

WILDLIFE DATA CENTRE

FEATURED SPECIES - TURKEY VULTURE

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A bald, wrinkled, wart-like red head, large nostrils that you can see through, and repulsive feeding habits are not the most endearing attributes for any bird. But for the Turkey Vulture (*Cathartes aura*) they are all adaptations for a scavenging way of life. In the air they are masters at finding rising thermals and up-draughts where they appear to float motionless, tipping from side to side, in their constant search for carrion. Although their eyesight is excellent the Turkey Vulture is best known for its ability to locate food by smell because of its unusually large olfactory organs.

When searching for food the Turkey Vulture is often a loner, but when a carcass is discovered numbers soon gather to share the spoils. They are opportunistic feeders and often gather during fish die-offs and hay-cutting operations when small animals become readily available. They become more social at night when they roost together in forests and on rock bluffs.

The Turkey Vulture is a short-distance migrant that flies in early spring from the southern United States and Central America north to southern British Columbia to breed.

For years the Turkey Vulture was classified as a bird of prey. In 1994, as a result of studies on anatomy, physiology, behaviour, and DNA analysis, this beneficial scavenger was reclassified and placed in the stork family Ciconiidae.

Wildlife Data Centre Provincial Status Designation

The Turkey Vulture is *Not Threatened* in British Columbia although there is some concern about protection of traditional summer and autumn roosts. The species is very adaptable and frequents a wide variety of habitats, scavenges on diverse animal carrion, and nests in a variety of locations. Populations are stable to increasing and its breeding range is expanding northward along eastern Vancouver Island and throughout the southern interior.

At a Glance

Other names: Turkey Buzzard, Carrion Crow, Red-necked Buzzard, Buzzard.

Similar species: In British Columbia, Bald Eagle (first year), Golden Eagle, and Red-tailed Hawk.

Breeding adult (Figure 1)

- blackish brown body
- small, naked, red head
- ivory-coloured bill
- legs dull rose to orange

Juvenile and immature

- all-black body
- small, dark gray head
- dark bill

In flight (Figure 2)

- two-toned underwing
- rocks side to side
- appears “headless”
- long tail
- primaries separated

Length

64 to 81 cm (26 to 33 in)

Wingspan

1.5 to 2 m (5 to 6.6 ft)

Weight

2 kg (4.4 lbs)

Where and When

World range

Breeds from southern Canada throughout the United States, Mexico, and South America to Tierra del Fuego and on the Falkland Islands. Also breeds in Trinidad, Margarita Island, some Caribbean Islands, and Puerto Rico where it has been introduced. Winters primarily from northern California, south across the southern United States, and south throughout its breeding range in Central and South America.



Figure 1. Adult Turkey Vulture. Felda, FL. 8 November 1997 (R. Wayne Campbell).



Figure 2. Adult Turkey Vulture in flight. Okefenokee Swamp, GA. 2 November 1997 (R. Wayne Campbell).

British Columbia

The Turkey Vulture is widely distributed across southern British Columbia, becoming far less common northward through the interior. There are isolated occurrences for the Prince George region and near Chetwynd (Figure 3). On the coast it is a fairly common to common migrant and local summer visitant along southeastern Vancouver Island, the Gulf Islands, and Sunshine Coast. Abundant in autumn on extreme southern Vancouver Island. Rare in spring and uncommon in autumn in the Greater Vancouver area, becoming an uncommon migrant and local summer visitant throughout the lower Fraser River valley. Casual elsewhere and very rare in winter on the coast.

In the interior an uncommon migrant and

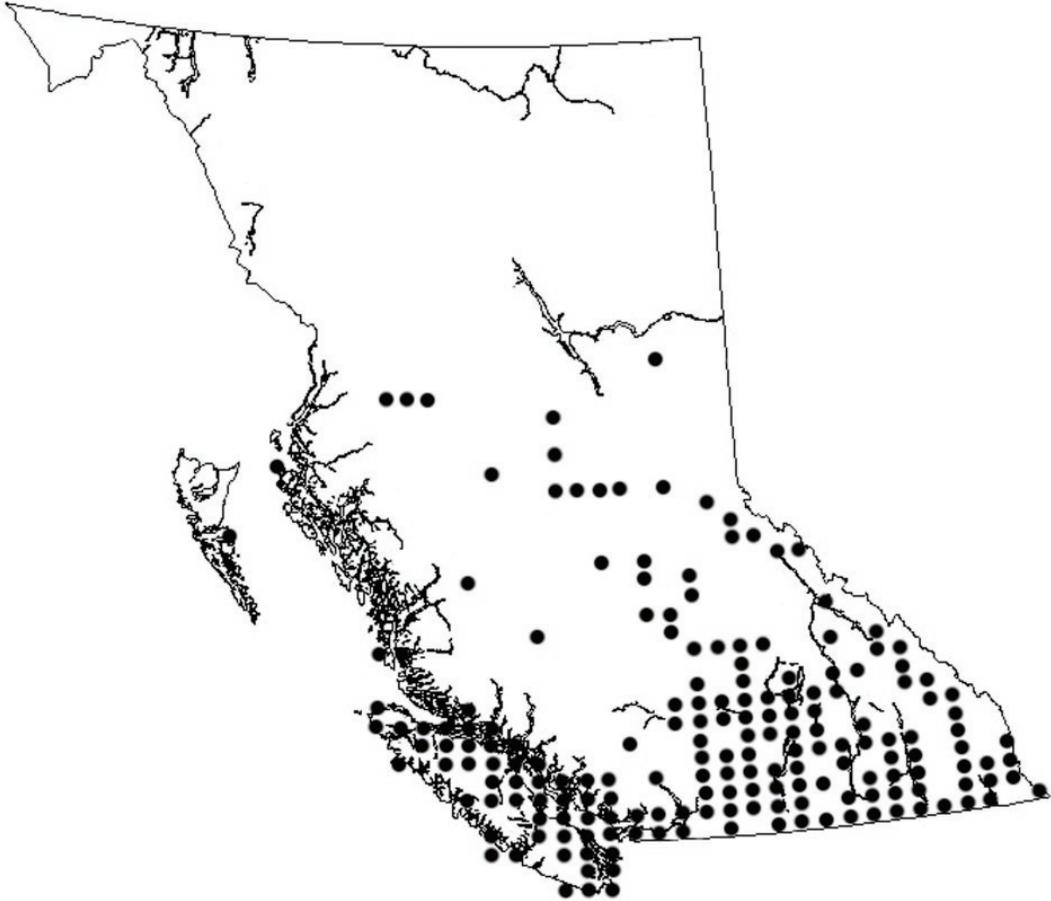


Figure 3. Locations (dots) of confirmed occurrence of Turkey Vulture in British Columbia, 1890 - 2005.

local summer visitant throughout the Okanagan valley, becoming less common further north in the Thompson Plateau. Casual in winter. Locally rare to uncommon migrant and summer visitant across the rest of the extreme southern interior, except in the Creston valley where it is a common migrant and summer visitant and accidental in winter. Elsewhere in the interior, and as far north as Chetwynd, the Turkey Vulture is very rare to accidental.

Change in Distribution

The Turkey Vulture was first recorded in British Columbia at Harrison Bay, in the lower Fraser River

valley, in June 1890. Over the next 45 years small populations became established along southeastern Vancouver Island, throughout the Okanagan valley, Enderby, Shuswap Lake region, and locally in the vicinity of Cranbrook in the southeastern corner of the province (Figure 4a and 4b). By 1965 small populations were present in summer in the lower Fraser River valley, Creston valley, Revelstoke, and along the Thompson River west of Kamloops. Pioneering vagrants were reported as far north as the Prince George region.

During the decades from 1966 to 1985 the Turkey Vulture continued to expand its range and settle into

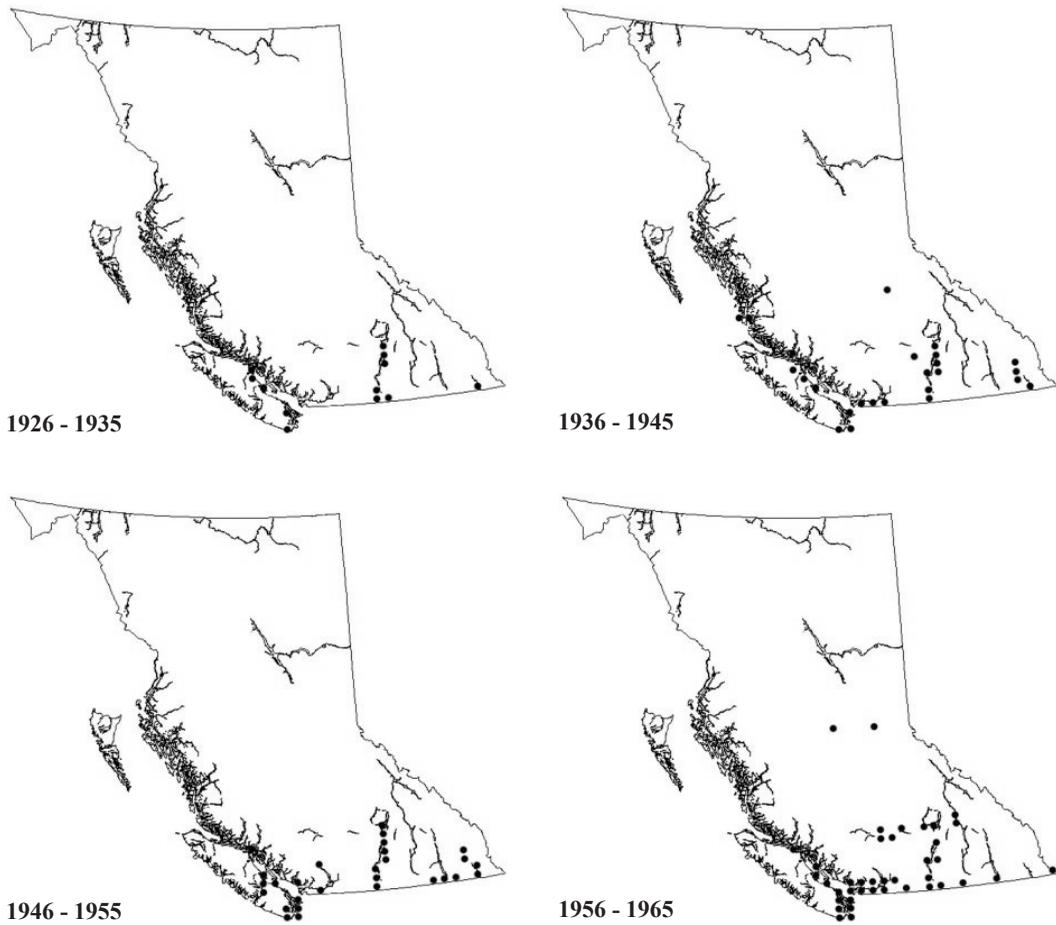


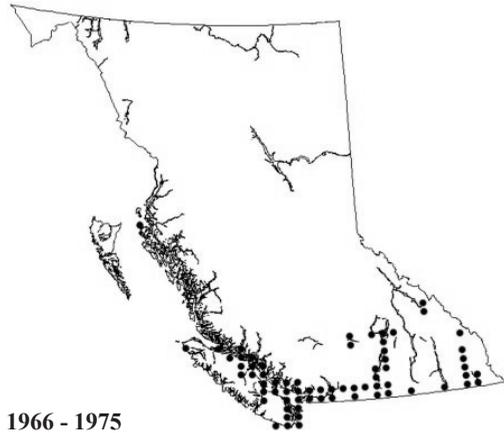
Figure 4a. Locations (dots) of confirmed occurrence of Turkey Vulture by decade (1926 - 1965) showing the gradual northward range expansion.

pockets of suitable habitat across southern portions of the province. For example, Tony Greenfield moved to the Sunshine Coast in February 1971 but did not observe his first Turkey Vulture until 1 April 1979. During the 1986 to 1995 decade (Figure 4b) there was a general dispersal from the central interior northwest through the province towards the Kispiox Valley.

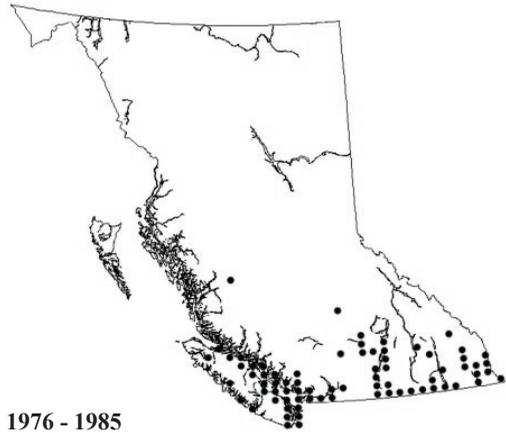
During the past decade (1996-2005) the Turkey Vulture continued to occupy new habitats across southern portions of British Columbia, expanding its range further north with vagrants being reported

from the Queen Charlotte Islands, Cedarvale, Fort St. James, and Chetwynd.

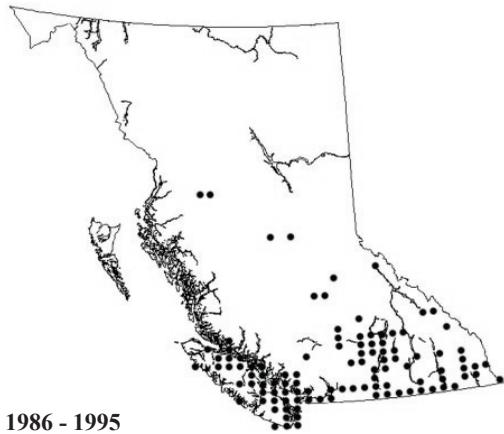
Human-induced environmental changes during the 20th century are unprecedented in our history and are considered one of the most significant reasons for recent changes in the distribution of birds. Northward range expansion by the Turkey Vulture into British Columbia is probably due to human-induced events. Such activities include the expansion of open habitat by logging, agricultural activities, and rural development (urbanization, etc.), increased road building and traffic offering more



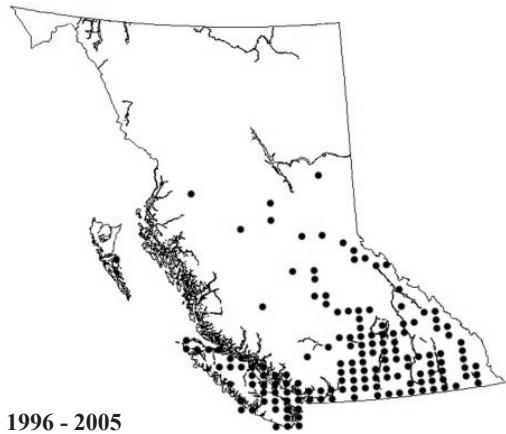
1966 - 1975



1976 - 1985



1986 - 1995



1996 - 2005

Figure 4b. Locations (dots) of confirmed occurrence of Turkey Vulture by decade (1966 - 2005) showing the gradual northward range expansion.

available carcasses, reduced human persecution, and more available rangeland for free-ranging livestock. Climate change may be another factor affecting the distribution of birds in North America.

Breeding

On the coast, the Turkey Vulture breeds locally along the entire eastern side of Vancouver Island from Sooke north to the vicinity of Woss, on some of the larger Gulf Islands, the Sunshine Coast, and the central lower Fraser River valley from the vicinity of Vedder Canal, Harrison Lake, and Hope.

There are no breeding records for the Fraser River delta. In the interior this species breeds locally in the Okanagan valley from Kilpoola Lake north to Vernon, throughout the Shuswap Lake region and in the Creston valley (Figure 5).

The centre of breeding abundance occurs along southeastern Vancouver Island, including some of the larger Gulf Islands (Figure 5).

Habitat

Foraging, breeding, and roosting habitats are different, although there is some overlap due to



Figure 5. Breeding distribution (black area) of Turkey Vulture in British Columbia. Between Vancouver Island and the mainland, breeding occurs on larger Gulf Islands.

the bird's opportunistic feeding habits. Open and sparsely vegetated environments are preferred hunting habitats. These include farmland, rangeland, estuaries, seashores, lakeshores, pastureland, golf courses, roadsides, fields, marine islets, exposed tidal flats, seabird islands, sewage lagoons, marshes, deltas, transmission corridors (Figure 6), landfills, and slaughter houses, where domestic and wild animal carcasses can be found. It also frequents semi-open forested habitats where mule and white-tailed deer, black bear, and elk carcasses commonly occur.

The breeding habitat is not well known because few nests have been found. Most nests, however, are associated with isolated, open or closed canopy forest situations where rock bluffs, cliffs (see Figure 12), outcroppings, and rock rubble is evident. Often open foraging sites are nearby. The species also nests on the ground in undisturbed, mature, semi-open forests that include Douglas-fir, western redcedar, western hemlock, arbutus, bigleaf maple, and Garry oak.

Roosting habits and habitat requirements are poorly documented. Mixed, semi-open coniferous forests, on large marine islands (e.g., Discovery Island) and the mainland (e.g., East Sooke), have been identified. Smaller evening roost sites, up to 50 or so birds, have also been located in mature stands of



Figure 6. On the Sunshine Coast, transmission corridors are important foraging grounds for Turkey Vultures. Near Sechelt, BC. 2 May 2001 (R. Wayne Campbell).

black cottonwood on the Saanich Peninsula (Figure 7).

Annual Occurrence

While a few birds may occur irregularly in winter on the south coast, including southeastern Vancouver Island, the Gulf Islands, Sunshine Coast, and the central Fraser River valley, the species is mostly present from April through early October (Figure 8). Small pre-migratory flocks may still be observed during the second and third weeks of October on extreme southern Vancouver Island after which stragglers may be present throughout the rest of the year (Figure 8).

In the southern interior, the Turkey Vulture is present mainly from mid-April through mid-September, especially in the Okanagan valley, Thompson Basin (Kamloops region), Eastern Thompson Upland (Salmon Arm region), and the Creston valley. There are sporadic but widely scattered



Figure 7. Descriptions of roost sites, traditionally and seasonally, are largely unknown in British Columbia. On 28 September 1999, at least 53 Turkey Vultures roosted in a small stand of mature black cottonwoods (*Populus balsamifera*) near Livesay and Welch roads in Central Saanich, BC. 6 April 1997 (R. Wayne Campbell).

occurrences in winter. Large autumn aggregations, an annual event on extreme southern Vancouver Island, are not known for interior regions.

Migration

The Turkey Vulture is considered a partial migrant in western North America, where populations that breed north of their wintering range migrate short distances each year while southern populations are resident. In British Columbia, the species is primarily a summer visitant arriving from wintering grounds in the southern United States, and perhaps Central America, in spring and departing in autumn each

year. Arrival and departure times vary from year to year depending on weather, storm fronts, location of updrafts and thermals, nesting disturbance, food availability, and other factors.

Average arrival dates for southern coastal regions of the province range from 20 February to 12 March and in the southern interior from 10 to 21 March (Table 1). Average autumn departure dates for the same areas ranged from 30 September to 19 October, and 30 September to 20 October, respectively.

Autumn Staging

The only major staging area for Turkey Vultures in British Columbia occurs each autumn on the extreme southwestern tip of Vancouver Island. Here, from about mid-September through early October, hundreds of vultures gather in preparation for the 19 km flight across Juan de Fuca Strait to mainland

Table 1. Average arrival and departure dates for the Turkey Vulture for select regions of British Columbia, 1890-2005. Estimated dates are based on strings of consecutive data, and do not include rare occurrences or over-wintering birds.

Region	Spring Arrival	Autumn Departure
Chilliwack-Hope	19 Mar	30 Sep
Creston Valley	15 Mar	5 Oct
Okanagan Valley	10 Mar	20 Oct
Sunshine Coast	22 Feb	10 Oct
Thompson/Shuswap	21 Mar	30 Sep
Vancouver	20 Feb	12 Oct
Victoria	12 Mar	19 Oct



Figure 8. Annual chronology of Turkey Vulture in British Columbia.

Washington state. The main movement each year occurs generally between 24 September and 6 October. During this three-week mustering period, “kettles” of vultures, including birds of prey and Common Ravens, can be watched circling overhead or drifting eastward across the city of Victoria in loose flocks searching for weather patterns to allow the continuation of their autumn migration.

Since 1992 Diann MacRae (Figure 9) has been monitoring this exodus from Vancouver Island from an observation station in Salt Creek County Park, Clallam County, Washington. Numbers of migrating vultures fluctuate from year to year and have ranged from 782 birds in 1995 (rain and strong winds) to 2,869 vultures in 2002. During 12 of her 14 year study, from 1992 to 2005, she tallied 18,440 Turkey Vultures (Figure 10), averaging 1,537 birds per year. Over that same period, the number of birds per year has gradually increased, from a running average of about 1,000 birds in 1992, to nearly 2,000 birds in 2005 (Figure 10).

The origin of Turkey Vultures gathering on northern Vancouver Island is unknown but it is suspected that they filter southward from northern and eastern Vancouver Island, including the Canadian



Figure 9. For 12 of 14 consecutive years (see Figure 10) Diann MacRae has been monitoring the annual autumn departure of Turkey Vultures into Washington State from staging areas on southern Vancouver Island. Woodland Park Zoo, Seattle, WA. 2001 (Jim Leo).

Gulf Islands. Other autumn pre-staging areas, all minor and of short duration, have been reported for more northerly coastal locations at Comox, Black Creek, Cowichan Bay, Duncan, and the Malahat.

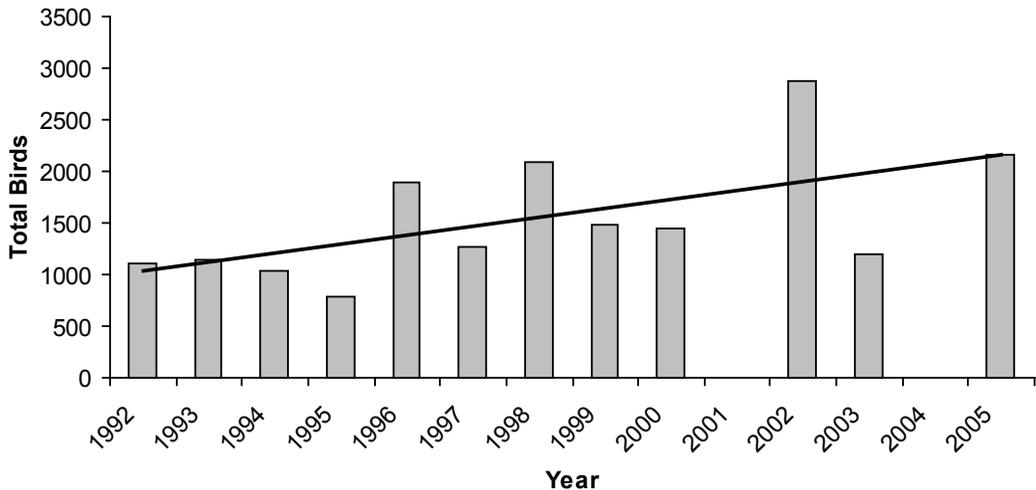


Figure 10. Annual totals of Turkey Vultures counted at Salt Creek Park, WA, migrating across Juan de Fuca Strait from southern Vancouver Island, 1992-2005. Data was not gathered in 2001 and 2004. Line indicates a significant, increasing linear trend in annual abundance.

Wintering

The first winter (December, January, February) records reported for British Columbia are from Vancouver Island at Comox (24 February 1920) and Oyster River (4 January 1936). In the interior, the first winter record was from Okanagan Landing (25 January 1939). Since then, additional coastal records have been from numerous places on southeastern Vancouver Island, the Lower Mainland, and the Sunshine Coast, and additional interior records have been from such places as Hazelton, Little Fort, Christina Lake, Hat Creek, and various locales throughout the Okanagan valley (Figure 11).

Family Life

Breeding

The Turkey Vulture is monogamous and mates for life. It generally socializes with other vultures during much of its life although it is a solitary nester. Breeding pairs appear to remain apart during migration and on their wintering grounds, but return to traditional nest sites (Figure 12) each year to raise a family. Together they may remain in the vicinity of their nest site for up to a month before laying eggs. The longest pair bond in British Columbia, a partial albino, is six years. Turkey Vultures reach sexual

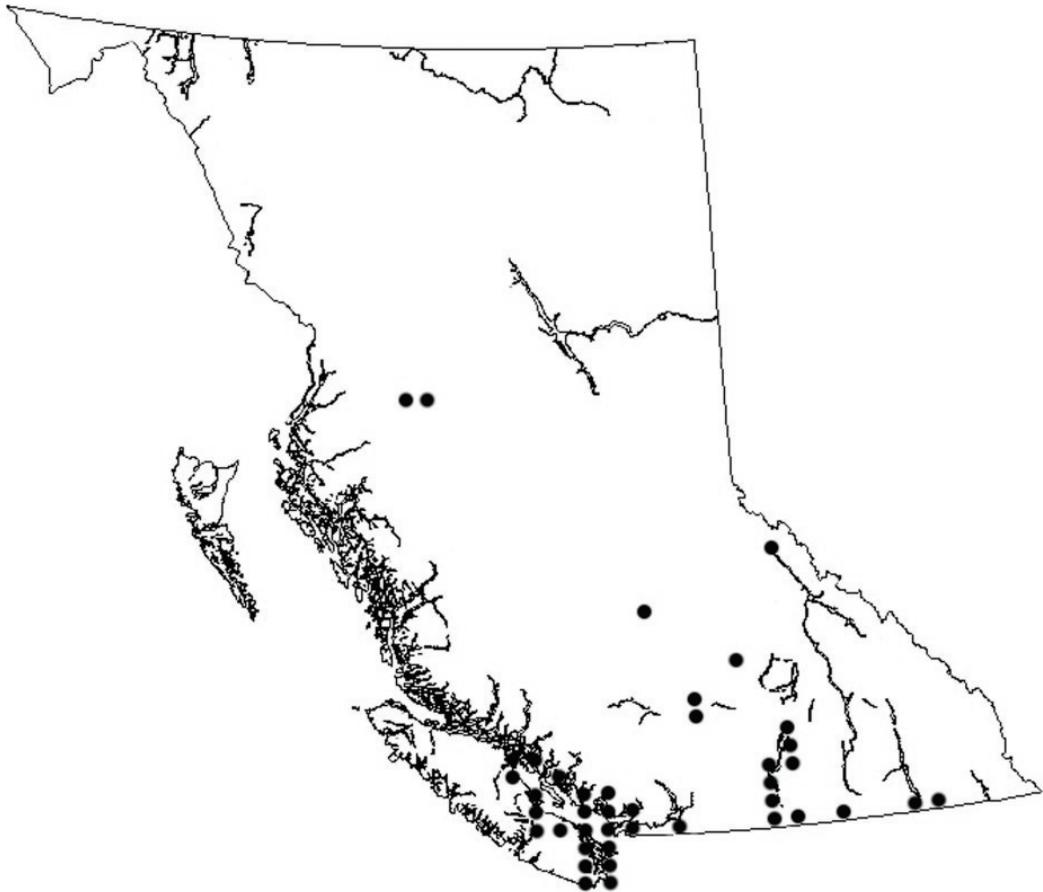


Figure 11. Winter (December to February) distribution of Turkey Vulture in British Columbia, 1920 to 2005.

maturity at 3 to 4 years old. There is no evidence in British Columbia that a second clutch will be laid if the first is destroyed, as has been recorded in the southern United States.



Figure 12. The cliffs and bluffs on a rocky mountain face near Seabird Island, BC has been a traditional nest site for Turkey Vultures for many years. 20 November 2005 (R. Wayne Campbell). BC Photo 3273.

Annual Cycle

Breeding pairs may arrive in southern British Columbia in late March (Figure 13) but most return to their breeding grounds during the first half of April and immediately disperse to traditional nest sites. Here pairs fly, soar, and perch near the site until courting occurs, which can be as much as a month later depending on weather and disturbance. Courtship is relatively short and is performed in the air by displays and on the ground with a “dance” that includes outstretched, down-pointed wings.

It is not known which sex selects the nest site. The nesting season is long and may last over four months from egg-laying to first flight. Peak egg-laying occurs from mid-May to early June and hatching from late June through early July. By September most young have fledged, although they do remain in family groups for one to several weeks in the vicinity of the nest site before moving south.

Nests

All but one of the 57 nest sites described in British Columbia are located in areas that are remote and often inaccessible, or where there is little likelihood of disturbance (see Figure 12). Most nests (45%) were located in caves or alcoves in rock cliffs and bluffs. Other nest sites were situated among large boulders (e.g., rock rubble) (22%), crevices in rock cliffs and bluffs (23%), caves or alcoves in sandstone cliffs (5%), and on the forest floor (5%; Figure 14). Cave nests ranged from 2.5 to 6.0 m long, 0.8 to 1.5 m high, and 2.5 to 4.0 m deep. Nests have been found from 5 to 980 m elevation.

Wayne Grady, in his book *Vulture-Nature's Ghastly Gourmet*, wrote “*For all vultures the word ‘nest’ is always a verb, never a noun. Vultures nest*”

Figure 13. Breeding chronology of Turkey Vulture in British Columbia, 1890-2005.

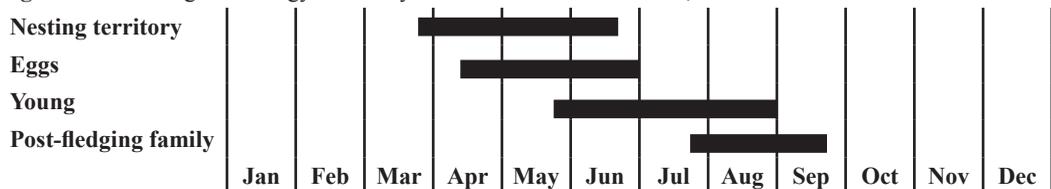




Figure 14. In late mature and old-growth forests hollow stumps and fallen tree trunks can provide nesting sites for Turkey Vultures. Sooke Hills, BC. 25 May 1995 (R. Wayne Campbell). BC Photo 3213.

but they do not make nests.” The same is true in British Columbia. No nest is actually constructed, although a smooth depression may be formed by adults as they jostle for position during incubation. Some nests have contained loose collections of debris, which include wood chips, bones, green conifer boughs, twigs, dried mushrooms, tree cones, bark strips, leaves, and conifer needles. Most of these materials, however, probably made their way into the nest chamber inadvertently.

Many nest sites are traditional and may be used in consecutive years. At McKee Peak, in the central Fraser River valley, a nest site in a cave/alcove on a cliff face was first noticed being used in 1955 and was last used in 2000. Although this is a span of 45 years, it is not known if the site was used every year.

A nest site near Somenos, situated among four very large boulders on an exposed hillside, was used for 11 consecutive years, and on Cortes Island a nest site was used successfully for at least three consecutive years.

As Turkey Vultures continue to expand their breeding range northward, the use of human constructs as potential nest sites may become more commonplace. Deserted farmhouses, undisturbed and isolated derelict buildings, and other similar structures are expected locations. This trend has been recently noticed in Alberta and Saskatchewan.

Eggs

Eggs are sub-elliptical and slightly glossy with a smooth or finely granulated surface. The creamy white ground colour is marked with reddish-brown blotches that are concentrated at the larger end (see Figure 14).

The usual clutch size is two eggs, but several nests have been found with a single egg, and occasionally three eggs have been found in a nest. The average egg size is 65 mm (2.6 in) long by 75 mm (3 in) at the widest point. Eggs are laid one to three days apart and incubation commences with laying of the second egg. Both the male and female share equally in the incubation duties. The incubation period ranges from 38 to 40 days and eggs hatch up to three days apart.

Young

Nestlings hatch covered in long white down but the dark face and throat are naked (Figure 15). For



Figure 15. Turkey Vulture nestlings, estimated at two weeks old, on Cortes Island, BC. 24 June 1995 (Fred C. Zwickel). BC Photo 3266.

the first five days they are helpless and are unable to stand or hold their head up, so they require constant brooding that tapers off when the young are about two weeks old. At 18 days old pin feathers appear on the wings but another two months is required before feathers cover the entire body. At 11 weeks old young are capable of flight but still show traces of down on the head. Up to three additional weeks may be spent near the nest site perching, roosting, and being fed by their parents before autumn departure. They may remain loosely associated with their parents for up to three years.

Lifespan

In Pennsylvania and Maryland, based on radio-tagged and banded birds, the annual survival rate of Turkey Vultures was 75.4 to 78.5%. The oldest known bird in the wild is variously listed as 16 years 10 months to 17 years or older. In captivity, a bird in the San Francisco Zoo is reportedly 33 years old.

Foraging and Feeding

The Turkey Vulture is not well equipped for killing prey and only rarely has been recorded eating live animals in British Columbia. Unlike birds of prey, the feet of Turkey Vultures cannot be used for predation, nor can the weak bill be used to tear open the thick hides of larger mammals. The bill is designed for tearing and ripping flesh, unlike the crushing or cutting of raptors. Vultures generally must wait (Figure 16a) until larger carcasses are opened by other animals, such as wolves, coyotes,



Figure 16a. Turkey Vultures waiting for Common Ravens to penetrate the hide of a horse carcass before they can feed. Creston, BC. 30 August 2004 (Linda M. Van Damme).

and bears, and smaller carcasses by Golden and Bald eagles, and Common Ravens. However, limited feeding on the soft tissue around the eyes, mouth, and anus of carrion does not require prior opening by other species (Figure 16b). Some carcasses are readily exposed from vehicle collisions and from farm or heavy industrial equipment. The Turkey Vulture is primarily an opportunistic scavenger and carrion feeder that prefers fresh meat.

Vultures leave their evening roosts, usually individually, within two to three hours after sunrise and immediately begin their search for food using morning thermals for flight. Many hundreds of hectares can be covered during a single search. Available carcasses are detected by both sight and smell. When a vulture locates carrion it may circle above the carcass for an hour or more and then finally descend to check that it is dead. Often it is soon joined by others that may be immatures who stay with their parents for several years.

Most feeding occurs on the ground but individuals may wade in water to feed on dead marine invertebrates, fishes, and live amphibians. If a carcass is freshly killed vultures may have to roost in an area for days until it “ripens”. During this period, usually mid-morning and late afternoon, they preen and spread their wings to catch rays of sun (Figure 17).

Animals eaten by Turkey Vultures in British Columbia, listed alphabetically within each of the main animal groups, include:



Figure 16b. Turkey Vultures feeding on soft, accessible tissue (e.g., eyes, mouth) prior to the hide being broken by other animals. Creston, BC. 30 August 2004 (Linda M. Van Damme).



Figure 17. Turkey Vulture basking in afternoon sun, Fort Rodd Hill, BC. 1 October 2003 (R. Wayne Campbell).

Invertebrates: California sea cucumber (*Stichopus californicus*), marine worms (intertidal), octopus (*Octopus* sp.), purple sea star (*Pisaster ochraceus*), red sea urchin (*Strongylocentrotus franciscanus*), and sunflower star (*Pycnopodia helianthoides*).

Fishes: chinook salmon (*Oncorhynchus tshawytscha*), chum salmon (*O. keta*), coho salmon (*O. kisutch*), pink salmon (*O. gorbuscha*), marine fish species (discarded offal), sockeye salmon (kokanee) (*O. nerka*), and spiny dogfish (*Squalus acanthias*).

Amphibians: live Western Toad (*Bufo boreas*) toadlets .

Reptiles: Common Garter Snake (*Thamnophis sirtalis*), Gopher Snake (*Pituophis catenifer*), Western Rattlesnake (*Crotalus oreganus*), and Western Terrestrial Garter Snake (*T. elegans*).

Birds: American Wigeon (*Anas americana*), Canada Goose (*Branta canadensis*), domestic chicken (*Gallus domesticus*), and their droppings, domestic turkey (*Melleagris gallopavo*), Double-crested Cormorant (*Phalacrocorax auritus*) nestling and fish regurgitation, duck sp., Glaucous-winged Gull (*Larus glaucescens*) chicks , Great Blue Heron (*Ardea herodias*), Mallard (*A. platyrhynchos*), Mute Swan (*Cygnus olor*), scoter (*Melanitta* sp.), and Surf Scoter (*M. perspicillata*).

Mammals: American beaver (*Castor canadensis*), black bear (*Ursus americanus*), Columbian ground squirrel (*Spermophilus columbianus*), common muskrat (*Ondatra zibethicus*), coyote (*Canis latrans*), deer (*Odocoileus* sp.), deer mouse (*Peromyscus maniculatus*), domestic cat (*Felis domesticus*), domestic cow (*Bos taurus*), domestic goat (*Capra hircus*), domestic rabbit (*Oryctolagus cuniculus*), domestic sheep (*Ovis aries*), Eastern cottontail (*Sylvilagus floridanus*), Eastern gray squirrel (*Sciurus carolinensis*), elk (*Cervus canadensis*), fallow deer (*Dama dama*), harbour seal (*Phoca vitulina*) and afterbirth, horse (*Equus caballus*) placenta and carcass (Figure 16a and 16b), meadow vole (*Microtus pennsylvanicus*), mule deer (*O. hemionus*), northern sea-lion carcass (*Eumetopias jubatus*) and fresh droppings, Virginia opossum (*Didelphis virginiana*), common porcupine (*Erethizon dorsatum*), common raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), Townsend's vole (*M. townsendii*), white-tailed deer (*O. virginianus*), and yellow-bellied marmot (*Marmota flaviventris*).

There is no quantitative information on the seasonal diet of the Turkey Vulture in British Columbia. Like some species of birds, vultures regurgitate pellets. These are prevalent at roost sites and can be collected systematically and analyzed to determine dietary composition and relative frequency of food types. The task is challenging, however, as it requires a reference collection of hair and feather fragments.

Conservation and Management

Throughout history the relationship between vultures and human beings has ranged from fear to reverence. Because they are large and conspicuous birds we readily notice their habits and without much scientific evidence are quick to believe in the folklore that surrounds their mystique. Perhaps we believe that birds who eat foul-smelling dead food must be bad themselves and surely must transmit harmful bacteria and diseases to other birds and as well as to humans. Scientific recognition for vultures has been slow in coming, but today there is a paradigm shift in studies and appreciation of these beneficial scavengers. The most significant event for vulture enthusiasts occurred in 1979 when the first

International Symposium on Vultures was held in Santa Barbara, California to exchange information and ideas among researchers. Since then, scientific interest in vultures as a group has grown immensely in North America but we still lack basic natural history information.

The Turkey Vulture is not endangered or threatened in any part of its world range and is the most abundant of all New World vulture species. It is an adaptable species that has been able to adjust well to increases in human population and accompanying changes in land practices. The population appears stable but segments have shifted geographically over time with a general northward range expansion. The Canadian breeding population is estimated at 5,000 to 20,000 pairs. Less than 300 pairs probably nest in British Columbia.

Our databases do not adequately reflect all of the mortality factors that affect the Turkey Vulture in British Columbia. Fortunately, the Wildlife Rehabilitators Network of BC has submitted many of their records to the Wildlife Data Centre. The sources of mortality for 116 Turkey Vultures included: cause unknown (45%), shot (29%), poisoned (9%), flew into unidentified object (5%), caught in trap (4%), starvation (4%), inclement weather (2%), collision with a roadway vehicle (1%), drowned (< 1%), collision with airplane (< 1%), electrocution (< 1%), and disease and parasites (< 1%).

Human activities that impact Turkey Vultures in British Columbia include:

Persecution

Deliberate shooting is the highest reported known source of Turkey Vulture mortality in the province. It occurs locally (e.g., Cowichan Bay, Pitt Meadows, Agassiz, and Harrison River) but has a negligible impact on the provincial population as a whole. Reasons for killing vultures include sport, the illegal feather trade, posing a threat to livestock and other domestic farm animals, and the misunderstanding that vultures carry and transmit diseases. Fortunately, through education, the persecution of all vultures (and raptors) is much less today than it was historically.

Poisoning and Pesticides

Ten vultures were reported poisoned indirectly from eating mammals that were being controlled

by poisoned bait on agricultural lands. Most of the carcasses eaten were coyotes. At the height of the DDT contamination era, Turkey Vultures in western North America showed moderate levels of shell thinning with no apparent impact on the population. There have been no reports of mortality to vultures by pesticide use in British Columbia.

Logging

Roost sites are used daily by Turkey Vultures from the time they arrive in the province to their departure. During the breeding season immatures form in small groups and spend the night at favourite sites. Numbers may range from three to 11 individuals but locations of these roost sites, occupancy, and physical descriptions are poorly known.

After the breeding season adults and juveniles join immatures and migrants at more traditional sites to roost prior to autumn departure. This is most evident on southern Vancouver Island, but again little is known specifically about these roosts. A few such sites have been identified over the years. These include: Discovery and Chatham Islands, Sooke Hills, near Rocky Point, Royal Roads, Malahat, and East Sooke Park. A common characteristic of these particular roost sites include associations of late second-growth to mature mixed coniferous forests of Douglas-fir, western redcedar, grand fir, and western hemlock in undisturbed areas.

Infrequently, roost sites have been located in mature stands of black cottonwood (see Figure 7), but these are usually used for only short periods in late September. On larger offshore marine islands, where there is little disturbance, some vultures may spend the evening roosting on rock bluffs and outcroppings.

Autumn roost sites, especially on southern Vancouver Island, are one of the weak links in the life history of the Turkey Vulture during its time in British Columbia. These sites should be identified and described with some protection from logging, clearing, and disturbance during their occupancy. Management plans should also consider nearby habitats that can be used as alternate or buffer sites.

Retaining large, open tree roots, low stumps and snags, and large downed tree trunks (see Figure 14), especially on hillsides, should be considered in management plans by foresters.

Agriculture

Farming and ranching is a major use of land in the province and its overall effects on Turkey Vultures are probably beneficial (Figure 18). Farming causes direct loss of natural habitat, but also provides food for vultures during mowing or harvest operations that kill and maim small mammals and birds. In addition, discarded carcasses from commercial chicken and turkey farms and refuse from slaughter houses are a major source of food for vultures in the lower Fraser River valley and locally on Vancouver Island each year. An indirect source of vulture mortality could be through the use of pesticides on crops and rodenticides to control mice and voles.

Livestock grazing from ranching probably benefits vultures in the form of available afterbirth and carcasses since vultures rarely capture and kill live animals.



Figure 18. Turkey Vultures are increasingly common at farms and ranch operations where prey may be readily available. Dutch Creek, BC. 8 May 2005 (Michael I. Preston).

Recreation

Amateur and professional rock climbing activities on cliffs and bluffs during the breeding season have impacted nesting Turkey Vultures in British Columbia. Two such sites in the lower Fraser River valley were abandoned by vultures in the summer of 1985 and 1999. In addition, rescue and forest fire

training activities have been carried out on cliffs in spring and summer in the central Fraser River valley known to have nesting vultures.

Urbanization

Urbanization throughout the lower Fraser River valley (Lower Mainland) is now expanding into the foothills of the mountains, from Vancouver to Hope. Enroaching housing developments in the vicinity of McKee Mountain (Figure 19) caused abandonment of a nest site used by vultures (and Peregrine Falcons) since at least the late 1950s.



Figure 19. In the lower Fraser River valley, where urbanization is enroaching into the foothills of the mountains, Turkey Vultures have abandoned traditional nest sites in rock outcroppings. 10 April 2005 (R. Wayne Campbell).

Other Threats

As the breeding range of the Turkey Vulture continues to expand into British Columbia the impact of aircraft collisions may become a more serious economic and safety problem. In the United States, 152 recorded collisions with Turkey Vultures between 1991 and 1998 cost the aviation industry \$5.1 million. Collisions with Turkey Vultures ranked thirteenth of 21 groups of species identified. At the present time only the Nanaimo and Comox airport on Vancouver Island, is reporting vultures as concerns for airplane strikes.

Trends

There is no reliable trend information or population estimates for the Turkey Vulture in British Columbia.

Breeding Bird Surveys have limited value because most Turkey Vultures do not begin their foraging forays until near the end of the survey period. Long-term migration counts at well known observation sites may be useful for general comparisons, but the methodology varies considerably and does not allow rigorous scientific scrutiny of the data. Biologists like A.M. Fish and D.J.T. Hussell have voiced concerns over inconsistencies in data collection that includes poor standardization of count procedures, locations, and observer numbers and proficiency, influences of weather, and insufficient knowledge of sampling efficiency and species-specific migration behaviour. Procedures for standardized data collection and help with the analysis of data with statistics are currently being developed by the Wildlife Data Centre to maximize our efforts in the field.

Generally, the North American summer population was stable, despite some geographical shifts during the 1960s and 1970s. Between 1980 and 1994, northern populations showed considerable growth and expansion and this trend has continued on a broad scale through 2005. Some of this expansion may be attributed to changing land-use patterns (e.g., agriculture and logging), shift in available food base (e.g., road mortality and ranching), and global warming.

Databases

The standard to which all bird databases in the province is compared is the *The Birds of British Columbia*. Since publication of the Turkey Vulture account in 1990 the volume of new information that has become available to the Wildlife Data Centre is substantial. Some of the long-term migration information has been gathered by D. Stirling who initiated autumn staging counts on southern Vancouver Island that were subsequently continued by members of the Victoria Natural History Society. New distribution and trend information was complemented by numerous roadside raptor counts that were initiated in the late 1960s and are still being conducted today. Additional information was freely provided by hundreds of naturalists scattered around the province.

This account is based on 65,690 occurrence records, and 67 breeding records. It reflects a huge increase in both recent and historical information

that has been gathered over the past 15 years (Figures 20 and 21). According to L.F. Kiff, World Centre for Birds of Prey (Boise, ID) and R. VanRiper, President, *The Turkey Vulture Society* (St. Louis, MO), our dataset for Turkey Vulture, that spans 116 years, is the largest and most complete for any region in North America.

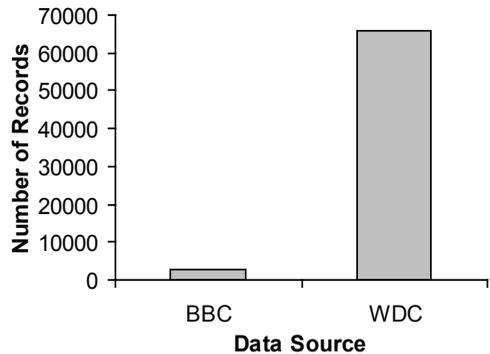


Figure 20. Comparison of total number of occurrence records since *The Birds of British Columbia* (BBC) (1990) with records at the Wildlife Data Centre (WDC) (2005) in Victoria.

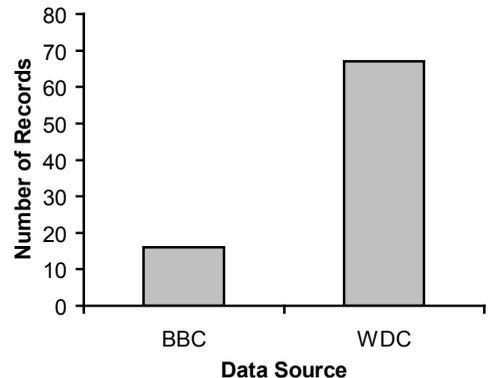


Figure 21. Comparison of total number of breeding records since *The Birds of British Columbia* (BBC) (1990) with records at the Wildlife Data Centre (WDC) (2005) in Victoria.

The Biodiversity Centre for Wildlife Studies has amassed a very large working database for the conservation of Turkey Vultures in British Columbia. Keeping current will be important in monitoring the growth of the population in the province. We hope that field naturalists and biologists will continue to support this effort by contributing their sightings and nest cards to the BCFWS.

Did You Know?

A-scented Advantage

In any given environment there are only so many carcasses to go around, and if you're not keenly tuned in, the late bird may never get the maggot. Turkey Vultures must compete for food like any other species. Among carcasses, avian competitors usually include Common Ravens, crows, Black-billed Magpies, and Bald or Golden eagles. The advantage for the Turkey Vulture is its keenly developed sense of smell. While all of the aforementioned competitors must rely primarily on visual cues to locate prey, the Turkey Vulture can locate prey that is not visible. For example in British Columbia, prey that is covered or cached by Cougar (*Puma concolor*), Red Fox (*Vulpes vulpes*), or Grizzly Bear (*Ursus arctos*) will not be seen by visually-dependent competitors. Also, carcasses in densely covered forests will be hidden from visual scavengers, whereas the Turkey Vulture can use olfactory cues to locate prey more easily. Such advantages are also used to locate the bodies of animals buried by humans, such as those of trapped pests in agricultural settings, or accidentally killed animals that are subsequently buried by farm equipment.

Superb Senses

The eyesight of Turkey Vultures is reported to be seven times as keen as human sight, and this benefit allows them to detect small mammals in open forests and fields when flying over. Their sense of smell is among the best in the bird world. In a recent study of the size of the olfactory bulb in 108 species of birds, the Turkey Vulture ranked ninth largest - larger than its cousin, the California Condor.

Strikes of a Different Kind

Birds that preferentially soar over, fly across, or

hunt above open fields are potential hazards when those fields are airports. Bird collisions with aircraft are known as bird strikes. In British Columbia there are no documented cases of a Turkey Vulture-aircraft strike, but the potential exists wherever airports offer favourable flying conditions for vultures. At the Vancouver International Airport on Sea Island, potential collisions with Turkey Vultures are considered low (3 on a scale of 1 [high] to 6). The ranking, assigned to over 100 species, is based on flocking tendency, weight of the bird (which measures the potential for damage given a strike), and use of the area. In the United States, 31% of all United States Air Force (USAF) collisions with birds are with Turkey Vultures, although most reports are from areas where Turkey Vulture numbers are high (e.g., the southern and eastern states). The only documented financial cost associated with a Turkey Vulture collision is from Texas, where repairs to a Citation 550 exceeded US \$550,000 and two weeks of lost service time. Costs associated with USAF collisions include entire aircraft and human lives.

Day of the Buzzard

Each year thousands of people in Hinckley, Ohio gather on the Sunday after the Ides of March to celebrate "Buzzard Day". Turkey Vultures apparently arrive each year on 15 March and their return is greeted with traffic jams that last for hours and party litter that requires days to clean up.

Sunning with a Purpose

During the day Turkey Vultures are often seen sitting on snags and rock-outcroppings with wings spread (See Figure 17). This behaviour, called "horaltic pose", is believed to function as wing drying, body warming, and controlling bacteria by exposing them to direct rays of the sun.

Not now, I'm sleeping?

When most people think of vultures, they think of their primary food – a rotting carcass. But for the Turkey Vulture, too much of a good thing is simply too much. Throughout North America, including British Columbia, numbers of Turkey Vultures are rising at about 1.8% per year. Unfortunately, however, the potential for conflict with humans is also likely on the rise, as Turkey Vultures often roost communally in

rural and suburban environments. In the southeastern United States, where numbers of vultures are very large, vulture roosts regularly exceed 100 birds, and often occur on large, metal communication or broadcast towers. Roosts of this nature are usually located near homes and local businesses, and the defecation and odour associated with these vulture roosts can cause problems for people living or working nearby. Excessive defecation by roosting vultures also interferes with proper operation of tower equipment, resulting in increased maintenance costs and unsafe work conditions. To counteract the problem, researchers in Florida hung either a vulture carcass, a stuffed effigy, or a decoy from the tower to create unfavourable roosting locations. Reduction in vulture numbers at the roost site was realized almost immediately, with a 93 - 100% decrease in the number of birds using the problem site. The lasting effect of the deterrent was realized for up to five months, even if the deterrent was removed in as little as seven days. This method is an example of non-invasive pest control.

"Nature's Sanitary Engineers" – Others Care Too

A growing number of professional and amateur ornithologists and active field naturalists are helping people understand the value of Turkey Vultures in addition to birds of prey with which vultures migrate and share habitats. Education is the key to their preservation. Fortunately, the world-wide change in attitude towards vultures over the past several decades has been dramatic and encouraging. You can learn more about the lives and concerns for vultures and birds of prey at:

[Global Raptor Information Network](http://www.globalraptors.org)
(www.globalraptors.org)

[Hawk Mountain Sanctuary Association](mailto:info@hawkmountain.org)
(info@hawkmountain.org)

[HawkWatch International](mailto:hwi@hawkwatch.org)
(hwi@hawkwatch.org)

[Kern River Valley Vulture Watch](http://www.valley.wild.org/TVcount.htm)
(www.valley.wild.org/TVcount.htm)

[National Audubon Society](#)

(www.audubon.org/bird/cbc/)

[Olympic Vulture Study](mailto:tvulture@vei.net)
(tvulture@vei.net)

[Patuxent Wildlife Research Center](http://www.mbr-wrc.usgs.gov/bbs)
(www.mbr-wrc.usgs.gov/bbs)

[The Turkey Vulture Society](mailto:VultureSociety@gmail.com)
(VultureSociety@gmail.com)

[Vulture Study Group](mailto:ewt@ewt.org.za)
(ewt@ewt.org.za)

[Vultures](http://www.vultures.homestead.com/turkey.html)
(www.vultures.homestead.com/turkey.html)

[Vultures and Condors](http://www.lairweb.org.nz)
(www.lairweb.org.nz)

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*The vulture produces no polluting smoke,
no plastic waste, just natural fertilizers that
enrich the soil. Why didn't we think of it first.*

A.B. Turner, *Vulture*