

closure were more likely to have been LCSP points than random points. Points with greater canopy height, greater vertical vegetative cover between ground level and 0.5 m, less litter depth, and reduced canopy closure were more likely to have been LCSP points than HESP points. The mean distance between HESP points (28.9 m) and the nearest prairie edge was significantly less than that for LCSP points (40 m,  $P = 0.001$ ).

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### **Relationships Between Eastern Whip-Poor-will and Chuck-Will's-Widow Abundance and Landscape Composition and Management**

Melissa C Roach, Frank R Thompson

Eastern Whip-poor-will (*Antrastomus vociferous*) and Chuck-will's-widow (*Antrastomus carolinensis*) are nocturnal aerial insectivores that have experienced steep declines in abundance over the last 50 years across their ranges. There is little information on the effects of forest management practices on these species, in part, due to their secretive nature. However, increased efforts to restore savanna and woodland in the Eastern U.S. could potentially benefit these species. Our objective was to relate abundance of Eastern Whip-poor-will and Chuck-will's-widow to land cover, forest structure, and woodland restoration practices in the Missouri Ozarks. We conducted 385 nocturnal roadside point counts in the Ozark Highlands, Missouri during the 2014 and 2015 breeding seasons in areas with and without pine woodland restoration. We detected 375 Eastern Whip-poor-wills and 111 Chuck-will's-widows with a range of 0-5 and 0-2 individuals per point, respectively. We used Bayesian time-removal models in an information theoretic approach to evaluate the effects of management treatment, canopy cover, basal area, and forest cover. Abundances of Eastern Whip-poor-will and Chuck-will's-widow were positively related to the proportion of the landscape forested but negatively related to canopy cover in the forest. Abundance was also positively related to the proportion of the landscape treated by forest thinning. Pine woodland restoration appears to be benefiting these species of conservation concern in the Missouri Ozarks.

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### **The Shorebirds May Disappear from Around the Largest City in South America**

Fábio Schunck

Shorebirds and their migratory routes are globally threatened, and one such region in South America is

situated near the center of the city of So Paulo, one of the largest urban centers in the world, with more than 21 million inhabitants. Characterized as "Vrzea of the Enbu-Mirim River", this wetland is in the basin of the Guarapiranga River, with aquatic habitats partially protected within a municipal reserve. Between 2007 and 2010, this region was impacted by a public works Project called "Rodoanel", a thoroughfare around the city of So Paulo. With the aim of identifying possible environmental impacts of the Rodoanel affecting migratory shorebird populations, an ongoing, voluntary monitoring project started 15 years ago, thus covering the periods before, during, and after the Rodoanel. Monthly censuses were conducted from 2007 to the present, totaling 143 over 150 field-hours. The study registered *Bartramia longicauda*, *Actitis macularius*, *Tringa solitaria*, *T. flavipes*, *T. melanoleuca*, *Calidris fuscicollis* and *C. melanotos*, that use the region between August and April. Before the Rodoanel project was begun, groups of up to 400 *T. flavipes* and 300 *T. melanoleuca* were registered; during the public works activities, these numbers fell drastically. After the completion of the Rodoanel, *T. flavipes* returned in good numbers, but *T. melanoleuca* stopped using the area, probably due to the grounding that affected their preferred feeding areas. *B. longicauda* also seems to have disappeared. These data reveal the impact that the Rodoanel has had on this group of birds, and show that the Guarapiranga region needs urgent, formal protection in the face of disorganized urban sprawl and other anthropogenic alterations of relictual urban wetlands.

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### **Shorebirds Use the Surroundings of the Largest Urban Area of South America**

Fábio Schunck

Brazil possesses 32 species of migratory shorebirds. The country has several reserves recognized internationally as priority areas for conservation of these migratory birds, but there exist many other regions with few available data, which limits their priority for conservation attention. One of these areas lies near the center of the metropolis of So Paulo, with 21 million inhabitants ranking among the most heavily populated cities in the world. So Paulo is situated about 50 km from the Atlantic coast (750 m a.s.l), between two migratory corridors: the Atlantic littoral and the Brazilian interior. In light of the lack of data from this region, an ongoing, voluntary research project has been conducted over the past 19 years in wetlands in the city, with the aim of identifying which species and

how many of them are using these urban oases during migration and at other times of the year. Up to the year 2000, six species had been registered: *Pluvialis dominica*, *Bartramia longicauda*, *Tringa solitaria*, *T. flavipes*, *Calidris alba* and *C. fuscicollis*. The list grew to 16 between 2000 and 2019, with the addition of *Pluvialis squatarola*, *Charadrius semipalmatus*, *C. collaris*, *Limosa haemastica*, *Actitis macularius*, *Tringa melanoleuca*, *Calidris canutus*, *C. melanotos*, *C. himantopus* and *Phalaropus tricolor*. The region occasionally receives visitors from the coastal region, especial in association with the passage of strong storms, making it a form of safe-haven for these birds. These relictual wetland habitats in and around the city of So Paulo need to be protected as formal reserves, where monitoring of Nearctic migrants, should be continued.

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### **The People of the Largest City in South America Are Unaware of Their Shorebirds**

Fabio Schunck

Migratory shorebirds occur in a wide variety of habitats, including urban centers. In Brazil, which boasts one of the most species-rich avifaunas in the world, including 32 species of migratory shorebirds, awareness of these birds is, like many areas of the world, generally poor and restricted to a small subset of the population. The level of familiarity with migratory shorebirds is lesser yet when one considers modern population centers like the megalopolis of So Paulo, with 21 million inhabitants, where a large percentage of the people have little or no contact with natural environments. These people are always surprised to learn that these amazing little birds perform vast migratory movements out of the boreal regions of North America to spend the winter months in Brazil, sometimes passing through the very city in which they reside, spending a few days resting and feeding before continuing their flights. With the aim of popularizing local knowledge of Nearctic migrant shorebirds and the importance of their conservation, especially in the metropolitan region of So Paulo, data accumulated over the past 19 years is being shared with the public through illustrated presentations in universities, parks, and schools, field trips, and lay articles in widely read magazines. Thus, contact is achieved with a good cross-section of the population ranging from biology students and general residents to retired people and school children. These efforts have been entirely voluntary, with the much-appreciated support of the American Birding Association, particularly the Birder's Exchange Program, which has donated optical equipment.

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### **An Analysis of Translocation Regimes for the Endangered Puaiohi**

Jean E Fantle-Lepczyk, David Duffy, Lisa Crampton, Andrew Taylor, Sheila Conant

The ongoing and often synergistic effects of habitat loss, invasive species, and climate change pose challenges for conservation and management as widespread species become greatly reduced, sometimes to a single small population. To address this problem, conservation biologists must consider using approaches like translocation to create new populations, reducing the probability of extinction by splitting a population into two or more populations in geographically distinct locales. The puaiohi (*Myadestes palmeri*), an endangered Hawaiian forest bird, has a small population size (494; 95% CI 414580) and restricted range (40 km<sup>2</sup>). One recovery plan objective involves translocating birds to higher elevation Hawaiian Islands. To evaluate translocation scenarios, we built upon previously developed population viability analysis models and considered how translocation regimes (initial population, number supplemented per event, supplementation interval, and supplementation length) would affect both original and new populations. Furthermore, we modeled the puaiohi release population under three different conditions: a stable population, a predator-controlled environment, and a habitat improved in terms of resource availability. Our results indicated that while translocation offers hope of increasing puaiohi population size and decreasing extinction risk, success will depend on conditions at the release site. Furthermore, harvest and rearing of eggs to the juvenile stage or re-establishment of a captive breeding program may be necessary to provide enough birds to translocate, as the current wild population may not be productive enough to sustain levels of harvest necessary to successfully establish a new population.

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### **Engaging Incarcerated People in Avian Research and Conservation: The Sustainability in Prisons Project (SPP)**

Philip C Fischer, Jessica Brown, Kelli Bush, Teresa Lorenz

Incarcerated people have been overlooked for their interest in avian science and a desire to make positive contributions in conservation. The Sustainability in Prisons Project (SPP) is a program designed to address these issues in Washington State. It is a partnership founded