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Turkey Vulture

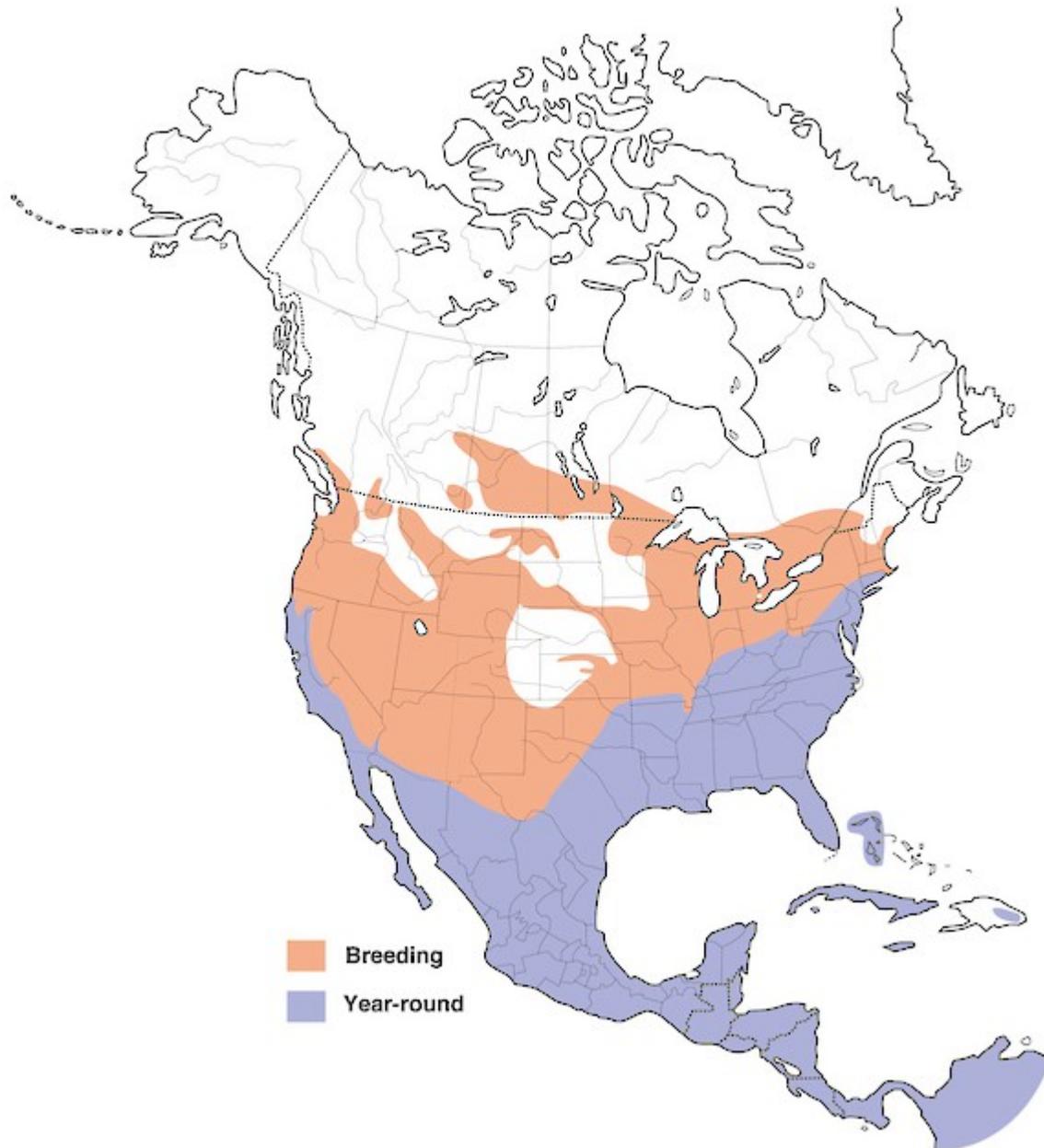
Cathartes aura

Order: CATHARTIFORMES

Family: CATHARTIDAE

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Distribution, Migration and Habitat



<https://download.ams.birds.cornell.edu/api/v1/asset/31755791>

Figure 1. Distribution of Turkey Vulture.

[+Enlarge \(https://download.ams.birds.cornell.edu/api/v1/asset/31755791\)](https://download.ams.birds.cornell.edu/api/v1/asset/31755791)

This species also breeds in South America and e. Caribbean. See text for details.



[+ Enlarge \(https://ebird.org/ebird/embedmap/turvul?table=true&env.minX=-99.47021484375&env.minY=10&env.maxX=-78.37646484375&env.maxY=65&mapType=roadmap\)](https://ebird.org/ebird/embedmap/turvul?table=true&env.minX=-99.47021484375&env.minY=10&env.maxX=-78.37646484375&env.maxY=65&mapType=roadmap)

eBird range map for Turkey Vulture

Generated from eBird observations (Year-Round, 1900-2017)

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Distribution in the Americas

Breeding Range

[Figure 1 \(https://download.ams.birds.cornell.edu/api/v1/asset/25002431\)](https://download.ams.birds.cornell.edu/api/v1/asset/25002431) . Breeds north to s. British Columbia (s. Vancouver I., along southern coast and Strait of Georgia north to Quadra I. and east to Hope I., Okanagan Valley from Osoyoos Lake north to Shuswap

Lake; [Campbell et al. 1990a \(/Species-Account/bna/species/turvul/references#REF15960\)](#)), n. Idaho, nw. Montana, e.-central (Cold Lake and Big Valley areas) and se. (North Saskatchewan River valley) Alberta ([Semenchuk 1992 \(/Species-Account/bna/species/turvul/references#REF55543\)](#)), w.-central to se. Saskatchewan ([Smith 1996b \(/Species-Account/bna/species/turvul/references#REF55615\)](#)), s. Manitoba ([Cleveland et al. 1988 \(/Species-Account/bna/species/turvul/references#REF6910\)](#)), [Cuthbert et al. 1990 \(/Species-Account/bna/species/turvul/references#REF59981\)](#)), w. Ontario north and west of Thunder Bay and se. Ontario to about 47°N ([Cadman 1987d \(/Species-Account/bna/species/turvul/references#REF21570\)](#)), s. Québec to about 47°N ([Chabot and Barrette 1989 \(/Species-Account/bna/species/turvul/references#REF21571\)](#)), [Gauthier and Aubry 1996b \(/Species-Account/bna/species/turvul/references#REF49446\)](#)), w. and central Vermont, s. New Hampshire, and southern half of coastal Maine ([Coleman and Fraser 1989b \(/Species-Account/bna/species/turvul/references#REF40101\)](#)). Apparent vagrants occasionally recorded as far north as n. Ontario ([Cadman 1987d \(/Species-Account/bna/species/turvul/references#REF21570\)](#)) and Newfoundland ([Montevecchi and Tuck 1987 \(/Species-Account/bna/species/turvul/references#REF9469\)](#)); e.g., some northern birds may breed in New Brunswick and Nova Scotia ([Erskine 1992a \(/Species-Account/bna/species/turvul/references#REF64430\)](#)).

Range extends south through continental U.S., Middle America, and South America to Tierra del Fuego and Falkland Is. In Middle and South America, also breeds on many of the larger offshore islands, including Margarita I. (Venezuela) and Trinidad.

Also breeds on islands in Caribbean, including portions of Bahamas (Andros, Grand Bahama, and Abaco; [Brudenell-Bruce 1975 \(/Species-Account/bna/species/turvul/references#REF58563\)](#)), Cuba and Isle of Pines ([Garrido and Kirkconnell 1993a \(/Species-Account/bna/species/turvul/references#REF7618\)](#)), Cayman Brac (rare, at least formerly; [Bradley 1985b \(/Species-Account/bna/species/turvul/references#REF13223\)](#)), Jamaica ([Downer and Sutton 1990 \(/Species-Account/bna/species/turvul/references#REF2806\)](#)), Hispaniola (at least in e.

Dominican Republic; [Stockton De Dod 1981 \(/Species-Account/bna/species/turvul/references#REF21644\)](#), and Puerto Rico (primarily in southwest; [Raffaele 1989 \(/Species-Account/bna/species/turvul/references#REF7180\)](#)).

Within w. U.S. and w. Canada, breeding range discontinuous. Breeding very local or absent in portions of Great Plains, including most of Nebraska, e. Colorado, and much of w. Kansas ([Johnsgard 1979a \(/Species-Account/bna/species/turvul/references#REF61582\)](#)), s. and nw. Minnesota ([Janssen 1987 \(/Species-Account/bna/species/turvul/references#REF65004\)](#)), and e. Dakotas and portions of w. Dakotas ([Stewart 1975b \(/Species-Account/bna/species/turvul/references#REF2259\)](#), [Peterson 1995 \(/Species-Account/bna/species/turvul/references#REF29173\)](#)). Also sparse or absent from much of n. Montana ([Montana Bird Distribution Records Committee 1992 \(/Species-Account/bna/species/turvul/references#REF11723\)](#)), sw. Saskatchewan, except for Cypress Hills area ([Smith 1996b \(/Species-Account/bna/species/turvul/references#REF55615\)](#)), central and n. Idaho ([Stephens and Sturts 1991 \(/Species-Account/bna/species/turvul/references#REF7106\)](#)), ne. Oregon ([Gilligan et al. 1994 \(/Species-Account/bna/species/turvul/references#REF56692\)](#)), central and se. Washington and most of Washington's Olympic Peninsula (Washington Breeding Bird Atlas unpubl.).

Winter Range

Winters primarily from n. California (Humboldt Co. along coast and n. Central Valley in interior) south to Mexican border, lower Colorado River valley north to Parker, AZ, extreme s. Arizona, n. Mexico, eastern half of Texas, se. Oklahoma, southernmost portions of Missouri and Illinois, s. Indiana, s. Ohio, n. West Virginia, se. Pennsylvania, southernmost New York, and s. Connecticut ([Peterjohn 1989b \(/Species-Account/bna/species/turvul/references#REF56491\)](#), [Rosenberg et al. 1991 \(/Species-Account/bna/species/turvul/references#REF56157\)](#), [Master 1992d \(/Species-Account/bna/species/turvul/references#REF21617\)](#), Christmas Bird Count data) south through remainder of breeding range. Occasional observations on smaller islands of Caribbean east to Virgin Is. could be North American migrants, but origin of these birds uncertain. Birds may move northward temporarily on southerly winds during warm

periods, and occasionally overwinter as far north as sw. British Columbia ([Campbell et al. 1990a \(/Species-Account/bna/species/turvul/references#REF15960\)](#)), s. Wisconsin (MJM), and se. Ontario ([Cadman 1987d \(/Species-Account/bna/species/turvul/references#REF21570\)](#)).

Distribution Outside the Americas

Not recorded.

Nature of Migration

Partial migrant; individuals that breed north of the wintering range ([Figure 1 \(https://download.ams.birds.cornell.edu/api/v1/asset/25002431\)](#)) are generally migratory; eastern populations (which intergrade with western populations from Wisconsin to Kansas, Oklahoma, and e. Texas) are less migratory than western populations. Nomadic along northern border of winter range. Generally resident in Florida, other Gulf states, and along se. Atlantic Coast; also in sw. U.S. as far north as northern coastal California ([Abbors 1979 \(/Species-Account/bna/species/turvul/references#REF21555\)](#)), and Nebraska southward ([Wetmore 1964a \(/Species-Account/bna/species/turvul/references#REF49490\)](#)). In East, some individuals are year-round residents in northern part of winter range (s. Ohio, Indiana, s. Pennsylvania, e. Virginia, Delaware; [Coles 1938 \(/Species-Account/bna/species/turvul/references#REF49437\)](#), [Stewart 1977 \(/Species-Account/bna/species/turvul/references#REF49480\)](#), [Coleman and Fraser 1989c \(/Species-Account/bna/species/turvul/references#REF21573\)](#)).

As eastern migrants join residents, individuals concentrate in southern part of winter range from Carolina lowlands to Louisiana ([Bailey and Wright 1931 \(/Species-Account/bna/species/turvul/references#REF12034\)](#), [Potter et al. 1980 \(/Species-Account/bna/species/turvul/references#REF5993\)](#)) and especially Florida ([Gaby 1982 \(/Species-Account/bna/species/turvul/references#REF21586\)](#)). Birds breeding in northern

part of breeding range migrate over more southerly breeding populations to winter farther south—e.g., from Michigan to Florida and Georgia, from Indiana to Louisiana, from Ohio to Florida and Mississippi. Most western birds are long-distance migrants, spending the boreal winter with Central and South American races ([Kirk and Houston 1995 \(/Species-Account/bna/species/turvul/references#REF49456\)](#)). Lack of information on migration patterns of *C. a. meridionalis* and *C. a. aura* populations is exacerbated by problems with leg-banding (see Conservation and management: management, below).

Timing and Routes of Migration

Fall

Apparently leaves northern breeding areas late Aug–early Nov, but early and late migrants often hard to distinguish from summer residents and overwintering birds, respectively. Traditional communal roosts often swell with arrival of migrants, and serve as staging areas in north; numbers generally higher and for longer period in fall than in spring. In s. Wisconsin (Baraboo Hills), arrival of migrants first evident in early Sep, numbers peaking mid-Oct (e.g., summer roost of 60–130 birds grows to 200–280); latest departure dates related to mildness of weather, range 9 Oct–26 Nov (median 22 Oct, $n = 18$), progressively later as population has increased ([Lange 1986 \(/Species-Account/bna/species/turvul/references#REF49458\)](#), MJM). In Ohio, migration begins 15–25 Sep; largest movements through 15 Oct (up to 270 counted at established roosts); migrants are gone from northern and central counties by 25 Oct–5 Nov and from southern counties by 15 Nov ([Peterjohn 1989b \(/Species-Account/bna/species/turvul/references#REF56491\)](#)). In British Columbia, migration peaks early Sep, most birds departing by late Oct ([Campbell et al. 1990a \(/Species-Account/bna/species/turvul/references#REF15960\)](#)); at Becher Bay headlands (near Victoria, British Columbia), numbers peak in last 10 days of Sep, and all birds have departed by mid-Oct ([Stirling 1994 \(/Species-Account/bna/species/turvul/references#REF21643\)](#)).

Although counted at North American hawk-watches, few rigorous statistical trend results published for this species (e.g., [Hussell and Brown 1992 \(/Species-Account/bna/species/turvul/references#REF16047\)](#)). Reported on watches from most western states; peaks in Oregon early Sep–early Oct, and in California late Sep through Oct ([Heintzelman 1986 \(/Species-Account/bna/species/turvul/references#REF16585\)](#)). Periods of passage (95% of birds) on western hawk-watches: 3 Sep–6 Oct (Wellsville Mtns., UT); 28 Aug–5 Oct (Goshute Mtns., NV); 23 Aug–6 Oct (Manzano Mtns., NM; [Hoffman et al. 1992b \(/Species-Account/bna/species/turvul/references#REF21596\)](#)). Western hawk-watch data show bell-shaped curve in migration activity—skewed slightly to early part of season in fall, skewed to late part of season in spring ([Hoffman et al. 1992b \(/Species-Account/bna/species/turvul/references#REF21596\)](#)). At Duluth, MN (southwestern tip of Lake Superior), migration mainly Sep and early Oct, peaks mid- to late Sep ([Hofslund 1966 \(/Species-Account/bna/species/turvul/references#REF21597\)](#)). At Hawk Cliff along northern shore of Lake Erie, generally mid-Sep–mid-Nov, mostly Oct ([Haugh 1972a \(/Species-Account/bna/species/turvul/references#REF32954\)](#)); in 1991, 7 Sep–16 Nov, with peak of 2,907 on 13 Oct ([Duncan et al. 1991 \(/Species-Account/bna/species/turvul/references#REF49443\)](#)). Major migration of Canadian birds across Detroit River mouth, mostly 5–20 Oct, when 10,000–16,000 pass over, with daily highs of 2,000–3,000 ([Kielb 1994 \(/Species-Account/bna/species/turvul/references#REF21605\)](#)). Peak movement at Hawk Mtn., PA, early Nov; main passage 5 Oct–10 Nov ([Atkinson et al. 1996 \(/Species-Account/bna/species/turvul/references#REF15949\)](#)).

Eastern migrants arrive in s. Florida wintering areas from early Oct into Nov ([Stevenson 1970 \(/Species-Account/bna/species/turvul/references#REF21640\)](#), [Gaby 1982 \(/Species-Account/bna/species/turvul/references#REF21586\)](#)). Flocks seen flying south from Florida Keys mid-Nov–mid-Dec, possibly to Caribbean islands, although some apparently return instead ([Darrow 1983 \(/Species-Account/bna/species/turvul/references#REF25002\)](#)). Populations in Cuba and Puerto Rico do not increase during winter, so apparently do not attract large numbers of wintering migrants ([Santana et al. 1986c \(/Species-Account/bna/species/turvul/references#REF21634\)](#), [Wotzkow and Wiley 1988 \(/Species-](#)

[Account/bna/species/turvul/references#REF21656](#)). Many western migrants pass through s. Texas Sep–Nov ([Rappole and Blacklock 1985 \(/Species-Account/bna/species/turvul/references#REF1890\)](#)), El Salvador 12 Oct–13 Nov ([Brown and Amadon 1968 \(/Species-Account/bna/species/turvul/references#REF9577\)](#)), Honduras mid-Oct ([Monroe 1968 \(/Species-Account/bna/species/turvul/references#REF57425\)](#)), and Panama mid-Oct–early Dec ([Loftin 1963a \(/Species-Account/bna/species/turvul/references#REF21614\)](#), [Wetmore 1965b \(/Species-Account/bna/species/turvul/references#REF55635\)](#), [Smith 1980c \(/Species-Account/bna/species/turvul/references#REF25024\)](#)). Earliest arrival at Venezuelan Llanos 12 Oct. Near Veracruz, Mexico, 1.2–1.6 million migrants each fall, 1994–1996; peak Oct (Pro natura, Hawk Mtn. unpubl. data). May enter South America on west side of Andes and cross into Amazonia near Colombia–Ecuador border ([Smith 1985b \(/Species-Account/bna/species/turvul/references#REF21637\)](#)).

Spring

Eastern migrants depart Florida wintering areas in Mar and Apr ([Gaby 1982 \(/Species-Account/bna/species/turvul/references#REF21586\)](#)). Western migrants appear to depart n. Colombia in Feb and Mar ([Koester 1982 \(/Species-Account/bna/species/turvul/references#REF21610\)](#)); those wintering in Venezuelan Llanos may begin departing mid-Feb, with other migrants evidently passing through in Mar, and all migrants gone by early to mid-Apr (19 Apr latest date; [Kirk 1988 \(/Species-Account/bna/species/turvul/references#REF21606\)](#), [Kirk and Currall 1994 \(/Species-Account/bna/species/turvul/references#REF35634\)](#)). In Panama, wintering birds leave in Feb; birds wintering farther south pass through until late Apr ([Smith 1980c \(/Species-Account/bna/species/turvul/references#REF25024\)](#)). Concentrations reported moving through El Salvador in early Mar ([Brown and Amadon 1968 \(/Species-Account/bna/species/turvul/references#REF9577\)](#)), along Mexican Gulf Coast states in late Mar through Apr ([Bussjaeger et al. 1967 \(/Species-Account/bna/species/turvul/references#REF21569\)](#), [Purdue et al. 1972 \(/Species-Account/bna/species/turvul/references#REF49471\)](#), [Thiollay 1980 \(/Species-Account/bna/species/turvul/references#REF17051\)](#)), and Texas coastal bend during Feb

–Apr ([Rappole and Blacklock 1985 \(/Species-Account/bna/species/turvul/references#REF1890\)](#)). A few birds may attempt migration across Gulf of Mexico (or perhaps to Cuba, where this species is also a permanent resident; [Garrido and Kirkconnell 1993a \(/Species-Account/bna/species/turvul/references#REF7618\)](#)) from Yucatán Peninsula ([Van Tyne and Trautman 1945 \(/Species-Account/bna/species/turvul/references#REF21650\)](#)).

Although individuals (apparently from more northerly wintering flocks) sometimes wander north into nonwintering range during winter warm spells, first true migrants arrive around late Feb in w. Oregon, s. Arizona, e. Texas, s. Missouri, s. Illinois, n. Indiana, Pennsylvania, and W. Virginia. From early Mar to early Apr, the species occurs progressively farther north; numbers generally peak about 2–3 wk after first arrivals, and transients usually are evident until early–late May. In s. Wisconsin, lone birds sometimes seen briefly during Feb warm spells; first arrivals noted 4–30 Mar (median 20 Mar, $n = 17$; [Lange 1986 \(/Species-Account/bna/species/turvul/references#REF49458\)](#)), marked breeders usually first seen mid- to late Mar (MJM). In British Columbia, most birds arrive Apr; earliest late Feb or early Mar on coast, 28 Mar–15 May inland ([Campbell et al. 1990a \(/Species-Account/bna/species/turvul/references#REF15960\)](#)). Small concentrations along Great Lakes; e.g., flights of 200 to >250 along w. Lake Erie usually during southwesterly winds in late Apr, migrants may linger until early Jun ([Peterjohn 1989b \(/Species-Account/bna/species/turvul/references#REF56491\)](#)); average of 99/yr (1988–1992) at Whitefish Point on Lake Superior ([Kielb 1994 \(/Species-Account/bna/species/turvul/references#REF21605\)](#)). For both fall and spring dates see Tyler ([Tyler 1937 \(/Species-Account/bna/species/turvul/references#REF49487\)](#)); however, some of these dates are no longer representative in areas where populations have increased.

Migratory Behavior

Diurnal migrant, generally dispersed or in loose flocks (narrow lines or kettles), but concentrated where migration route narrows (e.g., Isthmus of Panama; [Smith 1985b \(/Species-Account/bna/species/turvul/references#REF21637\)](#)). In many areas, migrants more widely distributed than summer residents (see [Mossman 1991a \(/Species-Account/bna/species/turvul/references#REF40111\)](#)). More concentrated ahead of storm fronts (e.g., 1,500 in n.-central Texas on 2 Nov ahead of an approaching cold front; [Pulich 1988b \(/Species-Account/bna/species/turvul/references#REF23302\)](#)), along leading lines such as escarpments, and (since generally avoids crossing large bodies of water) along shorelines such as Great Lakes or coast. Increasingly concentrated southward from s. Texas to Panama, where spectacular flights involve thousands of birds, especially in fall.

Migrates almost entirely by gliding flight, using deflective updrafts along hills, escarpments, and mountains, and convective thermals, including storm fronts and cloud "streets" ([Smith 1985b \(/Species-Account/bna/species/turvul/references#REF21637\)](#), [Kerlinger 1989a \(/Species-Account/bna/species/turvul/references#REF8570\)](#)). Usually low-level migrant, but may ride thermals to several hundred meters, then glide to next thermal, or rise as high as 6,400 m above storm systems ([Smith 1980c \(/Species-Account/bna/species/turvul/references#REF25024\)](#)). Mean altitude of 26 migrating birds in Texas was 552 m \pm 245 SD (based on 12 radar measurements; [Kerlinger and Gauthreaux 1985b \(/Species-Account/bna/species/turvul/references#REF49455\)](#)). Individuals may fly within clouds, above clouds, or otherwise beyond range of human sight ([Heintzelman and MacClay 1974 \(/Species-Account/bna/species/turvul/references#REF49448\)](#); but not in cloud bases in Panama [[Smith 1985b \(/Species-Account/bna/species/turvul/references#REF21637\)](#)]). Observed migration peaks in afternoon; midday "lull" in observations at hawk-watches may result because birds are flying at altitudes beyond human vision ([Smith 1980c \(/Species-Account/bna/species/turvul/references#REF25024\)](#), [Kerlinger 1989a \(/Species-Account/bna/species/turvul/references#REF8570\)](#)) or in part because observers are too busy counting other species at midday to count high-altitude birds ([Hoffman et al. 1992b](#)

([/Species-Account/bna/species/turvul/references#REF21596](#)). Does not migrate on rainy or (in Panama) completely overcast days, because of lack of thermals ([Smith 1985b](#) ([/Species-Account/bna/species/turvul/references#REF21637](#))).

May migrate in loose association with other species; in sw. U.S. and Central America, often migrates with Swainson's Hawk and Broad-winged Hawk (*Buteo platypterus*). In s. Texas during 28 Mar–16 Apr, 19.9% of observed Turkey Vulture flocks ($n = 618$ vultures) were monospecific, 7.6% (46 flocks) were mixed—mostly with Broad-winged Hawks ([Kerlinger and Gauthreaux 1985b](#) ([/Species-Account/bna/species/turvul/references#REF49455](#))).

May make short water crossings—e.g., from Florida to Caribbean islands, where does not breed ([Santana et al. 1986c](#) ([/Species-Account/bna/species/turvul/references#REF21634](#))) and to Cuba, where Florida-tagged birds are resighted but their travel route is unknown ([Wotzkow and Wiley 1988](#) ([/Species-Account/bna/species/turvul/references#REF21656](#)), S. Gaby pers. comm.). Also over Almirante Bay in Panama ([Hicks et al. 1966](#) ([/Species-Account/bna/species/turvul/references#REF21595](#))), infrequently at Whitefish Point, MI (25 km across Lake Superior) or Cape May Point, NJ (18 km across Delaware Bay; [Kerlinger 1985b](#) ([/Species-Account/bna/species/turvul/references#REF16598](#))), but regularly across Juan de Fuca Strait (21 km), British Columbia ([Macrae 1994](#) ([/Species-Account/bna/species/turvul/references#REF35636](#))). Birds seen flying out of sight southward from Florida Keys toward Cuba ([Darrow 1983](#) ([/Species-Account/bna/species/turvul/references#REF25002](#))), or north across Gulf of Mexico from Yucatán ([Van Tyne and Trautman 1945](#) ([/Species-Account/bna/species/turvul/references#REF21650](#))), may represent uncommon longer crossings or aborted attempts. Exhaustion exhibited by a group of individuals landing on boat 13 km from land in Florida Bay ([Mote 1969](#) ([/Species-Account/bna/species/turvul/references#REF21622](#))) suggests that crossings may be risky. In most cases, birds hesitate before venturing over water. Of 31 observations at Cape May, NJ, and Whitefish Point, MI, 10% crossed water, 64% did not leave shore and 26% flew out over water and then back ([Kerlinger 1985b](#) ([/Species-Account/bna/species/turvul/references#REF16598](#))). When crossing water, glides when

leaving shore (sometimes after ascending in kettle), and flaps and glides intermittently when returning to shore or arriving at opposite shore ([Kerlinger 1985b \(/Species-Account/bna/species/turvul/references#REF16598\)](#), [Macrae 1994 \(/Species-Account/bna/species/turvul/references#REF35636\)](#)).

Daily migration distance unknown, but 1 marked juvenile present in s. Wisconsin on 15 Oct was recovered 6 d later 980 km to the south (average 163 km/d; MJM). Smith ([Smith 1980c \(/Species-Account/bna/species/turvul/references#REF25024\)](#)) estimated duration of migration for individuals as 28–70 d. Flight ground-speed of 1 bird on migration was 55 km/h with a 24-km/h crosswind ([Broun and Goodwin 1943 \(/Species-Account/bna/species/turvul/references#REF8607\)](#)).

At least some birds feed during migration in North America (reports of wing-tagged individuals; MJM), but most apparently do not feed during passage through Central America, as suggested by lack of foraging observations (although individuals have been seen drinking) and by absence of whitewash or pellets under nocturnal roosts of migrants in Panama ([Wetmore 1965b \(/Species-Account/bna/species/turvul/references#REF55635\)](#), [Smith 1980c \(/Species-Account/bna/species/turvul/references#REF25024\)](#)). Migrants arrived in Oct and Nov in Venezuela in poor condition; body mass improved to a maximum in Mar/early Apr before migration northward, suggesting fat storage for migration ([Kirk and Gosler 1994 \(/Species-Account/bna/species/turvul/references#REF21607\)](#)). Fasting during at least part of migration likely; individuals can fast for up to 16 d in captivity ([Hatch 1970a \(/Species-Account/bna/species/turvul/references#REF49447\)](#)).

Control and Physiology of Migration

Little known. Move southward probably in response to drop in temperature (see [Tyler 1937 \(/Species-Account/bna/species/turvul/references#REF49487\)](#)), to snow cover, and to winter storms; frozen carcasses are hard to eat. Individuals are cold-hardy in captivity when well fed (MJM), and for at least short periods in wild. Individuals at northern edge

of winter range often move farther north temporarily during winter warm spells, and may overwinter (e.g., in s. Wisconsin in 1994–1995) when early part of winter is mild. Northern winter range limit corresponds roughly with average minimum Jan temperature of 10.4–15.5°C, except for absence of species in Pacific Northwest ([Root 1988b \(/Species-Account/bna/species/turvul/references#REF44041\)](#)).

Habitat in Breeding Range

Preferred habitat in e. North America includes mixed farmland and forest, which provides best opportunity for foraging on both wild and domestic carrion. For nesting, prefers forested or partly forested areas with nest sites (rock outcrops, fallen trees, abandoned buildings) isolated from human and perhaps other mammalian disturbance (see Breeding: nest site, below). For communal roosting, prefers stands of large trees free from human disturbance. Also preferred are hilly areas that provide deflective updrafts for flight, especially in North, where thermals may be weak and unpredictable. Avoids extensive areas of row-crop farmland. The preferred features are best attained in swampy areas or hilly, often unglaciated uplands with low-input agriculture ([Coleman and Fraser 1989c \(/Species-Account/bna/species/turvul/references#REF21573\)](#), [Peterjohn 1989b \(/Species-Account/bna/species/turvul/references#REF56491\)](#), [Mossman 1991a \(/Species-Account/bna/species/turvul/references#REF40111\)](#), [Mossman and Hartman 1992 \(/Species-Account/bna/species/turvul/references#REF57616\)](#)). Year-round observations of radio-tagged vultures in s. Pennsylvania and n. Maryland suggest preference for open sites for feeding and forested sites for roosting; home ranges had proportionally less forest, and more roads and open habitats than did the study area overall ([Coleman and Fraser 1989c \(/Species-Account/bna/species/turvul/references#REF21573\)](#)). Pasture important for foraging ([Graber and Graber 1963 \(/Species-Account/bna/species/turvul/references#REF58787\)](#)) and perching ([Coleman and Fraser 1989c \(/Species-Account/bna/species/turvul/references#REF21573\)](#)). Although sometimes found in urban or suburban areas in s. U.S. ([Ferrara 1987 \(/Species-](#)

[Account/bna/species/turvul/references#REF49444](#)), [Gaby 1982 \(/Species-Account/bna/species/turvul/references#REF21586\)](#), J. D. Weintraub, R. A. Layman, and B. K. Vance in litt.), tends to avoid these areas, unlike Black Vulture.

In West, tends to occur most regularly in areas of pastured rangeland, nonintensive agriculture, or wild areas, with rock outcrops suitable for nesting, but generally not in high mountains. In Alberta, most breeding records in parkland and grassland natural regions ([Semenchuk 1992 \(/Species-Account/bna/species/turvul/references#REF55543\)](#)). In Puerto Rico, most common in subtropical dry forest, less common in subtropical moist and wet forests ([Santana et al. 1986c \(/Species-Account/bna/species/turvul/references#REF21634\)](#)).

Landscape features that meet Turkey Vulture breeding-season habitat requirements vary geographically, and have confounded attempts to identify suitable habitat on a broad scale. Abundance according to U.S. Breeding Bird Survey (BBS) data (1973-1989) correlated poorly with agricultural variables, but correlated most highly (negatively) with soybeans, supporting the idea that Turkey Vultures avoid row-crop agriculture ([Butcher et al. 1991 \(/Species-Account/bna/species/turvul/references#REF49436\)](#)). Abundance on BBS routes positively correlated with several habitats, most of which suggest areas of intermixed forest, shrub, or open areas, and with interrelated factors such as May thermal reflectance and temperature, maximum and minimum annual temperature, and number of frost-free days. Abundance negatively correlated with forest habitat and with elevation and topographic relief (probably indicating avoidance of mountains rather than "hilly" country; [Defusco 1994 \(/Species-Account/bna/species/turvul/references#REF49442\)](#)).

Nesting Habitat

Of 292 eastern nests, 22% were in "forest," 22% on rocky cliff or slope, 19% in deciduous forest, 10% in palmetto, 7% in "brushy" habitat, 5% in grassy habitat, 4% in honeysuckle or briars, 3% in wet deciduous forest, 2% in mixed forest, 2% in coniferous forest, and remainder in fence rows, mottes, "agricultural" locales, and bamboo ([Jackson 1983f](#)

([/Species-Account/bna/species/turvul/references#REF40106](#)). Of 309 western nests, 91% were on rocky cliff or slope, 5% in various forest types, 3% in brushy habitat, and remainder in honeysuckle, briars, and grassy habitat.

Roosting Habitat

In w. U.S., typically roosts in large trees-e.g., cottonwood (*Populus deltoides*)-or on rock outcrops ([Davis 1983b \(/Species-Account/bna/species/turvul/references#REF35630\)](#), [Thomaides and Reid 1984 \(/Species-Account/bna/species/turvul/references#REF21648\)](#)) and on saguaro cactus (*Carnegiea gigantea*) in s. Arizona ([Bennett and Kunzmann 1994 \(/Species-Account/bna/species/turvul/references#REF57611\)](#)). In e. U.S., characteristically roosts in trees. At some sites, especially on warm, still nights, may roost on cliffs, power-line pylons or communication towers (MJM), and in South occasionally on buildings or in trees in urban or suburban areas ([Gaby 1982 \(/Species-Account/bna/species/turvul/references#REF21586\)](#), [Ferrara 1987 \(/Species-Account/bna/species/turvul/references#REF49444\)](#)). Most roosts are isolated or protected from human disturbance, often in extensive forested areas in east ([Mossman 1976 \(/Species-Account/bna/species/turvul/references#REF21621\)](#), [Coleman and Fraser 1989c \(/Species-Account/bna/species/turvul/references#REF21573\)](#)). In Minnesota, mean distance to nearest human activity was 662 m ($n = 4$ roosts; [Tenney 1986 \(/Species-Account/bna/species/turvul/references#REF35644\)](#)). In s. Pennsylvania and adjacent areas, mean distance to human habitation was 146 m ($n = 16$ roosts; [Thompson et al. 1990 \(/Species-Account/bna/species/turvul/references#REF57620\)](#)). Tends to occur near water in some areas ([Prather et al. 1976 \(/Species-Account/bna/species/turvul/references#REF49469\)](#), [Rabenold 1983 \(/Species-Account/bna/species/turvul/references#REF4900\)](#)), often in rugged topography, which may provide deflective updrafts for flight ([Mumford and Keller 1984 \(/Species-Account/bna/species/turvul/references#REF63831\)](#), [Thompson et al. 1990 \(/Species-Account/bna/species/turvul/references#REF57620\)](#), MJM). Roosts are usually located within 1 km of rock outcrops, fields, exposed snags, or sandbars, where birds engage in maintenance activities before and after roosting. Mean distance to clearing 110 m in

Pennsylvania (for 33 trees in one roost; [Wright et al. 1986 \(/Species-Account/bna/species/turvul/references#REF40123\)](#)) and 119 m in Minnesota (for 4 roosts; [Tenney 1986 \(/Species-Account/bna/species/turvul/references#REF35644\)](#)).

Compared to nearby random sites, roosts in s. Pennsylvania, n. Maryland, and ne. Virginia had more conifers and larger trees, greater land surface ruggedness and habitat interspersions, and less extensive cropland, and they were closer to clearings, human residences, roads, and permanent streams. Roosts used frequently by many vultures had significantly taller trees and more trees than less used roosts had ([Thompson et al. 1990 \(/Species-Account/bna/species/turvul/references#REF57620\)](#)). Roost trees typically are larger than random trees: in Minnesota, mean 62.7 cm diameter at breast height (dbh) and 25.4 m tall ($n = 3$ roosts; [Tenney 1986 \(/Species-Account/bna/species/turvul/references#REF35644\)](#)); in Pennsylvania, 57.4 cm dbh and 28.8 m tall (33 trees, one roost; [Wright et al. 1986 \(/Species-Account/bna/species/turvul/references#REF40123\)](#)).

Forested roosts are usually semiopen within canopy to allow maneuverability, but trees are sufficiently close to provide thermal cover at northern latitudes ([Wright et al. 1986 \(/Species-Account/bna/species/turvul/references#REF40123\)](#), [Coleman and Fraser 1989c \(/Species-Account/bna/species/turvul/references#REF21573\)](#), [Thompson et al. 1990 \(/Species-Account/bna/species/turvul/references#REF57620\)](#)). Nearest-neighbor distance of roost trees 10.5 m in Minnesota (5 trees in 2 roosts; [Tenney 1986 \(/Species-Account/bna/species/turvul/references#REF35644\)](#)), 7.9 m in Pennsylvania (33 trees in one roost; [Wright et al. 1986 \(/Species-Account/bna/species/turvul/references#REF40123\)](#)). Roost trees usually characterized by large, stout, horizontal limbs for perching in or just below canopy, especially mature white pine (*Pinus strobus*), oaks (*Quercus* spp.), sycamore (*Platanus occidentalis*), bigtooth aspen (*Populus grandidentata*), and cottonwood (*P. deltoides*; [Thiel 1976 \(/Species-Account/bna/species/turvul/references#REF49484\)](#), [Tenney 1986 \(/Species-Account/bna/species/turvul/references#REF35644\)](#), [Wright et al. 1986 \(/Species-Account/bna/species/turvul/references#REF40123\)](#), [Thompson et al. 1990 \(/Species-Account/bna/species/turvul/references#REF57620\)](#), MJM). Often shifts from hardwood to

conifer roosts in fall (presumably to maintain thermal cover), and returns to hardwoods in spring ([Coles 1938 \(/Species-Account/bna/species/turvul/references#REF49437\)](#), [Tenney 1986 \(/Species-Account/bna/species/turvul/references#REF35644\)](#), [Wright et al. 1986 \(/Species-Account/bna/species/turvul/references#REF40123\)](#), MJM).

Habitat in Migration

Migrating birds rarely descend to ground in Central America, except in poor flying conditions. In North America, habitat similar to that used in other seasons, although birds more widespread in some areas, more concentrated along shorelines and ridges elsewhere.

Habitat in the Winter Range

In areas with year-round population, habitat use may change somewhat during winter-e.g., more time spent in areas without roads ([Coleman and Fraser 1989c \(/Species-Account/bna/species/turvul/references#REF21573\)](#)), or increased use of urban areas ([Gaby 1982 \(/Species-Account/bna/species/turvul/references#REF21586\)](#)); and residents may shift habitat use in response to influx of migrants. Among overwintering migrants in Florida, immatures occurred at landfills more often than adults did ([Gaby 1982 \(/Species-Account/bna/species/turvul/references#REF21586\)](#)). In Venezuelan Llanos, wintering migrant *C. a. meridionalis* preferred open and semiopen habitats (e.g., savannas, shrub woodland, open wetlands) over gallery and semideciduous forest, while resident *ruficollis* restricted their foraging almost entirely to gallery forest during period of sympatry with migrants; apparently expanded or moved into more open habitats when migrants left ([Kirk and Currall 1994 \(/Species-Account/bna/species/turvul/references#REF35634\)](#)).

Historical Changes to the Distribution

Beginning 1920–1940 and continuing to 1990s in upper Midwest, breeding range has expanded northward; population has increased markedly in northern parts of range, where formerly bred only sparingly (see Demography and populations: population status, below; [Mossman 1991a \(/Species-Account/bna/species/turvul/references#REF40111\)](#)) —e.g., ne. U.S. ([Bagg and Parker 1951 \(/Species-Account/bna/species/turvul/references#REF21561\)](#), [Bagg and Parker 1953 \(/Species-Account/bna/species/turvul/references#REF35627\)](#), [Coleman and Fraser 1989b \(/Species-Account/bna/species/turvul/references#REF40101\)](#)) and e. Canada ([Bagg and Parker 1951 \(/Species-Account/bna/species/turvul/references#REF21561\)](#), [Cadman 1987d \(/Species-Account/bna/species/turvul/references#REF21570\)](#), [Erskine 1992a \(/Species-Account/bna/species/turvul/references#REF64430\)](#)).

Populations on Puerto Rico, Hispaniola, and Grand Bahama said to have been introduced ([Stockton De Dod 1981 \(/Species-Account/bna/species/turvul/references#REF21644\)](#), [American Ornithologists' Union 1983 \(/Species-Account/bna/species/turvul/references#REF18624\)](#), [Garrido and Kirkconnell 1993a \(/Species-Account/bna/species/turvul/references#REF7618\)](#), [Lever 1994 \(/Species-Account/bna/species/turvul/references#REF21612\)](#)), but may have originated from natural range expansion ([Santana et al. 1986c \(/Species-Account/bna/species/turvul/references#REF21634\)](#), [Raffaele 1989 \(/Species-Account/bna/species/turvul/references#REF7180\)](#)). Deforestation for cattle-rearing also led to expansion in Puerto Rico ([Raffaele 1989 \(/Species-Account/bna/species/turvul/references#REF7180\)](#)). In contrast, intensive agriculture and urbanization evidently eliminated the species from large areas of former grassland and forest in Midwest and Great Plains ([Mossman 1991a \(/Species-Account/bna/species/turvul/references#REF40111\)](#)), and probably elsewhere.

Fossil History

Oldest record of cathartid vulture *Paracathartes howardae* is from early Eocene (about 60–50 million years) in Wyoming; slightly larger than extant Turkey Vulture ([Rich 1983 \(/Species-Account/bna/species/turvul/references#REF21632\)](#)). Pleistocene record includes extant and extinct cathartids ([Rich 1983 \(/Species-Account/bna/species/turvul/references#REF21632\)](#)). *Cathartes aura* apparently originated in mid-Pleistocene ([Miller 1942e \(/Species-Account/bna/species/turvul/references#REF21619\)](#)), and Pleistocene fossils from La Brea tar deposits in California (40,000–10,000 years) indicate that these vultures were larger than present-day ones, perhaps because of cooler climate and prevalence of large herbivores ([Hertel 1994 \(/Species-Account/bna/species/turvul/references#REF21594\)](#)).

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Recommended Citation

Kirk, David A. and Michael J. Mossman. 1998. Turkey Vulture (*Cathartes aura*), version 2.0. In The Birds of North America (P. G. Rodewald, editor). Cornell Lab of Ornithology, Ithaca, New York, USA.

<https://doi.org/10.2173/bna.339> (<https://doi.org/10.2173/bna.339>)

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