

MONITORING POPULATIONS AND DEMOGRAPHY OF LANDBIRDS IN RIPARIAN CORRIDORS OF THE COASTAL REDWOOD ZONE

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Abstract: Riparian habitats in coastal coniferous forests have been thought to be less important than interior riparian habitats. We contrast birds of these riparian corridors with inland riparian habitats. We used mist nets to monitor the birds, and discuss the advantages of this method, as compared to censuses. We describe the breeding strategies of the common species as deduced from mist net monitoring and the importance of coastal riparian habitats for management.

Introduction

Censuses of land birds in forested areas provide much useful information about population size, trends, and habitat association. However, the other principal monitoring method in use, constant effort mist netting, provides important additional information. The primary aims in monitoring birds using mist netting is to estimate population composition, including species abundances and various demographic parameters, such as survivorship, productivity, and mortality.

A primary advantage of mist nets is that it captures many cryptic species, especially those species frequenting the lower vegetation strata, and not activity singing. These species may be missed by census and, yet, may be a very important component of the avifauna. Further, censusing merely can reveal that a species has declined; it provides very little information on the potential causes of a decline.

Specifically, we asked the following questions:

- How similar are nearby stations in their species composition and abundances?
- What characterizes coastal redwood forest birds from more inland stations?
- Do any stations have consistently lower or higher numbers of young in some species, that is, were they sources or sinks (sensu)?
- What is the timing of movements of the various species through the coastal redwood belt, and how do they differ between stations?

Methods

In northwestern California, with our cooperators, we have established a series of stations using mist nets (Table 1). In the four-month breeding season, each station had a minimum of ten nets, operated once or twice during each 10-day period, beginning in early May and continuing to the end of August. Net operations and processing followed the guidelines in Ralph et al. (1993).

All stations were located in riparian areas bordered by or within coniferous forests. Four of the coastal stations were in riparian stations within redwood (*Sequoia sempervirens*) stands, and two other coastal stations were along the riparian margin of a coastal pine (*Pinus contorta*) forest.

We used data taken during 1993 and 1995 and compared the commonest species of birds caught during the breeding season. The number of individuals of each species

Table 1. Mist-net capture stations, the principal habitat, and station operators			
Name of Station	Code	Principal Habitat	Operator/Organization
Lost Man Creek	LOST	Mature alder/redwood	Howard Sakai, Redwood National Park
Redwood Creek	RECR	Alder thickets near redwood	Redwood Sciences Laboratory
Park	PARK	Willow/alder/field near pine	Humboldt Bay Bird Observatory
Home	HOME	Pine/ willow/alder/field	Humboldt Bay Bird Observatory
Wright Refuge	WREF	Second-growth redwood/field	Luke George, Humboldt State
Yager Creek	YACR	Alder/willow/redwood	Sal Chinnici, Pacific Lumber Company

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captured during the entire season was pooled at each station. Since the effort was similar at all stations, no weighting by effort was necessary.

We used cluster analysis for determining similarity of species composition at each station. We compared the proportion that each species made up of the total number of individuals of all species captured at that station over both years of the study.

Results

Similarity of Species Composition between Stations

We found that geographic juxtaposition did not ensure similarity of the bird community. Comparing the commonest species at all coastal and inland stations in northwestern California during the summer revealed that the stations were clustered into groups by general habitat types. The coastal stations all grouped together, as compared to inland stations. The inland stations separated into five groups, according to the different widths of the riparian corridors and the elevation. Three pairs of stations were quite close, each pair only 0.4 km apart. One pair of inland stations (WEST and HUM1), along a creek, were similar in species composition. However, the two other pairs of stations, one pair inland and the other coastal, were more similar to other riparian stations than to the other member of each pair. The two coastal stations (HOME and PARK) were on a sand dune interface with the edge of an estuary with much riparian vegetation of willow (*Salix* spp.) and alder (*Alnus* spp.). One of the stations, however, was slightly different, having some net stations along the adjacent pine forest.

Using only the commonest species among the coastal forest stations to compare the similarity, the two closest coastal stations were still quite dissimilar. The two stations with a large field component were similar, as were the two widest riparian stations (RECR and YACR). The closed-canopy redwood station (LOST) was quite dissimilar from the other stations.

Species-specific Characteristics

Swainson's Thrush (*Catharus ustulatus*)---At all stations similar numbers of adult males and females were captured during the nesting portion of the breeding season in May and June. Unknown-sexed adults, which could be prebreeding local birds, or (quite possibly) migrants, were also present in the first two weeks of May. In July and August, during the post-breeding and dispersal period, all stations had a lower capture rate of adults. In this period, the most marked difference between stations involved capture of young. In the stations with a higher proportion of redwood trees, LOST and YACR, very few young were caught, as birds perhaps moved out of these forests into the areas with more riparian vegetation and old fields mixed with some conifers, such as WREF.

Song Sparrow (*Melospiza melodia*).----We found a common pattern at all stations. As with other species, modest numbers of adults were captured in the first two months. Substantial numbers of young birds were also captured at all stations in the later part of the breeding period (July-August). Unlike the Swainson's Thrush, more adults were captured at all stations later in the season, except at LOST.

Pacific-slope Flycatcher (*Empidonax difficilia*).----At stations with good capture rates, we had a constant pattern of adult captures in the early stages of the breeding period: with more fledged young captured in the later part of the breeding season.

Wilson's Warbler (*Wilsonia pusilla*).----Age and sex of adults were more readily discernible for this species, as fewer unknowns were noted. Higher counts of males in early May are most likely migrating birds. Incubating females were common in June. Young of the year were present later in the breeding season, except at LOST. Here, fewer captures of young suggests that the study area may be used for breeding, rather than for rearing the young.

Winter wren (*Troglodytes troglodytes*).---Only present in any numbers in the dense forest at LOST, it apparently had an early breeding season. In this species, we found a more constant pattern of captures of adults and young than any of the other species. The wren apparently has a much longer breeding season than the other species.

Discussion

The coastal stations were relatively similar in species composition, as compared to the inland stations. However, nearby coastal and inland stations could be very different in their species composition and abundances, and were apparently sampling different communities. We can conclude that even constant effort mist-netting stations only 400 m apart were essentially independent. Of the coastal stations, LOST was most different, being located in a mature alder/redwood stand, surrounded by old-growth and second-growth redwood.

We found that perhaps Swainson's Thrush and Wilson's Warbler had a marked movement of birds out of the forests into the riparian stations. We hypothesize that these birds breed in the forest where low levels of predation might occur and then move out into the earlier successional forests in July and August, where perhaps more food is available. It is important to note that this movement would be undetected by the census method alone? and the importance of riparian habitats to these species would have otherwise been unknown.

The constancy of the Song Sparrow in its age and sex composition among the different sites may be due to its highly resident status. In other research, we have also found it to be a riparian specialist, and thus confined to the

areas of our stations. The only exception was at LOST where the species was very rare.

The marked increase of young of several species, such as the Pacific-slope Flycatcher, in the later part of the study period could be attributed to young produced within the study area, or an influx of young migrating in from adjacent areas. We suspect it to be movements of young, based on evidence from movements of banded individuals of the various species.

Further research involving the establishment of more netting and censusing stations is recommended to verify these observations and to take full advantage of the methods.

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Literature Cited

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