NORTH AMERICAN BLUEBIRD SOCIETY

Bluebird

Spring 2005
Vol. 27, No.

Our cover is from a painting by Dempsey Essick entitled "Carolina Blue." It is the theme artwork for the NABS 2005 convention to be held May 19-22 in Asheville, North Carolina. Convention details are on page 3.

Bluebird population numbers are examined by Partners in Flight and two knowledgable NABS members. Turn to page 4.

Predators have memories Nest boxes can become more vulnerable to predation with time. Turn to page 8.

Mealworms offer supplementary nourishment for bluebirds in early spring or when they are feeding young. Buy them now at a special NABS discount. Turn to page 12.

When is it time to leave home?

This study examines the factors that influence the age at which Burrowing Owls leave their natal burrow

By Victoria Garcia and Courtney J. Conway

Western Burrowing Owls nest in abandoned ground cavities dug by mammals such as ground squirrels badgers, prairie dogs, and marmots. In non-migratory populations, adult Burrowing Owls sometimes remain at a nest burrow year-round. In contrast, juveniles usually disperse from their natal burrow.

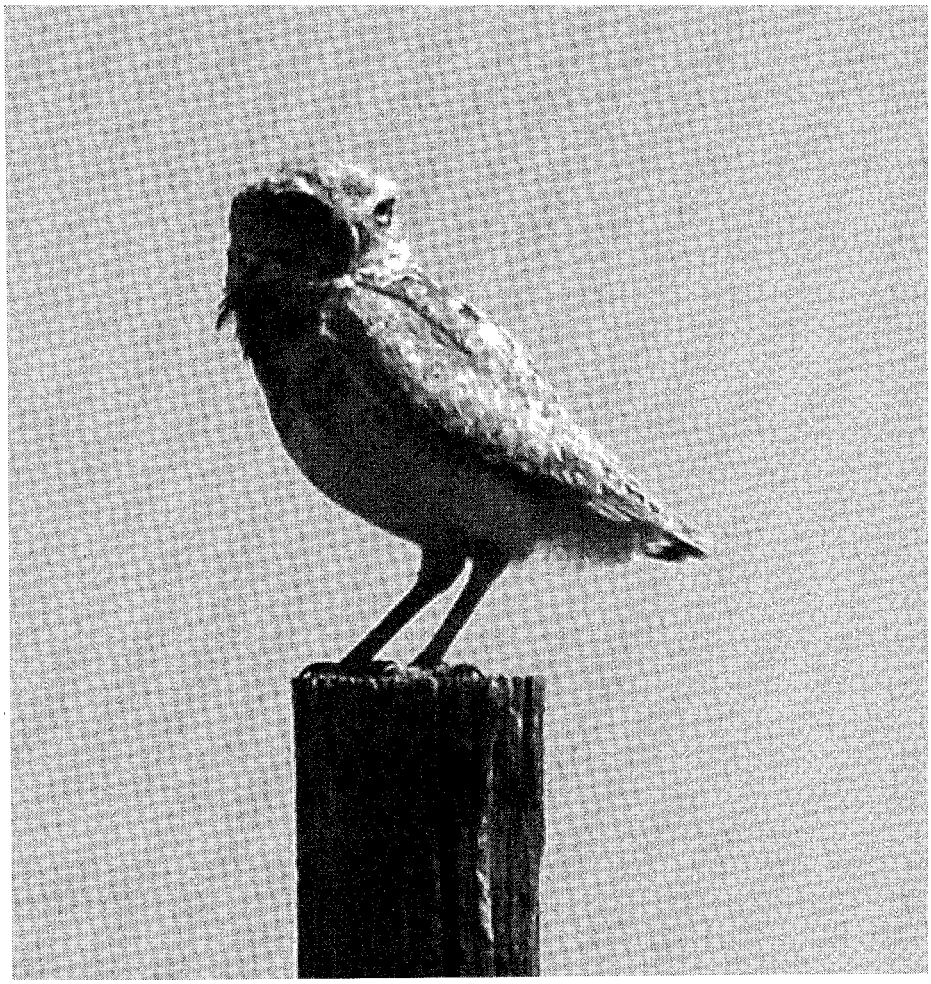
Juvenile owls usually move to another burrow or to a succession of burrows after leaving their nest site. Eventually, juveniles settle at a burrow where they will make their first breeding attempt.

This type of dispersal, called natal dispersal (the movement from the hatching burrow to the site of the first breeding attempt), differs from breeding dispersal (movement from the site of one breeding attempt to the site of the next breeding attempt).

Despite the need to disperse and set up their own territory, juveniles of many bird species remain on their parents' territory well after they have fledged, and even after they have become independent. Like many of these species of birds, juvenile Burrowing Owls do not all initiate natal dispersal around the same time.

Some of these birds begin this movement very soon after they fledge while others remain near their natal burrow for months after fledging. Some stay at their natal burrow so long that their plumage and behavior is indistinguishable from that of adults.

This variation in age at which dispersal is initiated is interesting because in a world of limited nest cavities, potential mates, or food resources, the time when a juvenile initiates dispersal could influence its survival and future breeding opportunities.



An adult Burrowing Owl on watch atop a South Dakota fence post. Photos by jim Williams.

For example, if suitable nest cavities are limited, juveniles who initiate dispersal earlier may have a greater chance of finding a nest burrow for the next breeding season. On the other hand, juveniles who delay dispersing until they are older may have a greater chance of surviving their eventual dispersal movement because they can continue to grow feathers, store fat, and gain experience at their natal site, where they are familiar with food resources and predators.

The age that natal dispersal is initiated is also an important component of many ecological and evolutionary processes. For example, delayed dispersal is thought to be a stepping-stone to the evolution of coop-

erative breeding systems in which juveniles remain at their nest and help rear siblings in later breeding seasons. This sometimes occurs with Western Bluebirds.

Juvenile male Western Bluebirds sometimes remain on their natal territories through the winter, and some of them even stay through the first breeding season and help their parents (sons help rear their siblings). One hypothesis for why some Western Bluebird sons remain on their natal territory to help (rather than try to breed themselves) has to do with the availability of mistletoe, a food resource that occurs in clumps and varies in abundance among territories.

Given that the age when juveniles initiate natal dispersal can have important implications to the individual, why do individuals vary in dispersal age? If leaving as soon as possible is best, why doesn't every juvenile leave as soon as possible? Or, if delaying dispersal is best, why doesn't every juvenile delay dispersal?

Our on-going Burrowing Owl research, conducted in eastern Washington State, suggests that the age in which juveniles initiate dispersal varies according to local conditions.

For example, a resource (i.e., food) may be plentiful in one natal area, causing juveniles there to disperse at a given age. That same resource may be limited in another natal area, causing those juveniles to disperse at a different age. Moreover, the specific conditions that will influence the decision to disperse from the natal area at any given time are context-dependent.

That is, juveniles may decide to disperse based on the availability of one resource within the natal area one year, but respond to another factor when making that decision the following year.

For example, if food is limited one year, food may influence dispersal age that year. If food is plentiful but ectoparasites are especially troublesome one year (like other cavity-nesting species, Burrowing Owls tend to have high densities of ectoparasites such as fleas and feather mites), then relative ectoparasite load may influence dispersal age, rather than the availability of food. In another year, food may be abundant, ectoparasites may be low, but predators may be especially abundant. In that year, relative risk of depredation may be the major influence on dispersal age.

Dispersal is an important stage in an owl's life, and the decision of when to initiate dispersal seems to be influenced by a variety of factors. Results from this study will contribute to our understanding of how intentional man-made changes in the environment are likely to affect dispersal, behavior in Burrowing Owls.

Additionally, the results can be used to manage Burrowing Owl populations in areas where those populations are declining. Burrowing owls are listed as endangered in Canada and are listed as *a Bird of National Conservation Concern* in the United States. They are also listed as *Endangered, Threatened,* or *a Species of Concern* in nine states. In Washington, Burrowing Owls are *a State Candidate* for listing as *Endangered, Threatened or Sensitive.*

Understanding the causes and implications of variation in natal dispersal age could be used in population recovery efforts. If, for example, delayed dispersal of juveniles tends to increase local recruitment, and increased food around the nest area tends to delay dispersal, then perhaps planting crops that attract Burrowing Owl prey near nests will allow juveniles to remain in the natal area longer. Hence, local recruitment would increase, thereby increasing population size.

Acknowledgments: This research was supported by an NABS Research Grant. Other sources of funding included.. USGS; Budweiser Conservation Scholarship; Frank M Chapman Memorial Grant; Silliman Memorial Research Award; Mewaldt-King Student Research Award; Marcia Brady Tucker Travel Award. K Altvater, L. Ellis, J Jarrell, R. Keck, A. Mitchell, W Morgan, C. Nadeau, E. Sullivan, and j Thalamus assisted with field work.

Literature used in preparation of this paper:

Greenwood, P J. 1980. Mating systems, philopatry and dispersal in birds and mammals. Animal Behaviour 28:1140-1162.

Mute, D. S., L. W Ayers, M. T Green, W H. Howe, S. L. Jones, J. A. Shaffer, S. R. Sheffield, and T. S. Zimmerman. 2003. Status Assessment and Conservation Plan for the Western Burrowing Owl in the United States. Biological Technical Publication FWS/BTP-R6001-2003, U.S. Department of Interior, Fish and Wildlife Service, Washington, D.C.

Kraaijeveld, K., and J. L. Dickinson. 2001. Family-based winter territoriality in western bluebirds: the structure and dynamics of winter groups. Animal Behaviour 61:109-117.

Russell, E. M. 2000. Avian life histories: Is extended parental care the Southern secret? Emu 100:377-399.

(Victoria Garcia is at the School of Natural Resources, University of Arizona, Tucson, Arizona. Courtney J. Conway is with the U.S. Geologic Survey, Arizona Cooperative Fish and Wildlife Research Unit, School of Natural Resources, University of Arizona, Tucson, Arizona. Ms. Garcia was recipient of a NABS research grant.)

Two juvenile Burrowing Owls keep a sharp eye on the photographer at the edge of their nest hole in a South Dakota pasture.