

Avian Diversity of Oak Woodland and Riparian
Communities in San Luis Obispo County, California

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Introduction

San Luis Obispo County is situated on the central coast of California and enjoys a Mediterranean climate with cool wet winters and warm dry summers. Over 400 species of birds have been documented within the county (Edell, 2002). This study compares avian diversity between riparian and oak woodland plant communities surrounding the Hi Mountain Lookout inside the Los Padres National Forest. The area is approximately 15 miles east of the city of San Luis Obispo. Vegetation in this area, on a large scale, is characterized by a mosaic of chaparral, oak woodland, and grassland intersected by narrow steep-sided oak/sycamore dominated riparian corridors. This is typical of San Luis Obispo county and the southern Coast Range of California. Avian communities were censused using the point count method at 50 1-hectare study plots. The Shannon-Wiener function was applied to create a diversity index for each of the two habitat types. Point counts are the standard method for monitoring population changes of breeding landbirds in the United States. Point counts allow tracking of yearly changes in bird populations at fixed points, differences in species composition between habitats, and abundance patterns of species (Ralph et al, 1993).

The null hypothesis states that the avian diversity in the oak woodland and riparian plots is equal. The alternative hypothesis states that the avian diversity in the oak woodland and riparian plots is not equal. Measuring diversity provides a way of assessing the ecological significance of a particular community across habitat types. A community with more diversity can be considered more important to bird populations on a whole than a community with lower diversity. Greater diversity would be expected within the riparian community due to habitat

features such as increased water and edge (Welty, 1988). Two wilderness areas, the Garcia and Santa Lucia, are found on the edge of our study area and indeed some of our plots were located within their boundaries.

This study is part of a larger involvement beginning in 2003 where baseline data was collected from oak woodland, chaparral, and riparian communities by California Polytechnic State University Biology Department students under the advise of Dr. Francis Villablanca. This is part of a long-term (25 year) undergraduate driven study assessing vegetative, avian, mammalian, herpetological, and invertebrate taxa for the Hi Mountain area. No previous widespread inventory of flora and fauna of this type have been attempted in the past for this area. The methods discussed below allow for quantitative measurement of communities over time.

Materials and Methods: Experimental Design and Plot Selection (Bohlman, 2003)

Geographic information systems (GIS) mapping was used to identify the dominant vegetation communities of the Hi Mountain area. Shape files were obtained from the San Luis Obispo county GIS database on Cal Poly's GIS server (<http://discover.lib.calpoly.edu/gis>) and compiled into a single ArcView database (Clay et al, 2001). The area surrounding the Hi Mountain Lookout was divided into representative vegetative communities. Primary vegetation communities were identified using a high-resolution vegetation shape file displayed in ArcView. San Luis Obispo county, Los Padres National Forest boundary, secondary roads, highways, and watershed shape files were projected on top of the vegetation shape file. A San Luis Obispo County sections grid was projected over the vegetation GIS map providing a connection of the GIS map to standard 7.5-minute topographic maps for the area.

A quarry was conducted to eliminate areas of vegetation, roadway, and watershed layers that fell outside of the Los Padres National Forest boundary. A second quarry eliminated all vegetation polygons (single vegetation types) that were not of sufficient size to contain the research design (minimum of 150 hectares of a single vegetation type, from which 25 one-hectare plots could be randomly chosen). Within each of these communities 25 one-hectare plots were randomly selected in order to maintain a minimal sample size (n) required to run an analysis of variance (ANOVA) and other statistical analyses with power. Finally mixed hardwood and riparian corridors located mainly along the Trout Creek watershed were isolated. Communities were identified and defined using California Vegetation (Holland and Keil, 1995).

Once identified, the two community's vegetative composition was ground-truthed for accuracy against the GIS shape-files. Global Positioning System (GPS) waypoints were taken at the intersection of roads and county sections occurring in the two plant communities within the Hi Mountain area. Each county section is approximately one square mile and can fit 256 one-hectare plots. Based on this information a one-hectare grid was overlaid onto each confirmed county section.

By placing the grid on a known point (based on collected GPS data above) the center of each prospective plot could be calculated through simple addition and subtraction of decimal degrees in 100 meter increments. Plots whose centers fell within 150 meters of a road were eliminated, as were those plots that straddled another vegetative community. The remaining viable plot centers were then entered into a handheld GPS unit as a unique waypoint. Plots were further assessed for potential workability (slope angle, accessibility, etc) by physically visiting each of their centers. Plots found to be too steep to safely survey and/or those too distant to

realistically access were eliminated from the pool of candidates. Plots were not eliminated based on vegetative characteristics (i.e. extremely dense chaparral, poison oak, etc.)

From the remaining pool of viable plots, 50 plots were randomly chosen within each community. The centers of the first 25 plots were surveyed and flagged. If a plot was ultimately found unsuitable for a survey it was discarded and the next plot on the list (#26) would be added until 25 plots were successfully surveyed. A list of plot names and GPS coordinates can be found in Table 1.

Avian Field Methods

Point count methods used in this study roughly follow those suggested by Ralph 1993. Point counts were conducted from the center of each of the fifty one-hectare plots (twenty-five oak woodland plots and twenty-five riparian plots). Each point was surveyed once in the breeding season between May 25 and June 3 (Table 2). Data was collected between 15 minutes after local sunrise and 1000 hours and recorded in a field notebook. Within this time period bird activity is relatively uniform and allows for good detection probability thus eliminating the bias from the highly active dawn chorus period and the significant drop off in activity that begins late morning and continues until late afternoon. Counts were done during favorable weather that did not reduce bird detectability. Plot centers were approached with minimal disturbance and counts began immediately upon reaching the center point and continued for five minutes. Individuals were separated as being detected during or after the first three minutes for comparison with the North American Breeding Bird Survey. Every individual detected from the point was tallied by species and whether it was within a fifty-meter radius of the point or outside the fifty-meter radius of the point (Table 3). Bird species that were detected flying over the hundred-meter

diameter circular plot were recorded as flyovers. Also any individuals flushed from the plot when approaching the center were also included in the tally. An effort was made not to double count individuals.

Analytical Methods

The Shannon-Weiner function, $H = \sum (p_i)(\log_2 p_i)$, was chosen to provide an index of diversity for each plot and each community where p_i equals the proportion of total individuals in the sample belonging to the i th species (Krebs, 1985). This function combines both the number of species and the evenness of allotment of individuals. A greater number of species increases the index, as does a more even allotment of individuals per species. Point count data was entered into Microsoft Excel to calculate two Shannon-Weiner diversity indices for each plot. The first index included all birds detected from the plot center. The second index only included birds detected within 50 meters of the plot center excluding flyovers. The diversity indices generated from oak woodland and riparian plots were then used in Minitab to perform multiple ANOVA's.

The diversity indices generated by the Shannon-Weiner function did not meet the normality assumption of ANOVA. The indices were squared to transform them into normal data sets. Two ANOVA's were performed, one including all individuals detected from the plot center and a second ANOVA including only the detections within 50 meters of the plot center excluding flyovers.

Data was also collected this same spring by another student who followed the identical field methods employed in this study (Messer, 2003). The same plots were surveyed by Messer, although on different days. Shannon-Weiner diversity indices were created using the above-mentioned formula from Messer's raw data and squared when needed to meet normality

assumptions. Two ANOVA's were completed on her data in the same manner as mentioned above. Additionally four ANOVA's were performed to determine if Messer's detections for each community differed significantly from the authors. Two ANOVA's per community were conducted, one including all detections from the plot center and one including only detections within 50 meters of the plot center excluding flyovers.

Results

The average diversity index for the plots was higher in the oak woodland than in the riparian community, 3.40 and 3.21 respectively (Table 4). This was true only when considering all detections from the plot center. When considering only detections within 50 meters of the plot center and excluding flyovers the average diversity index was greater in the riparian plots than in the oak woodland, 2.66 and 2.14 respectively.

An ANOVA between the two communities using data from all detections from the plot center revealed a F-value of 3.49 with an associated p-value of 0.068 thus accepting the null hypothesis that the avian diversity in the oak woodland and riparian plots is equal (Table 5). Computing the same ANOVA but including only detections within 50 meters excluding flyovers produced a F-value of 8.19 and a p-value of 0.006. In this case the null hypothesis is rejected in favor of the alternate hypothesis that the avian diversity in the oak woodland and riparian plots is not equal. When considering only detections within 50 meters and excluding flyovers there is a significant difference between avian diversity in oak woodland and riparian plots with the riparian plots having the highest level of diversity.

The average diversity index for the plots using Messer's data was higher in the oak woodland than in the riparian community (Table 6). An ANOVA of Messer's data using all

detections from the plot center produced a F-value of 7.95 and a p-value of 0.007 (Table 5). An ANOVA using data collected from within 50 meters of the plot center and excluding flyovers gave a F-value of 1.93 and a p-value of 0.171. Messer's data when using all detections from the plot center show a significant difference between the avian diversity of the two communities with a higher diversity in the oak woodland plots.

The four ANOVA's comparing Messer's and the authors diversity indices from oak woodland and riparian plots produced an average F-value of 37.93 and an average p-value of 0.009 all of which were less than 0.05 (Table 7). There is a significant difference between the average diversity indices produced from Messer's and the author's data. Therefore there is too much variance between our data sets and they are not similar enough to be pooled together into a single analysis.

Discussion

The plots in the oak woodland and riparian communities were found to have unequal avian diversity. The average diversity was higher in the oak woodland when considering analysis of all detections from the center of the plot. When using only detections within 50 meters of the plot center and excluding flyovers (only 6 out of 996 detections) then avian diversity is higher in the riparian community. Analysis of Messer's data showed higher diversity in oak woodland plots.

There were a number of problems when it came to analyzing the data. Many of the plots in this study were side-by-side contrary to the recommendations of Ralph et al. 1993. This allowed for individual birds to be counted multiple times as their territories undoubtedly overlapped multiple study plots. The lack of independent plots, a basic assumption for

statistical analysis that was somehow overlooked in the experimental design necessary for point count censusing, removes a lot of the statistical power of this study. For future studies in the Hi Mountain area new plots will need to be found which are a minimum of 250 meters apart, far enough away for the plots to be independent (Ralph et al, 1993).

Some independence can be gained by analyzing just the detections within 50 meters of the study plot center. When selectively looking at this data alone the plots in the riparian community compared to plots in the oak woodland community not only have higher average diversity but also are statistically different. If instead you analyze the data with all of the detections from the plot centers, which knowingly counted birds that were inside other nearby plots, the communities are statistically equal. A two sample t-test of 10 riparian and 8 oak woodland plots that were 250 meters apart from each other revealed higher diversity, $p = 0.021$, in the oak woodland plots (Table 8). This is the only statistically valid analysis computed with this data.

Taking a look at Messer's data all of her analysis points to higher diversity in the oak woodland plots. These results could potentially be misleading. The dates of her data collection span from May 10 to June 21, i.e. from the middle of the breeding season to the end of the breeding season (Table 9). 72% of the oak woodland plots were surveyed on May 10 and 11 and the majority of the riparian plots were surveyed in June during the end of the breeding season. Surveying the oak woodland plots significantly earlier in the breeding season than the riparian community can bias the data. Early in the breeding season you have the presence of migrants that can increase the amount of diversity in the community. Comparing this to another community sampled later in the season after the migrants have moved through may make the first community appear more diverse. Surveying a community late in the breeding season also

leads to biased data as many of the birds are becoming less conspicuous, vocalizing less, and beginning post-breeding dispersal. Plots that you wish to compare should be sampled relatively close in time to one another due to the seasonal changes in avian communities.

A look at 12 species of migrants in these surveys revealed that the author actually detected more migrants than did Messer, 26% versus 22% of total detections respectively (Table 10). One interesting observation this table shows is how many more migrants were detected in the riparian than in the oak woodland. Between Messer's and the author's data there were actually 1.8 times as many migrants detected in riparian than in the oak woodland. This is evidence of the significance of riparian communities to bird populations.

This work attempted to provide first year baseline data of a previously unstudied area in the Los Padres National Forest. Neglecting to sample plots that were independent of each other produced results that lacked statistical power and were difficult to interpret. Locating additional plots that are at least 250 meters apart and discarding plots that are closer than 250 meters from one another will allow this area to be surveyed indefinitely with the statistical power necessary to track changes in diversity and community structure. As long as there is an interest in this project by Cal Poly students this can be accomplished. It will lead to a better understanding of the changes in diversity of two of the dominant communities within the central coast of California.

Table 1. Plot names and GPS coordinates.

<u>Plot</u>	<u>Coordinates</u>		<u>Plot</u>	<u>Coordinates</u>	
H31245	35 15.793	120 24.949	R07079	35 14.915	120 24.481
H30019	35 16.988	120 24.303	R07078	35 14.915	120 24.546
H30054	35 16.882	120 24.108	R07077	35 14.915	120 24.611
H30016	35 16.829	120 24.043	R07103	35 14.968	120 24.741
H30015	35 16.829	120 24.108	R07102	35 14.968	120 24.806
H30031	35 16.776	120 24.108	R07099	35 14.968	120 25.001
H30032	35 16.776	120 24.043	R07098	35 14.968	120 25.066
H30030	35 16.640	120 24.124	R01116	35 14.974	120 25.214
H31184	35 15.740	120 24.429	R01114	35 15.004	120 25.337
H31253	35 15.793	120 24.303	R01115	35 15.000	120 25.275
H31252	35 15.793	120 24.429	R10190	35 14.418	120 21.400
H31251	35 15.793	120 24.559	R10187	35 14.471	120 21.465
H31182	35 15.740	120 24.559	R10192	35 14.630	120 21.725
H31181	35 15.740	120 24.624	R10225	35 14.482	120 21.855
H31250	35 15.793	120 24.624	R10188	35 14.736	120 21.855
H31234	35 15.846	120 24.624	R10191	35 14.736	120 21.790
H10178	35 14.630	120 21.660	R10189	35 14.683	120 21.790
H10097	35 14.683	120 21.530	R04237	35 14.929	120 22.235
H10147	35 17.736	120 21.595	R04236	35 14.929	120 22.300
H10151	35 14.842	120 21.530	R04223	35 14.982	120 22.365
H10166	35 14.842	120 21.595	R04174	35 15.141	120 22.960
H10148	35 14.895	120 21.725	R04173	35 15.141	120 22.755
H10134	35 14.842	120 21.790	R04208	35 15.141	120 22.820
H10145	35 14.736	120 21.725	R05182	35 15.276	120 23.181
H31235	35 15.846	120 24.559	R05181	35 15.278	120 23.244

*H = Oak woodland

**R = Riparian

***first two numbers of the plot refer to the county section

****last three numbers of the plot refer to the plot within the county section

Table 2. Dates surveyed.

Plot	Date	Plot	Date
H31245	5/25/2003	R07079	5/26/2003
H30019	5/25/2003	R07078	5/26/2003
H30054	5/25/2003	R07077	5/26/2003
H30016	5/25/2003	R07103	5/26/2003
H30015	5/25/2003	R07102	5/26/2003
H30031	5/25/2003	R07099	5/26/2003
H30032	5/25/2003	R07098	5/26/2003
H30030	5/25/2003	R01116	5/26/2003
H31184	5/25/2003	R01114	5/26/2003
H31253	5/25/2003	R01115	5/26/2003
H31252	5/25/2003	R10190	6/1/2003
H31251	5/25/2003	R10187	6/1/2003
H31182	5/25/2003	R10192	6/1/2003
H31181	5/25/2003	R10225	6/1/2003
H31250	5/25/2003	R10188	6/1/2003
H31234	5/25/2003	R10191	6/1/2003
H10178	6/1/2003	R10189	6/1/2003
H10097	6/1/2003	R04237	6/1/2003
H10147	6/1/2003	R04236	6/1/2003
H10151	6/1/2003	R04223	6/1/2003
H10166	6/1/2003	R04174	6/1/2003
H10148	6/1/2003	R04173	6/1/2003
H10134	6/1/2003	R04208	6/1/2003
H10145	6/1/2003	R05182	6/1/2003
H31235	6/3/2003	R05181	6/1/2003

Table 3. Point count data.

Plot	Species	< 50 M	> 50 M	FO	Plot	Species	< 50 M	> 50 M	FO
H31245	HOWR	2	0	0	H30016	MODO	0	1	0
H31245	CAQU	0	1	0	H30016	WREN	0	1	0
H31245	SPTO	0	2	0	H30016	SPTO	0	1	0
H31245	CALT	1	1	0	H30015	WESJ	2	2	0
H31245	OATI	1	0	0	H30015	OATI	1	0	0
H31245	ACWO	1	0	0	H30015	HOWR	0	1	0
H31245	BEWR	2	0	0	H30015	CAQU	0	2	0
H31245	ANHU	1	0	0	H30015	MOQU	0	2	0
H31245	WREN	0	2	0	H30015	MODO	0	2	0
H31245	STJA	1	1	0	H30015	BHGR	0	2	0
H31245	UNSW	1	0	0	H30015	WREN	0	2	0
H31245	ATFL	0	1	0	H30015	ACWO	0	3	0
H31245	ORJU	0	1	0	H30015	WBNU	0	1	0
H30019	MOQU	0	1	0	H30015	CALT	0	1	0
H30019	CAQU	1	0	0	H30015	LEGO	0	1	0
H30019	WREN	2	1	0	H30015	NUWO	0	2	0
H30019	BEWR	2	2	0	H30031	HOWR	1	1	0
H30019	ACWO	0	1	0	H30031	BGGN	1	0	0
H30019	BHGR	0	2	0	H30031	ACWO	2	2	0
H30019	OATI	2	0	0	H30031	MOQU	0	2	0
H30019	SPTO	1	2	0	H30031	CAQU	0	2	0
H30019	PSFL	1	0	0	H30031	WESJ	1	0	0
H30019	NUWO	1	0	0	H30031	BHGR	1	1	0
H30019	WESJ	0	1	0	H30031	NUWO	1	1	0
H30019	ATFL	0	1	0	H30031	WBNU	3	0	0
H30019	OCWA	0	1	0	H30031	HUVI	1	0	0
H30019	NOFL	1	0	0	H30031	SPTO	0	1	0
H30054	CALT	1	0	0	H30031	MODO	0	1	0
H30054	ACWO	3	3	0	H30031	OATI	2	0	0
H30054	WESJ	1	1	0	H30031	WREN	0	1	0
H30054	WREN	0	1	0	H30032	BHGR	1	1	0
H30054	OATI	1	1	0	H30032	MOQU	0	2	0
H30054	MOQU	0	2	0	H30032	CALT	2	0	0
H30054	BHGR	1	1	0	H30032	NUWO	0	3	0
H30054	VGSW	0	1	0	H30032	CAQU	0	1	0
H30054	HOWR	0	1	0	H30032	SPTO	1	1	0
H30054	CAQU	2	2	0	H30032	WREN	0	2	0
H30054	MODO	0	1	0	H30032	HUVI	0	1	0
H30054	BEWR	0	1	0	H30032	BEWR	0	1	0
H30054	SPTO	1	0	0	H30032	HOWR	0	2	0
H30054	ATFL	0	1	0	H30032	ACWO	2	2	0
H30016	MOQU	0	1	0	H30032	MODO	0	2	0
H30016	CAQU	1	2	0	H30032	BEWR	1	1	0
H30016	ACWO	3	2	0	H30032	ANHU	1	0	0
H30016	OATI	2	1	0	H30032	WBNU	0	2	0
H30016	BHGR	0	2	0	H30032	BGGN	1	0	0
H30016	HOWR	0	2	0	H30030	MODO	0	1	0
H30016	WBNU	1	1	0	H30030	MOQU	0	3	0
H30016	CALT	1	0	0	H30030	CAQU	3	2	0

Table 3. Point count data continued.

Plot	Species	< 50 M	> 50 M	FO	Plot	Species	< 50 M	> 50 M	FO
H30030	HOWR	1	0	0	H31251	WESJ	0	2	0
H30030	WESJ	1	2	0	H31251	WREN	0	1	0
H30030	BHGR	0	3	0	H31251	MODO	0	1	0
H30030	RSFL	0	1	0	H31182	STJA	1	0	0
H30030	SPTO	1	4	0	H31182	HOWR	2	1	0
H30030	WEWP	0	2	0	H31182	CAQU	0	2	0
H30030	ORJU	3	0	0	H31182	HUVI	1	2	0
H30030	ACWO	1	1	0	H31182	MOQU	0	2	0
H30030	WREN	0	2	0	H31182	OATI	0	1	0
H30030	NUWO	0	1	0	H31182	MODO	1	1	0
H31184	MOQU	0	1	0	H31182	WESJ	1	0	0
H31184	WESJ	1	3	0	H31182	SPTO	1	0	0
H31184	BUSH	1	0	0	H31181	PSFL	1	0	0
H31184	ACWO	0	2	0	H31181	SPTO	1	1	0
H31184	WREN	0	3	0	H31181	BHGR	1	0	0
H31184	SPTO	0	4	0	H31181	HUVI	1	1	0
H31184	STJA	0	2	0	H31181	OATI	0	2	0
H31184	WEWP	0	1	0	H31181	MODO	1	1	0
H31184	RSFL	0	2	0	H31181	ACWO	1	1	0
H31184	BHGR	0	1	0	H31181	WREN	1	1	0
H31184	MODO	0	1	0	H31181	MOQU	0	1	0
H31253	WREN	0	3	0	H31181	ATFL	0	1	0
H31253	RSFL	0	1	0	H31181	HOWR	0	1	0
H31253	ACWO	1	2	0	H31181	TUVU	0	0	1
H31253	MOQU	0	1	0	H31250	SPTO	0	3	0
H31253	CAQU	0	2	0	H31250	ACWO	0	1	0
H31253	WIWA	1	0	0	H31250	ATFL	2	1	0
H31253	BEWR	0	1	0	H31250	MOQU	0	1	0
H31253	WESJ	0	1	1	H31250	WESJ	2	1	0
H31253	HOWR	0	1	0	H31250	HOWR	0	3	0
H31253	MODO	0	1	0	H31250	MODO	1	2	0
H31252	SPTO	0	3	0	H31250	OATI	1	1	0
H31252	OATI	0	1	0	H31250	WBNU	0	1	0
H31252	RSFL	0	1	0	H31234	OATI	3	1	0
H31252	HOWR	0	2	0	H31234	MODO	1	2	0
H31252	HUVI	1	1	0	H31234	HUVI	0	2	0
H31252	WIWA	1	1	0	H31234	ATFL	0	2	0
H31252	CAQU	0	1	0	H31234	WREN	0	1	0
H31252	WREN	0	1	0	H31234	SPTO	1	1	0
H31252	BUSH	1	0	0	H31234	HOWR	0	1	0
H31252	WESJ	0	1	0	H31234	ACWO	1	3	0
H31251	ANHU	2	0	0	H31234	WESJ	0	1	0
H31251	SPTO	0	2	0	H31234	ANHU	1	0	0
H31251	BHGR	0	1	0	H10178	BGGN	2	0	0
H31251	OATI	0	1	0	H10178	HOWR	0	2	0
H31251	ACWO	0	2	0	H10178	CAQU	0	1	0
H31251	MOQU	0	1	0	H10178	PSFL	0	1	0
H31251	HOWR	0	1	0	H10178	WETA	0	2	0
H31251	HUVI	0	1	0	H10178	OCWA	0	1	0

Table 3. Point count data continued.

Plot	Species	< 50 M	> 50 M	FO	Plot	Species	< 50 M	> 50 M	FO
H10178	BHGR	0	2	0	H10166	WESJ	0	1	0
H10178	LEGO	2	1	0	H10166	WREN	1	0	0
H10178	ACWO	0	1	0	H10166	NUWO	1	1	0
H10178	MODO	0	1	0	H10166	WBNU	1	0	0
H10178	WBNU	0	1	0	H10166	HUVI	0	1	0
H10178	PUFI	0	1	0	H10166	ACWO	0	3	0
H10097	ANHU	2	0	0	H10166	BGGN	1	0	0
H10097	WREN	0	1	0	H10148	HOWR	1	1	0
H10097	ACWO	0	2	0	H10148	WESJ	0	3	0
H10097	ORJU	1	0	0	H10148	ANHU	1	1	0
H10097	SPTO	2	2	0	H10148	WREN	0	1	0
H10097	BHGR	0	1	0	H10148	HUVI	1	1	0
H10097	LEGO	1	0	0	H10148	SPTO	0	2	0
H10097	WESJ	0	1	0	H10148	MODO	0	1	0
H10097	WBNU	3	1	0	H10148	ACWO	1	0	0
H10097	PUFI	1	0	0	H10148	NUWO	0	1	0
H10097	MODO	0	2	0	H10148	BHGR	0	1	0
H10097	OATI	1	2	0	H10148	ATFL	0	2	0
H10097	ATFL	0	1	0	H10134	HOWR	1	0	0
H10097	PSFL	1	0	0	H10134	ACWO	0	2	0
H10147	ATFL	2	0	0	H10134	CAQU	0	1	0
H10147	WBNU	2	0	0	H10134	MODO	2	0	0
H10147	ORJU	0	1	0	H10134	OATI	0	1	0
H10147	OATI	3	0	0	H10134	SPTO	0	2	0
H10147	ACWO	5	2	0	H10134	RSFL	0	1	0
H10147	WAVI	0	1	0	H10134	HUVI	0	1	0
H10147	MODO	1	1	0	H10134	ANHU	1	0	0
H10147	PUFI	1	1	0	H10134	WAVI	0	1	0
H10147	ANHU	1	0	0	H10134	LEGO	1	0	0
H10147	WESJ	0	1	0	H10134	WBNU	0	1	0
H10147	HUVI	1	0	0	H10134	PUFI	0	1	0
H10151	SPTO	1	1	0	H10134	BEWR	0	1	0
H10151	WREN	0	2	0	H10145	PSFL	1	0	0
H10151	WESJ	1	1	0	H10145	HOWR	0	1	0
H10151	MODO	0	1	0	H10145	BHGR	0	1	0
H10151	ACWO	0	2	0	H10145	PUFI	1	2	0
H10151	HUVI	2	0	0	H10145	ORJU	0	2	0
H10151	LEGO	0	1	0	H10145	WBNU	0	1	0
H10151	PUFI	0	1	0	H10145	ANHU	1	0	0
H10151	HOWR	1	0	0	H10145	HUVI	0	1	0
H10151	PSFL	0	1	0	H10145	LEGO	2	0	0
H10166	ANHU	1	0	0	H10145	CAQU	0	1	0
H10166	CAQU	1	2	0	H10145	OATI	1	0	0
H10166	PUFI	0	1	0	H10145	ACWO	0	2	0
H10166	MODO	0	1	0	H31235	WESJ	2	0	0
H10166	ATFL	1	1	0	H31235	SPTO	0	4	0
H10166	SPTO	0	2	0	H31235	CAQU	0	2	0
H10166	LEGO	1	0	0	H31235	WBNU	2	1	0
H10166	HOWR	0	2	0	H31235	MODO	0	2	0

Table 3. Point count data continued.

Plot	Species	< 50 M	> 50 M	FO	Plot	Species	< 50 M	> 50 M	FO
H31235	ACWO	2	2	0	R07103	CAQU	3	2	0
H31235	OATI	2	0	0	R07103	SPTO	1	1	0
H31235	WREN	0	1	0	R07103	OCWA	0	1	0
H31235	STJA	1	0	0	R07103	ACWO	0	1	0
H31235	HUVI	0	1	0	R07103	ORJU	0	1	0
R07079	CAQU	4	2	0	R07103	BEWR	0	1	0
R07079	SPTO	1	0	0	R07103	VGSW	2	0	0
R07079	WREN	0	3	0	R07103	RSFL	0	1	0
R07079	BHGR	0	1	0	R07103	WREN	0	1	0
R07079	ACWO	1	2	0	R07103	BUSH	2	0	0
R07079	OATI	1	0	0	R07103	WBNU	1	0	0
R07079	WEWP	0	2	0	R07102	ANHU	2	0	0
R07079	WESJ	1	1	0	R07102	BHGR	0	1	0
R07079	HAWO	0	1	0	R07102	ATFL	0	1	0
R07079	ANHU	1	0	0	R07102	CALT	1	0	0
R07079	WBNU	1	0	0	R07102	BEWR	1	0	0
R07079	HOWR	1	0	0	R07102	SPTO	1	0	0
R07079	RSFL	0	1	0	R07102	CAQU	1	1	0
R07079	BUSH	3	0	0	R07102	OCWA	1	1	0
R07078	TUVU	0	0	1	R07102	WESJ	1	0	0
R07078	BHGR	0	2	0	R07102	RSFL	1	1	0
R07078	OATI	2	0	0	R07102	WBNU	3	0	0
R07078	WREN	1	2	0	R07102	HOWR	0	1	0
R07078	CAQU	0	1	0	R07102	OATI	2	0	0
R07078	ACWO	0	1	0	R07102	LEGO	2	0	0
R07078	BGGN	1	0	0	R07102	ACWO	0	0	1
R07078	CAQU	2	2	0	R07102	WREN	0	1	0
R07078	SPTO	0	3	0	R07102	HUVI	1	0	0
R07078	WEWP	0	1	0	R07099	CAQU	2	3	0
R07078	HUVI	0	1	0	R07099	BUSH	3	0	0
R07078	VGSW	0	0	1	R07099	BGGN	1	0	0
R07078	BEWR	0	1	0	R07099	SPTO	1	0	0
R07078	RSFL	0	1	0	R07099	WESJ	2	0	0
R07077	BHGR	1	0	0	R07099	WREN	0	2	0
R07077	ANHU	1	0	0	R07099	CALT	0	1	0
R07077	CAQU	1	2	0	R07099	HOWR	0	2	0
R07077	ACWO	1	0	0	R07099	ACWO	0	2	0
R07077	OATI	6	0	0	R07098	WESJ	2	0	0
R07077	BGGN	2	0	0	R07098	HOWR	2	1	0
R07077	WEWP	1	0	0	R07098	WREN	0	1	0
R07077	WTSW	0	0	1	R07098	BHGR	0	1	0
R07077	NUWO	2	0	0	R07098	CAQU	1	0	0
R07077	YWAR	2	0	0	R07098	SPTO	1	0	0
R07077	SPTO	0	1	0	R07098	ACWO	2	5	0
R07077	ATFL	0	1	0	R07098	OATI	1	0	0
R07077	HUVI	1	0	0	R07098	WBNU	0	1	0
R07103	BHGR	1	0	0	R07098	BGGN	1	0	0
R07103	WESJ	0	1	0	R07098	MODO	0	1	0
R07103	HOWR	2	0	0	R07098	ANHU	1	0	0

Table 3. Point count data continued.

Plot	Species	< 50 M	> 50 M	FO	Plot	Species	< 50 M	> 50 M	FO
R07098	MOQU	0	2	0	R10187	PSFL	1	0	0
R01116	ANHU	1	1	0	R10192	PSFL	1	2	0
R01116	BHGR	0	2	0	R10192	HOWR	3	1	0
R01116	CAQU	1	2	0	R10192	PUFI	1	1	0
R01116	ORJU	2	1	0	R10192	ANHU	1	0	0
R01116	HOWR	0	1	0	R10192	MODO	0	1	0
R01116	ACWO	0	2	0	R10192	WAVI	1	0	0
R01116	WREN	0	2	0	R10192	LEGO	1	0	0
R01114	CAQU	1	2	0	R10192	WEWP	1	0	0
R01114	BHGR	1	0	0	R10192	CAVI	1	0	0
R01114	MOQU	0	1	0	R10225	HOWR	2	1	0
R01114	ACWO	0	3	0	R10225	WBNU	1	1	0
R01114	WREN	0	3	0	R10225	OATI	2	0	0
R01114	SPTO	1	1	0	R10225	PUFI	0	1	0
R01114	OATI	1	0	0	R10225	BHGR	0	2	0
R01114	ORJU	0	2	0	R10225	SPTO	0	2	0
R01114	ANHU	1	0	0	R10225	ACWO	1	1	0
R01114	CATH	0	1	0	R10225	MODO	0	1	0
R01114	BEWR	1	0	0	R10225	CAQU	0	1	0
R01114	HOWR	0	1	0	R10225	HUVI	1	0	0
R01115	ORJU	2	1	0	R10225	ANHU	0	1	0
R01115	HOWR	2	0	0	R10225	WAVI	0	1	0
R01115	CATH	0	1	0	R10188	SPTO	2	1	0
R01115	WBNU	1	0	0	R10188	ANHU	2	0	0
R01115	ANHU	2	0	0	R10188	WAVI	2	1	0
R01115	SPTO	0	1	0	R10188	LEGO	1	0	0
R01115	OATI	1	1	0	R10188	PUFI	1	0	0
R01115	WREN	0	1	0	R10188	ORJU	2	0	0
R01115	BHGR	0	1	0	R10188	HOWR	2	1	0
R01115	ATFL	2	0	0	R10188	WBNU	1	0	0
R10190	PSFL	1	0	0	R10188	BEWR	1	0	0
R10190	HOWR	0	2	0	R10188	MODO	1	0	0
R10190	WAVI	1	0	0	R10188	OCWA	1	0	0
R10190	WREN	0	1	0	R10188	BHGR	1	0	0
R10190	SPTO	1	1	0	R10191	LEGO	3	0	0
R10190	MODO	1	0	0	R10191	SPTO	2	1	0
R10190	WETA	1	1	0	R10191	PSFL	0	1	0
R10190	BRCR	1	1	0	R10191	WAVI	1	1	0
R10190	ORJU	0	1	0	R10191	BHGR	1	1	0
R10187	WAVI	1	0	0	R10191	ANHU	2	0	0
R10187	CALT	1	0	0	R10191	ORJU	1	0	0
R10187	HOWR	1	2	0	R10191	WBNU	0	1	0
R10187	PUFI	1	2	0	R10191	OCWA	0	1	0
R10187	BRCR	2	0	0	R10191	HOWR	2	1	0
R10187	OATI	1	0	0	R10191	HUVI	0	1	0
R10187	WREN	0	1	0	R10191	ORJU	0	1	0
R10187	ANHU	1	0	0	R10189	CAVI	1	0	0
R10187	OCWA	0	1	0	R10189	ANHU	1	0	0
R10187	ORJU	0	2	0	R10189	PSFL	2	0	0

Table 3. Point count data continued.

Plot	Species	< 50 M	> 50 M	FO	Plot	Species	< 50 M	> 50 M	FO
R10189	ORJU	1	0	0	R04173	WESJ	1	0	0
R10189	WEWP	0	1	0	R04173	WBNU	0	1	0
R10189	LEGO	1	0	0	R04173	LEGO	0	1	0
R10189	WAVI	2	1	0	R04173	WREN	0	1	0
R10189	PUFI	2	0	0	R04173	NUWO	1	1	0
R10189	ATFL	1	0	0	R04173	SPTO	0	1	0
R10189	HOWR	1	1	0	R04173	ANHU	1	0	0
R10189	SPTO	1	0	0	R04173	BHGR	1	1	0
R10189	BHGR	0	1	0	R04173	WEWP	0	1	0
R10189	WBNU	1	0	0	R04208	HUVI	1	0	0
R04237	HOWR	3	1	0	R04208	HOWR	2	10	0
R04237	WAVI	2	1	0	R04208	WAVI	1	0	0
R04237	PSFL	2	0	0	R04208	ORJU	0	1	0
R04237	WBNU	2	1	0	R04208	OCWA	0	1	0
R04237	SPTO	2	1	0	R04208	WESJ	0	1	0
R04237	CAVI	1	0	0	R04208	SPTO	0	1	0
R04237	OCWA	1	0	0	R04208	PSFL	1	0	0
R04236	HOWR	3	1	0	R04208	WEWP	0	1	0
R04236	CAVI	1	0	0	R04208	BHGR	0	1	0
R04236	WAVI	3	0	0	R04208	WREN	0	1	0
R04236	PUFI	1	0	0	R04208	OATI	1	0	0
R04236	SPTO	1	1	0	R05182	HOWR	3	1	0
R04236	ANHU	1	0	0	R05182	SPTO	2	1	0
R04223	HUVI	2	0	0	R05182	BUSH	3	0	0
R04223	WAVI	2	1	0	R05182	MODO	0	1	0
R04223	HOWR	2	1	0	R05182	ACWO	1	0	0
R04223	DOWO	1	0	0	R05182	PSFL	1	0	0
R04223	CAVI	1	1	0	R05181	SPTO	1	2	0
R04223	PSFL	1	1	0	R05181	HUVI	0	1	0
R04223	ORJU	1	0	0	R05181	ORJU	0	1	0
R04223	SPTO	2	1	0	R05181	RSFL	0	2	0
R04223	WEWP	0	1	0	R05181	WESJ	1	1	0
R04223	MODO	0	1	0	R05181	OCWA	0	1	0
R04223	WBNU	1	0	0	R05181	WREN	0	1	0
R04174	WEWP	1	0	0	R05181	MODO	1	1	0
R04174	WESJ	1	1	0	R05181	BUSH	2	0	0
R04174	HOWR	2	0	0	R05181	WBNU	0	1	0
R04174	SPTO	1	0	0	R05181	OATI	1	0	0
R04174	MODO	1	0	0					
R04174	ORJU	1	0	0					
R04174	OCWA	0	1	0					
R04174	NUWO	0	1	0					
R04174	OATI	0	1	0					
R04174	WBNU	2	0	0					
R04174	HUVI	1	0	0					
R04173	HUVI	3	1	0					
R04173	HOWR	2	1	0					
R04173	ACWO	1	1	0					
R04173	ORJU	2	0	0					

* Four letter species codes listed in Appendix 1.

Table 4. Diversity indices.

Plot	Diversity Index*	Diversity Index**	Plot	Diversity Index*	Diversity Index**
H31245	2.92	3.62	R07079	2.90	3.50
H30019	2.91	3.59	R07078	1.92	3.59
H30054	2.65	3.49	R07077	2.97	3.38
H30016	2.16	3.23	R07103	2.69	3.57
H30015	0.92	3.55	R07102	3.45	3.97
H30031	3.03	3.65	R07099	2.20	2.97
H30032	2.73	3.88	R07098	2.91	3.29
H30030	2.37	3.49	R01116	1.50	2.74
H31184	1.00	3.24	R01114	2.58	3.41
H31253	2.00	3.16	R01115	2.52	3.20
H31252	1.58	3.19	R10190	2.58	3.09
H31251	0.00	3.37	R10187	2.95	3.29
H31182	2.52	3.03	R10192	2.85	2.92
H31181	2.81	3.50	R10225	2.24	3.47
H31250	1.92	3.03	R10188	3.50	3.41
H31234	2.13	3.12	R10191	2.69	3.43
H10178	1.00	3.46	R10189	3.38	3.57
H10097	2.86	3.57	R04237	2.72	2.66
H10147	2.73	3.11	R04236	2.37	2.36
H10151	1.92	3.24	R04223	3.09	3.31
H10166	3.00	3.76	R04174	2.92	3.38
H10148	2.00	3.35	R04173	2.86	3.52
H10134	1.92	3.73	R04208	2.25	2.65
H10145	2.25	3.45	R05182	2.17	2.35
H31235	2.28	3.15	R05181	2.25	3.34
Average	2.14	3.40		2.66	3.21

*Data of detections <50 meters from plot center excluding flyovers.

**Data of all detections from plot center.

Table 6. Messer's diversity indices.

Plot	Diversity Index*	Diversity Index**	Plot	Diversity Index*	Diversity Index**
H31245	2.93	1.75	R07079	1.25	2.04
H30019	1.50	2.75	R07078	0.00	2.50
H30054	2.11	3.22	R07077	1.58	2.93
H30016	2.12	2.50	R07103	2.00	3.01
H30015	1.00	2.71	R07102	1.06	1.70
H30031	2.73	2.98	R07099	2.32	3.37
H30032	2.25	3.45	R07098	1.52	2.45
H30030	2.58	2.52	R01116	1.58	2.69
H31184	1.00	2.50	R01114	0.00	2.24
H31253	0.54	2.33	R01115	1.92	2.78
H31252	2.24	3.02	R10190	1.92	2.05
H31251	1.00	3.02	R10187	2.25	2.16
H31182	2.50	3.04	R10192	2.32	2.50
H31181	1.50	3.04	R10225	0.99	2.25
H31250	2.25	2.59	R10188	2.16	2.64
H31234	1.56	2.79	R10191	2.13	2.26
H10178	1.37	1.88	R10189	2.13	2.82
H10097	1.50	2.66	R04237	1.51	1.72
H10147	2.17	2.97	R04236	1.25	1.99
H10151	2.19	2.82	R04223	2.00	2.16
H10166	2.24	2.87	R04174	1.56	2.47
H10148	0.00	3.11	R04173		
H10134	0.92	2.90	R04208	1.88	2.77
H10145			R05182	0.00	1.75
H31235	1.81	2.66	R05181	0.00	2.79
Average	1.75	2.75		1.47	2.42

*Data from detections <50 meters from plot center excluding flyovers.

**Data from all detections from plot center.

Table 7. Comparison by author of Messer's and author's data within community.

One-way ANOVA: Comparison of Oak woodland H-indices (<50 meters without flyovers, squared for normality).

```

Analysis of Variance for c2 squar
Source   DF      SS      MS      F      P
observer  1    30.41    30.41    4.58    0.038
Error    47   312.40     6.65
Total    48   342.81

```

```

Level      N      Mean      StDev
M          24    3.585    2.379
A          25    5.160    2.755

Individual 95% CIs For Mean
Based on Pooled StDev
-----+-----+-----+-----+-----+
(-----*-----)
(-----*-----)
-----+-----+-----+-----+-----+
Pooled StDev = 2.578          3.0      4.0      5.0      6.0

```

One-way Analysis of Variance: Comparison of Oak woodland H-indices (all detections).

```

Analysis of Variance for h-index
Source   DF      SS      MS      F      P
observer  1    5.095    5.095   49.51    0.000
Error    47    4.837     0.103
Total    48    9.932

```

```

Level      N      Mean      StDev
M          24    2.7533   0.3875
A          25    3.3984   0.2401

Individual 95% CIs For Mean
Based on Pooled StDev
-----+-----+-----+-----+-----+
(----*----)
(----*----)
-----+-----+-----+-----+-----+
Pooled StDev = 0.3208      2.75      3.00      3.25      3.50

```

One-way Analysis of Variance: Comparison of Riparian H-indices (<50 meters without flyovers, squared for normality).

```

Analysis of Variance for c5 squar
Source   DF      SS      MS      F      P
observer  1   253.17   253.17   53.37    0.000
Error    47   222.95     4.74
Total    48   476.12

```

```

Level      N      Mean      StDev
M          24    2.738    1.797
A          25    7.285    2.489

Individual 95% CIs For Mean
Based on Pooled StDev
-----+-----+-----+-----+-----+
(----*----)
(---*----)
-----+-----+-----+-----+-----+
Pooled StDev = 2.178      2.0      4.0      6.0      8.0

```

One-way Analysis of Variance: Comparison of Riparian H-indices (all detections).

```

Analysis of Variance for h-index
Source   DF      SS      MS      F      P
observer  1    7.768    7.768   44.24    0.000
Error    47    8.252     0.176
Total    48   16.020

```

```

Level      N      Mean      StDev
M          24    2.4183   0.4345
A          25    3.2148   0.4036

Individual 95% CIs For Mean
Based on Pooled StDev
-----+-----+-----+-----+-----+
(----*----)
(----*----)
-----+-----+-----+-----+-----+
Pooled StDev = 0.4190      2.45      2.80      3.15      3.50

```

* M = Messer, T = Author

Table 8. Two sample t-test and confidence interval for plots 250 meters apart.

Two sample T for H-index all detections

Community	N	Mean	StDev	SE Mean
Oak woodland	8	3.485	0.267	0.094
Riparian	10	3.132	0.407	0.13

95% CI for mu (oak woodland) - mu (riparian): (0.013, 0.69)

T-Test mu (oak woodland) = mu (riparian) (vs >): T = 2.21 P = 0.021 DF = 15

Table 9. Messer's dates surveyed.

Plot	Date	Plot	Date
H30015	5/10/2003	R07103	5/24/2003
H30019	5/10/2003	R07102	5/24/2003
H30016	5/10/2003	R07077	5/24/2003
H30031	5/10/2003	R10190	6/7/2003
H30032	5/10/2003	R10187	6/7/2003
H30054	5/11/2003	R10192	6/7/2003
H30044	5/11/2003	R10178	6/7/2003
H30030	5/11/2003	R10097	6/7/2003
H31235	5/11/2003	R10147	6/7/2003
H30250	5/11/2003	R10151	6/7/2003
H31251	5/11/2003	R10166	6/7/2003
H31182	5/11/2003	R10148	6/7/2003
H31181	5/11/2003	R10134	6/7/2003
H31252	5/11/2003	R10225	6/7/2003
H31253	5/11/2003	R10191	6/7/2003
H31184	5/11/2003	R10188	6/7/2003
H31234	5/11/2003	R10189	6/7/2003
H31245	5/11/2003	R04237	6/7/2003
R01114	5/24/2003	R05181	6/21/2003
R01115	5/24/2003	R05182	6/21/2003
R01116	5/24/2003	R04208	6/21/2003
R07098	5/24/2003	R04236	6/21/2003
R07099	5/24/2003	R04223	6/21/2003
R07078	5/24/2003	R04174	6/21/2003
R07079	5/24/2003		

Table 10. Migrants.

Author's migrants				Messer's migrants			
Oak woodland		Riparian		Oak woodland		Riparian	
Species	Detections	Species	Detections	Species	Detections	Species	Detections
ATFL	16	ATFL	5	BGGN	3	BGGN	7
BGGN	5	BGGN	5	BHGB	13	BHGR	7
BHGR	23	BHGR	20	EMPI s	2	CAVI	3
HOWR	32	CAVI	6	HOWR	27	HOWR	55
OCWA	2	HOWR	65	OCWA	1	PSFL	13
PSFL	6	OCWA	10	PSFL	1	Swallow sp.	3
Swallow sp.	1	PSFL	14	Swallow sp.	5	WAVI	4
VGSW	1	VGSW	3	WEWP	1	WETA	1
WAVI	2	WAVI	22			WEWP	6
WEWP	3	WETA	2				
WIWA	3	WEWP	10				
		YWAR	2				
Total	94		164	Total	53		99
258 out of 996 total detections = 26% migrants				152 out of 700 total detections = 22% migrants			

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Appendix 1. Four-letter species codes.

COMMON NAME	ALPHA CODE		
American Black Duck	ABDU	Arctic Loon	ARLO
American Black Oystercatcher	ABOY	Arctic Tern	ARTE
Abert's Towhee	ABTO	Arctic Warbler	ARWA
Acadian Flycatcher	ACFL	Ashy Storm-Petrel	ASSP
Aleutian Canada Goose	ACGO	Atlantic Brant	ATBR
Antillean Crested Hummingbird	ACHU	Ash-throated Flycatcher	ATFL
Acorn Woodpecker	ACWO	Atlantic Puffin	ATPU
Adelie Penguin	ADPE	American Tree Sparrow	ATSP
Adelaide's Warbler	ADWA	Audubon's Oriole	AUOR
African Penguin	AFPE	Audubon's Shearwater	AUSH
American Green-winged Teal	AGWT	Audubon's Warbler	AUWA
Arrow-headed Warbler	AHWA	American White Pelican	AWPE
Akekee	AKEK	Aztec Thrush	AZTH
Akepa	AKEP	Black x Atlantic Brant Intermediate	BABI
Akiapolau	AKIP	Bachman's Sparrow	BACS
Alder Flycatcher	ALFL	Bald Eagle	BAEA
Allen's Hummingbird	ALHU	Barrow's Goldeneye	BAGO
Altamira Oriole	ALOR	Bahama Swallow	BAHS
Aleutian Tern	ALTE	Baird's Sparrow	BAIS
American Avocet	AMAV	Bahama Mockingbird	BAMO
American Bittern	AMBI	Bananaquit	BANA
American Coot	AMCO	Band-rumped Storm-Petrel	BANP
American Crow	AMCR	Bank Swallow	BANS
American Dipper	AMDI	Baltimore Oriole	BAOR
American Goldfinch	AMGO	Bar-tailed Godwit	BARG
American Golden-Plover	AMGP	Barn Swallow	BARS
American Kestrel	AMKE	Baird's Sandpiper	BASA
American Oystercatcher	AMOY	Baikal Teal	BATE
American Pipit	AMPI	Bahama Woodstar	BAWO
American Redstart	AMRE	Black-and-White Warbler	BAWW
American Robin	AMRO	Bahama Yellowthroat	BAYE
American Wigeon	AMWI	Black-browed Albatross	BBAL
American Woodcock	AMWO	Black-billed Cuckoo	BBCU
Antillean Euphonia	ANEU	Buff-breasted Flycatcher	BBFL
Anhinga	ANHI	Blue-black Grassquit	BBGR
Anna's Hummingbird	ANHU	Broad-billed Hummingbird	BBLH
Anianiau	ANIA	Black-billed Magpie	BBMA
Antillean Mango	ANMA	Baltimore x Bullock's Oriole Hybrid	BBOH
Ancient Murrelet	ANMU	Black-bellied Plover	BBPL
Antillean Nighthawk	ANNI	Broad-billed Prion	BBPR
Antarctic Petrel	ANPE	Buff-breasted Sandpiper	BBSA
Antarctic Tern	ANTE	Bay-breasted Warbler	BBWA
Apapane	APAP	Black-bellied Whistling-Duck	BBWD
Aplomado Falcon	APFA	Black-backed Woodpecker	BBWO
		Black-capped Chickadee	BCCH

Brown-crested Flycatcher	BCFL
Black-capped Gnatcatcher	BCGN
Black-chinned Hummingbird	BCHU
Black-crowned Night-Heron	BCNH
Buff-collared Nightjar	BCNI
Black-cowled Oriole	BCOR
Bermuda Petrel	BCPE
Brown-capped Rosy-Finch	BCRF
Black-chinned Sparrow	BCSP
Black-crested Titmouse	BCTI
Black-capped Vireo	BCVI
Barred Owl	BDOW
Blue-eyed Cormorant	BECO
Bean Goose	BEGO
Berylline Hummingbird	BEHU
Belted Kingfisher	BEKI
Bewick's Swan	BESW
Bendire's Thrasher	BETH
Bell's Vireo	BEVI
Bewick's Wren	BEWR
Black-footed Albatross	BFAL
Blue-footed Booby	BFBO
Black-faced Grassquit	BFGR
Blue-gray Gnatcatcher	BGGN
Blue-gray Noddy	BGNO
Blue Greater Snow Goose	BGSG
Brown-headed Cowbird	BHCO
Black-headed Grosbeak	BHGR
Black-headed Gull	BHGU
Brown-headed Nuthatch	BHNU
Black-headed Parakeet	BHPA
Blue-headed Vireo	BHVI
Bishop's O'o	BIOO
Bicknell's Thrush	BITH
Black-tailed Godwit	BLAG
Black Brant	BLBR
Blue Bunting	BLBU
Blackburnian Warbler	BLBW
Black Drongo	BLDR
Lesser Snow Goose (Blue phase)	BLGO
Blue Grosbeak	BLGR
Black Guillemot	BLGU
Blue Jay	BLJA
Black-legged Kittiwake	BLKI
Black Noddy	BLNO
Blue Petrel	BLPE
Black Phoebe	BLPH

Blackpoll Warbler	BLPW
Black Rail	BLRA
Black Rosy-Finch	BLRF
Black Scoter	BLSC
Black Skimmer	BLSK
Black Storm-Petrel	BLSP
Black Swift	BLSW
Black Tern	BLTE
Black Turnstone	BLTU
Bluethroat	BLUE
Blue-throated Hummingbird	BLUH
Black Vulture	BLVU
Barn Owl	BNOW
Black-necked Stilt	BNST
Black-naped Tern	BNTE
Bobolink	BOBO
Boreal Chickadee	BOCH
Bonaparte's Gull	BOGU
Boreal Owl	BOOW
Bonin Petrel	BOPE
Botteri's Sparrow	BOSP
Bohemian Waxwing	BOWA
Brandt's Cormorant	BRAC
Brambling	BRAM
Brewer's Blackbird	BRBL
Brown Booby	BRBO
Brown Creeper	BRCR
Brown Jay	BRJA
Bronze Manakin	BRMA
Barnacle Goose	BRNG
Brown Noddy	BRNO
Bronzed Cowbird	BROC
Brown Pelican	BRPE
Bridled Quail-Dove	BRQD
Brown Shrike	BRSH
Brown Skua	BRSK
Brewer's Sparrow	BRSP
Bridled Tern	BRTE
Brown Thrasher	BRTH
Bridled Titmouse	BRTI
Brewster's Warbler	BRWA
Bridled White-eye	BRWE
Black-rumped Waxbill	BRWX
Belding's Savannah Sparrow	BSSP
Black-throated Blue Warbler	BTBW
Bristle-thighed Curlew	BTCU
Black-tailed Gnatcatcher	BTGN

Boat-tailed Grackle	BTGR
Band-tailed Gull	BTGU
Broad-tailed Hummingbird	BTLH
Black-throated Green Warbler	BTNW
Band-tailed Pigeon	BTPI
Black-throated Sparrow	BTSP
Black-throated Gray Warbler	BTYW
Buller's Albatross	BUAL
Bufflehead	BUFF
Buff-bellied Hummingbird	BUFH
Bumblebee Hummingbird	BUHU
Buller's Shearwater	BULS
Bullock's Oriole	BUOR
Burrowing Owl	BUOW
Bulwer's Petrel	BUPE
Bushtit	BUSH
Black-vented Oriole	BVOR
Black-vented Shearwater	BVSH
Black-backed Wagtail	BWAG
Broad-winged Hawk	BWHA
Blue-winged Teal	BWTE
Black-whiskered Vireo	BWVI
Blue-winged Warbler	BWWA
Cassin's Auklet	CAAU
Cackling Goose	CACG
Carolina Chickadee	CACH
Cactus Wren	CACW
Cattle Egret	CAEG
Caribbean Elaenia	CAEL
Cassin's Finch	CAFI
California Gnatcatcher	CAGN
Canada Goose	CAGO
California Gull	CAGU
Cardinal Honeyeater	CAHO
Calliope Hummingbird	CAHU
Cassin's Kingbird	CAKI
California Condor	CALC
California Towhee	CALT
Canyon Towhee	CANT
Canvasback	CANV
Canyon Wren	CANW
Caribbean Parakeet	CAPA
Cape Petrel	CAPE
Caribbean Coot	CARC
Carolina Wren	CARW
Cassin's Sparrow	CASP
Cave Swallow	CASW

Caspian Tern	CATE
California Thrasher	CATH
Cassin's Vireo	CAVI
Canada Warbler	CAWA
Cayenne Tern	CAYT
Chestnut-backed Chickadee	CBCH
Common Black Hawk	CBHA
Curve-billed Thrasher	CBTH
Chestnut-collared Longspur	CCLO
Clay-colored Robin	CCRO
Clay-colored Sparrow	CCSP
Cedar Waxwing	CEDW
Cerulean Warbler	CERW
Chestnut Manakin	CHMA
Chinstrap Penguin	CHPE
Chihuahuan Raven	CHRA
Christmas Shearwater	CHSH
Chipping Sparrow	CHSP
Chimney Swift	CHSW
Cinnamon Teal	CITE
Clark's Grebe	CLGR
Clark's Nutcracker	CLNU
Clapper Rail	CLRA
Cliff Swallow	CLSW
Cape May Warbler	CMWA
Common Canary	COCA
Common Chaffinch	COCH
Common Eider	COEI
Cordilleran Flycatcher	COFL
Common Ground-Dove	COGD
Common Goldeneye	COGO
Common Grackle	COGR
Cooper's Hawk	COHA
Costa's Hummingbird	COHU
Couch's Kingbird	COKI
Collared Kingfisher	COLK
Common Loon	COLO
Colima Warbler	COLW
Common Merganser	COME
Common Moorhen	COMO
Common Murre	COMU
Common Waxbill	COMW
Common Myna	COMY
Common Nighthawk	CONI
Connecticut Warbler	CONW
Cook's Petrel	COPE
Common Pochard	COPO

Common Poorwill	COPW
Common Raven	CORA
Common Redpoll	CORE
Common Rosefinch	CORO
Common Sandpiper	COSA
Cory's Shearwater	COSH
Common Snipe	COSN
Common Tern	COTE
Common Yellowthroat	COYE
Crested Auklet	CRAU
Crested Caracara	CRCA
Crested Honeycreeper	CRHO
Craveri's Murrelet	CRMU
Crested Myna	CRMY
Common Ringed Plover	CRPL
Crested Tern	CRTE
Crissal Thrasher	CRTH
Cape Sable Seaside Sparrow	CSSS
Chestnut-sided Warbler	CSWA
Cuban Grassquit	CUGR
Cuban Pewee	CUPE
Curlew Sandpiper	CUSA
Chuck-will's-widow	CWWI
Double-crested Cormorant	DCCO
Dusky-capped Flycatcher	DCFL
Dickcissel	DICK
Dove Prion	DOPR
Dovekie	DOVE
Downy Woodpecker	DOWO
Dark-rumped Petrel	DRPE
Dusky Flycatcher	DUFL
Dunlin	DUNL
Dusky Thrush	DUTH
Dusky Warbler	DUWA
Eastern Bluebird	EABL
Eared Grebe	EAGR
Eastern Kingbird	EAKI
Eastern Meadowlark	EAME
Eastern Phoebe	EAPH
Eastern Screech-Owl	EASO
Eastern Towhee	EATO
Eared Trogon	EATR
Eastern Wood-Pewee	EAWP
Eye Browed Thrush	EBTH
Eurasian Collared-Dove	ECDO
Eurasian Green-winged Teal	EGWT
Elepaio	ELEP

Elf Owl	ELOW
Elegant Tern	ELTE
Elegant Trogon	ELTR
Emperor Goose	EMGO
Emperor Penguin	EMPE
Eurasian Tree Sparrow	ETSP
Eastern Tufted Titmouse	ETTI
Eurasian Bullfinch	EUBU
Eurasian Dotterel	EUDO
European Goldfinch	EUGO
Eurasian Golden-Plover	EUGP
Eurasian Kestrel	EUKE
European Starling	EUST
Eurasian Wigeon	EUWI
European Woodcock	EUWO
Evening Grosbeak	EVGR
Eastern White-crowned Sparrow	EWCS
Elfin Woods Warbler	EWWA
Falcated Duck	FADU
Fairy Penguin	FAPE
Fairy Prion	FAPR
Flame-colored Tanager	FCTA
Ferruginous Hawk	FEHA
Ferruginous Pygmy-Owl	FEPO
Flesh-footed Shearwater	FFSH
Florida Grasshopper Sparrow	FGSP
Fish Crow	FICR
Fieldfare	FIEL
Field Sparrow	FISP
Flicker Intergrade	FLIN
Flammulated Owl	FLOW
Florida Scrub-Jay	FLSJ
Fox Sparrow	FOSP
Forster's Tern	FOTE
Franklin's Gull	FRGU
Five-striped Sparrow	FSSP
Fork-tailed Flycatcher	FTFL
Fork-tailed Storm-Petrel	FTSP
Fan-tailed Warbler	FTWA
Fulvous Whistling-Duck	FUWD
Greater Antillean Bullfinch	GABU
Gadwall	GADW
Greater Antillean Elaenia	GAEL
Greater Antillean Grackle	GAGR
Galapagos Penguin	GALP
Garganey	GARG
Groove-billed Ani	GBAN

Great Black-backed Gull	GBBG
Great Blue Heron	GBHE
Gray-breasted Martin	GBMA
Gray-backed Storm-Petrel	GBSP
Gull-billed Tern	GBTE
Gray-cheeked/Bicknell's Thrush	GCBT
Great Crested Flycatcher	GCFL
Golden-crowned Kinglet	GCKI
Gray-crowned Rosy-Finch	GCRF
Golden-crowned Sparrow	GCSP
Gray-cheeked Thrush	GCTH
Golden-cheeked Warbler	GCWA
Gray-crowned Yellowthroat	GCTH
Gentoo Penguin	GEPE
Golden-fronted Woodpecker	GFWO
Great Gray Owl	GGOW
Gray-headed Albatross	GHAL
Gray-headed Junco	GHJU
Great Horned Owl	GHOW
Gilded Flicker	GIFL
Gila Woodpecker	GIWO
Green Kingfisher	GKIN
Great Kiskadee	GKIS
Glaucous Gull	GLGU
Glossy Ibis	GLIB
Greater Necklaced Laughing-Thrush	GHLT
Golden Bishop	GOBI
Golden Eagle	GOEA
Golden-crowned Warbler	GOLW
Golden White-eye	GOWE
Gray Jay	GRAJ
Gray Kingbird	GRAK
Gray-backed Tern	GRAT
Gray Wagtail	GRAW
Gray Bunting	GRBU
Gray Catbird	GRCA
Great Cormorant	GRCO
Greater Akialoa	GREA
Greater Flamingo	GREF
Great Egret	GREG
Green Jay	GREJ
Greenish Elaenia	GREL
Green-breasted Mango	GREM
Gray Flycatcher	GRFL
Great Frigatebird	GRFR
Gray Hawk	GRHA
Green Heron	GRHE

Green Mango	GRMA
Greater Pewee	GRPE
Greater Roadrunner	GRRO
Greater Scaup	GRSC
Greater Shearwater	GRSH
Great Skua	GRSK
Grasshopper Sparrow	GRSP
Green Violet-ear	GRVE
Gray Vireo	GRVI
Grace's Warbler	GRWA
Greater Yellowlegs	GRYE
Gray-spotted Flycatcher	GSFL
Greater Snow Goose	GSGO
Green-throated Carib	GTCA
Great-tailed Grackle	GTGR
Green-tailed Towhee	GTTO
Guanay Cormorant	GUCO
Guam Swiflet	GUSW
Gambel's White-crowned Sparrow	GWCS
Greater White-fronted Goose	GWFG
Glaucous-winged Gull	GWGU
Great White Heron	GWHE
Golden-winged Warbler	GWWA
Gyrfalcon	GYRF
Hawaii Amakihi	HAAM
Hawaiian Coot	HACO
Hammond's Flycatcher	HAFL
Hawaiian Goose	HAGO
Hawaiian Moorhen	HAMO
Harlequin Duck	HARD
Harris's Sparrow	HASP
Hawaiian Stilt	HAST
Hawaiian Duck	HAWD
Hawfinch	HAWF
Hairy Woodpecker	HAWO
Hook-billed Kite	HBKI
Hawaii Creeper	HCRE
Hawaiian Crow	HCRO
Heermann's Gull	HEEG
Herring Gull	HERG
Henslow's Sparrow	HESP
Hepatic Tanager	HETA
Hermit Thrush	HETH
Hermit Warbler	HEWA
Hispaniolan Pewee	HIPE
House Finch	HOFI
Horned Grebe	HOGR

Horned Lark	HOLA
Hooded Merganser	HOME
Hooded Oriole	HOOR
Horned Puffin	HOPU
Hoary Redpoll	HORE
House Sparrow	HOSP
Hooded Warbler	HOWA
House Wren	HOWR
Hispaniolan Parakeet	HPKT
Hispaniolan Parrot	HPRT
Harlan's Hawk	HRLH
Harris's Hawk	HRSR
Hudsonian Godwit	HUGO
Humboldt Penguin	HUPE
Hutton's Vireo	HUVI
Hawaiian Hawk	HWAH
Hybrid Albatross	HYAL
Hybrid Chickadee	HYCH
Hybrid Common x Roseate Tern	HCRT
Hybrid Gull	HYGU
Hybrid Nonpasserine	HYNO
Hybrid Passerine	HYP A
Hybrid Sapsucker	HYSA
Hybrid Skua	HYSK
Hybrid Tern (not COTE x ROST, see 072.5)	HYTE
Hybrid Towhee	HYTO
Iceland Gull	ICGU
Indian Hill Myna	IHMY
Iiwi	IIFI
Indigo x Lazuli Bunting Hybrid	ILBH
Island Scrub-Jay	ILSJ
Indigo Bunting	INBU
Inca Dove	INDO
Ipswich Sparrow	IPSP
Ivory Gull	IVGU
Japanese Bush-Warbler	JABW
Jamaican Crow	JACR
Jamaican Elaenia	JAEL
Jamaican Euphonia	JAEU
Jamaican Mango	JAMA
Jamaican Oriole	JAOR
Jamaican Pewee	JAPE
Java Sparrow	JASP
Jamaican Tody	JATO
Japanese White-eye	Jawe
Juniper Titmouse	JUTI

Jamaican White-eyed Vireo	JWEV
Kauai Amakihi	KAAM
Kauai Creeper	KACR
Kamao (Large Kauai Thrush)	KAMA
Kauai O'o	KAoo
Kerguelen Petrel	KEPE
Kerguelen Tern	KETE
Kentucky Warbler	KEWA
King Eider	KIEI
Killdeer	KILL
Kittlitz's Murrelet	KIMU
King Penguin	KIPE
King Rail	KIRA
Kirtland's Warbler	KIWA
Key West Quail-Dove	KWQD
Laysan Albatross	LAAL
Laysan Duck	LADU
Laysan Finch	LAFI
Lawrence's Goldfinch	LAGO
Laughing Gull	LAGU
Lapland Longspur	LALO
Lanceolated Warbler	LANW
Lesser Antillean Pewee	LAPE
Lark Bunting	LARB
Lasagra's Flycatcher	LASF
Lark Sparrow	LASP
Lavender Waxbill	LAVW
Lawrence's Warbler	LAWA
Lazuli Bunting	LAZB
Lesser Black-backed Gull	LBBG
Long-billed Curlew	LBCU
Long-billed Dowitcher	LBDO
Little Blue Heron	LBHE
Long-billed Murrelet	LBMU
Large-billed Sparrow	LBSR
Long-billed Thrasher	LBTH
Least Bell's Vireo	LBVI
Ladder-backed Woodpecker	LBWO
Large Canada Goose	LCGO
Le Conte's Sparrow	LCSP
Le Conte's Thrasher	LCTH
Least Auklet	LEAU
Least Bittern	LEBI
Least Flycatcher	LEFL
Lesser Frigatebird	LEFR
Lesser Goldfinch	LEGO
Lesser Golden-Plover	LEGP

Least Grebe	LEGR
Lesser Nighthawk	LENI
Long-eared Owl	LEOW
Least Sandpiper	LESA
Lesser Antillean Bullfinch	LESB
Lesser Scaup	LESC
Lesser Antillean Flycatcher	LESF
Lesser Sheathbill	LESH
Least Tern	LETE
Lewis's Woodpecker	LEWO
Lesser Yellowlegs	LEYE
Leach's Storm-Petrel	LHSP
Little Bunting	LIBU
Little Gull	LIGU
Limpkin	LIMP
Little Shearwater	LISH
Little Tern	LITE
Lincoln's Sparrow	LISP
Light-mantled Sooty Albatross	LMSA
Loggerhead Kingbird	LOKI
Loggerhead Shrike	LOSH
Louisiana Waterthrush	LOWA
Lesser Snow Goose (White phase)	LSGO
Long-tailed Cuckoo	LTCU
Long-tailed Duck	LTDU
Long-tailed Jaeger	LTJA
Least Storm-Petrel	LTSP
Lucifer Hummingbird	LUHU
Lucy's Warbler	LUWA
Lesser White-fronted Goose	LWFG
Masked Booby	MABO
Macaroni Penguin	MACP
Maui Creeper	MACR
Mangrove Cuckoo	MACU
Masked Duck	MADU
Mariana Fruit-Dove	MAFD
Magnificent Frigatebird	MAFR
Marbled Godwit	MAGO
Magellanic Penguin	MAGP
Magellan Gull	MAGU
Magnificent Hummingbird	MAHU
Mallard	MALL
Marbled Murrelet	MAMU
Maui Parrotbill	MAPA
Mariana Crow	MARC
Manx Shearwater	MASH
Magnolia Warbler	MAWA

Marsh Wren	MAWR
Mallard x Black Duck Hybrid	MBDH
Many-colored Fruit Dove	MCFD
McCown's Longspur	MCLO
Mexican Chickadee	MECH
Mexican Duck	MEDU
Mew Gull	MEGU
Mexican Jay	MEJA
Melodius Laughing-Thrush	MELT
Merlin	MERL
MacGillivray's Warbler	MGWA
Middendorff's Grasshopper-Warbler	MIGW
Micronesian Honeyeater	MIHO
Mississippi Kite	MIKI
Millerbird	MILL
Micronesian Megapode	MIME
Micronesian Starling	MIST
McKay's Bunting	MKBU
Mountain Bluebird	MOBL
Mountain Chickadee	MOCH
Molokai Creeper	MOCR
Mourning Dove	MODO
Mottled Duck	MODU
Mongolian Plover	MONP
Mottled Petrel	MOPE
Mountain Plover	MOUP
Mourning Warbler	MOWA
Murphy's Petrel	MUPE
Mute Swan	MUSW
Mountain White-crowned Sparrow	MWCS
Myrtle Warbler	MYWA
Nashville Warbler	NAWA
Northern Beardless Tyrannulet	NBTY
Neotropic Cormorant	NECO
Newell's Shearwater	NESH
Northern Giant Petrel	NGPE
Northern Hawk Owl	NHOW
Nihoa Finch	NIFI
Nightingale Reed-Warbler	NIRW
Northern Cardinal	NOCA
Northwestern Crow	NOCR
Northern Fulmar	NOFU
Northern Gannet	NOGA
Northern Goshawk	NOGO
Northern Harrier	NOHA
Northern Jacana	NOJA
Northern Lapwing	NOLA

Northern Mockingbird	NOMO
Northern Parula	NOPA
Northern Pintail	NOPI
Northern Pygmy-Owl	NOPO
Northern Waterthrush	NOWA
Northern Wheatear	NOWH
Northern Rough-winged Swallow	NRWS
Northern Shoveler	NSHO
Northern Shrike	NSHR
Nelson's Sharp-tailed Sparrow	NSTS
Northern Saw-whet Owl	NSWO
Nutting's Flycatcher	NUFL
Nukupuu	NUKU
Nutmeg Manakin	NUMA
Nuttall's Woodpecker	NUWO
Nuttall's White-crowned Sparrow	NWCS
Oahu Amakihi	OAAM
Oahu Creeper	OACR
Oak Titmouse	OATI
Orange-billed Nightingale-Thrush	OBNT
Orange-crowned Warbler	OCWA
Orange-fronted Parakeet	OFPA
Other Hybrid Duck (not MALL x ABDU)	OHDU
Other Hybrid Goose (not LSGO x ROGO or BLBR x ATBR)	OHGO
Olive-capped Warbler	OLIW
Oloma'o (Molokai Thrush)	OLOM
Olive Sparrow	OLSP
Olive Warbler	OLWA
Omao (Hawaiian Thrush)	OMAO
Orangequit	ORAN
Orange-cheeked Waxbill	ORAW
Orange Bishop	ORBI
Oriental Greenfinch	ORGR
Oregon Junco	ORJU
Orchard Oriole	OROR
Olive-sided Flycatcher	OSFL
Osprey	OSPR
Olive Tree-Pipit	OLTP
O'u	OU
Ovenbird	OVEN
Orange-winged Parrot	OWPA
Parakeet Auklet	PAAU
Painted Bunting	PABU
Pacific Golden-Plover	PAGP
Parasitic Jaeger	PAJA

Pallas's Bunting	PALB
Palila	PALI
Pacific Loon	PALO
Pacific Pigeon	PAPI
Painted Redstart	PARE
Pauraque	PAUR
Pied-billed Grebe	PBGR
Purple-collared Fruit-Dove	PCFD
Plain-capped Starthroat	PCST
Pelagic Cormorant	PECO
Peregrine Falcon	PEFA
Pechora Pipit	PEPI
Pectoral Sandpiper	PESA
Pearly-eyed Thrasher	PETH
Pink-footed Goose	PFGO
Pink-footed Shearwater	PFSH
Phainopepla	PHAI
Phoenix Petrel	PHPE
Philippine Turtle-Dove	PHTD
Philadelphia Vireo	PHVI
Pine Grosbeak	PIGR
Pigeon Guillemot	PIGU
Pinyon Jay	PIJA
Piping Plover	PIPL
Pine Siskin	PISI
Pine Warbler	PIWA
Pileated Woodpecker	PIWO
Plain Pigeon	PLPI
Plumbeous Vireo	PLVI
Pomarine Jaeger	POJA
Polynesian Starling	POST
Po'ouli	POUL
Prairie Warbler	PRAW
Puerto Rican Emerald	PREM
Prairie Falcon	PRFA
Puerto Rican Flycatcher	PRFL
Puerto Rican Lizard-Cuckoo	PRLC
Puerto Rican Nightjar	PRNI
Prothonotary Warbler	PROW
Puerto Rican Parrot	PRPA
Puerto Rican Screech-Owl	PRSO
Puerto Rican Tanager	PRTA
Puerto Rican Tody	PRTO
Puerto Rican Vireo	PRVI
Puerto Rican Woodpecker	PRWO
Pacific-slope Flycatcher	PSFL
Puget Sound White-crowned Sparrow	PSWS

Pin-tailed Whydah	PTWH
Puaiohi (Small Kauai Thrush)	PUAI
Puerto Rican Bullfinch	PUEB
Purple Finch	PUFI
Purple Gallinule	PUGA
Purple Martin	PUMA
Purple Sandpiper	PUSA
Pygmy Nuthatch	PYNU
Pyrrhuloxia	PYRR
Razorbill	RAZO
Red-breasted Flycatcher	RBFL
Rose-breasted Grosbeak	RBGR
Ring-billed Gull	RBGU
Red-billed Leiothrix	RBLE
Red-breasted Merganser	RBME
Red-breasted Nuthatch	RBNU
Red-billed Pigeon	RBPI
Rufous-backed Robin	RBRO
Red-breasted Sapsucker	RBSA
Red-billed Tropicbird	RBTR
Red-bellied Woodpecker	RBWO
Red-crested Cardinal	RCCA
Red-cheeked Cordonbleu	RCCO
Ruby-crowned Kinglet	RCKI
Red-crowned Parrot	RCPA
Rufous-crowned Sparrow	RCSP
Rufous-capped Warbler	RCWA
Red-cockaded Woodpecker	RCWO
Red Avadavat	REAV
Reed Bunting	REBU
Red Crossbill	RECR
Redhead	REDH
Redwing	REDW
Reddish Egret	REEG
Western Reef Heron	REHE
Red Knot	REKN
Red Phalarope	REPH
Red Siskin	RESI
Red-eyed Vireo	REVI
Red-flanked Bluetail	RFBL
Red-footed Booby	RFBO
Red-faced Cormorant	RFCO
Red-faced Warbler	RFWA
Rhinoceros Auklet	RHAU
Red-headed Woodpecker	RHWO
Ringed Kingfisher	RIKI
Ringed Turtle-Dove	RITD

Rough-legged Hawk	RLHA
Red-legged Kittiwake	RLKI
Red-legged Thrush	RLTH
Ring-necked Duck	RNDU
Red-necked Grebe	RNGR
Red-necked Phalarope	RNPH
Red-naped Sapsucker	RNSA
Red-necked Stint	RNST
Royal Albatross	ROAL
Rockhopper Penguin	ROCP
Ross's Goose	ROGO
Ross's Gull	ROGU
Roadside Hawk	ROHA
Rock Sandpiper	ROSA
Roseate Spoonbill	ROSP
Roseate Tern	ROST
Rock Wren	ROWR
Royal Penguin	ROYP
Royal Tern	ROYT
Red-shafted Flicker	RSFL
Red-shouldered Hawk	RSHA
Rose-throated Becard	RTBE
Red-tailed Hawk	RTHA
Ruby-throated Hummingbird	RTHU
Red-throated Loon	RTLO
Red-throated Pipit	RTPI
Rufous-throated Solitaire	RTSO
Red-tailed Tropicbird	RTTR
Rusty Blackbird	RUBL
Rustic Bunting	RUBU
Ruddy Duck	RUDU
Rufous Fantail	RUFA
Ruff	RUFF
Rufous-tailed Hummingbird	RUFH
Rufous-collared Sparrow	RUFS
Ruddy Ground-Dove	RUGD
Rufous Hummingbird	RUHU
Ruddy Quail-Dove	RUQD
Ruddy Turnstone	RUTU
Red-vented Bulbul	RVBU
Red-winged Blackbird	RWBL
Red-whiskered Bulbul	RWBU
Rufous-winged Sparrow	RWSP
Sandhill Crane	SACR
Saffron Finch	SAFI
Sad Flycatcher	SAFL
Sage Sparrow	SAGS

Sabine's Gull	SAGU
Sanderling	SAND
Say's Phoebe	SAPH
Samoan Starling	SAST
Sandwich Tern	SATE
Sage Thrasher	SATH
Savannah Sparrow	SAVS
Smooth-billed Ani	SBAN
Southern Black-backed Gull	SBBG
Short-billed Dowitcher	SBDO
Sulphur-bellied Flycatcher	SBFL
Lesser Snow Goose (Intermed. phase)	SBGI
Slaty-backed Gull	SBGU
Spotted x Barred Owl Hybrid	SBOH
Small Canada Goose	SCGO
Scarlet Ibis	SCIB
Slate-colored Junco	SCJU
Scott's Oriole	SCOR
Scarlet Tanager	SCTA
Short-eared Owl	SEOW
Semipalmated Plover	SEPL
Semipalmated Sandpiper	SESA
Seaside Sparrow	SESP
Sedge Wren	SEWR
Southern Giant Petrel	SGPE
Shy Albatross	SHAL
Sharp-tailed Sandpiper	SHAS
Shiny Cowbird	SHCO
Shy Ground-Dove	SHGD
Short-tailed Shearwater	SHOS
Stripe-headed Tanager	SHTA
Southern House Wren	SHWR
Siberian Accentor	SIAC
Siberian Flycatcher	SIFL
Siberian Rubythroat	SIRU
Siberian Tit	SITI
Sky Lark	SKLA
Slate-throated Redstart	SLAR
Smith's Longspur	SMLO
Snow Bunting	SNBU
Snowy Egret	SNEG
Snail Kite	SNKI
Snowy Owl	SNOW
Snow Petrel	SNPE
Scaly-naped Pigeon	SNPI
Snowy Plover	SNPL
Snowy Sheathbill	SNSH

Sooty Albatross	SOAL
Southern Fulmar	SOFU
Sora	SORA
Solitary Sandpiper	SOSA
Sooty Shearwater	SOSH
Song Sparrow	SOSP
Sooty Tern	SOTE
Solitary Vireo	SOVI
Spotted Dove	SPDO
Spectacled Eider	SPEI
Spot-breasted Oriole	SPOO
Spoonbill Sandpiper	SPOS
Spotted Owl	SPOW
Sprague's Pipit	SPPI
Spotted Sandpiper	SPSA
South Polar Skua	SPSK
Spotted Towhee	SPTO
Snow x Ross's Goose Hybrid	SRGH
Sharp-shinned Hawk	SSHA
Saltmarsh Sharp-tailed Sparrow	SSTS
Short-tailed Albatross	STAL
Steller's Eider	STEI
Scissor-tailed Flycatcher	STFL
Short-tailed Hawk	STHA
Steller's Jay	STJA
Swallow-tailed Kite	STKI
Stolid Flycatcher	STOF
Streak-backed Oriole	STRO
Streaked Shearwater	STRS
Stilt Sandpiper	STSA
Sharp-tailed Sparrow	STSP
Short-tailed Swift	STSW
Streamertail	STTL
Strickland's Woodpecker	STWO
Surfbird	SURF
Surf Scoter	SUSC
Summer Tanager	SUTA
Sutton's Warbler	SUWA
Southwestern Willow Flycatcher	SWFL
Swainson's Hawk	SWHA
Swamp Sparrow	SWSP
Swainson's Thrush	SWTH
Swainson's Warbler	SWWA
Tamaulipas Crow	TACR
Thick-billed Kingbird	TBKI
Thick-billed Murre	TBMU
Thick-billed Parrot	TBPA

Thin-billed Prion	TBPR
Thick-billed Vireo	TBVI
Tennessee Warbler	TEWA
Thayer's Gull	THGU
Townsend's X Hermit Warbler Hybrid	THWH
Tinian Monarch	TIMO
Townsend's Shearwater	TOSH
Townsend's Solitaire	TOSO
Townsend's Warbler	TOWA
Tricolored Blackbird	TRBL
Trembler	TREM
Tree Swallow	TRES
Trail's Flycatcher	TRFL
Tricolored Heron	TRHE
Tropical Kingbird	TRKI
Tropical Mockingbird	TRMO
Troupial	TROU
Tropical Parula	TRPA
Tristram's Storm-Petrel	TRSP
Trumpeter Swan	TRUS
Tawny-shouldered Blackbird	TSBL
Three-toed Woodpecker	TTWO
Tufted Duck	TUDU
Tufted Puffin	TUPU
Turkey Vulture	TUVU
Unidentified Dark-eyed Junco	UDEJ
Unidentified Gull	UNGU
Unidentified Hummingbird	UNHU
Unknown Redpoll	UNRE
Unidentified Teal	UNTE
Upland Sandpiper	UPSA
Unknown Rufous-sided Towhee	URST
Unknown Yellow-rumped Warbler	UYRW
Varied Bunting	VABU
Vaux's Swift	VASW
Varied Thrush	VATH
Varied Tit	VATI
Violet-crowned Hummingbird	VCHU
Veery	VEER
Vermilion Flycatcher	VEFL
Verdin	VERD
Vesper Sparrow	VESP
Violet-green Swallow	VGSW
Victoria Penguin	VIPE
Virginia Rail	VIRA
Virginia's Warbler	VIWA
Wandering Albatross	WAAL

Wattled Honeyeater	WAHO
Warbling Silverbill	WASI
Wandering Tattler	WATA
Warbling Vireo	WAVI
White-bellied Dove	WBDO
White-breasted Nuthatch	WBNU
White-chinned Petrel	WCPE
White-crowned Pigeon	WCPI
White-collared Seedeater	WCSE
White-crowned Sparrow	WCSP
White-chinned Thrush	WCTH
Western Bluebird	WEBL
Western Flycatcher	WEFL
Western Grebe	WEGR
Western Gull	WEGU
White-eared Hummingbird	WEHU
Western Kingbird	WEKI
Western Meadowlark	WEME
Western Sandpiper	WESA
Western Scrub-Jay	WESJ
Western Screech-Owl	WESO
Western Tanager	WETA
White-eyed Thrush	WETH
White-eyed Vireo	WEVI
Worm-eating Warbler	WEWA
Western Wood-Pewee	WEWP
White-faced Ibis	WFIB
White-faced Storm-Petrel	WFSP
Whiskered Auklet	WHAU
Whooping Crane	WHCR
White Ibis	WHIB
Whimbrel	WHIM
White-cheeked Pintail	WHIP
Whooper Swan	WHOS
Whiskered Screech-Owl	WHSO
White-throated Storm-Petrel	WHSP
Whistling Swan	WHSW
White Tern	WHTE
White Wagtail	WHWA
White-headed Woodpecker	WHWO
Willow Flycatcher	WIFL
Willet	WILL
Wilson's Phalarope	WIPH
Wilson's Plover	WIPL
Williamson's Sapsucker	WISA
Wilson's Storm-Petrel	WISP
Wilson's Warbler	WIWA

West Indian Whistling-Duck	WIWD
West Indian Woodpecker	WIWO
Winter Wren	WIWR
White-necked Crow	WNCR
Wood Duck	WODU
Worthen's Sparrow	WOSP
Wood Stork	WOST
Wood Thrush	WOTH
Wood Warbler	WOWA
Western Palm Warbler	WPWA
Whip-poor-will	WPWI
Wrentit	WREN
White-rumped Sandpiper	WRSA
White-rumped Shama	WRSH
Wedge-rumped Storm-Petrel	WRSP
White-rumped Swiftlet	WRSW
White-tipped Dove	WTDO
White-throated Ground-Dove	WTGD
White-tailed Hawk	WTHA
White-tailed Kite	WTKI
Wedge-tailed Shearwater	WTSH
White-throated Sparrow	WTSP
White-throated Swift	WTSW
White-tailed Tropicbird	WTTR
White-vented Myna	WVMY
White-winged Crossbill	WWCR
White-winged Dove	WWDO
White-winged Junco	WWJU
White-winged Scoter	WWSC
White-winged Tern	WWTE
Xantus's Murrelet	XAMU
Yellow-billed Cardinal	YBCA
Yellow-breasted Chat	YBCH

Yellow-breasted Crake	YBCR
Yellow-billed Cuckoo	YBCU
Yellow-bellied Elaenia	YBEL
Yellow-bellied Flycatcher	YBFL
Yellow-billed Loon	YBLO
Yellow-billed Magpie	YBMA
Yellow-bellied Sapsucker	YBSA
Yellow-bellied Seedeater	YBSE
Yellow-crowned Night-Heron	YCNH
Yellow Grosbeak	YEGR
Yellow-eyed Junco	YEJU
Yellow Rail	YERA
Yellow-fronted Canary	YFCA
Yellow-faced Grassquit	YFGR
Yellow-footed Gull	YFGU
Yellow-green Vireo	YGVI
Yellow-headed Blackbird	YHBL
Yellow-nosed Albatross	YNAL
Yellow Palm Warbler	YPWA
Yellow-shouldered Blackbird	YSBL
Yellow-shafted Flicker	YSFL
Yellow-shouldered Grassquit	YSGR
Yellow-throated Vireo	YTVI
Yellow-throated Warbler	YTWA
Yellow Wagtail	YWAG
Yellow Warbler	YWAR
Zebra Dove	ZEBD
Zenaida Dove	ZEND
Zonotrichia Sparrow Hybrid (includes Junco x Zonotrichia)	ZSHY
Zone-tailed Hawk	ZTHA