A note on assessing the status of vagrant warblers on the California coast

Increasing attention to California's eastern vagrants poses interesting questions about data interpretation

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ALTHOUGH out-of-range, vagrant warblers of eastern origin have been recorded in California since the 1800s, significant numbers were not encountered until the early 1960s when observers began to understand the localized nature of the occurrences, most notable along the *immediate* coast and at oases in southwestern deserts. Vagrant eastern warbler data have been gathered rather industriously in recent years with the largest numbers being recorded since the mid-1970s. This is readily apparent from reading the Middle and Southern Pacific Coast Regional reports in *American Birds*. Although quantification is lacking (DeBenedictis 1971, Austin 1971, DeSante 1973), three related phenomena seem to account for the recent increase in vagrant warbler sightings in California: 1) a great increase in the popularity of birding and thus in observer hours spent afield, 2) increased emphasis on finding vagrant birds, 3) an increased familiarity with productive vagrant "traps."

A storehouse of information now exists on the relative abundance and timing of eastern vagrants in California. These species provide the barometer of coastal migrational timing and pulses; and arrival, departure, and peak dates are perhaps better known than for many western species.

Several analyses of California vagrant warbler occurrences have been prepared (*ibid*, and DeSante and Ainley 1980). Although relative abundance and timing of the various vagrant species is well known, until recently little has been published on year-to-year variation in vagrant numbers or timing of migration. DeSante has however analyzed 10 years of landbird census data from Southeast Farallon Island, San Francisco County, California. Comparing the number of northern vagrants for the successive 5-year periods 1968-1972 and 1973-1977, he found that significantly more birds were recorded in the latter period (DeSante MS). As there is minimal sampling or observer bias in the Farallon data (DeSante and Ainley 1980) this is a real trend, but the question of whether or not the actual number of vagrants has been increasing over time and is continuing to do so can perhaps only be answered by more long term data from this site.

A comparison of selected vagrants in northern California for the fall and spring of 1977 and 1978 indicated that there were fewer vagrants in both seasons of 1978 (Winter and Laymon 1979); the spring differences were originally thought to be significant. A re-analysis of those data shows that the spring differences were not statistically significant[1], as certain common species weighted the T-test in the original analysis. As these data were gathered by multiple observers at various sites with an unknown amount of observer effort there is undoubtedly some sampling and observer bias inherent in the data and caution should be used in interpreting the results.

IN ANOTHER ATTEMPT to look at year-to-year variation in vagrant warbler numbers in coastal California, data were gathered from the permanent notebooks compiled over the years by the regional editors of the Middle Pacific Coast Region of *American Birds*. Table 1 was constructed from data from outer Point Reyes, Marin County, California. This site has perhaps been the most consistently monitored area on the California coast (excluding Southeast Farallon Island, which has been censused daily since 1968 by personnel of the Point Reyes Bird Observatory) since it is relatively convenient to the large birding community of the San Francisco Bay area.

Outer Point Reyes is here defined as that area west and south of the main north-south axis of Drake's Estero, Point Reyes National Seashore; the latitude is 38°00'N and the elevation ranges from sea level to 620+ feet, where precipitous cliffs drop off at the southern end. The topography consists of gently rolling hills and flats and the vegetative cover is largely grassland with patches of sparse, shrubby growth (coastal scrub and coastal strand vegetation); much of the area is heavily grazed by cattle. The only trees are in windbreaks planted around ranch houses, especially Monterey cypress (*Cupressus macrocarpa*) and a few clumps of willows (*Salix* sp.) in the moist drainages. These isolated plant islands effectively concentrate migrant birds in both spring and fall, acting as magnets to birds returning from over the ocean after having overshot land in nocturnal migration. This effect, in combination with Point Reyes' projecting substantially into the Pacific Ocean makes this one of the best spots on the entire West Coast to observe migrant landbirds.

[1]3 way ANOVA: year-season interaction $F = 1.86$; $df = 1,40$; $p > .10$

Table 1. Comparison of selected vagrant wood warblers (Parulidae) on outer Point Reyes[1/] Autumns, 1970-1979 with detailed breakdown of autumns 1974 and 1979.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	Ave./Fall 1970-1979	Ave./Fall 1974-1979	Range of Dates Coastal[2/] Sighting 1979	Totals 1974 F.I.	Totals 1974 coastal	Totals 1974 interior	Totals 1974 total	Totals 1979 F.I.	Totals 1979 coastal	Totals 1979 interior	Totals 1979 total
Warblers																					
Black-and-white	1	0	3	1	4	5	1	2	0	1	1.8	3.0	8/27-11/12	2	12	3	17	3	18	0	21
Tennessee	2	0	1	1	7	11	10	10	7	8	5.7	9.5	8/26-10/28	21	21	2	43	5	15	1	21
N. Parula	0	0	0	0	3	1	1	0	0	2	0.7	1.2	9/2-9/30	0	6	0	6	0	9	1	10
Magnolia	0	1	1	0	5	4	2	1	3	4	2.1	3.5	9/17-10/22	15	16	0	31	8	10	0	18
Cape May	0	0	0	0	3	0	2	0	0	3	0.8	1.3	9/22-10/3	0	7	0	7	2	4	0	6
Black-throated Blue	4	0	0	1	5	5	1	1	3	13	3.3	5.5	9/23-10/21	5	13	3	21	9	15	0	24
Blackburnian	1	0	1	0	4	2	2	4	5	7	2.6	4.3	9/18-11/24	5	9	0	14	4	10	0	14
Chestnut-sided	0	0	0	0	6	2	2	5	5	5	2.5	4.2	9/13-10/14	21	15	1	36	9	12	1	22
Bay-breasted	0	1	0	0	1	1	1	2	1	2	0.9	1.5	10/1-10/14	7	3	0	10	1	3	0	4
Blackpoll	2	8	10	1	35	30	17	22	14	14	15.3	25.5	9/3-11/7	70	109	0	178	24	56	0	80
Prairie	0	0	1	0	1	0	0	4	2	8	1.6	2.7	9/8-11/16	2	6	0	8	2	9	1	12
Palm	2	2	2	4	42	9	7	22	21	40	15.1	25.2	9/18-11/28	70	112	1	166	45	151	0	196
Ovenbird	0	0	0	0	0	3	2	5	2	3	1.5	2.5	9/20-10/9	9	0	0	9	5	4	1	10
N. Waterthrush	0	0	0	0	0	1	1	1	0	0	0.3	0.5	9/6-10/27	3	3	1	6	2	5	1	8
Canada	0	0	0	0	1	0	1	2	0		0.5	0.8	9/24-11/11	3	3	0	9	1	3	0	4
Am. Restart	0	2	8	0	16	18	14	24	1	30	11.3	18.8	8/30-11/10	24	37	1	59	25	57	3	85
Totals	12	14	27	8	133	92	64	105	64	141				257	372	12	620	145	381	9	535

[1/] outer Pt. Reyes is that area W and S of the main N/S axis of Drake's Estero, P.R.N.S.
[2/] coastal includes all sightings on outer coast *including* outer Point Reyes

Since Point Reyes is only 18 miles due north of the Farallon Islands it is ideally suited for comparison to that site.

Table 1 shows that there is a sharp discontinuity between the total number of vagrant warblers seen from 1970-1973 and 1974-1979. DeSante's analysis showed a significant increase in vagrants between the periods 1968-1972 and 1973-1977, which also seems to fit the Point Reyes data well.

In contrast to the Farallon census data the Point Reyes data were gathered by multiple independent observers, on random days, and the total observer effort was nearly impossible to assess. There was a large increase in the number of observers in the Bay Area in the 1960s and especially the 1970s (Jon Winter, pers. comm.); any analysis of randomly collected data must take this into account.

It seems most likely that the increase in vagrants noted by DeSante also occurred on Point Reyes, but it also seems that this effect was probably compounded by the increase in observers on the mainland. The fall 1974 was truly a superlative one for vagrants as the Farallon data showed totals 2.4 times the previous highest total (Stallcup *et al.* 1975) and numbers were equally impressive on Point Reyes as can be seen from Table 1. It seems likely, and is borne out by observer impressions, that after such an extraordinary fall, observers began flocking to vagrant "traps" such as Point Reyes, when they realized how good vagrant hunting could be if the "traps" were diligently searched.

To assess the possible effect of observer bias on year-to-year variation in vagrant warbler numbers on Point Reyes, a comparison was made between the numbers of 16 species from Point Reyes and the Farallons for the autumns of 1974 and 1979 (Table 1). Nineteen seventy-four was chosen, as to that point, it was the best year on record for vagrant warblers and 1979 was chosen for comparison since the totals recorded for both Point Reyes and all of coastal-northern California seemed at first comparable to 1974 (Table 1). An analysis of these data show a statistically significant difference [2] between the numbers of vagrant warblers recorded at these two sites for these 2 years. As the Farallon data were gathered continuously by a standard census there were actually many more vagrant warblers there in 1974 (257) than in 1979 (145).

The best explanation for the very similar totals for Point Reyes for both 1974 (133) and 1979 (141) is that observer coverage increased over the years and that more vagrants were located and reported in 1979 for that reason, although the actual magnitude of birds in passage was not nearly as great as in 1974. The assumption here is that observer bias was the primary influencing factor accounting for the difference in these two sites for these 2 years. It could be argued that there was some inherent difference in the vagrant phenomenon between the sites or that from year-to-year there is not a strong correlation in the magnitude of migration between the two sites. What evidence does exist suggests just the opposite. To rigorously test this assumption demands census data from Point Reyes as accurate as to observer effort as provided for the Farallons. However, the Point Reyes data or other random data from along the California coast do provide much information on the status of vagrant warblers. In fact most of what is currently known about vagrant warblers in California is owing to the fine efforts of the enthusiastic hordes of birders that comb the deserts and coast in search of strays each migration. Even the excellent census data from the Farallons are owing primarily to the efforts of many competent volunteers

In summary it can be seen that the effect of observer bias must be weighed when dealing with randomly collected

[2] 3 way ANOVA: year-location interaction $F = 12.52$; $df = 1,46$; $p < .005$

data Although the relative abundance and timing of eastern vagrants in California is well known, attempts to refine our knowledge of year-to-year variation in vagrant numbers, variation in the timing of migration, of differences in latitudinal effects on vagrants must increasingly rely on census data or some effective measure must be constructed to quantify observer effort. An ability to more closely assess these parameters will reflect an increased ability to monitor changes in our environment.

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MANAGEMENT

The impact of Starlings on Purple Martin populations in unmanaged colonies

"Starlings are capable of seriously reducing martin populations whenever human beings fail to manage colonies"

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THERE HAS BEEN recent concern for populations of the Purple Martin (*Progne subis*) in North America (Arbib 1978); the species has been Blue-Listed since 1975. Inclement weather in the Appalachian Region in 1972 and heavy May freezes in the northeastern states in 1966 and 1967 drastically reduced numbers of martins there (Hall 1972, Rosche 1968), and recovery has generally been slow. One might also assume that populations in other parts of the United States have declined, as evidenced by the martin's Blue-Listed status in recent years. Yet, hypotheses other than that of inclement weather have not been advanced to account for these declines. The theory here presented may be inadequate to fully account for Purple Martin population depressions in all parts of the species' range. However, the implications of the following data require that at least the theory be considered a strong possible factor influencing population declines.

The introduction of the Starling (*Sturnus vulgaris*) and the House Sparrow (*Passer domesticus*) into North America was followed by their subsequent rapid spread. Martins and other cavity nesters are forced to compete with these foreign species for nest sites. Purple Martins in particular have faced severe competition, because martins in the eastern United States now nest largely in man-made birdhouses which are usually erected in areas of human habitation. These habitats are also preferred by the House Sparrow and Starling.

The literature has been rather scant regarding martin competition with Starlings and House Sparrows. Most authors (*e.g.* Deusing 1942, Sprunt *in* Bent 1942, Bent 1950, Allen and Nice 1952, Olmstead 1955, Gaunt 1959, Kessel 1959), simply mention that competition occurs but offer little or no assessment of its impact on martin populations. The few studies concerned with interspecific relations (Jackson and Tate 1974, Brown 1977) were conducted in managed or semimanaged martin colonies. That is, owing to human manipulation, martin occupancy was maximized, and Starling and House Sparrow occupancy was minimized. "Manage" here means general upkeep and maintenance of the martin colony, periodic sparrow and Starling nest cleanout during the nesting season, cleaning and closing of martin houses when Purple Martins are gone, etc. In addition, where legal and feasible, some people manage their colonies by eliminating sparrows and Starlings However, results of studies conducted in managed colonies are biased and do not