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Nest reuse by Western Kingbirds.—Nest reuse is apparently uncommon among passerine species that build open-canopy nests (Mountjoy and Robertson 1988, Petit and Petit 1988, Curson et al. 1996), but there are anecdotal reports for species such as the American Robin (*Turdus migratorius*), Prairie Warbler (*Dendroica discolor*), Eastern Kingbird (*Tyrannus tyrannus*), Cedar Waxwing (*Bombycilla cedrorum*), and Prothonotary Warbler (*Protonotaria citrea*) (Tyler 1949, Nolan 1978, Blancher and Robertson 1985, Mountjoy and Robertson 1988, Petit and Petit 1988). I am unaware, however, of any systematic studies of nest reuse for any canopy-nesting passerine species.

Western Kingbirds (*T. verticalis*), which are Neotropical migrants, commonly inhabit open and partially open areas with scattered trees (see Gamble and Bergin 1996). Pairs mate monogamously throughout the breeding season, normally raising a single brood. Western Kingbirds defend a nesting territory and build an open-canopy nest from grass, twigs, and other string-like materials. Females perform most, if not all, of the nest-building activity, while males stand guard. Western Kingbirds have reused nests of other species such as Northern Flickers (*Colaptes auratus*), Baltimore Orioles (*Icterus galbula*), and Bullock's Orioles (*I. bullockii*) (Quigley 1944, Pinkowski 1982, Kennedy 1915, Munro 1919, Bergin 1992). There is one historical record of Western Kingbirds reusing a conspecific nest; a new nest was built on top of the old (Hunter 1915).

The study sites were in the Lake Ogallala State Recreation Area adjacent to the Kingsley Dam of Lake MacConaughy in western Nebraska. The habitat was riparian woodland with interspersed grasses and forbs. Data on nest reuse were collected while studying the nesting ecology of Western Kingbirds from 1989–92. A nest found in a previously used nest site was considered "old" and was then visited at least every other day throughout the current breeding season to determine its fate: unused, reused-failed, and reused-successful.

Twenty-five out of 76 (33%) active Western Kingbird nests constructed from 1989 to 1991 survived to the next breeding season; of these, 18 had been successful the previous season. Of the surviving nests, 19 (76%) were reused by three different species (Table 1) including Mourning Doves (*Zenaida macroura*) (N = 8), Eastern Kingbirds (N = 1), and Western Kingbirds (N = 10). Of the nests reused by Western Kingbirds, six were successful (60%), two suffered wind damage (20%), one suffered nest predation (10%), and one was abandoned, compared to a success rate of 52%, wind damage of 15%, and nest predation of 33% for all other active Western Kingbirds nests from 1989 to 1992 (Bergin 1993). Seven of the nests reused by Western Kingbirds had previously been successful. Western Kingbirds were not banded, so individual recognition was not possible. It is possible, however, that some nests were reused by the same individuals that constructed them.

These observations illustrate the behavioral plasticity of Western Kingbirds which nest in many different structures, including trees, cacti, power poles, buildings, and windmill towers (Gamble and Bergin 1996). Some Western Kingbirds reuse old conspecific nests when available—often successfully. Even nests of other species are reused (Kennedy 1915, Quigley 1944, Bergin 1992). Some Western Kingbirds exhibit site fidelity after nesting successfully (Blancher and Robertson 1985, Gamble and Bergin 1996) and thus may be predisposed to reuse old nests.

Nest building is an energetically expensive activity because as many as 2500 trips may be required to build an adequate nest (Putnam 1949, Collias and Collias 1984). In addition, trips to acquire nest material potentially expose birds to an increased risk of predation (Lima and Dill 1990). These costs can be reduced considerably if old nests are reused, but the strategy of nest reuse has several drawbacks (Collias and Collias 1984, Mountjoy and Robertson 1988). First, old nests are more likely to carry diseases or ectoparasites. Second, old

TABLE 1
NEST REUSE BY WESTERN KINGBIRDS

Fate of nests constructed by Western Kingbirds	1989	1990	1991	1992	Total
Total number of active nests	22	27	27	20	96
No. surviving from previous breeding season	*	4	11	10	25
No. unused	*	1	3	3	7
No. reused	*	3	9	7	19
Western Kingbird	*	0	6	4	10
Eastern Kingbird	*	0	1	0	1
Mourning Dove	*	3	2	3	8
Fate of nests reused by Western Kingbirds					
Successful	*	0	4	2	6
Unsuccessful	*	0	2	2	4
Wind	*	0	1	1	2
Predation	*	0	0	1	1
Unknown	*	0	1	0	1

* Data unavailable.

nests are unpredictable resources that are unlikely to survive to the next breeding season. Third, the reuse of old nests increases the probability of nest failure due to prior structural damage. Researchers examining the trade-offs between the costs and benefits of nest reuse should consider an experimental approach (Rendall and Verbeek 1996a, b).

Nest reuse is rarely reported for canopy-nesting passerines (Curson et al. 1996). The reasons are unclear. Perhaps old nests are difficult for researchers to track. Nest reuse by Western Kingbirds was documented only after a systematic search-effort during a multi-year study. Perhaps nest reuse is truly rare for canopy-nesting passerines. Only long-term studies of many species will reveal its true prevalence.

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Tawny Fish Owl activity pattern.—Fish owls, often regarded as nocturnal counterparts of the diurnal Osprey (*Pandion haliaetus*), fish eagles *Ichthyophaga* spp., and sea eagles (*Haliaeetus* spp.), consist of four species in the genus *Ketupa* from Asia and three species in the genus *Scotopelia* in Africa (Fogden 1973). Little is known about the natural history of the rare, seclusive Tawny Fish Owl (*Ketupa flavipes*) (Voous 1988). To date, no consensus has been reached regarding the circadian rhythm of the Tawny Fish Owl. Ali (1986), Severinghaus (1987), and Meyer De Schauensee (1984) described the owl as crepuscular and partially diurnal in habit. In Taiwan, Chang (1985) noted that Tawny Fish Owls were nocturnal, whereas Yeng (1985) reported them to be diurnal or crepuscular (Wang et al. 1991). These discrepancies are likely based on the results of scanty observations. In this paper, we examine the activity pattern of this species.

Methods.—We conducted field studies at Fusan, Nanshih Stream, 350 m in elevation, approximately 30 km south of Taipei, Taiwan. Vegetation consisted mostly of tropical rainforest formations dominated by *Ficus* and *Lauraceae* on the east and south banks of the stream (Taiwan Forestry Bureau 1995), whereas plantations, mostly of Makino Bamboo (*Phyllostachys makinoi*) and Japanese Fir (*Cryptomeria japonica*), farmland, and human