

THE RECENT EXPANSION OF TROPICAL KINGBIRD IN ARIZONA

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INTRODUCTION

The Tropical Kingbird (*Tyrannus melancholicus*; Fig.1) has a wide distribution throughout the Americas, but in the United States breeds only in southern Arizona and southern and western Texas (Stouffer and Chesser 1998). There is also one documented breeding record in New Mexico (pers. comm. S. Williams). In Arizona the Tropical Kingbird is migratory and is typically present only during the breeding season (Phillips et al. 1964, Corman 2005). There are only two confirmed winter records of this kingbird in the state, both in Maricopa County (Stevenson and Rosenberg 2004(a); Stevenson and Rosenberg 2013(a)).

The occurrence of Tropical Kingbird in Arizona is relatively recent and its numbers and range are expanding. Its known history in the state began with a bird collected at Fort Lowell near Tucson in 1905, but this species was not reported again until Phillips (1940) discovered it nesting south of Tucson between Midvale Farms and the San Xavier Mission area in 1938. Called the "West Mexican Kingbird" at the time, Phillips collected a pair and found two or three more pairs, as well as several young. Three pairs were detected in the same area in 1939. The nests he found were in Fremont cottonwood (*Populus fremontii*). From his 1938-39 observations, Phillips (1940) concluded the Tropical Kingbird "is a regular summer resident at the present time near Tucson, from May 12 to September 3 at least." At that time three subspecies of *Tyrannus melancholicus* were recognized in the United States and Mexico: *T. m. occidentalis* (the subspecies in Arizona documented by Phillips), *T. m. couchii*, and *T. m. chloronotus* (Traylor 1979). In the 1970s Traylor (1979) studied some 800 museum specimens, and based on his findings proposed that morphological differences in bill length/wing length ratio and the wing tip index warranted acknowledging that *T. m. couchii* and *T. m. occidentalis* were separate sympatric species with minimal hybridization in southeastern Mexico. It had already been established that their vocalizations were different. In the field these two sibling species can be confidently identified only by their vocalizations. Both species are resident in southern Texas, but there are only two records (both winter) of Couch's Kingbird in Arizona—Yuma County, 2007 (Rosenberg et al. 2011) and Cochise County, 2015 (eBird 2012).

From the 1950s to the beginning of the Arizona Breeding Bird Atlas (Atlas) period in the early 1990s, Tropical Kingbirds expanded their nesting range in the state (Phillips et al. 1964, Monson and Phillips 1981). First reported mainly along the Santa Cruz River between Tucson and Nogales, Tropical Kingbirds were discovered nesting at Cook's Lake between Mammoth and Dudleyville on the lower San Pedro River in 1975 (Monson and Phillips 1981), and by the mid-1980s they had expanded their breeding along the river from Dudleyville to San Manuel (Corman 2005). During this period there were also several reports of nesting away from the Santa Cruz and San Pedro rivers, including along the Salt River east of Phoenix in 1956, the San Bernardino Ranch east of Douglas in 1976, and Arivaca in 1977 (Monson and Phillips 1981).

During the primary Atlas period, 1993-2000, Tropical Kingbirds were found nesting in most of the previously established areas and also in several new locations. Nesting along the San Pedro River did not proceed in a strictly south-to-north pattern; nesting in some northern sites occurred earlier than some to the south. From its first locations between Mammoth and Dudleyville, the Tropical Kingbird was then discovered nesting farther south between San Manuel and Cascabel (Corman 2005). Even farther south, the first confirmed breeding for the upper San Pedro River was of a pair nest building 24 July 1993 and later feeding young at Kingfisher Pond in the San Pedro Riparian National Conservation Area (Krueper 1999). Nesting has continued at this location to the present (eBird 2012). Nesting was also reported farther north between Dudleyville and Winkelman (Corman 2005).

Along the Santa Cruz River, nesting was confirmed north of Tucson in Marana north to a pecan grove just south of the Pinal Airpark (Corman 2005). A sighting from this area in June 1982 and numerous reports in the 1990s suggest Tropical Kingbirds had been likely nesting there longer (birdwg05 archives, eBird 2012).



Figure 1: Fledgling Tropical Kingbird, Santa Cruz Flats, 7 August 2013.
Photo by Keith Kamper

Away from the San Pedro and Santa Cruz rivers, outlier pairs were observed at Fortuna Pond northeast of Yuma in 1994, and nesting was confirmed at Quitobaquito Springs at Organ Pipe Cactus National Monument in 2000 and Hassayampa River Preserve near Wickenburg in 2001 (Corman 2005).

During the Atlas period nearly 60% of all confirmed nests were along perennial drainages and ponds containing tall stands of older Fremont cottonwood and Goodding willow (*Salix gooddingii*). Favoring woodland edges, their preferred nesting site in Arizona is the tops of larger cottonwoods with many exposed, dead branches for perching and foraging (Corman 2005). Of three nests discovered in cottonwoods, the mean height was 14.6 m with a range of 11.6-18.3 m (Corman 2005). In one instance a pair nested in a large athel tamarisk (*Tamarix aphylla*) at a golf course, and in at least one location pecan trees (*Carya illinoensis*) were used for nesting (Corman 2005). The Atlas surveys updated Phillips' (1940) early arrival date from 12 May to 24 April and late departure date from 3 September to early October (Corman 2005).

At the conclusion of the Atlas project, Corman (2005) predicted that "based on their history in the state, the nesting distribution of Tropical Kingbirds is expected to continue expanding in Arizona." The aim of this study is to review that expansion.

METHODS

To determine the expansion of breeding Tropical Kingbirds in Arizona, data from North American Birds, the AZFO Seasonal Reports, AZNMBirds listserv archives, its predecessor Birdwg05 archives, and eBird have been examined. Correspondence has also been conducted with observers about reports from specific areas. One-time reports of individual birds before and after the typical breeding season and away from known nesting areas were considered to be likely migrants or vagrants and not included in the data for breeding birds. Surveys were conducted 8 July 2013 and 20 July 2014 of two sites in northwestern Pima County, where breeding pairs were previously reported. In addition, five survey trips were made to recently discovered breeding locations at the Santa Cruz Flats area of Pinal County in 2013 between 28 May and 7 August, and six visits to the same area were made in 2014 between 9 May and 5 September. These surveys consisted of driving along farm roads with single rows of pecan trees, and making frequent stops to detect Tropical Kingbirds. Occasionally, playback of recorded vocalizations was used to elicit responses.

RESULTS

Nesting Tropical Kingbirds continue to be consistently found in their known breeding locations along the Santa Cruz and San Pedro rivers, although no census has been done of their numbers or research conducted on their density. Most of the reports along the Santa Cruz are between Green Valley (Pima County) and Nogales (Santa Cruz County). Along the lower San Pedro most of the reports continue to be between San Manuel (Pinal County) and Winkelman (Gila County), with the most numerous reports from the BHP Copper properties near San Manuel (Fig. 2), where Important Bird Area surveys have been conducted recently, and from accessible river sites between Dudleyville and Winkelman (AZNM listserv archives, birdwg05 archives, eBird 2012, IBA 2014).

Tropical Kingbirds are still found at a few of the previously known outlier sites, such as the San Bernardino National Wildlife Refuge (NWR) in southeastern Cochise County and Hassayampa River Preserve in northwestern Maricopa County. The latter is a well-



Figure 2: Tropical Kingbird at San Pedro River near San Manuel, 6 June 2011.
Photo by Doug Jenness

preserved cottonwood-willow-gallery riparian area where as many as three pairs have been reported (Stevenson and Rosenberg 2006). Tropical Kingbirds, however, are now absent from two sites where they previously nested in northwestern Pima County: the pecan grove south of the Pinal Airpark near Marana and a clump of two large cottonwoods on Hardin Road in Marana. These sites were surveyed by me once each during the 2013 and 2014 nesting seasons, but no Tropical Kingbirds were detected. The abandoned pecan grove was allowed to deteriorate and no longer exists. Although a healthy single row of pecan trees remains on the north side of the former grove, Tropical Kingbirds have not been reported there since 2009 (eBird 2012, AZNM listserv archives). At the Hardin Road site they were reported only in August of 2003 and 2009 (eBird 2012). Another Marana site, the Marana High Plains Effluent Recharge Project, where two kingbirds were reported in August 2009 (eBird 2012), was not visited.

Tropical Kingbirds began being reported along the Santa Cruz River in northwestern Tucson at the Sweetwater Wetlands in 2002 (Stevenson

and Rosenberg 2002). Nesting was first confirmed at Sweetwater and the Pima County Roger Road Water Reclamation Facility in 2007 (Stevenson and Rosenberg 2008; eBird 2012). From 1 August to 1 September 2014, Tropical Kingbirds were reported just to the north at Tucson's Christopher Columbus Park, including one report of a possible family group of three (eBird 2012). Whether this represented nesting at this location or wanderers from the nearby Sweetwater Wetlands is uncertain, but wandering is more likely. In 2014, at least two pairs nested at the Roger Road facility and Sweetwater Wetlands (eBird 2012).

On Tucson's east side, particularly along the Tanque Verde Wash, there have been reports of Tropical Kingbirds during the breeding season from a cluster of locations since 2003. Every year but one since 2003, this species has been observed at the Lakes of Castle Rock, a housing development with ponds and tall cottonwoods. Nesting in tall cottonwoods at this location has been confirmed most years through 2014 (pers. comm. B. Nicholas). At the Tucson Country Club, Tropical Kingbirds were observed carrying nesting material in 2012 (pers. comm. M. Stevenson). A pair was first reported from this location in 2004 (Stevenson and Rosenberg 2004(b)). As many as three were reported between 2008 and 2011 along the Tanque Verde Wash at Wentworth Road (eBird 2012). Individuals were reported at the intersection of Isabella Lee Natural Preserve and La Mariposa Resort in 2012 and 2013, and two along the adjacent Agua Caliente Wash in 2014 (eBird 2012). Elsewhere in Tucson two Tropical Kingbirds were reported from the Del Urich Golf Course adjacent to the Hardesty City Building on 12 June to 12 August 2014, but no evidence of breeding activity was detected (eBird 2012, pers. comm. M. Stevenson).

Although there had been a few sightings of Tropical Kingbirds during the breeding season along the lower Colorado River valley since 1947 (Rosenberg et al. 1999), the first confirmed nesting was not until 2011 (AZFO Seasonal Reports 2008). In that year a pair was documented nesting at the 'Ahakhav Tribal Preserve along the Colorado River south of Parker in La Paz County. The pair was confirmed nesting and built three nests before successfully fledging young. Nesting occurred again in 2012 with one nestling fledged (Fig. 3).



Figure 3: Tropical Kingbird on nest in a cottonwood at 'Ahakhav Tribal Preserve, 1 July 2012. Photo by David Vander Pluym

The pair was observed carrying nesting material to a probable nesting location in 2013, and although the nest was not detected, a single fledgling was found on 17 August 2013 (pers. comm. D. Vander Pluym). In 2014 a full-grown fledgling was observed on 6 July at the nest, and a juvenile was reported nearby with an adult 11 days later. Then, surprisingly, adults were found attending the same nest with nestlings on 9 August, suggesting double-brooding (pers. comm. L. Harter). This is especially interesting as there appears to be no previous documented reports of double-brooding by Tropical Kingbirds (Skutch 1960, Stouffer and Chesser 1998).

The most northern and western nesting record for the state is of a pair observed 9 July 2011 building a nest at Pintail Slough, Havasu NWR in Mohave County (AZFO Seasonal Reports 2008). The pair was present during each of the following three years and a nest was observed in 2013 (pers. comm. D. Vander Pluym). Incubation was observed on 20 July 2013 (pers. comm. L. Harter). Both of the lower Colorado River valley pairs have nested in Fremont cottonwoods (pers. comm. D. Vander Pluym).

There was also a pair likely breeding at Quigley Wildlife Area along the

Gila River in Yuma County in the summer of 2013. Single birds were also observed at two other locations on the Havasu NWR in the summer of 2014 (AZFO Seasonal Reports 2008).

The Holy Trinity Monastery at Saint David in Cochise County is a new nesting site near the San Pedro River and where Tropical Kingbirds have been reported nesting every year since 2008, with a high count of eight (two or three pairs with young) on 18 August 2011. At least two pairs were present in 2014 (eBird 2012). A nature trail at the monastery has a small pond, marsh, fields, and trees, including tall cottonwoods that attract the Tropical Kingbirds.

Away from the San Pedro and Santa Cruz rivers, individual Tropical Kingbirds had been reported farther east at Twin Lakes Golf Course in Willcox, Cochise County in July 1994 and late May 2008 (pers. comm. D. Stejskal), and a pair was observed 7-27 August 2011 (AZFO Seasonal Reports 2008). The presence of two juveniles with an adult 30 June 2012 offered the first evidence of nesting at this location (AZFO Seasonal Reports 2008). At least one Tropical Kingbird was present in the summer of 2013, and in August 2014 a nest with three nestlings was detected in a Chinese elm (*Ulmus parvifolia*). Later in the month six kingbirds were reported, apparently in two family groups (eBird 2012).

A pair of Tropical Kingbirds with at least one fledgling was reported at the Granite Reef Recreation Site along the Salt River in Maricopa County east of Phoenix in August 2011 but has not been detected there in the three subsequent summers (AZFO Seasonal Reports 2008, pers. comm. G. Karre).

The largest recently discovered population is in a broad agricultural strip through which the Santa Cruz River and its diversion channels flow intermittently west of Red Rock in southern Pinal County. This area, commonly referred to as the Santa Cruz Flats, is covered with cultivated fields of alfalfa, cotton, corn, sorghum, and barley, two sod farms, a large cattle feedlot, a dairy farm, sheep and cattle pastures, and several pecan groves. The area is laced with irrigation ditches, and sometimes the fields are flooded. A few roads are lined with single rows of mature pecan trees, which provide nesting kingbirds with the high branches they prefer for their nests and perches (Fig. 4).

It is not known how long Tropical Kingbirds have been nesting in the Santa Cruz Flats. Rather than recently expanding into that area, they may have been nesting there for many years. Possible evidence for this is that along a 1.6 km stretch of Overfield Road south of Greene Reservoir Road, Tropical Kingbirds were reported in the summers of 1998-2000 (pers. comm. R. Hoyer, pers. comm. M. Stevenson) and according to the Atlas map were likely nesting (Corman 2005). In the summer of 2013 no birds were found on three visits to this site by me, likely due to the severe degradation of the pecan trees along that stretch. The first recent reports of Tropical Kingbirds at the Santa Cruz Flats came from an area about 14.5 km to the east of Overfield Road along 12.9 km of contiguous roads: Baumgartner, Wheeler, Curtis, Fast Track, and Greene Reservoir roads and Picacho Highway. These reports included a single bird on 10 September 2008 on Wheeler Road just north of Baumgartner Road (AZFO Seasonal Reports 2008) and an adult with two fledglings three days later at the same location (pers. comm. R. Wright). A pair was reported along Baumgartner Road on 21 August 2011 (eBird 2012), a single bird was reported in pecan trees along Fast Track Road 11 September 2011 (pers. obs.), and two were observed in the same vicinity 15 July 2012 (pers. obs.). Then on 2 August 2012, G. Rosenberg and D. Stejskal discovered three pairs of Tropical Kingbirds in this area. Five days later Stejskal conducted an informal census along these roads and reported 43 Tropical Kingbirds, noting 21 adults and 22 juveniles (Stevenson and Rosenberg 2013 (b), AZFO Seasonal Reports 2008). This report spurred me to investigate this large breeding population in this unusual setting in the summers of 2013 and 2014.



Figure 4: Tropical Kingbird nesting habitat in a single row of pecan trees at Santa Cruz Flats. Photo by Doug Jenness

Tropical Kingbirds were found by K. Kamper and me along 8.4 km of the 12.9 km contiguous route described above that surrounds two pecan groves and several farm fields. Probable nesting pairs were found on all the roads referred to. In the summer of 2013, Tropical Kingbird pairs, sometimes with young, and in two instances, nests, were discovered along additional roads. These locations are: a 0.4 km dogleg stretch of Baumgartner Road with only four pecan trees 1.6 km to the east of the 12.9 km circuit, a 0.8 km stretch of Tweedy 8 km to the west, and a 1.6 km stretch of Curry 9.7 km to the west (Fig. 5).

Along the edges of these farm roads, Tropical Kingbirds were found nesting in single rows of tall pecan trees. These trees offer perches that overlook irrigated fields on both sides of the pecan rows, giving the kingbirds an open view to watch for predators and to sally for food. Irrigation ditches run near the base of the pecan rows and usually are located on the opposite sides of the roads as well. In both summers of my study, cotton and alfalfa fields were on either side of the pecan rows. The exceptions were two short stretches with desert habitat along one side, which didn't appear to affect nesting. During the Tropical Kingbird nesting season several alfalfa crops are produced, with fields flooded at the beginning of each crop cycle. The condition of the pecan trees ranged from healthy and fully foliated to nearly dead trees. Of three nests found, one was atop a fully leafed tree with only a few small dead branches, and two were in trees that were mostly foliated but with some degradation. Although pecan trees are not a nesting habitat typically associated with Tropical Kingbirds in Arizona, when planted in rows rather than groves they are generally consistent with the type of habitat these kingbirds use throughout their range. Stouffer and Chesser (1998) note that this species "inhabits open and semiopen country with scattered trees, fences, and hedges; also residential areas, roadsides, forest borders, forest clearings, thorn scrub, scrubby woodland, second growth, beach scrub, and marsh and river edges." The irrigated fields attract flying insects, which are the Tropical Kingbird's main source of food (Stouffer and Chesser 1998).

Two other Tyrannid flycatcher species, Western Kingbird (*Tyrannus verticalis*) and Vermilion Flycatcher (*Pyrocephalus rubinus*), also nest in the pecan trees. Even though they arrive and start breeding earlier, their nesting periods overlap with that of the Tropical Kingbirds with no apparent conflict. Phillips et al. (1964) also noted that late-arriving Tropical Kingbirds experienced no difficulty nesting in cottonwood rows already occupied by Cassin's (*Tyrannus vociferans*) and Western kingbirds. The same habitat-sharing

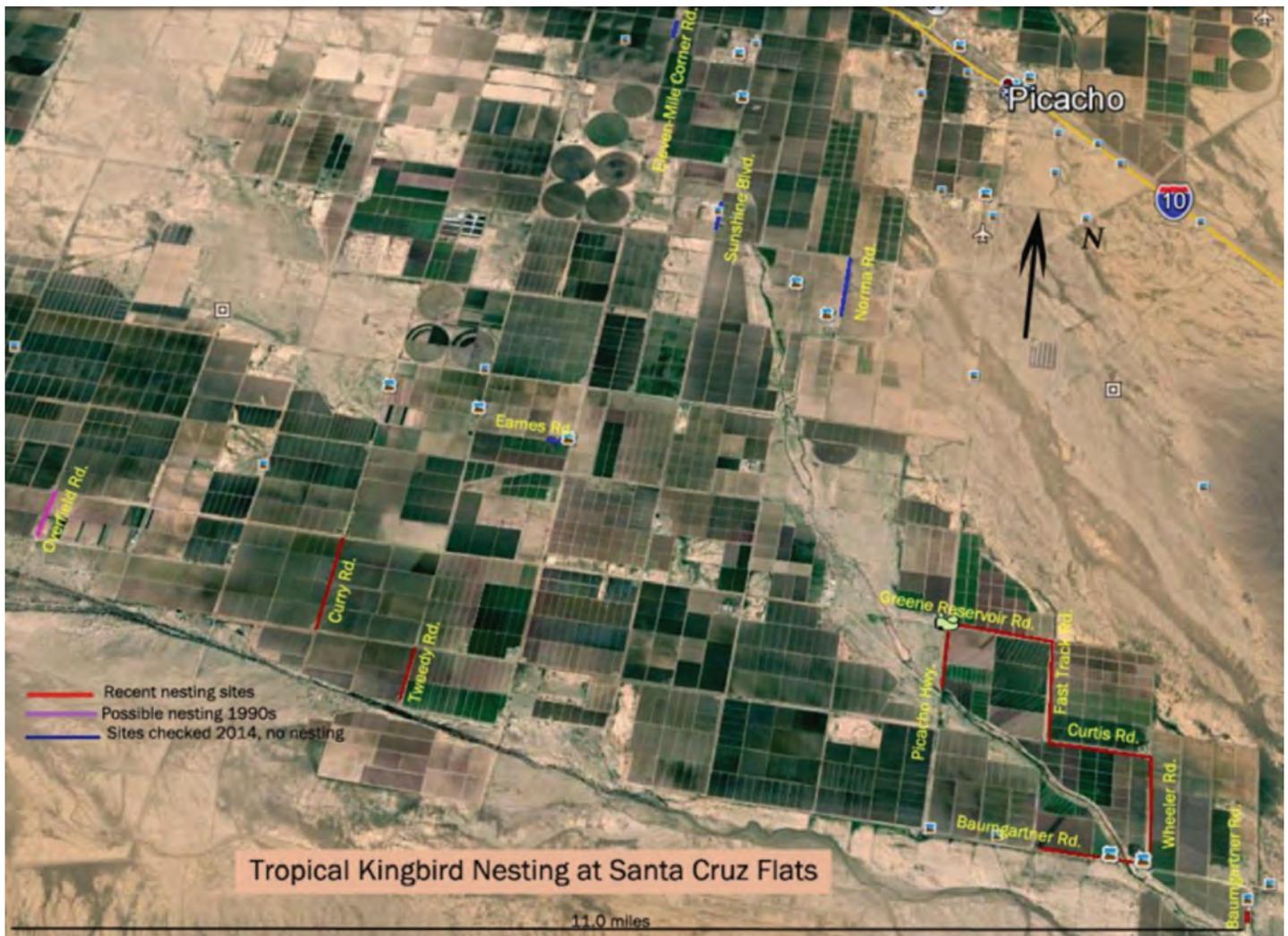


Figure 5: Tropical Kingbird nesting locations at Santa Cruz Flats

between Western and Tropical kingbirds has been observed at 'Ahakhav Tribal Preserve (pers. comm. L. Harter), and in south Texas with Couch's, Western, and Tropical kingbirds (Brush 2005). There is evidence that Tropical Kingbirds may be more specialized foragers than other flycatchers, capturing 94% of their insect prey by aerial hawking (Fitzpatrick 1980). Western Kingbirds are more generalized foragers, capturing insects on the ground or by gleaning at least 16% of the time, and often much more (Gamble and Bergin 2012). Stouffer and Chesser (1998) suggest that studying the diet, foraging, and microhabitat selection of the Tropical Kingbird may help explain how it can coexist with one to three other kingbird species throughout its range. The most important unresolved question regarding this species, they state, is how it coexists with other sympatric flycatchers.

In addition to the 11 survey trips made in the summers of 2013 and 2014, another 3.2 km of pecan tree-lined roads farther to the north at the Santa Cruz Flats were investigated in 2014 but no Tropical Kingbirds were detected. On the 0.8 km stretch along Tweedy Road, where there was one nest that fledged two young in 2013, no Tropical Kingbirds were detected in 2014. As to be expected, the largest number of birds reported was in early August, when most of the young had fledged but were still being fed and protected by the adults. In general, family groups appeared to remain near the nest site even after the young had fledged. On 7 August 2013, 31 Tropical Kingbirds - at least 24 of them in nine family groups - were detected in the 9.3 km of pecan tree-lined roads.

Fifty Tropical Kingbirds were detected on 11 August 2014 with a minimum of 15 family groups, although possibly more. It is not clear exactly how many nesting pairs use this area. It can be hard to accurately assess the numbers, because the young and the adults, even though noisy, are often hidden in the upper foliage of the trees. Occasionally, they come down low along the edges of fields to feed, where they are more visible. Of the three nests found, one was along Fast Track Road, one along the Baumgartner Road dogleg to the east of the main concentration, and one along Tweedy Road. All three of the nests observed were in the same height range (11.6-18.2 m) as those reported during the Atlas period (Corman 2005). Typical of the nests of this species, they were shallow, scraggly, untidy, and constructed mostly of grasses and weed stems (Fig. 6).

CONCLUSION

Analysis of the data and the surveys shows that the known geographical distribution of Tropical Kingbirds in Arizona is wider than it was at the end of the Atlas period (Fig. 7). Although a few locations appear to have been abandoned due to habitat degradation, this loss has been outweighed by the larger number of new nesting sites. Some new locations may not represent expansion but recently discovered sites. Most of the expansion is along the Santa Cruz and San Pedro rivers, which have the longest established breeding populations in the state. However, there are several new outlier breeding sites away from the traditional breeding areas, including west and north along the Colorado River and east to new locations in Cochise County.



Figure 6: Tropical Kingbird nest in a pecan tree along Tweedy Road at Santa Cruz Flats, 15 July 2013. Photo by Keith Kamper

The discovery of the Santa Cruz Flats breeding population is especially noteworthy because of its concentration in a relatively small area and its breeding in pecan trees, a nest location that was previously known to be only incidental in the state. It would be interesting to see if an investigation into similar habitats with pecan trees in other agricultural areas of the state would reveal nesting Tropical Kingbirds. The recent history of Tropical Kingbirds in Arizona suggests that their nesting distribution and our knowledge of this distribution will continue to increase. Why this and other species are expanding their breeding ranges northward is a topic that merits further study.

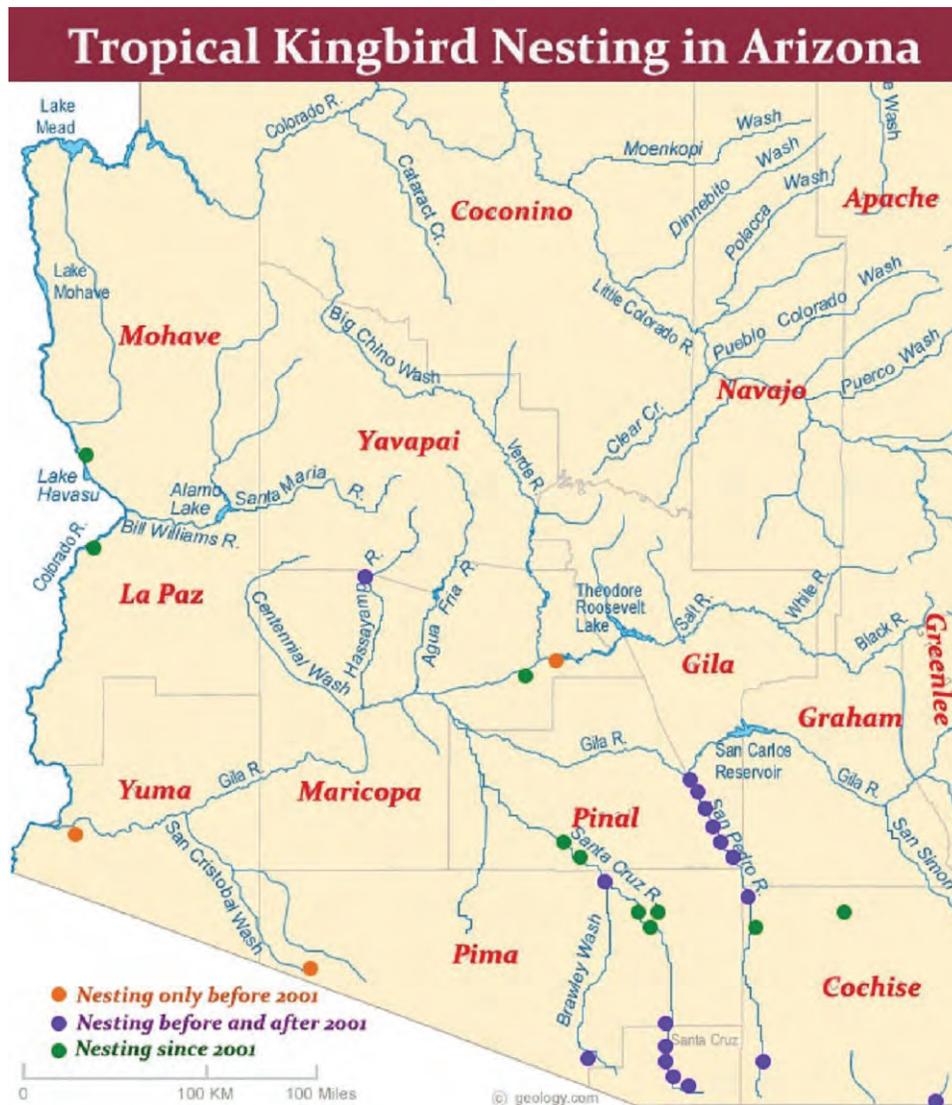


Figure 7: Expansion of Tropical Kingbird nesting in Arizona

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