0	1	0	0	6	0	0	8
30	10/7/2010	Captures/Net hour	0.00	0.33	0.00	0.00	0.35	0.00	0.00	1.89	0.00	0.00	0.27
31	10/8/2010	Net Hours	3:00	3:10	3:10	3:30	3:10	3:10	3:00	3:10	3:10	3:10	31:40
		Captures	0	1	0	2	0	5	2	4	5	3	22
		Captures/Net hour	0.00	0.32	0.00	0.57	0.00	1.58	0.67	1.26	1.58	0.95	0.69
32	10/12/2010	Net Hours	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:00	30:00
		Captures	0	0	1	2	0	0	1	0	0	4	8
		Captures/Net hour	0.00	0.00	0.33	0.67	0.00	0.00	0.33	0.00	0.00	1.33	0.27
33	10/13/2010	Net Hours	3:00	3:20	3:00	2:50	2:30	3:00	3:00	3:00	3:00	3:00	29:40
		Captures	2	0	1	0	4	1	1	0	0	1	10
		Captures/Net hour	0.67	0.00	0.33	0.00	1.60	0.33	0.33	0.00	0.00	0.33	0.34
34	10/14/2010	Net Hours	3:00	3:00	3:10	2:40	3:20	3:10	3:10	3:00	3:00	3:00	30:30
		Captures	0	0	1	1	1	0	0	1	0	0	4
		Captures/Net hour	0.00	0.00	0.32	0.38	0.30	0.00	0.00	0.33	0.00	0.00	0.13
35	10/15/2010	Net Hours	4:20	4:10	4:00	4:10	3:50	3:50	3:50	3:50	4:20	4:20	40:40
		Captures	2	0	1	3	3	2	0	8	1	0	20
		Captures/Net hour	0.46	0.00	0.25	0.72	0.78	0.52	0.00	2.09	0.23	0.00	0.49
Totals by NET		Net Hours	111:30	110:50	110:30	110:40	109:40	110:40	109:10	108:50	112:50	110:00	1104:40
		Captures ^a	23	21	14	30	16	17	14	57	38	26	256
		Captures/Net hour	0.21	0.19	0.13	0.27	0.15	0.15	0.13	0.52	0.34	0.24	0.23

^aTotal adjusted for one capture with unknown net number on 22 September 2010.

Table 4. Bird capture frequency of individuals: Point Loma, Fall 2010.

Species ^a	# Individuals per Capture Incidence (Banded Birds Only)		Total # Individuals		
	1 Capture	2 Captures	Banded Birds	Unbanded Birds	All Birds
AMKE	0	0	0	1	1
BCHU	0	0	0	1	1
COHU	0	0	0	1	1
RUHU	0	0	0	3	3
ALHU	0	0	0	1	1
NUWO	1	0	1	0	1
WEWP	1	0	1	0	1
WIFL	1	0	1	0	1
LEFL	3	0	3	0	3
DUFL	1	0	1	0	1
PSFL	60	1	61	1	62
SAPH	1	0	1	0	1
ATFL	1	0	1	0	1
WEKI	1	0	1	0	1
WAVI	6	0	6	0	6
HOWR	7	1	8	3	11
RCKI	3	0	3	0	3
BGGN	7	0	7	1	8
SWTH	11	0	11	1	12
HETH	6	0	6	0	6
YWAR	11	0	11	0	11
AUWA	28	0	28	1	29
BTYW	3	0	3	0	3
TOWA	3	0	3	0	3
THWH	1	0	1	0	1
WPWA	1	0	1	0	1
BLPW	2	0	2	0	2
MGWA	2	0	2	0	2
COYE	2	0	2	0	2
WIWA	5	0	5	1	6
YBCH	2	0	2	0	2
WETA	8	0	8	0	8
CHSP	3	0	3	0	3
BTSP	1	0	1	0	1
SAVS	1	0	1	0	1
LISP	2	0	2	1	3
WCSP	17	1	18	0	18
BHGR	3	0	3	0	3
BLGR	1	0	1	0	1

Species^a	# Individuals per Capture Incidence (Banded Birds Only)		Total # Individuals		
	1 Capture	2 Captures	Banded Birds	Unbanded Birds	All Birds
LAZB	2	0	2	0	2
LEGO	24	1	25	1	26
Total	232	4	236	17	253

^a See Appendix A for bird species codes.

Table 5. Number of bird captures by date: Point Loma, Fall 2010.

Species ^a	Banding Day																																				Total	Captures per 100 Net hours ^c
	1	2	3 ^b	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36		
	Date																																					
	8/16	8/19	8/23	8/26	8/30	8/31	9/1	9/2	9/3	9/7	9/8	9/9	9/10	9/13	9/14	9/15	9/16	9/17	9/20	9/21	9/22	9/23	9/24	9/27	9/28	9/29	9/30	10/1	10/4	10/5	10/7	10/8	10/12	10/13	10/14	10/15		
AMKE	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.09
BCHU	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.09
COHU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0.09
RUHU	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0.27
ALHU	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.09
NUWO	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.09
WEWP	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.09
WIFL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0.09
LEFL	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0.27
DUFL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.09
PSFL	1	0	0	0	1	1	1	1	0	0	3	5	4	3	3	5	2	1	0	0	7	3	1	1	7	1	3	1	1	1	0	2	1	1	0	2	63	5.70
SAPH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0.09
ATFL	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.09
WEKI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.09
WAVI	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	1	0	0	0	0	6	0.54
HOWR	0	1	0	1	1	0	0	0	0	0	1	1	1	0	0	2	0	0	0	0	0	1	0	2	0	0	0	1	0	0	0	0	0	0	0	0	12	1.09
RCKI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	3	0.27
BGGN	0	1	0	1	0	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	8	0.72
SWTH	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	3	1	2	2	0	0	1	0	0	0	1	12	1.09
HETH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	2	6	0.54
YWAR	0	0	0	1	1	2	0	0	0	1	1	0	1	0	0	0	0	0	0	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	11	1.00
AUWA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0	0	7	1	2	2	14	29	2.62	
BTYW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0.27
TOWA	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3	0.27
THWH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.09
WPWA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0.09
BLPW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0.18	

Species ^a	Banding Day																																				Total	Captures per 100 Net hours ^c
	1	2	3 ^b	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36		
	Date																																					
	8/16	8/19	8/23	8/26	8/30	8/31	9/1	9/2	9/3	9/7	9/8	9/9	9/10	9/13	9/14	9/15	9/16	9/17	9/20	9/21	9/22	9/23	9/24	9/27	9/28	9/29	9/30	10/1	10/4	10/5	10/7	10/8	10/12	10/13	10/14	10/15		
MGWA	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0.18
COYE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	2	0.18
WIWA	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	6	0.54
YBCH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2	0.18
WETA	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	1	0	1	1	0	2	0	0	0	0	0	0	0	0	0	8	0.72
CHSP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	3	0.27
BTSP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.09
SAVS	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.09
LISP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	3	0.27
WCSP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	1	10	3	2	0	0	19	1.72
BHGR	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0.27
BLGR	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.09
LAZB	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.18
LEGO	2	0	0	1	1	4	1	0	0	0	0	3	3	1	2	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	6	0	0	0	0	0	27	2.44
Captures/Day	7	3	0	6	5	8	3	3	1	1	9	12	11	9	6	10	3	1	1	2	12	14	6	7	18	9	8	4	4	2	8	22	8	10	4	20	257	23.26
Total Species	6	3	0	6	5	4	3	3	1	1	7	6	6	6	3	5	2	1	1	2	5	10	3	6	12	7	5	3	3	2	3	6	5	7	3	5	40	3.62

^a See Appendix A for bird species codes.

^b No migrants captured on this date

^c 1104:40 total net hours

Table 6. Sex and age of individual birds (banded and unbanded) captured: Point Loma, Fall 2010.

Species ^a	Female			Female Total	Male			Male Total	Unknown Sex			Unknown Total	Species Total
	Age ^b				Age ^b				Age ^b				
	HY	AHY	I		HY	AHY	I		HY	AHY	I		
AMKE	0	1	0	1	0	0	0	0	0	0	0	0	1
BCHU	0	0	0	0	1	0	0	1	0	0	0	0	1
COHU	0	0	0	0	0	0	0	0	1	0	0	1	1
RUHU	0	1	0	1	1	0	0	1	0	0	1	1	3
ALHU	0	1	0	1	0	0	0	0	0	0	0	0	1
NUWO	0	0	0	0	0	0	0	0	1	0	0	1	1
WEWP	0	0	0	0	0	0	0	0	1	0	0	1	1
WIFL	0	0	0	0	0	0	0	0	1	0	0	1	1
LEFL	0	0	0	0	0	0	0	0	0	1	2	3	3
DUFL	0	0	0	0	0	0	0	0	0	0	1	1	1
PSFL	0	0	0	0	0	0	0	0	56	0	6	62	62
SAPH	0	0	0	0	0	0	0	0	0	0	1	1	1
ATFL	0	0	0	0	0	0	0	0	0	0	1	1	1
WEKI	0	0	0	0	0	0	0	0	0	0	1	1	1
WAVI	0	0	0	0	0	0	0	0	4	1	1	6	6
HOWR	0	0	0	0	0	0	0	0	5	0	6	11	11
RCKI	0	0	0	0	0	0	0	0	0	0	3	3	3
BGGN	0	0	0	0	0	0	0	0	6	0	2	8	8
SWTH	0	0	0	0	0	0	0	0	5	3	4	12	12
HETH	0	0	0	0	0	0	0	0	2	1	3	6	6
YWAR	0	0	0	0	2	0	0	2	6	0	3	9	11
AUWA	3	4	2	9	11	4	3	18	0	0	2	2	29
BTYW	0	0	0	0	2	0	0	2	1	0	0	1	3
TOWA	0	0	0	0	2	0	0	2	1	0	0	1	3
THWH	0	0	0	0	0	0	0	0	1	0	0	1	1
WPWA	0	0	0	0	0	0	0	0	1	0	0	1	1
BLPW	0	0	0	0	0	0	0	0	2	0	0	2	2
MGWA	1	0	0	1	0	0	0	0	0	0	1	1	2
COYE	0	0	0	0	0	0	0	0	1	0	1	2	2
WIWA	0	1	0	1	2	0	0	2	2	0	1	3	6
YBCH	0	0	0	0	0	0	0	0	2	0	0	2	2
WETA	0	0	0	0	1	0	0	1	6	0	1	7	8
CHSP	0	0	0	0	0	0	0	0	3	0	0	3	3
BTSP	0	0	0	0	0	0	0	0	1	0	0	1	1
SAVS	0	0	0	0	0	0	0	0	1	0	0	1	1
LISP	0	0	0	0	0	0	0	0	2	0	1	3	3
WCSP	0	0	0	0	0	0	0	0	9	9	0	18	18
BHGR	1	0	0	1	1	0	0	1	1	0	0	1	3
BLGR	0	0	0	0	0	0	0	0	1	0	0	1	1
LAZB	0	0	0	0	1	0	0	1	1	0	0	1	2
LEGO	5	1	0	6	8	1	5	14	4	0	2	6	26
Total	10	9	2	21	32	5	8	45	128	15	44	187	253

^a See Appendix A for bird species codes.^b Age: HY=hatch year, AHY=after hatch year, I=indeterminable age

Fig. 6. Bird captures, net hours, and bird capture rate by net: Point Loma, Fall 2010. Total adjusted for one capture with unknown net number.

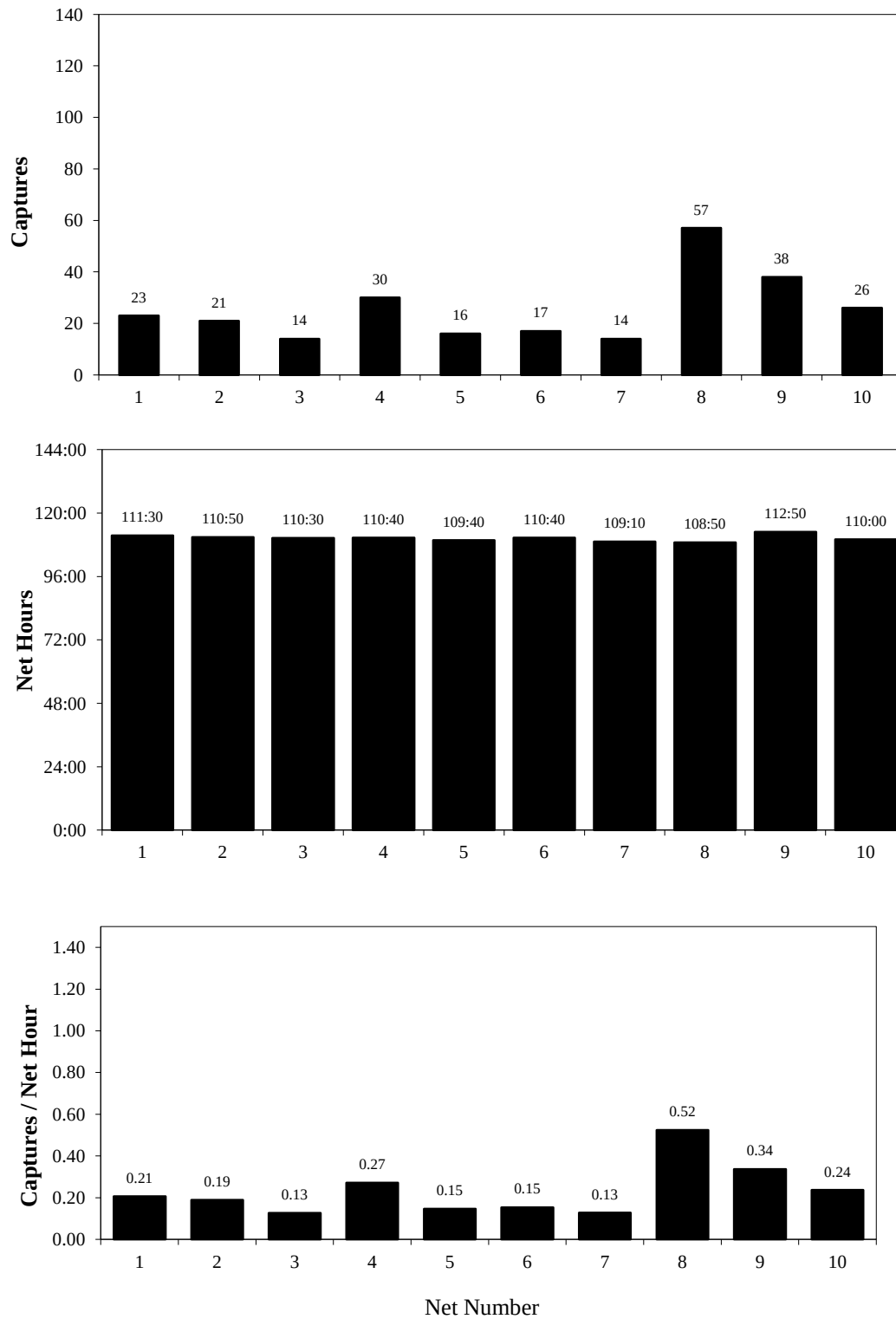


Table 7. First and median arrival dates of migratory species, Point Loma, Fall 2010.

Species ^a	First Arrival Date	Median Arrival Date ^b	N ^c
LAZB	16-Aug	23-Aug	2
BHGR	16-Aug	3-Sep	3
LEGO	16-Aug	10-Sep	26
PSFL	16-Aug	19-Sep	62
WAVI	16-Aug	27-Sep	6
ALHU	16-Aug		1
HOWR	19-Aug	10-Sep	11
BGGN	19-Aug	14-Sep	8
NUWO	19-Aug		1
RUHU	26-Aug	2-Sep	3
YWAR	26-Aug	8-Sep	11
AMKE	26-Aug		1
TOWA	30-Aug	22-Sep	3
WIWA	2-Sep	17-Sep	6
LEFL	8-Sep	20-Sep	3
WEWP	8-Sep		1
BLGR	8-Sep		1
MGWA	9-Sep	19-Sep	2
ATFL	9-Sep		1
WETA	10-Sep	25-Sep	8
BCHU	10-Sep		1
SWTH	13-Sep	30-Sep	12
SAVS	13-Sep		1
BTYW	15-Sep	16-Sep	3
BLPW	22-Sep	29-Sep	2
CHSP	23-Sep	28-Sep	3
LISP	23-Sep	28-Sep	3
DUFL	23-Sep		1
BTSP	23-Sep		1
WEKI	24-Sep		1
THWH	24-Sep		1
AUWA	27-Sep	14-Oct	29
YBCH	28-Sep	28-Sep	2
WCSP	28-Sep	8-Oct	18
COHU	28-Sep		1
WIFL	28-Sep		1
COYE	29-Sep	6-Oct	2
RCKI	12-Oct	13-Oct	3
HETH	12-Oct	13-Oct	6
SAPH	14-Oct		1
WPWA	15-Oct		1
Total Number of Captures			253

^a See Appendix A for bird species codes.

^b Median calculated for species with at least two individuals captured.

^c N = the total number of individuals per species.

APPENDIX C. Tables and additional figures,
Spring 2011, Point Loma, CA

Table 8. Number of birds captured, banded, and recaptured: Point Loma, Spring 2011.

Species ^a	IBP Code ^b	Total Captures ^c	Total Individuals Banded ^d	New Individuals Banded
COHU	08680	4	0	4
CAHU	08690	1	0	1
RUHU	08730	19	0	19
ALHU	08740	4	0	4
USHU	08774	14	0	14
WEWP	11380	2	2	2
WIFL	11475	2	2	2
HAFL	11510	7	7	7
PSFL	11555	35	34	35
COFL	11555	1	1	1
ATFL	11740	10	10	10
WAVI	12760	47	46	46
HOWR	14070	1	1	1
RCKI	14250	2	2	2
BGGN	14350	1	1	1
SWTH	14810	10	10	10
HETH	14820	8	8	8
PHAI	15590	1	1	1
NAWA	15670	24	22	22
YWAR	15750	3	3	3
AUWA	15800	2	2	2
BTYW	15810	12	12	12
TOWA	15840	30	30	30
THWH	15845	3	3	3
HEWA	15850	12	12	12
MGWA	16140	2	2	2
WIWA	16290	90	89	89
YBCH	16460	1	1	1
WETA	16840	4	4	4
GTTO	17790	1	1	1
CHSP	18020	5	3	5
BCSP	18070	2	2	2
LISP	18240	4	3	4
WTSP	18270	1	1	1
WCSP	18290	37	34	36
GCSP	18300	11	10	10
BHGR	18610	20	20	20
LAZB	18660	17	17	17
BUOR	19105	6	6	6
LEGO	19490	3	3	3
Total		459	405	453

^a See Appendix A for bird species codes.

^b Institute for Bird Populations Species Number Code.

^c Includes multiple captures of some individuals.

^d Does not include multiple captures of individuals.

Table 9. Bird capture rate by net and date: Point Loma, Spring 2011.

Banding Day	Date		Net										Totals by DATE
			1	2	3	4	5	6	7	8	9	10	
1	4/4/2011	Net Hours	3:00	3:00	3:10	3:20	3:00	2:20	0:00	2:20	3:00	3:00	26:10
		Captures	1	1	1	4	1	1	0	1	0	0	10
		Captures/Net hour	0.33	0.33	0.32	1.20	0.33	0.43	0.00	0.43	0.00	0.00	0.38
2	4/5/2011	Net Hours	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:00	30:00
		Captures	0	0	0	1	0	1	0	0	1	1	4
		Captures/Net hour	0.00	0.00	0.00	0.33	0.00	0.33	0.00	0.00	0.33	0.00	0.13
3	4/6/2011	Net Hours	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:00	3:00	30:00
		Captures	2	0	0	1	0	3	1	0	1	1	9
		Captures/Net hour	0.67	0.00	0.00	0.33	0.00	1.00	0.33	0.00	0.33	0.33	0.30
4	4/7/2011	Net Hours	3:00	0:40	3:00	2:20	1:00	3:00	3:00	3:10	3:10	3:00	25:20
		Captures	1	0	0	0	0	0	0	0	1	0	2
		Captures/Net hour	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.08
5	4/8/2011	Net Hours	3:00	3:00	3:00	0:00	1:00	0:40	1:50	3:00	0:00	2:40	18:10
		Captures	1	0	0	0	0	0	0	0	0	0	1
		Captures/Net hour	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
6	4/11/2011	Net Hours	3:20	3:10	3:20	3:00	3:10	3:10	3:10	3:10	3:20	3:20	32:10
		Captures	2	1	3	4	1	2	2	0	3	1	19
		Captures/Net hour	0.60	0.32	0.90	1.33	0.32	0.63	0.63	0.00	0.90	0.30	0.59
7	4/12/2011	Net Hours	3:10	3:00	3:00	3:00	3:00	3:10	3:00	3:00	3:10	3:10	30:40
		Captures	1	0	0	1	0	2	0	0	0	0	4
		Captures/Net hour	0.32	0.00	0.00	0.33	0.00	0.63	0.00	0.00	0.00	0.00	0.13
8	4/13/2011	Net Hours	3:10	3:00	3:00	0:00	3:10	3:20	3:00	3:00	1:10	3:20	26:10
		Captures	1	0	0	0	2	1	0	0	2	0	6
		Captures/Net hour	0.32	0.00	0.00	0.00	0.63	0.30	0.00	0.00	1.71	0.00	0.23
9	4/14/2011	Net Hours	3:00	3:00	3:00	3:10	3:10	3:10	3:00	3:00	3:00	3:00	30:30
		Captures	0	0	0	3	1	0	0	0	1	0	5
		Captures/Net hour	0.00	0.00	0.00	0.95	0.32	0.00	0.00	0.00	0.33	0.00	0.16
10	4/15/2011	Net Hours	3:10	3:20	3:10	3:00	3:20	3:20	3:00	3:10	3:10	3:20	32:00
		Captures	4	3	3	2	2	5	2	0	2	0	23
		Captures/Net hour	1.26	0.90	0.95	0.67	0.60	1.50	0.67	0.00	0.63	0.00	0.72

Banding Day	Date		Net										Totals by DATE
			1	2	3	4	5	6	7	8	9	10	
11	4/18/2011	Net Hours	3:00	2:50	3:30	3:30	2:00	3:20	3:20	3:10	2:50	3:10	30:40
		Captures	1	0	1	0	0	0	0	2	0	0	4
		Captures/Net hour	0.33	0.00	0.29	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.13
12	4/19/2011	Net Hours	3:10	3:10	3:00	3:10	3:00	3:10	3:00	3:10	3:20	3:10	31:20
		Captures	0	0	0	1	0	0	0	1	0	0	2
		Captures/Net hour	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.32	0.00	0.00	0.06
13	4/20/2011	Net Hours	3:20	3:30	3:40	3:40	2:50	3:10	3:10	3:20	3:20	3:20	33:20
		Captures	3	0	1	6	0	2	3	1	2	3	21
		Captures/Net hour	0.90	0.00	0.27	1.64	0.00	0.63	0.95	0.30	0.60	0.90	0.63
14	4/21/2011	Net Hours	3:00	3:00	3:00	2:50	2:40	2:40	3:00	3:10	3:00	3:00	29:20
		Captures	5	1	6	4	4	9	3	1	2	8	43
		Captures/Net hour	1.67	0.33	2.00	1.41	1.50	3.38	1.00	0.32	0.67	2.67	1.47
15	4/22/2011	Net Hours	3:00	3:00	3:00	3:20	3:10	3:20	3:20	3:20	3:00	3:10	31:40
		Captures	4	3	2	3	1	0	2	2	2	0	19
		Captures/Net hour	1.33	1.00	0.67	0.90	0.32	0.00	0.60	0.60	0.67	0.00	0.60
16	4/25/2011	Net Hours	3:20	3:20	3:20	3:20	2:50	3:00	3:00	2:40	3:20	3:20	31:30
		Captures	1	0	2	4	2	1	0	1	1	1	13
		Captures/Net hour	0.30	0.00	0.60	1.20	0.71	0.33	0.00	0.38	0.30	0.30	0.41
17	4/26/2011	Net Hours	3:50	3:10	3:10	3:20	3:30	1:00	3:30	3:20	4:00	3:00	31:50
		Captures	2	3	5	6	7	2	7	3	1	2	38
		Captures/Net hour	0.52	0.95	1.58	1.80	2.00	2.00	2.00	0.90	0.25	0.67	1.19
18	4/27/2011	Net Hours	3:30	3:10	3:20	3:20	4:00	4:10	4:00	4:10	3:20	3:20	36:20
		Captures	3	7	3	8	7	15	7	3	10	2	65
		Captures/Net hour	0.86	2.21	0.90	2.40	1.75	3.60	1.75	0.72	3.00	0.60	1.79
19	4/28/2011	Net Hours	3:10	2:30	3:00	3:10	3:00	3:10	3:00	3:10	3:00	3:00	30:10
		Captures	1	2	3	6	0	1	2	6	5	4	30
		Captures/Net hour	0.32	0.80	1.00	1.89	0.00	0.32	0.67	1.89	1.67	1.33	0.99
20	4/29/2011	Net Hours	3:20	3:10	3:20	3:00	2:00	3:00	3:20	3:20	3:20	3:40	31:30
		Captures	2	0	1	4	0	1	0	0	3	1	12
		Captures/Net hour	0.60	0.00	0.30	1.33	0.00	0.33	0.00	0.00	0.90	0.27	0.38

Banding Day	Date		Net										Totals by DATE
			1	2	3	4	5	6	7	8	9	10	
21	5/5/2011	Net Hours	5:30	4:50	4:50	5:10	5:10	5:00	4:10	5:20	5:40	5:40	51:20
		Captures	2	1	1	6	2	1	2	3	7	6	31
		Captures/Net hour	0.36	0.21	0.21	1.16	0.39	0.20	0.48	0.56	1.24	1.06	0.60
22	5/12/2011	Net Hours	5:10	5:20	5:10	5:00	4:40	4:50	2:50	4:20	5:00	4:30	46:50
		Captures	7	8	5	12	9	6	8	4	4	6	69
		Captures/Net hour	1.35	1.50	0.97	2.40	1.93	1.24	2.82	0.92	0.80	1.33	1.47
23	5/26/2011	Net Hours	5:00	5:10	4:50	5:10	4:50	4:50	4:40	4:50	5:00	5:00	49:20
		Captures	1	4	1	7	4	1	3	1	6	0	28
		Captures/Net hour	0.20	0.77	0.21	1.35	0.83	0.21	0.64	0.21	1.20	0.00	0.57
Totals by NET		Net Hours	79:10	74:20	77:50	71:50	70:30	72:50	70:20	77:10	74:10	78:10	746:20
		Captures ^a	45	34	38	83	43	54	42	29	54	36	458
		Captures/Net hour	0.57	0.46	0.49	1.16	0.61	0.74	0.60	0.38	0.73	0.46	0.61

^a Total adjusted for one capture with unknown net number.

Table 10. Capture frequency of individual birds: Point Loma, Spring 2011.

Species ^a	# Individuals per Capture Incidence (Banded Birds Only)		Total # Individuals		
	1 Capture	2 Captures	Banded Birds	Unbanded Birds	All Birds
COHU	0	0	0	4	4
CAHU	0	0	0	1	1
RUHU	0	0	0	19	19
ALHU	0	0	0	4	4
USHU	0	0	0	14	14
WEWP	2	0	2	0	2
WIFL	2	0	2	0	2
HAFL	7	0	7	0	7
PSFL	34	0	34	1	35
COFL	1	0	1	0	1
ATFL	10	0	10	0	10
WAVI	45	1	46	0	46
HOWR	1	0	1	0	1
RCKI	2	0	2	0	2
BGGN	1	0	1	0	1
SWTH	10	0	10	0	10
HETH	8	0	8	0	8
PHAI	1	0	1	0	1
NAWA	20	2	22	0	22
YWAR	3	0	3	0	3
AUWA	2	0	2	0	2
BTYW	12	0	12	0	12
TOWA	30	0	30	0	30
THWH	3	0	3	0	3
HEWA	12	0	12	0	12
MGWA	2	0	2	0	2
WIWA	88	1	89	0	89
YBCH	1	0	1	0	1
WETA	4	0	4	0	4
GTTO	1	0	1	0	1
CHSP	3	0	3	2	5
BCSP	2	0	2	0	2
LISP	3	0	3	1	4
WTSP	1	0	1	0	1
WCSP	33	1	34	2	36
GCSP	9	1	10	0	10
BHGR	20	0	20	0	20
LAZB	17	0	17	0	17
BUOR	6	0	6	0	6
LEGO	3	0	3	0	3
Total	399	6	405	48	453

^a See Appendix A for bird species codes.

Table 11. Number of bird captures by date: Point Loma, Spring 2011.

Species ^a	Banding Day																							Total	Captures per 100 Net Hours ^b
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
	Date																								
	4/4	4/5	4/6	4/7	4/8	4/11	4/12	4/13	4/14	4/15	4/18	4/19	4/20	4/21	4/22	4/25	4/26	4/27	4/28	4/29	5/5	5/12	5/26		
COHU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	1	0	4	0.54
CAHU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0.13
RUHU	4	1	0	0	0	2	0	1	1	6	0	0	0	0	0	0	0	3	1	0	0	0	0	19	2.54
ALHU	2	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0.54
USHU	0	1	0	0	0	5	0	0	1	3	0	1	0	1	0	0	0	0	1	0	0	1	0	14	1.87
WEWP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0.27
WIFL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0.27
HAFL	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	0	1	1	0	1	0	0	0	7	0.94
PSFL	0	0	0	0	0	0	0	0	0	0	0	0	1	5	1	0	5	3	7	1	1	10	1	35	4.69
COFL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0.13
ATFL	0	0	0	0	0	2	0	0	0	0	0	0	2	2	0	1	1	0	1	0	0	0	1	10	1.34
WAVI	0	0	1	0	0	0	0	1	0	0	0	0	2	4	4	1	5	4	4	1	2	8	10	47	6.29
HOWR	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.13
RCKI	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.27
BGGN	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.13
SWTH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2	6	0	10	1.34
HETH	1	1	2	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	1	0	0	8	1.07
PHAI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0.13
NAWA	0	0	1	1	0	0	2	1	0	2	0	1	1	1	2	0	2	7	1	2	0	0	0	24	3.21
YWAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	3	0.40
AUWA	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	0.27
BTYW	0	0	0	0	0	0	0	0	0	1	0	0	0	4	0	1	0	5	0	0	0	1	0	12	1.61
TOWA	0	0	0	1	0	0	0	0	0	0	0	0	1	3	0	0	1	10	0	1	2	10	1	30	4.02
THWH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	3	0.40
HEWA	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	8	1	0	0	2	0	12	1.61
MGWA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	2	0.27
WIWA	0	1	1	0	0	1	1	1	1	0	0	0	1	7	2	1	4	16	7	4	11	24	7	90	12.05

Species ^a	Banding Day																							Total	Captures per 100 Net Hours ^b
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
	Date																								
	4/4	4/5	4/6	4/7	4/8	4/11	4/12	4/13	4/14	4/15	4/18	4/19	4/20	4/21	4/22	4/25	4/26	4/27	4/28	4/29	5/5	5/12	5/26		
YBCH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0.13
WETA	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3	0	4	0.54
GTTO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0.13
CHSP	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	1	0	1	5	0.67
BCSP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2	0.27
LISP	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	4	0.54
WTSP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0.13
WCSP	1	0	1	0	0	3	0	2	0	5	0	0	8	7	1	3	0	4	2	0	0	0	0	37	4.95
GCSP	1	0	1	0	0	0	0	0	1	2	1	0	1	0	3	0	0	0	1	0	0	0	0	11	1.47
BHGR	1	0	0	0	0	1	1	0	0	0	0	0	0	4	1	2	8	2	0	0	0	0	0	20	2.68
LAZB	0	0	0	0	0	0	0	0	0	0	2	0	0	1	1	3	6	0	0	1	3	0	0	17	2.28
BUOR	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	1	1	0	0	0	1	0	6	0.80
LEGO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	0	3	0.40
Captures/Day ^c	10	4	9	2	1	19	4	6	5	23	4	2	21	43	19	12	38	66	30	12	29	69	28	459	61.45
Total Species ^d	6	3	8	2	1	9	3	5	4	9	3	1	11	14	12	8	12	14	13	8	14	11	11	38	5.09

^a See Appendix A for bird species codes.

^b 746:40 total net hours.

^c Includes multiple captures of some individuals.

^d Does not include unknown or hybrid (THWH).

Table 12. Sex and age of individual birds (banded and unbanded) captured: Point Loma, Spring 2011.

Species ^a	Female				Female Total	Male				Male Total	Unknown Sex				Unknown Total	Species Total
	Age ^b					Age ^b					Age ^b					
	AHY	SY	ASY	I		AHY	SY	ASY	I		AHY	SY	ASY	I		
COHU	0	0	0	0	0	0	0	0	1	1	0	0	0	3	3	4
CAHU	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1
RUHU	1	0	0	1	2	1	0	0	8	9	0	0	0	8	8	19
ALHU	0	0	0	0	0	2	0	0	1	3	0	0	0	1	1	4
USHU	0	0	0	1	1	0	0	0	3	3	0	0	0	10	10	14
WEWP	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
WIFL	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	2
HAFL	0	0	0	0	0	0	0	0	0	0	7	0	0	0	7	7
COFL	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
PSFL	0	0	0	0	0	0	0	0	0	0	31	1	1	2	35	35
ATFL	0	0	0	0	0	0	0	0	0	0	9	1	0	0	10	10
WAVI	0	0	0	0	0	0	0	0	0	0	41	2	1	2	46	46
HOWR	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
RCKI	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
BGGN	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
SWTH	0	0	0	0	0	0	0	0	0	0	7	1	2	0	10	10
HETH	0	0	0	0	0	0	0	0	0	0	5	0	3	0	8	8
PHAI	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
NAWA	1	1	0	0	2	4	2	4	0	10	10	0	0	0	10	22
YWAR	0	1	0	0	1	0	1	1	0	2	0	0	0	0	0	3
AUWA	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1	2
BTYW	1	1	0	0	2	1	1	1	0	3	7	0	0	0	7	12
TOWA	1	5	2	0	8	10	0	6	0	16	6	0	0	0	6	30
THWH	1	0	1	0	2	0	0	1	0	1	0	0	0	0	0	3
HEWA	0	0	1	0	1	0	1	1	0	2	9	0	0	0	9	12
MGWA	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	2
WIWA	5	8	6	0	19	20	5	9	0	34	31	0	5	0	36	89
YBCH	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
WETA	1	0	2	0	3	0	0	1	0	1	0	0	0	0	0	4
GTTO	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1

Species ^a	Female				Female Total	Male				Male Total	Unknown Sex				Unknown Total	Species Total
	Age ^b					Age ^b					Age ^b					
	AHY	SY	ASY	I		AHY	SY	ASY	I		AHY	SY	ASY	I		
CHSP	0	0	0	0	0	0	0	0	0	0	0	3	0	2	5	5
BCSP	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
LISP	0	0	0	0	0	0	0	0	0	0	3	0	0	1	4	4
WTSP	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
WCSP	0	0	0	0	0	0	0	0	0	0	29	3	2	2	36	36
GCSP	0	0	0	0	0	0	0	0	0	0	7	2	1	0	10	10
BHGR	4	0	4	0	8	3	2	5	0	10	2	0	0	0	2	20
LAZB	5	0	2	0	7	1	3	5	0	9	1	0	0	0	1	17
BUOR	0	0	1	0	1	3	0	1	0	4	1	0	0	0	1	6
LEGO	0	1	0	0	1	1	1	0	0	2	0	0	0	0	0	3
Total	24	18	19	2	63	48	16	35	14	113	216	13	17	31	277	453

^a See Appendix A for bird species codes.

^b Age: HY=hatch year, AHY=after hatch year, SY=second year, I=indeterminable age.

Fig. 7. Bird captures, net hours, and bird capture rate by net: Point Loma, Spring 2011. Total adjusted for one bird capture with unknown net number.

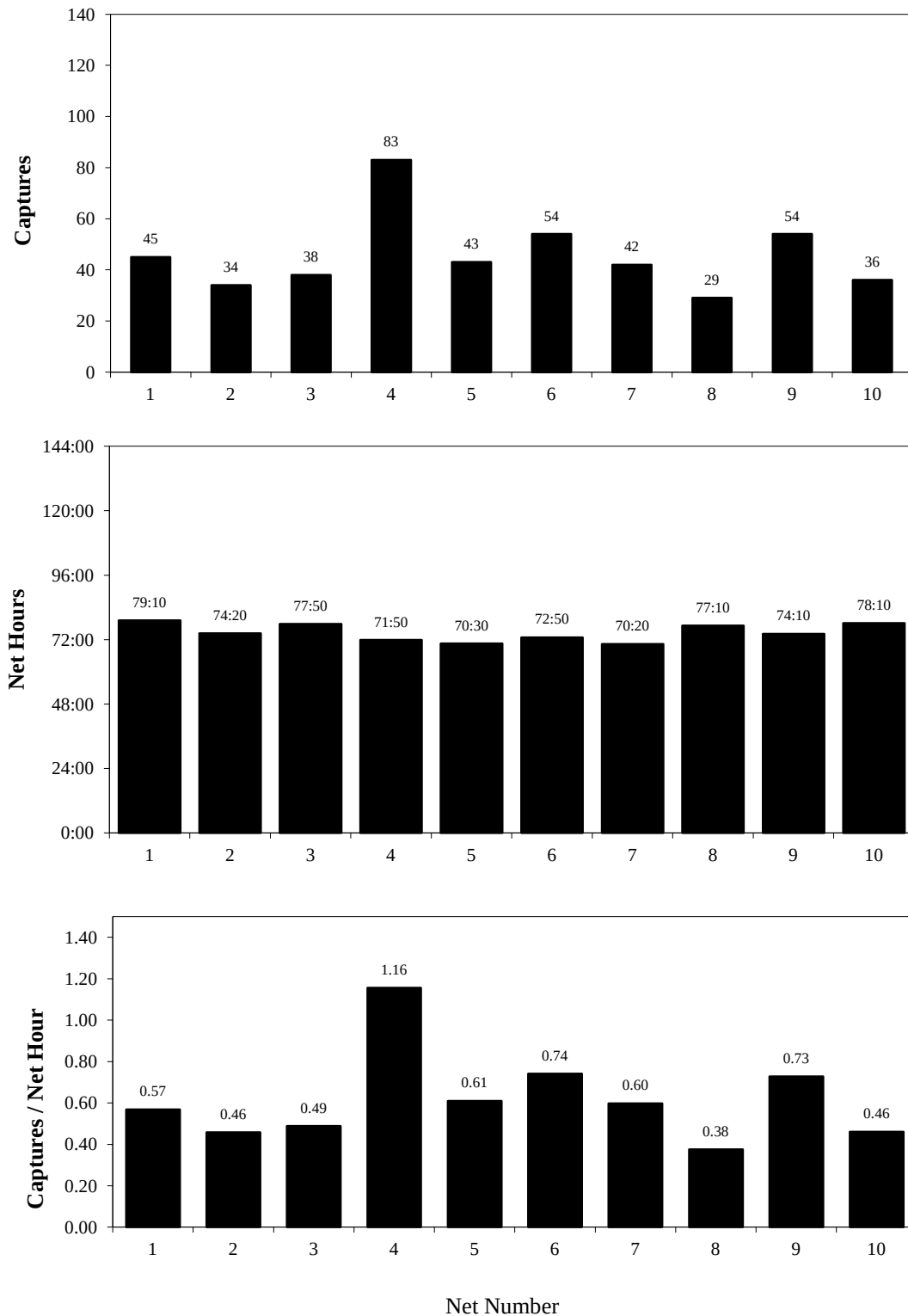


Table 13. First and median arrival dates of migratory species, Point Loma, Spring 2011.

Species ^a	First Arrival Date	Median Arrival Date ^b	N ^c
ALHU	4-Apr	9-Apr	4
HETH	4-Apr	10-Apr	8
RUHU	4-Apr	15-Apr	19
GCSP	4-Apr	16-Apr	10
WCSP	4-Apr	20-Apr	36
BHGR	4-Apr	25-Apr	20
USHU	5-Apr	14-Apr	14
WIWA	5-Apr	29-Apr	89
LISP	6-Apr	11-Apr	4
NAWA	6-Apr	24-Apr	22
WAVI	6-Apr	28-Apr	46
BGGN	6-Apr		1
TOWA	7-Apr	27-Apr	30
RCKI	8-Apr	9-Apr	2
AUWA	11-Apr	19-Apr	2
ATFL	11-Apr	21-Apr	10
HOWR	11-Apr		1
BUOR	15-Apr	24-Apr	6
BTYW	15-Apr	25-Apr	12
CHSP	15-Apr	29-Apr	5
LAZB	18-Apr	26-Apr	17
WETA	18-Apr	12-May	4
HAFL	20-Apr	22-Apr	7
PSFL	20-Apr	28-Apr	35
HEWA	21-Apr	27-Apr	12
COHU	22-Apr	1-May	4
SWTH	22-Apr	12-May	10
LEGO	25-Apr	5-May	3
BCSP	26-Apr	26-Apr	2
THWH	26-Apr	5-May	3
MGWA	27-Apr	11-May	2
CAHU	28-Apr		1
GTTO	28-Apr		1
YWAR	5-May	26-May	3
PHAI	5-May		1
YBCH	5-May		1
WTSP	5-May		1
WEWP	12-May	19-May	2
WIFL	26-May	26-May	2
COFL	26-May		1
Total Number of Captures			453

^a See Appendix A for bird species codes.

^b Median calculated for species with at least two individuals captured.

^c N = the total number of individuals per species.

APPENDIX D. Tables and additional figures,
MAPS 2011, Point Loma, CA

Table 14. Number of birds captured, banded, and recaptured: Point Loma, MAPS 2011.

Species ^a	IBP Code ^b	Total Captures ^c	Total Individuals Banded ^d	New Individuals Banded
CAQU	03130	1	0	1
ANHU	08670	55	0	55
COHU	08680	5	0	5
ALHU	08740	3	0	3
USHU	08774	1	0	1
UNHU	08775	4	0	4
WEWP	11380	3	3	3
WIFL	11475	2	2	2
DUFL	11530	1	1	1
PSFL	11555	12	11	12
COFL	11555	1	1	1
ATFL	11740	4	3	3
WAVI	12760	23	22	22
WESJ	13110	1	1	1
BUSH	13680	53	34	46
BEWR	14040	18	14	16
HOWR	14070	2	2	2
SWTH	14810	8	8	8
HETH	14820	1	1	1
WREN	15110	20	17	20
NOMO	15150	3	2	3
CATH	15270	12	12	12
PHAI	15590	1	1	1
OCWA	15660	81	57	74
YWAR	15750	3	3	3
BTYW	15810	1	1	1
TOWA	15840	13	13	13
THWH	15845	2	2	2
HEWA	15850	2	2	2
MGWA	16140	1	1	1
WIWA	16290	43	43	43
YBCH	16460	1	1	1
WETA	16840	3	3	3
SPTO	17810	27	21	27
CALT	17850	34	26	30
CHSP	18020	2	1	2
SOSP	18230	1	0	1
WTSP	18270	1	1	1
BHGR	18610	1	0	1
BLGR	18640	1	1	1
LAZB	18660	3	3	3
OROR	19040	1	1	1
HOOR	19050	13	13	13

Species^a	IBP Code^b	Total Captures^c	Total Individuals Banded^d	New Individuals Banded
BUOR	19105	2	2	2
HOFI	19370	8	7	8
LEGO	19490	11	11	11
AMGO	19510	1	1	1
Total		490	349	468

^a See Appendix A for bird species codes.

^b Institute for Bird Populations Species Number Code.

^c Includes multiple captures of some individuals.

^d Does not include multiple captures of individuals.

Table 15. Bird capture rate by net and date: Point Loma, MAPS 2011.

Banding Day	Date		Net										Totals by DATE
			1	2	3	4	5	6	7	8	9	10	
1	5/5/2011	Net Hours	5:30	4:50	4:50	5:10	5:10	5:00	4:10	5:20	5:40	5:40	51:20
		Captures	13	5	5	9	2	3	5	8	10	7	67
		Captures/Net hour	2.36	1.03	1.03	1.74	0.39	0.60	0.00	1.50	1.76	0.00	1.31
2	5/12/2011	Net Hours	5:10	5:20	5:10	5:00	4:40	4:50	2:50	4:20	5:00	4:30	46:50
		Captures	14	15	11	16	11	7	12	14	9	10	119
		Captures/Net hour	2.71	2.81	2.13	3.20	2.36	1.45	4.24	3.23	1.80	0.00	2.54
3	5/26/2011	Net Hours	5:00	5:10	4:50	5:10	4:50	4:50	4:40	4:50	5:00	5:00	49:20
		Captures	12	6	5	12	8	2	4	4	10	6	69
		Captures/Net hour	2.40	1.16	1.03	2.32	1.66	0.41	0.86	0.83	2.00	1.20	1.40
4	6/2/2011	Net Hours	5:10	5:00	5:00	5:10	5:00	4:40	4:50	4:50	5:10	5:00	49:50
		Captures	10	2	2	7	7	2	4	11	3	2	50
		Captures/Net hour	1.94	0.40	0.40	1.35	1.40	0.43	0.83	2.28	0.58	0.40	1.00
5	6/16/2011	Net Hours	5:20	5:00	4:50	5:00	4:00	5:10	5:00	5:10	4:50	4:40	49:00
		Captures	10	2	3	1	0	1	0	1	2	8	28
		Captures/Net hour	1.88	0.40	0.62	0.00	0.00	0.19	0.00	0.19	0.00	1.71	0.57
6	6/23/2011	Net Hours	5:10	5:00	5:30	5:00	5:10	4:50	5:10	5:10	5:10	5:20	51:30
		Captures	3	2	3	0	0	8	1	5	1	9	32
		Captures/Net hour	0.58	0.40	0.55	0.00	0.00	1.66	0.19	0.97	0.19	1.69	0.62
7	7/6/2011	Net Hours	5:30	5:00	4:50	5:00	4:20	4:40	4:40	5:00	5:10	5:10	49:20
		Captures	8	3	2	6	1	2	8	2	4	11	47
		Captures/Net hour	1.45	0.60	0.41	1.20	0.23	0.43	1.71	0.40	0.77	2.13	0.95
8	7/14/2011	Net Hours	5:20	4:20	4:50	4:20	4:50	4:30	5:10	5:10	4:50	4:50	48:10
		Captures	2	1	3	3	1	0	0	1	13	7	31
		Captures/Net hour	0.38	0.23	0.62	0.00	0.21	0.00	0.00	0.19	2.69	1.45	0.64
9	7/21/2011	Net Hours	4:50	4:50	4:50	4:50	4:50	5:00	5:00	5:00	5:00	5:00	49:10
		Captures	4	0	0	2	0	2	0	8	6	2	24
		Captures/Net hour	0.83	0.00	0.00	0.41	0.00	0.40	0.00	1.60	1.20	0.40	0.49

Banding Day	Date		Net										Totals by DATE
			1	2	3	4	5	6	7	8	9	10	
10	8/3/2011	Net Hours	5:10	5:10	4:50	4:40	4:50	4:20	1:40	0:40	5:20	5:10	41:50
		Captures	3	0	7	3	0	0	0	0	2	7	22
		Captures/Net hour	0.58	0.00	1.45	0.64	0.00	0.00	0.00	0.00	0.38	1.35	0.53
Totals by NET		Net Hours	52:10	49:40	49:30	49:20	47:40	47:50	43:10	45:30	51:10	50:20	486:20
		Captures ^a	79	36	41	59	30	27	34	54	60	69	489
		Captures/Net hour	1.51	0.72	0.83	1.20	0.63	0.56	0.79	1.19	1.17	1.37	1.01

^a Total adjusted for one capture with unknown net number.

Table 16. Capture frequency of individual birds: Point Loma, MAPS 2011.

Species ^a	# Individuals per Capture Incidence (Banded Birds Only)			Total # Individuals		
	1 Capture	2 Captures	3 Captures	Banded Birds	Unbanded Birds	All Birds
CAQU	0	0	0	0	1	1
ANHU	0	0	0	0	55	55
COHU	0	0	0	0	5	5
ALHU	0	0	0	0	3	3
USHU	0	0	0	0	1	1
UNHU	0	0	0	0	4	4
WEWP	3	0	0	3	0	3
WIFL	2	0	0	2	0	2
DUFL	1	0	0	1	0	1
PSFL	11	0	0	11	1	12
COFL	1	0	0	1	0	1
ATFL	2	1	0	3	0	3
WAVI	21	1	0	22	0	22
WESJ	1	0	0	1	0	1
BUSH	39	4	1	44	2	46
BEWR	13	2	0	15	1	16
HOWR	2	0	0	2	0	2
SWTH	8	0	0	8	0	8
HETH	1	0	0	1	0	1
WREN	20	0	0	20	0	20
NOMO	3	0	0	3	0	3
CATH	12	0	0	12	0	12
PHAI	1	0	0	1	0	1
OCWA	67	5	1	73	1	74
YWAR	3	0	0	3	0	3
BTYW	1	0	0	1	0	1
TOWA	13	0	0	13	0	13
THWH	2	0	0	2	0	2
HEWA	2	0	0	2	0	2
MGWA	1	0	0	1	0	1
WIWA	43	0	0	43	0	43
YBCH	1	0	0	1	0	1
WETA	3	0	0	3	0	3
SPTO	26	0	0	26	1	27
CALT	26	4	0	30	0	30
CHSP	1	0	0	1	1	2
SOSP	1	0	0	1	0	1
WTSP	1	0	0	1	0	1
BHGR	0	0	0	0	1	1
BLGR	1	0	0	1	0	1
LAZB	3	0	0	3	0	3

Species ^a	# Individuals per Capture Incidence (Banded Birds Only)			Total # Individuals		
	1 Capture	2 Captures	3 Captures	Banded Birds	Unbanded Birds	All Birds
OROR	1	0	0	1	0	1
HOOR	13	0	0	13	0	13
BUOR	2	0	0	2	0	2
HOFI	7	0	0	7	1	8
LEGO	11	0	0	11	0	11
AMGO	1	0	0	1	0	1
Total	372	19	2	390	78	468

^a See Appendix A for bird species codes.

Table 17. Number of bird captures by date: Point Loma, MAPS 2011.

Species ^a	Banding Day										Total	Captures per 100 Net Hours ^b
	1	2	3	4	5	6	7	8	9	10		
	Date											
	5/5	5/12	5/26	6/2	6/16	6/23	7/6	7/14	7/21	8/3		
CAQU	1	0	0	0	0	0	0	0	0	0	1	0.21
ANHU	5	14	9	16	3	1	3	3	1	0	55	11.32
COHU	1	1	0	1	0	1	0	1	0	0	5	1.03
ALHU	0	0	0	1	0	0	1	0	0	1	3	0.62
USHU	0	1	0	0	0	0	0	0	0	0	1	0.21
UNHU	1	0	1	0	0	1	1	0	0	0	4	0.82
WEWP	0	1	1	1	0	0	0	0	0	0	3	0.62
WIFL	0	0	2	0	0	0	0	0	0	0	2	0.41
DUFL	0	0	0	0	0	1	0	0	0	0	1	0.21
PSFL	1	10	1	0	0	0	0	0	0	0	12	2.47
COFL	0	0	1	0	0	0	0	0	0	0	1	0.21
ATFL	0	0	1	1	1	1	0	0	0	0	4	0.82
WAVI	2	8	10	3	0	0	0	0	0	0	23	4.73
WESJ	0	0	0	0	0	1	0	0	0	0	1	0.21
BUSH	0	6	1	6	0	9	6	10	9	6	53 ^c	10.91
BEWR	0	3	1	0	0	0	7	3	2	2	18	3.70
HOWR	0	0	0	0	0	0	0	1	0	1	2	0.41
SWTH	2	6	0	0	0	0	0	0	0	0	8	1.65
HETH	1	0	0	0	0	0	0	0	0	0	1	0.21
WREN	0	6	1	2	4	0	3	3	1	0	20	4.12
NOMO	0	0	0	0	2	0	1	0	0	0	3	0.62
CATH	1	1	1	1	1	1	0	3	0	3	12	2.47
PHAI	1	0	0	0	0	0	0	0	0	0	1	0.21
OCWA	20	15	20	8	7	2	2	2	1	4	81	16.67
YWAR	1	0	2	0	0	0	0	0	0	0	3	0.62
BTYW	0	1	0	0	0	0	0	0	0	0	1	0.21
TOWA	2	10	1	0	0	0	0	0	0	0	13	2.67
THWH	1	1	0	0	0	0	0	0	0	0	2	0.41
HEWA	0	2	0	0	0	0	0	0	0	0	2	0.41
MGWA	0	0	1	0	0	0	0	0	0	0	1	0.21
WIWA	11	24	7	1	0	0	0	0	0	0	43	8.85
YBCH	1	0	0	0	0	0	0	0	0	0	1	0.21
WETA	0	3	0	0	0	0	0	0	0	0	3	0.62
SPTO	4	1	1	2	1	3	8	1	3	3	27	5.56
CALT	4	1	4	2	4	6	4	2	5	2	34	7.00
CHSP	1	0	1	0	0	0	0	0	0	0	2	0.41
SOSP	0	0	0	1	0	0	0	0	0	0	1	0.21
WTSP	1	0	0	0	0	0	0	0	0	0	1	0.21
BHGR	0	0	0	0	0	0	0	1	0	0	1	0.21
BLGR	0	0	0	0	1	0	0	0	0	0	1	0.21

Species ^a	Banding Day										Total	Captures per 100 Net Hours ^b
	1	2	3	4	5	6	7	8	9	10		
	Date											
	5/5	5/12	5/26	6/2	6/16	6/23	7/6	7/14	7/21	8/3		
LAZB	3	0	0	0	0	0	0	0	0	0	3	0.62
OROR	0	0	0	0	0	1	0	0	0	0	1	0.21
HOOR	0	3	0	0	0	1	7	0	2	0	13	2.67
BUOR	0	1	0	0	0	0	1	0	0	0	2	0.41
HOFI	0	0	2	2	0	0	2	1	0	1	8	1.65
LEGO	2	0	0	2	3	3	1	0	0	0	11	2.26
AMGO	0	0	0	0	1	0	0	0	0	0	1	0.21
Captures/Day ^d	67	119	69	50	28	32	47	31	24	23	490	100.82
Total Species ^e	20	20	20	16	11	13	13	12	8	9	45	9.05

^a See Appendix A for bird species codes.

^b 486:20 total net hours.

^c Includes one banded bird with unknown band number, not included in Table 16.

^d Includes multiple captures of some individuals.

^e Does not include unknown or hybrid (THWH).

Table 18. Sex and age of individual birds (banded and unbanded) captured: Point Loma, MAPS 2011.

Species ^a	Female Age ^b					Female Total	Male Age ^b					Male Total	Unknown Sex Age ^b					Unknown Total	Species Total
	HY	AHY	SY	ASY	I		HY	AHY	SY	ASY	I		HY	AHY	SY	ASY	I		
CAQU	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
ANHU	5	6	0	0	6	17	16	5	0	0	4	25	4	0	0	0	9	13	55
COHU	0	0	0	0	0	0	1	2	0	0	0	3	0	0	0	0	2	2	5
ALHU	1	1	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	3
USHU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
UNHU	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	4	4
WEWP	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	3
WIFL	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	2
DUFL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
COFL	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
PSFL	0	0	0	0	0	0	0	0	0	0	0	0	0	10	1	0	1	12	12
ATFL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	3
WAVI	0	0	0	0	0	0	0	0	0	0	0	0	0	20	2	0	0	22	22
WESJ	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
BUSH	11	7	2	1	0	21	8	7	1	1	0	17	5	0	1	0	2	8	46
BEWR	0	1	0	0	0	1	0	0	0	0	0	0	12	3	0	0	0	15	16
HOWR	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2	2
SWTH	0	0	0	0	0	0	0	0	0	0	0	0	0	5	1	2	0	8	8
HETH	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
WREN	0	0	0	0	0	0	0	0	0	0	0	0	13	6	0	1	0	20	20
NOMO	0	0	0	1	0	1	0	0	0	0	0	0	1	0	0	1	0	2	3
CATH	0	0	0	0	0	0	0	0	0	0	0	0	7	5	0	0	0	12	12
PHAI	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
OCWA	0	8	10	10	0	28	0	5	6	9	0	20	17	8	0	0	1	26	74
YWAR	0	0	1	0	0	1	0	0	1	1	0	2	0	0	0	0	0	0	3
BTYW	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
TOWA	0	0	4	2	0	6	0	0	0	6	0	6	0	1	0	0	0	1	13
THWH	0	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2

Species ^a	Female Age ^b					Female Total	Male Age ^b					Male Total	Unknown Sex Age ^b					Unknown Total	Species Total
	HY	AHY	SY	ASY	I		HY	AHY	SY	ASY	I		HY	AHY	SY	ASY	I		
HEWA	0	0	0	1	0	1	0	0	1	0	0	1	0	0	0	0	0	0	2
MGWA	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
WIWA	0	3	8	5	0	16	0	3	3	2	0	8	0	13	1	5	0	19	43
YBCH	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
WETA	0	0	0	2	0	2	0	0	0	1	0	1	0	0	0	0	0	0	3
SPTO	0	2	1	2	0	5	0	2	0	5	0	7	14	0	0	0	1	15	27
CALT	0	2	0	0	0	2	0	8	0	0	0	8	16	3	1	0	0	20	30
CHSP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	2
SOSP	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
WTSP	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
BHGR	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
BLGR	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
LAZB	0	0	0	1	0	1	0	0	0	2	0	2	0	0	0	0	0	0	3
OROR	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1
HOOR	0	2	1	0	0	3	0	1	0	0	0	1	8	0	1	0	0	9	13
BUOR	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	1	2
HOFI	0	1	0	0	0	1	0	3	0	0	0	3	3	0	0	0	1	4	8
LEGO	6	3	1	0	0	10	0	0	1	0	0	1	0	0	0	0	0	0	11
AMGO	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1
Total	23	39	31	26	7	126	26	39	14	27	4	110	103	83	12	10	24	232	468

^a See Appendix A for bird species codes.

^b Age: HY=hatch year, AHY=after hatch year, SY=second year, ASY=after second year, I=indeterminable age

Fig. 8. Captures, net hours, and capture rate by net: Point Loma, MAPS 2011. Total adjusted for one capture with unknown net number.

