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Tree-Species Preferences of Foraging Insectivorous Birds: Implications for Floodplain Forest Restoration. 2002. Gabbe, A., Dept. of Environmental Studies, University of California, Santa Cruz, CA 95064, gabbe@cats.ucsc.edu; S.K. Robinson and J.D. Brawn. **Conservation Biology** 16(2):462-470.

The authors examined the foraging behavior of 13 bird species in floodplain forests in southern Illinois. They found that 12 of the species foraged selectively with regards to tree species. Most favored the kingnut hickory (*Carya laciniosa*), bitternut hickory (*C. cordiformis*), and silver maple (*Acer saccharinum*). The yellow-throated warbler (*Dendroica dominica*) and cerulean warbler (*D. cerulea*) were the most selective, and the yellow-throated vireo (*Vireo flavifrons*), red-eyed vireo (*V. olivaceus*), and eastern tufted titmouse (*Baeolophus bicolor*) were the least. In general, the more selective foragers were less common. Because heavy-seeded hickories do not quickly recolonize forests restored with common oak species (*Quercus* spp.), the authors conclude that restoring floristically diverse floodplain forests with heavy-seeded and uncommon trees preferred by these birds will enhance their habitat quality.

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Bird Species Associated with Riparian Woodland in Fragmented, Temperate-Deciduous Forest. 2002. Groom, J.D. and T.C. Grubb, Jr., Dept. of Evolution, Ecology, and Organismal Biology, The Ohio State University, Columbus, OH, 43210-1293, groom.10@osu.edu. **Conservation Biology** 16(3):832-836.

The authors conducted a study along Big and Little Darby Creeks in Ohio to determine the relationship between riparian forest fragmentation and the probability of detecting bird species. They concluded that woodland area is better for predicting the presence of bird species than woodland width. Their results also suggest that if riparian habitat zones are not large enough, declining Neotropical migrant birds may not benefit from restoration efforts.

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Sky Is Falling on Prairie Chicken, Sacrifice of a Rite of Spring. 2002. Laux, E.V. **New York Times** May 28:D3.

Laux reports on efforts to change the current land management practices to restore the prairie chicken (*Tympanuchus cupido*) habitat on private lands in the Flint Hills of Kansas. Currently, cattle ranchers use a fire and grazing regime that involves annually burning large parts of the prairie each spring. Such frequent burning destroys the vegetative cover and has led to a sharp decline in the number of prairie chickens. The Tallgrass Legacy Alliance, consisting of ranchers, conservationists and state agency representatives, has formed to figure out the best way to preserve the tallgrass prairie for the habitat diversity while allowing for ranchers to make a living.

TOOLS & TECHNOLOGY

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INsect Count Analyzer: A Tool to Assess Responses of Butterflies to Habitat Restoration

Travis Longcore and Rudi Mattoni, The Urban Wildlands Group, P.O. Box 24020, Los Angeles, CA 90024-0020, U.S.A., 310/247-9719, Fax: 310/247-9719, longcore@urbanwildlands.org; and Cor Zonneveld and Jorn Bruggeman, Dept. of Theoretical Biology, Vrije Universiteit Amsterdam, The Netherlands

We have developed INsect Count Analyzer (INCA) as a free software program designed to help researchers who are monitoring the response of insects with discrete generations, including some species of butterflies, to habitat restoration and management activities. This tool enables users to automate the analysis of data from daily transect counts using a relatively complex mathematical model (Zonneveld 1991). Unlike other methods that calculate an index of insect population size from transect count data (Pollard and Yates 1993), the Zonneveld model produces estimates of four characteristics of the target species during its flight period: the population index, time of peak emergence, spread of emergence times, and death rate.

We have applied the Zonneveld model and INCA software to data collected on more than 20 species of butterflies from North American and Europe, including the endangered El Segundo blue butterfly (*Euphilotes bernardino allyni*) in Los Angeles (Mattoni and others 2001) and the scarce large blue (*Maculinea teleius*) at a reintroduction site in the Netherlands (data from Wynhoff and others 2000). Here, we illustrate its use with data collected for the endangered Palos Verdes blue butterfly (*Glaucopsyche lygdamus palosverdesensis*).

In 1994, Mattoni rediscovered this species at a military fuel depot in the Palos Verdes hills in southwestern Los Angeles County, ten years after it was thought to have become extinct (Mattoni 1994). He then implemented a program to protect, restore, and monitor habitat for the Palos Verdes blue butterfly (Mattoni 2002). Management actions included revegetation of 10 acres (4 ha) of coastal sage scrub habitat with the historical complement of native shrubs, including the Palos Verdes blue butterfly's two foodplants, deerweed (*Lotus scoparius*) and Santa Barbara milkvetch (*Astragalus trichopodus lonchus*).

In 2002, we entered data into INCA from counts of adult Palos Verdes blue butterflies that our technician, Rick Rogers, had collected on a fixed transect throughout the flight seasons of each year from 1994 through 2002. The transect included all sites that Palos Verdes blues are known to occupy or that have appropriate larval foodplants. Using INCA, we analyzed eight of the resulting abundance curves with little difficulty. The model did not fit the data from 1997 sufficiently well to produce reliable estimates. We, therefore, designed INCA so that users can input prior information about the death rate of the target

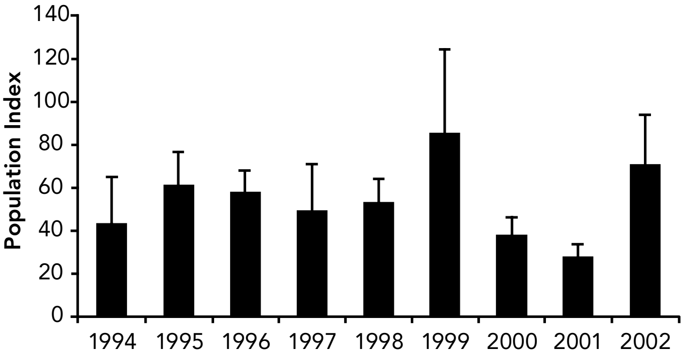

Figure 1. Population index of Palos Verdes blue butterfly (*Glaucopsyche lygdamus palosverdesensis*) at Defense Fuel Support Point, 1994-2002. Error bars represent one standard deviation. Estimate for 1997 was calculated using prior information about the death rate.

species. In this manner, INCA allows additional, previously known information about death rate, to be added to improve analysis of transect counts, and adjusts the expression of results to a Bayesian approach accordingly (Gelman and others 1995).

The results of our analysis suggest that the population size of the butterfly has not expanded significantly in response to the management action (Figure 1). However, further analysis of population size and other flight-period parameters calculated by INCA indicated a positive relationship between weather—particularly rainfall leading up to the prior year's flight season—and butterfly abundance.

We have found that an INCA-generated analysis is most robust when transect counts are made regularly, preferably twice per week, during the entire flight season of a target species. While relatively labor intensive, this approach provides ample information about the surveyed population and allows for some measurement of uncertainty in the estimates.

The INsect Count Analyzer may be downloaded from our Web site at www.urbanwildlands.org/INCA/. It runs only on Windows 95 or higher operating system. It also requires Excel 97 or higher and Internet Explorer 5 or higher.

Acknowledgments

Research was supported by the Chevron Pipe Line Company, the Defense Fuels Region–West, and the U.S. Fish and Wildlife Service.

References

Gelman, A., J.B. Carlin, H.S. Stern and D.B. Rubin. 1995. *Bayesian data analysis*. Boca Raton: Chapman & Hall/CRC.

Mattoni, R. 2002. Status and trends: Habitat restoration and the endangered Palos Verdes blue butterfly at the Defense Fuel Support Point, San Pedro, California, 1994–2001. The Urban Wildlands Group, Los Angeles.

—. 1994. Rediscovery of the endangered Palos Verdes blue butterfly, *Glaucopsyche lygdamus palosverdesensis* Perkins and Emmel (Lycaenidae). *Journal of Research on the Lepidoptera* 31:180–194.

Mattoni, R., T. Longcore, C. Zonneveld and V. Novotny. 2001. Analysis of transect counts to monitor population size in endangered insects: The case of the El Segundo blue butterfly, *Euphilotes bernardino allyni*. *Journal of Insect Conservation* 5:197–206.

Pollard, E. and T. J. Yates. 1983. *Monitoring butterflies for ecology and conservation: The British butterfly monitoring scheme*. London: Chapman & Hall.

Wynhoff, I., J.G.B. Oostermeijer, C.A.M. van Swaay, J.G. van der Made and H.H.T. Prins. 2000. Re-introduction in practice: *Maculinea teleius and M. nausithous* (Lepidoptera: Lycaenidae). *Entomologische Berichten* (Amsterdam) 60:107–117.

Zonneveld, C. 1991. Estimating death rates from transect counts. *Ecological Entomology* 16:115–121.

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MANAGEMENT & MONITORING

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FROM: Abstracts of the 15th Annual Meeting of the Society for Conservation Biology

47.1

Do Invasive Plant Species Overcome the Mycorrhizal Barrier That Limits Recruitment of Native Species? Koske, R.E., Dept. of Biological Sciences, University of Rhode Island, Kingston, RI 02881; J.N. Gemma, M. Habte and R.J. Cabin.

According to the authors, a majority of native Hawaiian plant species recruit poorly in disturbed habitats because of low populations of symbiotic arbuscular mycorrhizal fungi (AMF), while many non-native invasive species grow well in these same soils. The authors note that this is due to two mechanisms: 1) the roots of many non-natives can become heavily colonized by AMF when the fungi population is low, and 2) many non-native grasses are highly efficient in their phosphorus uptake in the absence of AMF. The authors conclude that for restorations to be successful at disturbed sites, there needs to be an adequate AMF population either present at the site or added during outplanting.

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The Focal-Species Approach and Landscape Restoration: A Critique. 2002. Lindenmayer, D.B., Centre for Resource and Environmental Studies, The Australian National University, Canberra, ACT 0200, Australia, davidl@cres.anu.edu.au; A.D. Manning, P.L. Smith, H.P. Possingham, J. Fischer, I. Oliver and M.A. McCarthy. **Conservation Biology** 16(2):338-345. **Focal Species and Restoration Ecology: Response to Lindenmayer et al.** 2002. Lambeck, R.J., Greening Australia (Western Australia), 10-12 The Terrace, Fremantle, Western Australia 6160, Australia, rlambeck@gawa.comdek.net.au.**Conservation Biology** 16(2):549-551.

Lindenmayer and colleagues address potential problems in the focal-species approach advanced by Robert Lambeck (see Lambeck, *Conservation Biology* 11{1997}:849-857) as a guide for restoring fragmented landscapes. The focal-species approach identifies and targets a suite of plants and animals on the basis of threatening processes (for example, grazing, introduced competitors, habitat loss, and so on). This suite will act as a surrogate for other species in managing the landscape. Lindenmayer and colleagues argue that the underlying theoretical basis of this taxon-based surrogate scheme is problematic and note that other taxon-based schemes have had limited success. They also point out that the large amount of data needed for this approach may be impractical to obtain in many cases. They argue that restoration projects should adopt a mix of strategies to spread the risk of failure of any one approach.