SPECIES

White-tailed Kite *Elanus leucurus*

Jeffrey R. Dunk

Version: 1.0 — Published March 4, 2020
Text last updated January 1, 1995

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Habitat

Habitat in Breeding Range

Generally occurs in low elevation grassland, agricultural, wetland, oak-woodland, or savannah habitats. Riparian areas adjacent to open areas also used. Specific plant associations seem unimportant; vegetation structure and prey abundance more important. Areas with extensive winter freezes generally avoided, but rainfall and humidity vary greatly throughout the range (e.g., nw. California can receive > 150 cm precipitation/yr whereas habitats in s. California receive < 20 cm/yr). Topography flat to steep. Lightly grazed or ungrazed fields generally support larger prey populations and are thus more suitable. Intensively cultivated areas also used. Nest trees range from single isolated trees to trees within relatively large stands (>100 ha). Nest tree/shrub species extremely variable, from shrubs <3 m tall (e.g., *Atriplex* and *Baccharis*) (Stendell 1972 (/bow/species/whtkit/cur/references#REF54890)) to large trees >50 m tall (e.g., *Sequoia sempervirens* and *Picea sitchensis*) (JRD). See also Food Habits: feeding.

Habitat in Nonbreeding Range

Habitat in Migration

Habitat in Migration

No information.

Habitat in Overwintering Range

Generally similar to breeding range, but proximity to nest trees is not important. Ungrazed areas used much more than grazed lands (Bammann 1975 (/bow/species/whtkit/cur/references#REF37677), JRD). Bammann reported that tall rank grass comprised only 1.27% of his study area, yet kites used that habitat for hunting > 72% of the time. Communal roosts in fall and winter are generally in small stands of trees (isolates) (Waian and Stendell 1970 (/bow/species/whtkit/cur/references#REF30937), JRD), but have been observed in open fields on the ground (Clark and Wheeler 1989b (/bow/species/whtkit/cur/references#REF54881)) and in orchards (Dixon et al. 1957 (/bow/species/whtkit/cur/references#REF54882), Waian 1973 (/bow/species/whtkit/cur/references#REF54891), A. Erichsen pers. comm.). Again plant associations not important for roost sites; wide variety of associations used. Important features of roost-sites are unknown.

‹ **Distribution (/bow/species/whtkit/cur/distribution)**

Movements and Migration (/bow/species/whtkit/cur/movement) ›

Recommended Citation

Dunk, J. R. (2020). White-tailed Kite (*Elanus leucurus*), version 1.0. In Birds of the World (A. F. Poole and F. B. Gill, Editors). Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.whtkit.01 (https://doi.org/10.2173/bow.whtkit.01)

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Breeding

Phenology

Pair Formation

Pairs found together year-round, but more individuals paired Dec through Aug. Courtship behaviors Dec through Sep. Pairs spend more time near the nesting area shortly after courtship begins. Nest building generally occurs rather slowly over the course of weeks.

Nest Building

Jan through Aug.

First/Only Brood Per Season

In San Diego Co., CA, first eggs by 6 Feb (Dixon et al. 1957 (/bow/species/whtkit/cur/references#REF54882)), in n. California first eggs mid to late March. Peak egg laying period unknown but probably within 1 mo of spring. Of approximately 250 nest contents collected by oologists (Western Foundation of Vertebrate Zoology records), most collected during Mar. Chicks hatch between 30 and 32 d (Hawbecker 1942 (/bow/species/whtkit/cur/references#REF37678)) and are dependent on parents for approximately 2–3 mo (1 mo as nestlings and 1–2 as fledglings). Adults hunt and deliver prey to young, or are mobbed by hungry young when approaching with prey. Adults observed flying into young from a first nesting attempt apparently to drive them from the nesting area (Dixon et al. 1957 (/bow/species/whtkit/cur/references#REF54882)).

Second Brood(s) Per Season

Will begin a second nest if first is destroyed and may initiate a second nest while young from the first nest are still dependent (Hawbecker 1940b (/bow/species/whtkit/cur/references#REF30927), Stendell 1972 (/bow/species/whtkit/cur/references#REF54890), Wright 1978 (/bow/species/whtkit/cur/references#REF54892)).

Nest Site

Selection

Both sexes participate (JRD), but Dixon et al. (Dixon et al. 1957 (/bow/species/whtkit/cur/references#REF54882)) observed only females selecting nests.

Microhabitat And Site Characteristics

Nest trees from 3 m to 50 m tall. Trees may be isolated or parts of contiguous forested areas. Most nests are on habitat edges and are placed in upper third of trees. Nest tree species variable; more than 20 species used (see Pickwell 1930a (/bow/species/whtkit/cur/references#REF54889), Dixon et al. 1957 (/bow/species/whtkit/cur/references#REF54882), Wright 1978 (/bow/species/whtkit/cur/references#REF54892)). Tree structure apparently most important determinant of use. No studies have quantified microhabitat characteristics in and around nest (i.e. within 20 m) or examined nest-site selection. Erichsen et al. (Erichsen et al. 1996 (/bow/species/whtkit/cur/references#REF30925)) examined habitat characteristics within 0.8 km of 22 nests in a largely agricultural setting and found that plots around successful nests (n = 9) contained more natural vegetation and human development, though not urban. Successful nests were placed on habitat edge and were > 100 m from a road.

Nest

Construction Process

Both sexes contribute in n. California (Watson 1940 (/bow/species/whtkit/cur/references#REF30939), Hawbecker 1942 (/bow/species/whtkit/cur/references#REF37678), JRD), although some authors stated only females build nests (Dixon et al. 1957 (/bow/species/whtkit/cur/references#REF54882)). Dummy nests often built (Waian 1973 (/bow/species/whtkit/cur/references#REF54891), JRD). Nest building takes between 7 (Hawbecker 1942 (/bow/species/whtkit/cur/references#REF37678)) and 28 d (Dixon et al. 1957 (/bow/species/whtkit/cur/references#REF54882)). Birds grasp twigs from trees in bill or in feet and flap or jump to break twig. In n. California males bring most twigs to nests while females arrange most twigs (JRD). Copulations common after nest material is brought to nest.

Structure And Composition Matter

Primarily composed of small twigs and lined with grass, hay, or leaves; generally well made (Hawbecker 1942 (/bow/species/whtkit/cur/references#REF37678), Watson 1940 (/bow/species/whtkit/cur/references#REF30939), Dixon et al. 1957 (/bow/species/whtkit/cur/references#REF54882)).

Dimensions

Typical dimensions: inside diameter 18 cm, inside depth 9 cm, outside diameter 53 cm, and outside depth 21 cm (Dixon et al. 1957 (/bow/species/whtkit/cur/references#REF54882)).

Microclimate

Little information. Nests may be shaded or exposed to direct sunlight for long periods of the day.

Maintenance Or Reuse Of Nests, Alternate, And Nonbreeding Nests

Of 130 nests followed (Dixon et al. 1957 (/bow/species/whtkit/cur/references#REF54882)), 128 built exclusively by kites, 2 built on top of nests of other species. Nests generally not reused in subsequent breeding attempts although reuse was reported by Barlow (Barlow 1897 (/bow/species/whtkit/cur/references#REF30920)) and Wright (Wright 1978 (/bow/species/whtkit/cur/references#REF54892)) . Alternate nests commonly built and may be used in subsequent breeding attempts (Waian 1973 (/bow/species/whtkit/cur/references#REF54891)).

Eggs

Shape

Ovate to oval (Bent 1937b (/bow/species/whtkit/cur/references#REF23961)).

Size

Of 50 eggs measured by Bent (Bent 1937b (/bow/species/whtkit/cur/references#REF23961)), mean dimensions: 42.5 x 32.8 mm with extremes of 45.3 x 33.3 mm, 42.4 x 35.6 mm, and 38.1 x 30.0 mm. From collection of Western Foundation of Vertebrate Zoology (WFVZ): mean (and range) of 87 eggs from 20 clutches: 43.17 (40.66–46.31) x 32.65 mm (31.50–33.64).

Mass

Shell mass 1.810 g (1.636–2.079; WFVZ). Mean weight 24 g (Newton 1979).

Eggshell Thickness

Eggshell thickness 0.266 mm (0.245–0.294).

Color: Ground Color And Markings

Bent (Bent 1937b (/bow/species/whtkit/cur/references#REF23961)) described the eggs as follows: “The white, or creamy-white, ground color is usually largely, and often wholly, concealed by the profuse markings of rich browns, large blotches of dark ‘bone brown' or ‘liver brown,' over washes or splashes of brighter browns, such as ‘burnt sienna,' ‘amber brown,' ‘hazel,' ‘tawny,' or ‘ochraceous-tawny;' in some eggs the heaviest markings are concentrated at one end and very rarely the rest of the egg or the entire egg is mainly white; the splashes and blotches have a longitudinal trend.” Dixon et al. (Dixon et al. 1957 (/bow/species/whtkit/cur/references#REF54882)) stated that there was great intra-clutch variation in egg coloration and patterns from “pure white to a heavily marked condition in which there are light purple and rust-red spots and blotches.” They further stated that colors fade with incubation.

Clutch Size

Typically 4 (see Demography and Populations: measures of breeding activity).

Egg-Laying

One egg every other day (Stendell 1972 (/bow/species/whtkit/cur/references#REF54890)).

Incubation

Onset Of Broodiness And Incubation In Relation To Laying

Begins with first or second egg (Stendell 1972 (/bow/species/whtkit/cur/references#REF54890)).

Incubation Patch(es)

No information.

Incubation Period

30–32 d (Hawbecker 1942 (/bow/species/whtkit/cur/references#REF37678)).

Parental Behavior

Only female incubates (Watson 1940 (/bow/species/whtkit/cur/references#REF30939), Hawbecker 1942 (/bow/species/whtkit/cur/references#REF37678), Dixon et al. 1957 (/bow/species/whtkit/cur/references#REF54882)). Male hunts and guards nesting area when nearby. Female comes off nest to get prey from male in either a perched side-by-side prey exchange or an aerial exchange. In the latter, male announces his presence with a *kewt* call, after which female flies toward him; male briefly hovers and female, from behind, reaches up and forward, grasping prey from male (Watson 1940 (/bow/species/whtkit/cur/references#REF30939), Waian 1973 (/bow/species/whtkit/cur/references#REF54891),

JRD). Female leaves nest briefly to preen, stretch (Dixon et al. 1957 (/bow/species/whtkit/cur/references#REF54882)), and to remove pellets which are dropped > 50 m from the nest (Moore and Barr 1941 (/bow/species/whtkit/cur/references#REF37680), JRD).

Hardiness Of Eggs Against Temperature Stress; Effect Of Egg Neglect

No information.

Hatching

Hatch asynchronously (Hawbecker Hawbecker 1940b (/bow/species/whtkit/cur/references#REF30927), Hawbecker 1942 (/bow/species/whtkit/cur/references#REF37678), Stendell 1972 (/bow/species/whtkit/cur/references#REF54890)). Maximum hatch interval reported is 11 d (Stendell 1972 (/bow/species/whtkit/cur/references#REF54890)). Few data on other aspects of hatching.

Young Birds

Condition At Hatching

Altricial young covered with a light tan down (Hawbecker 1942 (/bow/species/whtkit/cur/references#REF37678)) or yellowish down (Waian 1973 (/bow/species/whtkit/cur/references#REF54891)). Dixon et al. (Dixon et al. 1957 (/bow/species/whtkit/cur/references#REF54882)) described just hatched young as having a “grayish down”, but Waian (Waian 1973 (/bow/species/whtkit/cur/references#REF54891)) found that this gray down was not present until after the first week.

Growth And Development

From Stendell (Stendell 1972 (/bow/species/whtkit/cur/references#REF54890)). Mean mass at hatching 17.4 g (*n* = 5). Increase in mass rapid, with adult weight achieved or exceeded by fourth week; mass gain is approximately 12 g/d for the first 28 d. Growth rates for broods of 2 and 3 differ slightly, although all birds were of similar size prior to fledging. Tarsus length on day 1 approximately 10 mm; increases rapidly through day 20 when nearly adult length (mean = 34.4 mm). Wing chord 15 mm on day 1; 73% of adult length (mean = 317.1 mm) at 35 d when young capable of flight. Tails only 10–12 mm on day 10, after which growth rapid; at day 35 tail lengths 70% of that of adult (190.9 mm).

Behavior

At 2 wk of age, respond to threats by opening gape without making noise and raising wings (Moore and Barr 1941 (/bow/species/whtkit/cur/references#REF37680)). Some nestlings may attempt to get more food than their siblings; female “wards off an aggressive bird by striking it between the eyes with the elbow of her wing. This treatment seems to be very effective” (Dixon et al. 1957 (/bow/species/whtkit/cur/references#REF54882)). Siblicide not reported.

Parental Care

Brooding

No information.

Feeding

Figure 4 (https://cdn.download.ams.birds.cornell.edu/api/v1/asset/25018131) . By female (Dixon et al. 1957 (/bow/species/whtkit/cur/references#REF54882), Waian 1973 (/bow/species/whtkit/cur/references#REF54891)). Prey ripped apart by female and nestlings actively take pieces from female's beak (Waian 1973 (/bow/species/whtkit/cur/references#REF54891)). Moore and Barr (Moore and Barr 1941 (/bow/species/whtkit/cur/references#REF37680)) reported that by 3.5 wk old, young were fed entire prey items.

Nest Sanitation

Young defecate over nest edge (JRD); females observed removing pellets from nest (JRD).

Parental Carrying Of Young

No information.

Cooperative Breeding

Unknown.

Brood Parasitism by Other Species

Unknown.

Fledgling Stage

First flight approximately 4–5 wk after hatching (Waian 1973 (/bow/species/whtkit/cur/references#REF54891)). Waian (Waian 1973 (/bow/species/whtkit/cur/references#REF54891)) speculated that adults may teach juveniles to hunt by repeatedly hovering, dropping, pulling up prior to hitting the ground, and emitting the *eegrack* call. Juveniles often join parent in this behavior; if they refuse, adult may dive on them. Youngest juvenile known to kill its own prey was 33 d post-fledging (Waian 1973 (/bow/species/whtkit/cur/references#REF54891)).

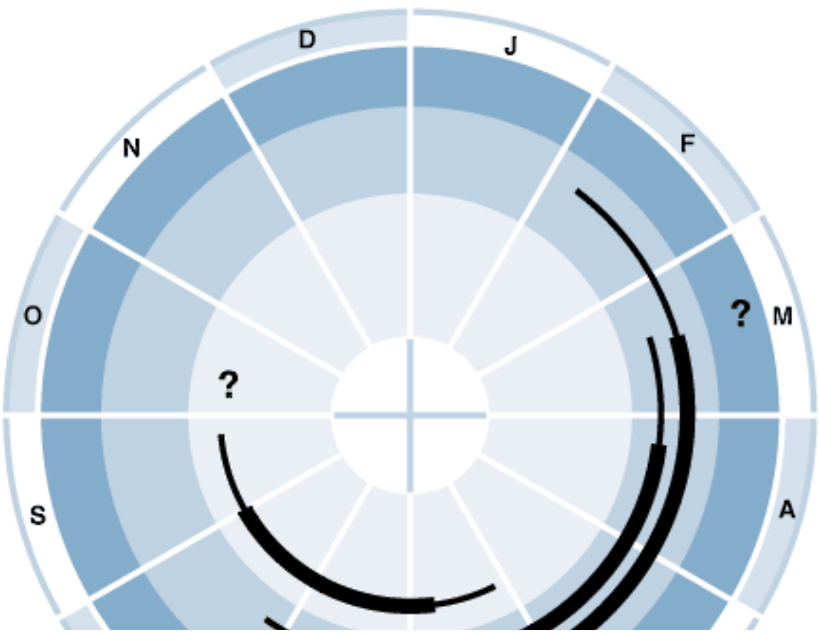
Immature Stage

Immature plumage kept for at least 4 mo but total duration is unknown. Bammann (Bammann 1975 (/bow/species/whtkit/cur/references#REF37677)) was unable to distinguish juvenile kites from adults after Dec in n. California. Waian (Waian 1973 (/bow/species/whtkit/cur/references#REF54891)) reported that immature kites were “consistently social” often flying, chasing, perching near and calling to one another. Immatures

apparently able to enter territories of neighboring kites; may even be fed by a neighboring territorial male with young of its own without aggression (Waian 1973 (/bow/species/whtkit/cur/references#REF54891)). Immatures have been known to establish and hold territories at approximately 2 mo post-fledging (JRD). No quantitative information published on time and activity budgets, hunting success, etc., of juveniles. Bammann (Bammann 1975 (/bow/species/whtkit/cur/references#REF37677)) combined such data because juveniles "had little difficulty in capturing small mammals early in November."

Behavior (/bow/species/whtkit/cur/behavior)

Demography and Populations (/bow/species/whtkit/cur/demography)



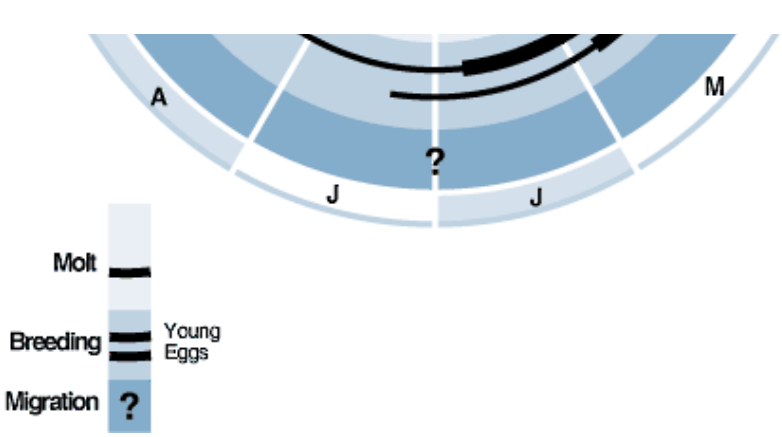


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Figure 3. Annual cycle of breeding, migration, and molt for the White-tailed Kite in North America.

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Thick lines show peak activity, thin lines off-peak.

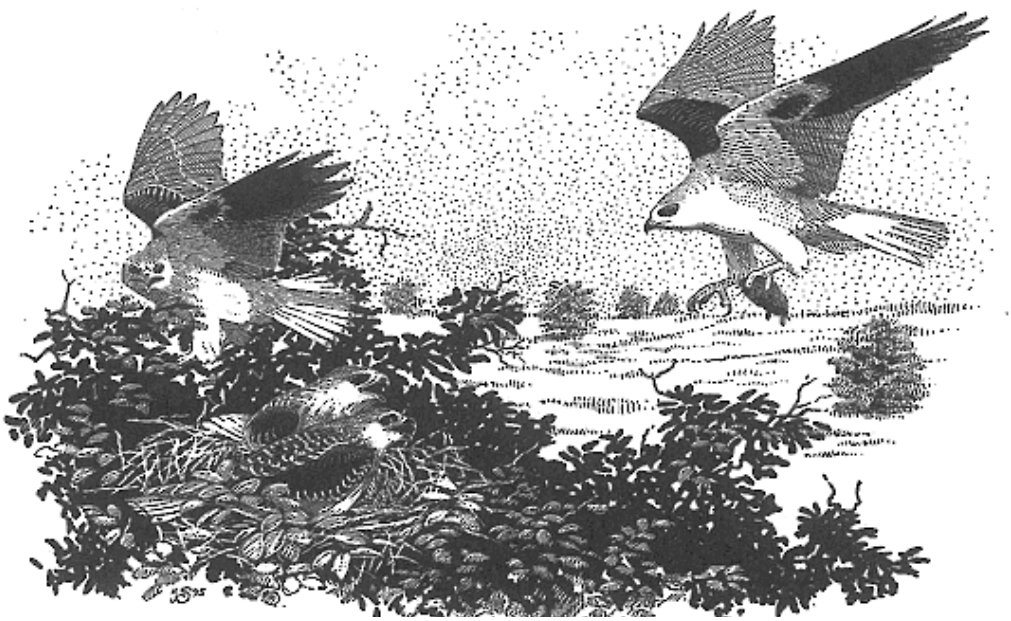

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Figure 4. White-tailed Kite delivering food to young in the nest.

Drawing by J. Schmitt.

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Dunk, J. R. (2020). White-tailed Kite (*Elanus leucurus*), version 1.0. In Birds of the World (A. F. Poole and F. B. Gill, Editors). Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.whtkit.01 (https://doi.org/10.2173/bow.whtkit.01)

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Diet and Foraging

Feeding

Main Foods Taken

Small mammals.

Microhabitat For Foraging

Prefers ungrazed grasslands (Bammann 1975 (/bow/species/whtkit/cur/references#REF37677), JRD), wetlands dominated by grasses, and fence rows and irrigation ditches (with residual vegetation) adjacent to grazed lands (Bammann 1975 (/bow/species/whtkit/cur/references#REF37677)). Mendelsohn and Jacsic (Mendelsohn and Jaksic 1989 (/bow/species/whtkit/cur/references#REF58846)) did an excellent review of nearly all aspects of the foraging ecology of both *leucurus* and *caeruleus* . They found: activity patterns generally similar throughout range; hunting success approximately 40-50% (strikes yielding prey); grasslands, low shrub, open woodlands

and cultivated areas favored for hunting (by both species). Also found that *leucurus* has longer tail and longer, narrower wings than *caeruleus*, probably stemming from its reliance on hover-hunting; *caeruleus* perch-hunts more.

Food Capture And Consumption

Generally arrives on hunting territory just after first light, except during inclement weather when it may arrive much later (JRD). Hunts almost exclusively by hovering, 5-25 m high, facing into the wind and scanning the ground for prey. Hovers last 1 s to > 1 min; longer hovers in windier conditions. While hovering, scans ground beneath and periodically looks from side to side, apparently for potential competitors or predators. Hovers generally end with: 1) dive to ground for prey, 2) flight to another hover location, 3) soaring/interacting with another bird, or 4) flight to perch. Perch hunting rarely recorded (Jaksic et al. 1987 (/bow/species/whtkit/cur/references#REF30930), JRD).

Warner and Rudd (Warner and Rudd 1975 (/bow/species/whtkit/cur/references#REF30938)) reported a mean of 16.1 ± 2.2 (SE) hovering positions (discrete points at which kite hovered and searched for prey) per hunt (*n* = 48). Mean time/hunting bout (generally from leaving a perch, hunting, and returning to a perch) estimated at 6.1 ±0.7 min (*n* = 205) near Davis, CA (Warner and Rudd 1975 (/bow/species/whtkit/cur/references#REF30938)), 5.04 min (*n* = 674) in Arcata, CA (Bammann 1975 (/bow/species/whtkit/cur/references#REF37677)).

Many studies report hunting primarily during first and last hours of day (Warner and Rudd 1975 (/bow/species/whtkit/cur/references#REF30938), Jaksic et al. 1987 (/bow/species/whtkit/cur/references#REF30930)), but during winter along California coast (an area with a maritime climate where temperatures rarely exceed 20°C) hunting increased as day progressed (Bammann 1975 (/bow/species/whtkit/cur/references#REF37677)). Warner and Rudd (Warner and Rudd 1975 (/bow/species/whtkit/cur/references#REF30938)) reported this kite hunting most frequently at temperatures < 20°C. Whether kites respond directly to temperature as Mendelsohn and Jacsic (Mendelsohn and Jaksic 1989 (/bow/species/whtkit/cur/references#REF58846)) suggested or to variations in activity levels of prey, as has been found in other vole-eating raptors (Daan et al. 1982 (/bow/species/whtkit/cur/references#REF30922)), is unknown.

Hovers often terminate with drops in altitude (apparently elicited by prey), followed by hovering at lower location. Hovers also terminated when a dive is aborted, generally within 3 m of ground. When attacking prey, wings are put in a nearly vertical position and the bird drops feet first. Successful attacks are almost always followed by a low (< 5 m) straight flight to a "favored" perch. Exceptions to this are during the breeding season when prey are delivered to or near the nest, when being pursued by kleptoparasitic species (e.g., Northern Harriers, Red-tailed Hawks [*Buteo jamaicensis*], Common Ravens [*Corvus corax*]), or after capturing very small prey which may be eaten whole on the wing (JRD). After perching with prey, kite eviscerates it, rips off head and eats that, then consumes body (beginning at posterior end, JRD). Generally, between every tug or bite on prey, kite scans surroundings; thus, much of the measured "feeding time" is actually spent observing. Mean feeding time estimated at 6.6 ± 0.6 min (Warner and Rudd 1975 (/bow/species/whtkit/cur/references#REF30938)), and

6.3 min (calculated from data in Bammann 1975 (/bow/species/whtkit/cur/references#REF37677) .5 min/d feeding and 3.1 prey/d). Hunting success is defined as min hunting/prey captured, though some researchers have defined it as the percentage of attempts that result in capture. The latter, however, does not relate to the energy expended while hunting whereas the former does. Hunting success 17.8 min/prey in n. California (*n* = 191 kills, Bammann 1975 (/bow/species/whtkit/cur/references#REF37677)), 34.6 min/prey in Chile (*n* = 24 kills, Jaksic et al. 1987 (/bow/species/whtkit/cur/references#REF30930)).

Diet

Major Food Items And Quantitative Analysis

Well studied. Early works (e.g., Fisher 1907 (/bow/species/whtkit/cur/references#REF54884)) reported a varied diet including small mammals, birds, lizards, and insects. More recent general reference material echo this (e.g., Grossman and Hamlet 1964 (/bow/species/whtkit/cur/references#REF60388)). These accounts do not accurately reflect this kite's reliance on small mammals, however, and the low diversity of prey taken at any one location.

In all, over 12,500 prey items identified (all from pellets); 1,635 from Chile, 10,959 from California. Of 12 studies of food habits, small mammals comprised > 95% of prey items in all cases (Appendix 2 (/bow/appendix/ACT1050982/APP1004119)). This kite can be considered a small mammal specialist. Small mammal prey generally fall within 20 to 70 g range. Rodent *Octodon degus* (150 to 250 g) not taken in Chile, even though it is the most common diurnal rodent in the area (Meserve 1977 (/bow/species/whtkit/cur/references#REF30931)). Prey other than small mammals are taken only incidentally and probably should not be considered "normal" prey. Pellets provide a fair, but not perfect representation of prey ingested (Stendell 1972 (/bow/species/whtkit/cur/references#REF54890)). No evidence of food caching and no information on senses of taste or smell.

Food Selection and Storage

No information.

Nutrition and Energetics

Koplin et al. (Koplin et al. 1980 (/bow/species/whtkit/cur/references#REF37679)) used time and activity data gathered by Bammann (Bammann 1975 (/bow/species/whtkit/cur/references#REF37677)) to calculate daily energy budgets during the nonbreeding season: 3.1 prey killed/d, equaling 76.6 g killed/d (mass after evisceration), 137.9 kcal ingested/d, and 113.1 kcal assimilated/d. These data probably are an overestimate because body mass of kites underestimated and flight time to and from communal roosts overestimated (T. A. Comet, E. Connors, JRD, and D. G. Leslie unpubl. data).

Metabolism and Temperature Regulation

No information.

Drinking, Pellet-Casting, and Defecation

Drinking not reported. With a captive bird, frequency of pellet casting was related to timing of feeding (Stendell 1972 (/bow/species/whtkit/cur/references#REF54890)). One pellet was cast when the bird ate at mid-morning and late afternoon, whereas two were cast when fed at sunrise and sunset. Typical raptorial pellet-casting behavior with neck expanding and contracting for < 1 min before opening mouth and releasing pellet. Pellet volume related to prey weight.

Movements and Migration (/bow/species/whtkit/cur/movement)

Sounds and Vocal Behavior (/bow/species/whtkit/cur/sounds)

Recommended Citation

Dunk, J. R. (2020). White-tailed Kite (*Elanus leucurus*), version 1.0. In Birds of the World (A. F. Poole and F. B. Gill, Editors). Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.whtkit.01 (https://doi.org/10.2173/bow.whtkit.01)

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ORIGINALLY PUBLISHED IN

The Cornell Lab of Ornithology Birds of North America

Handbook of Birds of the World Alive

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