Pasco County Summary

Rare Species and Natural Communities

Scientific Name	Common Name	Global Rank*	State Rank*	Federal Status*	State Status*	Occurrence Status†
FISH						
Enneacanthus chaetodon	blackbanded sunfish	G4	S3	N	N	C
AMPHIBIANS						
Notophthalmus perstriatus	striped newt	G2G3	S2S3	N	N	P
Rana capito	gopher frog	G4	S3	N	LS	P
REPTILES						
Alligator mississippiensis	American alligator	G5	S4	T(S/A)	LS	P
Caretta caretta	loggerhead	G3	S3	LT	LT	N
Chelonia mydas	green turtle	G3	S2	LE	LE	N
Crotalus adamanteus	eastern diamondback rattlesnake	G5	S3	N	N	C
Dermochelys coriacea	leatherback	G3	S2	LE	LE	N
Drymarchon corais couperi	eastern indigo snake	G4T3	S3	LT	LT	C
Gopherus polyphemus	gopher tortoise	G3	S3	N	LS	C
Lepidochelys kempii	Kemp's ridley	G1	S1	LE	LE	P
Pituophis melanoleucus mugitus	Florida pine snake	G5T3?	S3	N	LS	C
Pseudemys concinna suwanniensis	Suwannee cooter	G5T3	S3	N	LS	P
Stilosoma extenuatum	short-tailed snake	G3	S3	N	LT	C
BIRDS						
Accipiter cooperii	Cooper's hawk	G4	S3?	N	N	P
Aimophila aestivalis	Bachman's sparrow	G3	S3	N	N	P
Ajaia ajaja	roseate spoonbill	G5	S2S3	N	LS	P
Ammodramus maritimus peninsulae	Scott's seaside sparrow	G4T2	S2	N	LS	C
Aphelocoma coerulescens	Florida scrub-jay	G3	S3	LT	LT	C
Aramus guarauna	limpkin	G5	S3	N	LS	P
Ardea alba	great egret	G5	S4	N	N	C
Buteo brachyurus	short-tailed hawk	G4?	S3	N	N	P
Charadrius melodus	piping plover	G3	S2	LT	LT	C
Cistothorus palustris marianae	Marian's marsh wren	G5T3	S3?	N	LS	P
Dendroica discolor paludicola	Florida prairie warbler	G5T3	S3	N	N	P
Egretta caerulea	little blue heron	G5	S4	N	LS	C
Egretta thula	snowy egret	G5	S4	N	LS	C
Egretta tricolor	tricolored heron	G5	S4	N	LS	C
Elanoides forficatus	swallow-tailed kite	G4	S2S3	N	N	P
Eudocimus albus	white ibis	G5	S4	N	LS	C
Falco columbarius	merlin	G5	SU	N	N	P
Falco peregrinus	peregrine falcon	G4	S2	LE	LE	P
Falco sparverius paulus	southeastern American kestrel	G5T3T4	S3?	N	LT	C
Fregata magnificens	magnificent frigatebird	G5	S1	N	N	P
Grus canadensis pratensis	Florida sandhill crane	G5T2T3	S2S3	N	LT	C
Haliaeetus leucocephalus	bald eagle	G4	S3	LT	LT	C
Ixobrychus exilis	least bittern	G5	S4	N	N	P
Laterallus jamaicensis	black rail	G4	S3?	N	N	P
Mycteria americana	wood stork	G4	S2	LE	LE	C
Nyctanassa violacea	yellow-crowned night-heron	G5	S3?	N	N	P
Nycticorax nycticorax	black-crowned night-heron	G5	S3?	N	N	C
Pandion haliaetus	osprey	G5	S3S4	N	LS**	P

Pasco County Summary

Rare Species and Natural Communities

Scientific Name	Common Name	Global Rank*	State Rank*	Federal Status*	State Status*	Occurrence Status†
Pelecanus occidentalis	brown pelican	G4	S3	N	LS	P
Picoides villosus	hairy woodpecker	G5	S3?	N	N	P
Plegadis falcinellus	glossy ibis	G5	S2	N	N	P
Rallus longirostris scottii	Florida clapper rail	G5T3?	S3?	N	N	P
Rynchops niger	black skimmer	G5	S3	N	LS	P
Speotyto cunicularia floridana	Florida burrowing owl	G4T3	S3	N	LS	C
Sterna antillarum	least tern	G4	S3	N	LT	P
Sterna maxima	royal tern	G5	S3	N	N	P
MAMMALS						
Corynorhinus rafinesquii	Rafinesque's big-eared bat	G3	S3?	N	N	P
Mustela frenata peninsulae	Florida long-tailed weasel	G5T3	S3?	N	N	P
Mustela vison halilimnetes	Gulf salt marsh mink	G5T3	S3	N	N	P
Neofiber alleni	round-tailed muskrat	G3	S3	N	N	C
Podomys floridanus	Florida mouse	G3	S3	N	LS	P
Sciurus niger shermani	Sherman's fox squirrel	G5T2	S2	N	LS	C
Sorex longirostris longirostris	southeastern shrew	G5T5	S4	N	N	P
Trichechus manatus	manatee	G2?	S2?	LE	LE	C
Ursus americanus floridanus	Florida black bear	G5T2	S2	C	LT**	C
INVERTEBRATES						
Procambarus leitheuseri	coastal lowland cave crayfish	G2	S2	N	N	C
VASCULAR PLANTS						
Asplenium auritum	auricled spleenwort	G5	S2	N	LE	C
Blechnum occidentale	sinkhole fern	G5	S1	N	LE	C
Centrosema arenicola	sand butterfly pea	G2	S2	N	N	C
Cheiroglossa palmata	hand fern	G4	S2	N	LE	C
Coelorachis tuberculosa	piedmont jointgrass	G3	S3	N	N	C
Glandularia tampensis	Tampa vervain	G1	S1	N	LE	C
Gymnopogon chapmanianus	Chapman's skeletongrass	G2	S2	N	N	C
Litsea aestivalis	pondspice	G3	S2	N	LE	C
Myriophyllum laxum	piedmont water-milfoil	G3	S2S3	N	N	C
Nemastylis floridana	fall-flowering ixia	G2	S2	N	LE	C
Rhynchospora decurrens	decurrent beakrush	G3G4	S2	N	N	C
NATURAL COMMUNITIES						
Aquatic Cave		G3	S2	N	N	C
Beach Dune		G4?	S2	N	N	C
Estuarine Composite Substrate		G3	S3	N	N	C
Estuarine Tidal Marsh		G4	S4	N	N	C
Estuarine Unconsolidated Substrate		G5	S5	N	N	C
Floodplain Swamp		G?	S4?	N	N	C
Marine Composite Substrate		G3	S3	N	N	C
Marine Consolidated Substrate		G3	S3	N	N	C
Marine Mollusk Reef		G3	S3	N	N	C
Marine Tidal Marsh		G4	S4	N	N	C
Marine Tidal Swamp		G3	S3	N	N	C
Maritime Hammock		G4	S2	N	N	C
Scrub		G2	S2	N	N	C

Pasco County Summary

Rare Species and Natural Communities

Scientific Name	Common Name	Global Rank*	State Rank*	Federal Status*	State Status*	Occurrence Status†
OTHER						
Bird rookery				N	N	C

* See attached *FNAI Rank Explanations* sheet for definitions of **Global and State Ranks**, and **State and Federal Status**

** See attached *FNAI Rank Explanations* sheet, *Special Animal Listings - State and Federal Status* section

† **County Occurrence Status**

Vertebrates and Invertebrates:

C = (Confirmed) Occurrence status derived from a documented record in the FNAI data base.

P = (Potential) Occurrence status derived from a reported occurrence for the county, or the occurrence lies within the published range of the taxon.

N = (Nesting) For sea turtles only; occurrence status derived from documented nesting occurrences.

Plants, Natural Communities, and Other:

C = (Confirmed) Occurrence status derived from a documented record in the FNAI data base or from a herbarium specimen.

R = (Reported) Occurrence status derived from published reports.

American alligator

Alligator mississippiensis

Description

Body length: 6-16 ft.

The American alligator, once on the verge of extinction, has made a tremendous come-back over the past 30 years, thanks to protection by the public. A large, semi-aquatic, armored reptile. Related to crocodiles. Almost black in color, with prominent eyes and nostrils and large, coarse scales. Large, long head with visible teeth along the edge of the jaws. Front feet have 5 toes, rear feet have 4 toes and are webbed. An agile swimmer, often floating or swimming with only it's eyes and nostril exposed.

Normally avoid humans, but can become a nuisance when they establish territories in and around people. Can prey on pets. Must be treated with caution; alligators can be surprisingly quick on land and are capable of running short distances.

Life History

Semi-aquatic, found in or near the water. Carnivorous, eating anything it can catch, including fish, turtles, lizards, snakes, small mammals, waterfowl, and crustaceans. Can be very vocal; young typically make a squeak or yip and adults will roar or grunt, depending on the circumstance.

Breeding begins as alligators emerge from hibernation in April. The female will build a nest of leaves and vegetation up to 6 feet across and several feet high. She lays and buries her eggs in the center of this mound, allowing the warmth of the pile to incubate the eggs. Females typically lay over 50 eggs and each egg is about 3 inches long. The eggs incubate for about 9 weeks, and the female will watch and defend the nest during this time. As the young hatch, they "peep" and the female will assist them by digging them out of the nest. Newborn alligators are about 9 inches long and will stay near the female for up to a year. The female will continue to protect the young during this period.

Habitat and Distribution

Common in swamps, rivers, bayous, and marshes of the southern U.S., including the eastern third of Texas. Typically found in fresh-water, alligators can tolerate brackish water as well. Formerly an endangered species, the alligator is now a protected, game animal in Texas. Special permits are required to hunt, raise, or possess alligators.

Burrowing Owl

Article

Burrowing Owl, common name for a small ground-dwelling owl found only in the western hemisphere. The burrowing owl inhabits open country, such as grassland and farmlands. In the summer it nests from British Columbia and the western half of the United States as far east as Manitoba, Canada, and the Great Plains. In the winter, some burrowing owls migrate as far south as Central America and Panama. There is also a year-round population in Florida.

The adult burrowing owl has brown coloring on its head, back, wings, and tail, which are boldly spotted and barred with white. Its white chest is crossed with horizontal brown bars. Young burrowing owls in their first year, called juveniles, have plain, off-white chests. The burrowing owl is 23 to 28 cm (9 to 11 in) long and has distinctively long legs. Its night call is a soft *coo-coooo,* like the call of a dove. When disturbed, it makes an alarm call similar to a rattlesnake's rattle.

For much of the year, the burrowing owl's diet consists mostly of small mammals, including field mice, young prairie dogs, and rabbits. It will also eat small birds, frogs, lizards, snakes, and fish. In the summer, it eats mostly large insects, including grasshoppers, beetles, caterpillars, and also scorpions. The burrowing owl hunts mainly in the early evening and at night, but during the breeding season it also hunts by day. It may swoop down on prey from above or run along the ground to seize prey in its talons. Burrowing owls are known to deliberately follow a dog or a horse to look for animals stirred up by its passing.

Nesting takes place between March and July. During courtship, both the male and female repeatedly fly up into the air and hover together, then descend. The male feeds the female near the nesting site, and the two smooth each other's feathers and nibble at each other's beaks. Burrowing owls usually nest in small colonies, using the abandoned burrows of other animals, such as prairie dogs and ground squirrels. The owl uses its feet to enlarge the burrow until it is 1.8 to 3.0 m (6 to 10 ft) long, with a nest chamber at the end. It lines the burrow and the nest chamber with dried horse or cow manure and may use the same burrow year after year.

The female lays seven to nine white eggs and then incubates, or warms, them by sitting on them for 28 days until the young have hatched. For the first week or two after hatching, the male brings food to the female, who feeds it to the young. Later, both the male and female feed the young until they are ready to leave the nest, or fledge, about six weeks after hatching.

The burrowing owl has become ra in many of its former breeding are due to loss of habitat, and it is no considered endangered or threate in some areas.

Scientific classification: The burrowing owl belongs to the typi owl family, Strigidae, in the order Strigiformes, and is classified as *Speotyto cunicularia.*

BURROWING OWLS AND THEIR BURROWS

The purpose of this paper is to explain the Florida Game and Fresh Water Fish Commission's policy regarding issuance of permits to destroy burrowing owl nesting burrows. The Florida burrowing owl (Athene cunicularia floridana) is listed by the Commission as a Species of Special Concern (Florida Administrative Code 39-27.005). This classification means that the burrowing owl has a high vulnerability to factors that may lead to its becoming a threatened species in the absence of appropriate protection or management (please see the enclosed brochure). As a Species of Special Concern, it is illegal to take (pursue, hunt, capture, molest, or kill) burrowing owls and their nests and eggs without a permit issued by the Executive Director of the Commission (39-27.002 F.A.C.). Burrowing owls and their nests are also afforded protection under the federal Migratory Bird Treaty Act (Title 50, Code of Federal Regulations, Part 21). This act prohibits the destruction of nests without a federal permit, which is issued by the U.S. Fish and Wildlife Service Regional Office in Atlanta, Georgia.

It is the Commission's policy to issue permits to destroy burrowing owl nests only when all reasonable alternatives, such as realigning development to avoid the nest, are impractical. When such permits are issued, they apply only to inactive nests (i.e., burrows containing no eggs or flightless young). In South Florida, nests can generally be considered inactive from 7 July - 1 February. Between 1 February and 7 July, burrows attended by one or more burrowing owls are considered to be active nests unless information is available to suggest otherwise (i.e., proof that young fledged from the nest prior to 7 July). To determine if a burrow is attended by owls, we recommend visiting the site and looking for owls early in the morning or late in the afternoon on at least three successive days. Additionally, the entrance to active burrows are often "decorated" with sod, grass clippings, shredded paper, dog feces, etc.

If development is conducted in such a way that the area within 10 feet of the burrow is protected from disturbance, it is unlikely the nest will be destroyed as a direct result of construction. Under these conditions no permit is needed, but we urge that cautionary measures be taken to guard against accidental destruction of the nest. We recommend that a 20 foot diameter circle around the burrow entrance be staked and roped-off prior to initiating construction. Sod may be laid within the protected area outside the "active" nesting period, but the burrow entrance must be left open. Plugging the burrow entrance or causing the burrow to collapse would effectively destroy the nest, and as such, require a permit.

Letters requesting state permits to take burrowing owl nests should be addressed to Mr. Don Wood, Endangered Species Coordinator, Game and Fresh Water Fish Commission, 620 S. Meridian St., Tallahassee, FL 32399-1600. Such letters should include an explanation as to why it is necessary to destroy the burrow and the exact location of the nest. Letters requesting an application for a federal permit by the U.S. Fish and Wildlife Service should be addressed to the Special Agent in Charge, U.S. Fish and Wildlife Service, Division of Law Enforcement, P.O. Box 4839, Richard B. Russell, Federal Building, Atlanta, GA 30302 (phone [404] 221-5872).

Gopher Tortoise

(Gopherus polyphemus)

LISTING STATUS

USFWS: C2
FGFWFC: SSC
CITES: N/A
FCREPA: Threatened
FNAI: G3/S3

POPULATION DATA ON KSC

BREEDING SEASON: March - September

ESTIMATED POPULATION SIZE: 18,000

SEASONAL ABUNDANCE:	SPRING	SUMMER	FALL	WINTER
	Common	Common	Common	Common

The Gopher Tortoise is one of four tortoises that occur in North America and is the only one east of Texas. The Florida population is listed by the FGFWFC as a species of special concern (Wood 1992) and by the FCREPA as threatened (Auffenburg 1978). It has been estimated that the Florida population will be reduced nearly 70% by 2000 A.D. and could be eliminated from all but protected lands by 2025 A.D. (Auffenberg and Franz 1982). A combination of habitat destruction, predation by humans and other animals, and biological characteristics of the tortoise have placed its existence in jeopardy over most of its range.

Estimated life span of the Gopher Tortoise ranges between 40-60 years (Landers 1980) to as long as 150 years (Cox et al. 1987). Reproduction occurs from February (Dietlein and Franz 1979) to September, with the peak in May and June (Diemer 1986). The nest site is excavated by the female in an open sandy spot with direct sunlight (Landers and Buckner 1981). Average clutch size is 6 eggs (Diemer 1986), but ranges from 3 to 11 (Dietlein and Franz 1979). Most eggs laid never hatch because of mammalian predators such as Raccoons, Opossums, Foxes, and Armadillos (Landers et al. 1980, Auffenberg and Iverson 1979). It is estimated that of every 100 eggs laid, only 1-3 survives to become a reproductive adult (Landers 1980). All of these biological characteristics result in a low reproductive rate that makes the Gopher Tortoise susceptible to development or disturbance.

The distribution of the Gopher Tortoise was thought to be limited by their sensitivity to cold climates, the availability of deep, well-drained sandy soils, and a sparse canopy of shrubs and trees (Landers and Speake 1980, McRae et al. 1981, Auffenberg and Franz 1982, Diemer 1986). Subsequent research in other habitats has shown that Gopher Tortoises can occur in a variety of

conditions.

All tortoises in temperate regions dig some type of burrow (Auffenberg and Iverson 1979), but none use the burrow as consistently as the Gopher Tortoise (Deitlein and Franz 1979). Much of its time is spent within the burrow (Ernst and Barbour 1972) and the burrow serves as a focal point for many above ground activities (Auffenberg and Iverson 1979, McRae et al. 1981). Radio-tracked Gopher Tortoises were rarely seen outside the burrow, and retreated into the burrow when approached (Smith and Breininger unpub. data). The burrow provides refuge from fires, predators, and harsh climatic conditions, not only for Gopher Tortoises, but also for at least 39 invertebrate and 42 vertebrate species, several of which are federally or state listed (Speake 1981, Cox et al. 1987). The Gopher Tortoise is considered a "keystone species" (Eisenberg 1983) because it provides a significant element to habitat structure that greatly influences the community.

KSC is the largest area of protected habitat for this species along the Atlantic coast of Florida. Studies on KSC (Breininger et al. 1988, Giovanetto 1988, Breininger et al. 1991, Breininger et al. 1994, Smith and Breininger unpub. data) have shown that Gopher Tortoise densities are highest where herbaceous cover is the highest, and densities tend to decrease with increasing cover of oaks, shrubs, and pines. Total burrow densities in KSC scrub and slash pine range between 17.5-32.2 burrows/ha, with an average density of 1.3 animals/ha (Breininger et al. 1988). Tortoise burrows often vary in states of maintenance, i.e. actively being used by a tortoise; inactive at the present time, but still intact; or abandoned. In KSC scrub and slash pine flatwoods , it was found that during much of the year, the number of active burrows can be multiplied by 0.28 to get an estimate of the average number of tortoises (Breininger et al. 1988, 1991). This correction factor was determined using a camera system to survey burrows and emphasizes that correction factors are dependent on habitat and season, and should be applied with caution.

Eastern Indigo Snake

(Drymarchon corias couperi)

LISTING STATUS

USFWS:	Threatened
FGFWFC:	Threatened
CITES:	N/A
FCREPA:	SSC
FNAI:	G4T3/S3

POPULATION DATA ON KSC

BREEDING SEASON: All Year

ESTIMATED POPULATION SIZE: < 500

SEASONAL ABUNDANCE:

SPRING	SUMMER	FALL	WINTER
Common	Common	Common	Common

The Eastern Indigo Snake is the largest nonpoisonous snake in North America that was federally listed as a threatened species in 1978. Because Indigo Snakes are notoriously good natured, the commercial pet trade took a heavy toll on wild populations before federal protection (Kochman 1978a). Human exploitation combined with habitat loss and degradation now restrict the species mostly to Florida. Early habitat accounts emphasized the association of Eastern Indigo Snake with xeric sand ridge habitats and their dependence on Gopher Tortoise burrows for overwintering (Wright and Wright 1957, Mount 1975, Lawler 1977, Speake et al. 1978, Landers and Speake 1980, Speake and McGlincy 1981, USFWS 1982, Diemer and Speake 1983). The Indigo Snake is a top predator of a variety of prey including birds, young turtles, frogs, and other snakes, including rattlesnakes (Mount 1975, Ashton and Ashton 1981).

Habitat loss, degradation, and fragmentation are the greatest threats to the Indigo Snake (Lawler 1977, Diemer and Speake 1981, USFWS 1982, Moler 1986). Conditions that favor suitable prey populations and provide opportunity for prey capture may be important. Gopher Tortoise burrows are used by many potential prey items and Indigo Snakes capture prey, such as other snakes, in these locations (Judy Rodda pers. obs.). Fire suppression has a negative influence on Gopher Tortoises (Auffenberg and Franz 1982) and possibly Indigo Snakes. Indigo Snakes use active burrows but may prefer inactive and abandoned burrows (Speake et al. 1978). Other den sites include windthrows and hollow root channels of large live oaks (Speake et al. 1978, Moler 1986). Indigo Snakes frequently use disturbed areas where clearing has occurred and where debris piles remain (Speake et al. 1978, Moler 1986, Kehl et al. 1991).

Indigo Snakes were believed to be largely restricted to the central scrub belt on KSC, based on road kill information and the early literature (Ehrhart 1976). The range of the species on KSC was mapped (NASA 1979) to extend outward from the central ridge and include the coastal strand. Later studies on KSC (Kehl et al. 1991) revealed that the Indigo Snake is not as habitat specific as initially believed

and that many other areas on KSC may represent suitable habitat. Den sites are often in well-drained scrub and pine flatwoods which comprise only about 2% of KSC lands. In contrast to other studies, Indigo Snakes on KSC sometimes move considerable distances during warm periods in winter. Indigo Snakes are capable of movements outside den sites on sunny days when the outside temperature is greater than 55° F (P. Moler pers. comm.). It is unknown how Indigo Snakes fair when extended cold periods follow heavy rains that flood burrows. Studies of Indigo Snake habitat use on KSC have been conducted using radio telemetry. Ten adult Indigo Snakes have been implanted with radio transmitters, released and tracked between 1989 and 1991. The average homerange estimates were 279.4 ha for males and 99.8 ha for females (Kehl et al. 1991). The habitats used by these snakes included well-drained soils, hammocks, swales, ditches and ruderal areas.

A population estimate of 750 individuals on KSC occurs in a report prepared by the USFWS (NASA 1979). If homerange sizes from recent studies (Kehl et al. 1991) are used, a population of 300 animals is approximated. Certainly, many unproven assumptions are associated with this estimate, but it indicates that the population may be near the minimum size acceptable for sustaining a population. Thus, maintenance of viable populations of this top predator is of concern Most proposed construction projects occur within potential habitat for this protected species. Habitat management that benefits Gopher Tortoises may benefit Indigo Snakes but Indigo Snakes may require additional considerations. Fragmentation of habitat, even by low density development, is a potential threat given their susceptibility to road mortality (Moler 1986). Some road mortality has been intentional, even on KSC which encompasses a National Wildlife Refuge (pers. obs.). Road mortality to Indigo Snakes could be reduced by an education program informing employees about its protected status, beneficial roles, and generally gentle disposition towards humans.

AMERICAN KESTREL

Falco sparverius

Description

The American Kestrel is a beautiful, robin-sized falcon. This tiny raptor has the typical falcon body shape, a short neck and a small head that has a black and white pattern with dark, vertical, black stripes on the side of its head. It is a rust-colored falcon and the male is distinguishable by having blue-gray wings and an unbarred tail while the female sports a barred tail and lacks the blue-gray wings. The kestrel has a sharp, hooked bill and large, talon-tipped feet that are ideal for hunting. In flight, pointed wings and rapid wingbeats help to identify this raptor.

Life History

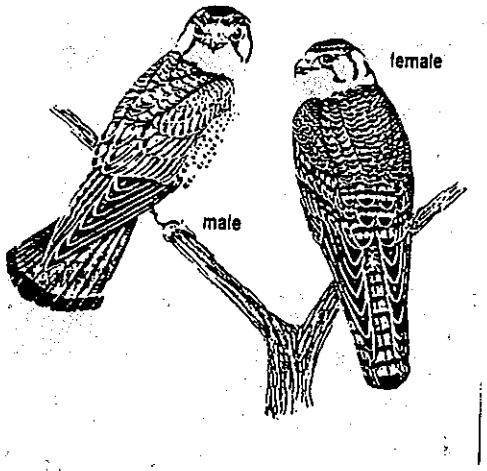
American Kestrels are apt and able hunters. They hunt large insects, bats, mice, birds and small reptiles. Kestrels usually hover before dropping on prey from above, pinning victims to the ground. They rarely chase prey, such as flying insects or bats, through the air.

Pair bonding among kestrels is strong and usually permanent. A pair is established after the male takes over a particular territory. Thereafter, a female will begin to hunt and associate herself with the male. The major components that will strengthen the bond between the two kestrels include courtship feeding of the female by the male, aerial displays and the search for a nest site. Kestrels nest in the spring from April to early June in woodpecker holes, natural cavities, niches in cliffs or buildings and in nest boxes that are specifically set up for them. The female is the main incubator of three to five whitish eggs that are heavily blotched with brown for approximately 30 days. During the nesting period, the male provides the family with food. Later, both will hunt as the nestlings mature and eventually leave the nest some 30 to 31 days after they hatch.

Habitat and Distribution

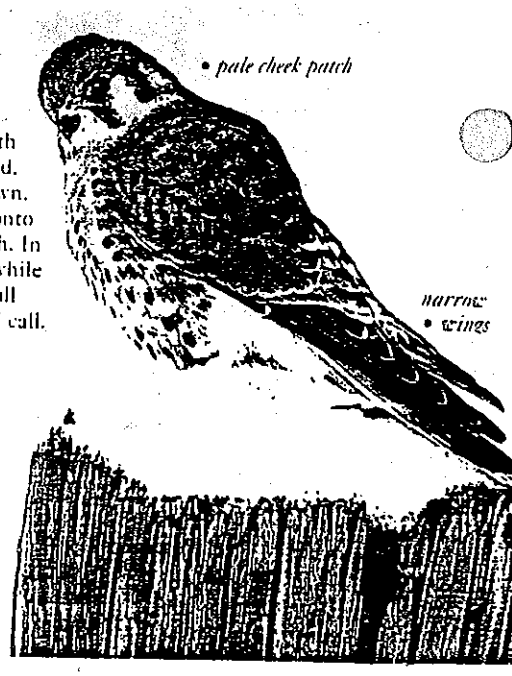
The American Kestrel is distributed very widely throughout North America. Although they are found from alpine zones down into desert habitats, they generally prefer savanna-like areas with few trees, farmsteads, woodland borders, city parks and suburban areas.

During migration and winter months, they are common throughout Texas. They also breed in northern and western portions of the state. Certainly, the kestrel's ability to adapt to such varying conditions has enabled it to remain one of the most abundant raptors of North America.



AMERICAN KESTREL

This small and beautifully patterned bird is one of the less powerful falcons, taking smaller and slower prey. It flies rapidly with quick downward wingbeats. When perched, it has a habit of wagging its tail up and down. When hunting, it often hovers and drops onto prey, less commonly watching from a perch. In summer, it feeds chiefly on large insects, while in winter it more often takes mice and small birds. It utters a repeated "klee" or "killy" call.



American Kestrel *(Falco sparverius)*

Other names: Sparrow Hawk, Killy Hawk

The Kestrel is our smallest and most colorful falcon, typically about the size of a robin. Florida is inhabited by a smaller race (*F. s. paulus*), which has been threatened by loss of cavity trees and reduced habitat availability. Both sexes and immatures exhibit vertical black streaks behind and in front of the eye. Males have slate-blue crowns and wing coverts, rusty tail with black terminal band, and rufous back. Undersides exhibit black spots on a buff background. Females are browner overall with more heavily marked back, tail, and undersides. Immatures resemble adults with more streaking below. Kestrels are found throughout Florida, usually nesting in abandoned woodpecker holes excavated in pine trees. A helpful tool for wildlife managers is the artifical nest box which these birds readily use. During spring (March-June) the female incubates 3 to 5 eggs while the male hunts for and feeds his mate. Insects make up the bulk of the diet although small mammals and reptiles frequently are taken. Florida experiences a large influx of northern Kestrels during winter. Like the Florida race, these birds often space themselves along telephone wires while hunting, but are distinguished by their larger size.

Florida is an important wintering area for American Kestrels from the north: they may be seen on utility poles and wires along most state highways from October through April. But the resident breeding population, the Southeastern Kestrel, which is smaller in size than its northern cousin, is relatively scarce and is declining in most parts of the state. The chief reason for the decline in central Florida is believed to be a reduction in the number of dead trees and snags that are the kestrel's nest sites. An intervention that may help increase the kestrel population is the installation of nesting boxes in suitable habitat throughout the state.

Habitat: More open, wooded areas, prairies, deserts, fields, and cities.

Biology: Nest: In hollows in tree or cactus, usually those dug by suitably sized woodpeckers; very rarely in old nests of other birds, such as crows or magpies. Eggs: 3–7, most commonly 4–5; whitish, finely speckled in varying degrees or heavily blotched with browns. Incubation: 29–30 days, by female with little assistance from male. Age at 1st flight: About 30–31 days. Food: More than 50% insects; small mammals, small birds, and snakes make up rest of diet.

INTEGRATING PROTECTION AREAS INTO THE DEVELOPMENT COMMUNITY

Kestrels are frequent residents of suburban areas and are tolerant of human activities. Some developed areas can even enhance or create suitable kestrel foraging habitat. If such areas are maintained properly and nest sites are available or provided, these areas may be included as part of the habitat protection area. Some possible developed areas that may be included as part of a kestrel habitat protection area are: (1) small airports, (2) horse stables, (3) golf courses, (4) parks, and (5) power line rights-of-way. Developed lands that are proposed for inclusion in a kestrel habitat protection area must meet all the criteria for suitable kestrel habitat (i.e., suitable foraging habitat; active, potential, and alternative nest sites; and 0.5 perch sites per hectare), and they must be within or contiguous to the habitat protection area. High use areas (e.g., airport terminal, riding arena, golf clubhouse, playground) should be located as far as possible from nest sites and will not count towards the goal of providing a habitat protection area of 50 ha. If the kestrel habitat overlaps with existing developed areas (e.g., power line rights-of-way), and this area can be managed and maintained as kestrel foraging habitat, then it may be included in the habitat protection area and will contribute toward the goal of providing a habitat protection area of 50 ha. If management of the developed area to be incorporated as part of the kestrel habitat protection area includes practices (e.g., pesticide use) that would directly or indirectly cause sickness, reduced reproductive capability, death, or reduced amounts of available prey, then these areas should NOT be included as part of the habitat protection area. Consultation with a habitat specialist is recommended if chemical treatment is planned for any area being considered for inclusion as a portion of the kestrel habitat protection area.

Other developed land may contain suitable kestrel foraging habitat, but should not be included as part of the protection area and will not count toward the required protection area. Areas of possible suitable foraging habitat that should NOT be incorporated into a habitat protection area include: (1) residential lawns, (2) isolated narrow grassy strips along roads, and (3) areas adjacent to high traffic roads. Low traffic roads may transect a protection area, but they should not count toward the required acreage of suitable foraging habitat.

MANAGING PROTECTION AREAS

Foraging areas

A minimum of 60% of the ground cover within habitat protection areas should be maintained at a height of < 25 cm by periodic mowing or burning. If mowing is used, rotational mowing of strips creates an interspersion of dense vegetation and open areas which may more closely approach an optimal combination of prey numbers and availability. Burning on a 2-3 year rotation should maintain suitable foraging substrate; however, needed frequency of burning will depend on the type and density of vegetation on the site. Developed areas included as part of kestrel habitat protection areas should be maintained similarly.

Removal/Relocation of a kestrel nest

If a site contains an active kestrel nest, and project plans call for clearing of land on which the nest site is located, and off-site compensation is pursued to mitigate impacts on kestrels, then appropriate procedures must be followed in order to remove the nest site. Permits must first be obtained from the Florida Game and Fresh Water Fish Commission pursuant to Rule 39-27.002(2), Florida Administrative Code, and from the U.S. Fish and Wildlife Service. Typically such permits do not allow for destruction or relocation of nests during the breeding season. In addition, if a proposed development site contains a kestrel nest and on-site habitat protection is pursued, but the nest is located in a structure which is scheduled for removal (e.g., abandoned building), then a permit must be obtained from the Florida Game and Fresh Water Fish Commission. Such permits typically require that alternative nest sites be installed in the vicinity of the original active nest site prior to removal. If an active kestrel nest is located in a man-made structure and the structure is not scheduled to be removed, then the nest site should not be disturbed and nest boxes should be placed around the structure to provide alternative nest sites if the structure is in poor condition or is slated for removal at a later date.

When the on-site habitat protection consists only of a 150 m radius buffer zone around an active kestrel nest site (i.e., the proposed development site contains an active nest but less than 10 ha of suitable foraging habitat on site), and it can later be documented that the kestrels have not nested in the habitat protection area for two consecutive breeding seasons, then the habitat protection area may be developed and the nest site may be removed.

Nest sites

Disturbance within the nest site buffer zone should be prohibited during the courtship, breeding, and nesting period (i.e., January - August). One nest box (Figure 13) per 10 ha should be erected within habitat protection areas. Maintenance of the nest boxes should include two routine maintenance checks per year, replacement of missing or damaged nest boxes, and removal of non-target species. One of the maintenance checks should be prior to the breeding season (i.e., December).

The nest boxes should be erected as near optimum conditions as possible and be in place by December. Several factors to consider in nest box placement include:

(1) Place the nest box approximately 7 meters high.

(2) Place the nest box on poles, snags, or live trees (or on utility poles if proper authorization has been received).

(3) Place nest box in close proximity to a roost tree.

(4) The nest box opening should face a southerly to easterly direction.

(5) The entrance of the nest box should be unobstructed with a clear flight path.

(6) The nest box should be placed in an open area at a distance greater than 50 m from a forest edge.

(7) If a live tree must be used as the support structure, then there should be 4.5-6.0 m between the nest box and the lowest branch on the tree.

Roost sites in close proximity to the nest site provide both cover from predators and initial perch sites for fledglings. If a tree (live or dead) is used as a nest box support structure, the health status of the tree also should be monitored during the nest box maintenance checks. If the tree becomes unsuitable (e.g., decayed) for a nest box structure, the nest box should be relocated to a nearby suitable structure (tree or pole). The nest box should only be relocated during the non-reproductive season (September-December). Removal or relocation of a nest box that has been used by kestrels requires a permit from Florida Game and Fresh Water Fish Commission and United States Fish and Wildlife Service.

Perch sites

The availability and density of perch sites directly influences the quality of foraging habitat. With the majority of their hunting accomplished by pouncing on prey from perch sites, the kestrel's ability to successfully capture prey can be severely reduced without adequate perch sites. Kestrels make most of their prey capture pounces within a 56 m radius of a perch site (Smallwood 1987). The overall density of perch sites (natural or man-made) for the protection area should be 0.5 perch sites/ha. If adequate perch sites do not exist on the protection area, perch sites should be erected and maintained. If man-made perch sites area required, then poles approximately 7-10 m high should be used for additional perch sites. The poles should be placed throughout the protection area wherever natural perch sites are lacking. Perch sites should be regularly distributed throughout the protection area to increase the amount of available foraging area. Power lines and poles provide excellent perch sites for kestrels and qualify as suitable perch sites for the protection area. Each 112 m length of power line will count as 1 perch site.

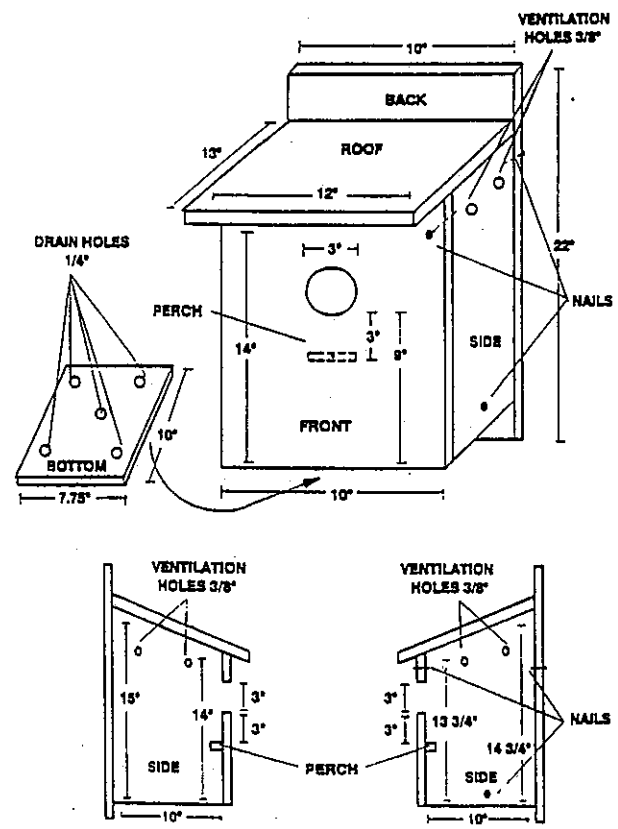


Figure 13. Kestrel nest box design. Shaft at the entrance cut-out is used for an inside perch. Attached with a screw. Two nails at the top of one side panel act as hinges to swing the side open for cleaning. A single nail is used at the bottom to secure the side shut. Use 1 inch thick wood for construction.