Western Wildlife 11:6–8 • 2024
Submitted: 31 January 2024; Accepted: 6 February 2024.

Peer-Edited Notes

Western Kingbird (*Tyrannus verticalis*) Feeds Pacific Chorus Frog (*Pseudacris regilla*) to Fledglings

Allison B. Titus

Center for Natural Lands Management, 27258 Via Industria, Suite B., Temecula, California 92590; e-mail: atitus@cnlm.org

***Abstract.*—Western Kingbirds (*Tyrannus verticalis*) are migratory flycatchers that breed in spring and summer in the Western U.S. and winter in Central America. They are insect specialists that supplement their diet with arthropods and occasionally fruits and berries. Here, I report predation by a Western Kingbird on Pacific Chorus Frog (*Pseudacris regilla*) to feed to three fledglings in Sacramento County, California. Pacific Chorus Frogs are common prey for many guilds of birds in California but are not documented as prey to flycatchers. To the best of my knowledge, this is a novel observation of a Western Kingbird, an insectivorous aerial hunter, repeatedly catching and feeding Pacific Chorus Frogs to fledglings.**

Key Words.—diet; fledgling; foraging; grassland; predation; prey; Tyrannidae

Western Kingbirds (*Tyrannus verticalis*) are primarily insectivorous flycatchers that occasionally eat fruits and berries (Gamble and Bergin 2020), and rarely small vertebrates such as frogs (Terres 1980). They are a migratory species that breed in spring and summer in western North America and spend winters in Central America (Gamble and Bergin 2020). The widespread and abundant Pacific Chorus Frog (*Pseudacris regilla*) is common prey to various guilds of birds such as herons, hawks, and ducks (Ethier et al. 2021). They are less common as prey for passerine birds in the Central Valley of California, the focal area of this observation, with the exception of some families such as shrikes (Laniidae) and corvids (Corvidae; Alvarez 2005; Winkler et al. 2020a,b; Olson and Titus 2022).

Western Kingbirds and Pacific Chorus Frogs are both commonly observed species at the Illa M. Collin Conservation Preserve in Sacramento County, California (Center for Natural Lands Management [CNLM] 2022). This preserve (38.5398°N, 121.2875°W, WGS 84) is a vernal pool and annual grassland landscape with small creeks and riparian areas. It is bordered primarily by residential development as well as an airport and undeveloped non-native annual grasslands. On 9 June 2023 at 0842, I observed an adult Western Kingbird feed each of its three fledglings a Pacific Chorus Frog at the preserve (Fig. 1). The three fledglings were perched on a sign adjacent to a road with open grassland on one side and riparian edge habitat on the other. They were demonstrating begging behavior, with mouths agape and frequent calls. The adult Western Kingbird would leave the fledglings for a few minutes and return with a chorus frog foraged from the slow-moving creek about 50 m away. The chorus frogs captured by the Western Kingbird were identified by their size and characteristic mask over the eye, and appeared to be adult frogs without the remnant tail appendages found on post-metamorphic frogs. The fledglings were fed one frog at a time, with each fledgling swallowing the prey whole. The adult kingbird diligently ensured each fledgling ate one chorus frog, despite competitive begging behavior between the siblings. I observed a more dominant fledgling make several attempts to eat additional chorus frogs, unsuccessfully, before its subdominant siblings. These observations were made from within a stationary vehicle, which acted as a blind, and facilitated clear and continuous observations.

Because Western Kingbirds are migratory, they may be more likely to vary their diet depending on prey availability (Parrish 2000). This species has been documented displaying opportunistic and flexible foraging strategies on tiger beetles (Cicindelidae) and other insects (Goldberg 1979; Schultz 1983). Additionally, research by Tallamy (2019) and other ornithologists has shown that many species of birds feed their young nutrient-dense foods that may differ from a typical adult diet. Western Kingbirds, however, are widely understood to be insect specialists with one of the smallest bill sizes of North American kingbird species (Kaufmann 1992). There is a paucity of data on predation of larger vertebrate prey such as frogs and, to my knowledge, there are no accounts of this species preying on small vertebrates to feed nestlings or fledglings. A single reference stated that Western Kingbirds occasionally take tree frogs as prey, but it does not include region, frog species, or any other descriptive information (Terres 1980). There have been limited accounts of other kingbird species preying on small vertebrates. For example, Ohlendorf (1974) observed a Cassin's Kingbird (*Tyrannus vociferans*) eating a small rodent in a study in Texas. Neotropical passerine birds more often eat reptiles and amphibians (Poulin et al. 2001) and there are a few records of the closely related Tropical Kingbird (*Tyrannus melancholicus*) eating small vertebrates such as House Geckos (*Hemidactylus frenatus*; Ramirez-Fernandez et al. 2019), tree frogs

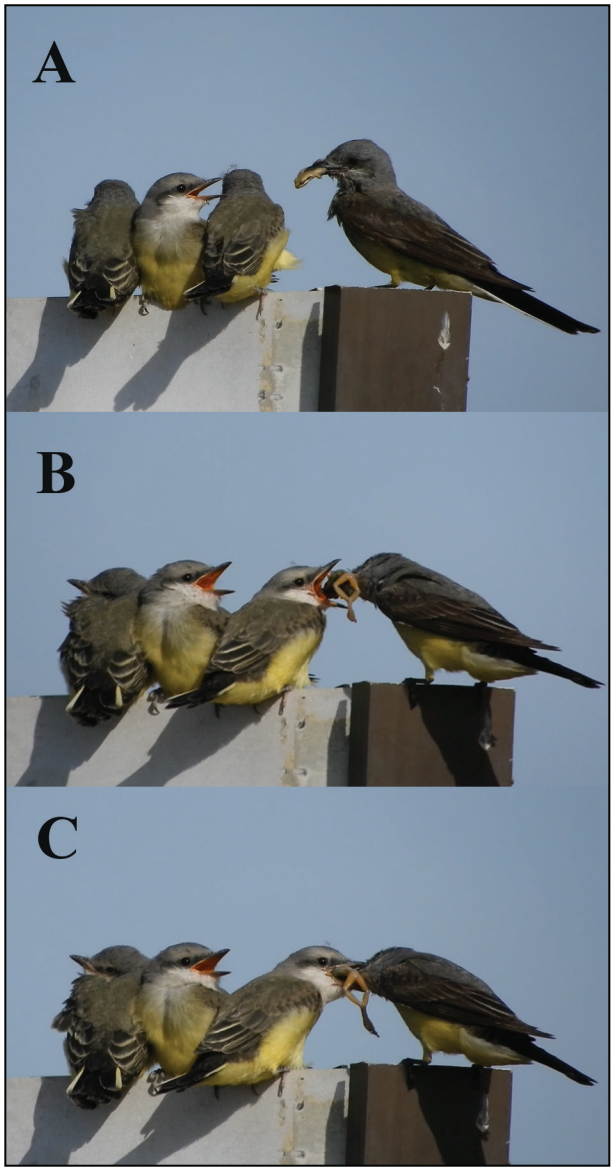

Figure 1. Western Kingbird (*Tyrannus verticalis*) feeding Pacific Chorus Frogs (*Pseudacris regilla*) to fledglings in Sacramento County, California, USA. (A) Although somewhat hard to see, there is a characteristic mask over the Pacific Chorus Frog eye. (B and C) Both siblings on the right show more aggressive begging behavior than the sibling on the left. The sibling on the left was the last to be fed by the adult. (Photographed by Allison B. Titus).

(Skutch 1954), and small fish (González-Oreja and Jiménez-Moreno 2018). Typical Western Kingbird prey such as grasshoppers, wasps, and bees (Beal 1912) are commonly observed and abundant at the preserve. Pacific Chorus Frogs are also a common and widespread species at the preserve and perhaps an easy, high nutrition prey source at this particular location (CNLM 2022). My observation of an adult Western Kingbird feeding multiple Pacific Chorus Frogs to young fledglings seems to be a novel occurrence and contributes to scant observations of Western Kingbird predation on frogs (Terres 1980). This account adds to a more comprehensive understanding of the life-history traits of both Western Kingbirds and Pacific Chorus Frogs, and their roles in North American food webs.

Acknowledgements.—This work was published with the permission of the County of Sacramento, the owner of the Illa M. Collin Conservation Preserve. I want to thank Eric Olson and Deborah L. Rogers from the Center for Natural Lands Management and Jeff Alvarez of The Wildlife Project for their review and helpful comments, as well as their encouragement to publish this observation.

Literature Cited

Alvarez, J.A. 2005. Unanticipated predation of California Red-Legged Frog at constructed wetlands (California). Ecological Restoration 21:66–67.

Beal, F. E. 1912. Food of our important flycatchers. Biological Survey Bulletin 44, U.S. Bureau of Biological Survey, Washington, D.C.

Center for Natural Lands Management (CNLM). 2022. Annual Report for 2022 Management Activities (January 1 to December 31, 2021) on the Illa M. Collin Conservation Preserve, Sacramento County. CNLM, Temecula, California. 156 p.

Ethier, J.P., A. Fayard, P. Soroye, D. Choi, M.J. Mazerolle, and V.L. Trudeau. 2021. Life history traits and reproductive ecology of North American chorus frogs of the genus *Pseudacris* (Hylidae). Frontiers in Zoology 18:40. https://doi.org/10.1186/s12983-021-00425-w.

Gamble, L.R., and T.M. Bergin. 2020. Western Kingbird (*Tyrannus verticalis*), Version 1.0. *In* Birds of the World. Poole, W.F. (Ed.). Cornell Lab of Ornithology, Ithaca, New York. https://doi.org/10.2173/bow.weskin.01

Goldberg, N.H. 1979. Behavioral flexibility and foraging strategies in Cassin's and Western kingbirds breeding sympatrically in riparian habitats in Central Arizona. Ph.D. Dissertation, University of Illinois at Urbana-Champaign. 86 p.

González-Oreja, J., and F. Jiménez-Moreno. 2018. First record of piscivory in the Tropical Kingbird (*Tyrannus melancholicus*). Huitzil 19:281–284.

Kaufmann, K. 1992. Western Kingbird identification. American Birds 46:323–326.

Ohlendorf, H.M. 1974. Competitive relationships among kingbirds (*Tyrannus*) in Trans-Pecos Texas. Wilson Bulletin 86:357–373.

Olson, E.O., and A. Titus. 2022. *Rana catesbeiana* (American Bullfrog). Predation. Herpetological Review 53:476.

Parrish, J.D. 2000. Behavioral, energetic, and conservation implications of foraging plasticity during migration. Studies in Avian Biology 20:53–70.

Poulin, B., G. Lefebvre, R.D. Ibáñez, C.A. Jaramillo, C. Hernandez, and A.S. Rand. 2001. Avian predation upon lizards and frogs in a neotropical forest

understory. Journal of Tropical Ecology 17:21–40.
Ramírez Fernández, J., E. Biamonte, A. Gutiérrez-Vannucchi, G. Sarria-Miller, A. Scott, and L. Sandoval. 2019. Previously undescribed food resources of eleven Neotropical bird species. Boletín SAO 28:1–8.
Tallamy, D.W. 2019. Nature's Best Hope: A New Approach to Conservation That Starts in Your Yard. Timber Press, Portland, Oregon.
Schultz, T.D. 1983. Opportunistic foraging of Western Kingbirds on aggregations of tiger beetles. Auk 100:496–497.
Skutch, A.F. 1954. Life history of the Tropical Kingbird. Proceedings of the Linnean Society of London 63–65:21–38.
Terres, J. K. 1980. The Audubon Society Encyclopedia of North American Birds. 1st Edition. Alfred A. Knopf, Inc, New York, New York.
Winkler, D.W., S.M. Billerman, and I.J. Lovette. 2020a. Crows, Jays, and Magpies (Corvidae), Version 1.0. *In* Birds of the World. Billerman, S.M., B.K. Keeney, P.G. Rodewald, and T.S. Schulenberg (Eds.). Cornell Lab of Ornithology, Ithaca, New York. https://doi.org/10.2173/bow.corvid1.01.
Winkler, D.W., S.M. Billerman, and I.J. Lovette. 2020b. Shrikes (Laniidae), version 1.0. *In* Birds of the World. Billerman, S.M., B.K. Keeney, P.G. Rodewald, and T.S. Schulenberg (Eds.). Cornell Lab of Ornithology, Ithaca, New York. https://doi.org/10.2173/bow.laniid1.01

Allison B. Titus is the Northern California Land Steward at the Center for Natural Lands Management (CNLM) and is based in Sacramento, California. She conducts on-the-ground stewardship and biological monitoring for high-value conservation lands, including diverse habitats such as vernal pools, annual grasslands, and perennial wetlands. Prior to joining CNLM, she worked in the North San Francisco Bay Area on vegetation management at Mount Tamalpais and she was a Community Education Manager in the Laguna de Santa Rosa watershed in Sonoma County. (Photographed by Ivan Parr).