Lagomorpha	Leporidae	Sylvilagus sp.	Tr.	1
Passeriformes	Fringillidae	Pipilo erythrophthalmus	2	1
Passeriformes	Fringillidae	Passerherbulus sp.	2	2
		Table 1. Continued		
Order	Family	Species	Volume Percent	Frequency of Occurrence
Passeriformes	Mimidae	Dumetella carolinensis	Tr.	1
Squamata	Colubridae	<u>Natrix</u> sp.	1	1
Squamata	Iguanidae	Anolis carolinensis	Tr.	1
Squamata	Unidentified	Unidentified	4	4
Salienta	Bufonidae	Bufo sp.	1	5
Salienta	Hylidae	Hyla sp.	Tr.	1
Salienta	Ranidae	Rana sp.	2	4
Miscellaneous:				
Feathers, vegetation, gravel	Unidentified	Unidentified	1	19

¹ Class Diplopoda

most prevalent invertebrates by volume (66 percent) and in frequency of occurrence in the diet. Families of Coleoptera not listed in the table but included under "Miscellaneous" were Cerambycidae, Dytiscidae, Elateridae, and Hydrophilidae. Miscellaneous families of Orthoptera included Gryllidae, Locustidae, Oedipodidae, and Tettigoniidae.

Reptiles and rodents were the most abundant vertebrate food in volume consumed, but amphibians were eaten more frequently.

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FIELD IDENTIFICATION OF DIFFICULT BIRDS: I SHORT-TAILED HAWK

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The uncommon Short-tailed Hawk (Buteo brachyurus) is often searched for in peninsular Florida without being found. Almost certainly more would be reported, however, if its habits were better known, and if current field guides or other ornithological literature easily available to field workers contained more correct and fuller descriptions of this species' plumages. I present here information on behavior and plumages of Short-tailed Hawks which should aid in locating this species and in identifying it in the field. I offer this information in the hope that increased frequency of accurate sightings of Short-tails will occur, resulting in the accumulation of additional data on breeding biology, habitat, and food habits of this unusual, bird-hunting Buteo (Ogden, Auk, in press).

The Short-tailed Hawk is approximately the same size as the small race of Red-shouldered Hawk resident in south Florida (Buteo lineatus extimus), but differs considerably from these Red-shouldered Hawks in

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body proportions. A soaring Short-tail shows long, broad wings and a relatively short, broad tail, and therefore is shaped more like the larger Red-tailed Hawk (*Buteo jamaicensis*), rather than like the slimmer-winged and longer-tailed Red-shoulder. The tail of the Short-tailed Hawk is 6 or 7 inches long, and does not appear proportionately shorter than that of some other buteos. Its wings, however, are quite long and broad, and probably have a greater surface area in relation to body size than do those of most other buteos.

Short-tailed Hawks are most frequently seen in the air, often soaring at great heights. They are most numerous near the edge of mature cypress, pine or riparian hardwood stands, or over coastal mangrove forest. Their flying often appears effortless, with individual birds performing little or no flapping during hours of slow soaring or "hanging" on rising air currents while searching for prey below. The wings are held flat when soaring, except that the outer primaries are decidedly upturned, thus presenting a different silhouette than that of the more completely flat-winged Redshouldered Hawk or Broad-winged Hawk (*Buteo platyperus*), or the dihedral wing posture of the Swainson's Hawk (*Buteo swainsoni*). Short-tails attempt to capture prey by swift, steep-angled dives, initiated from slow soaring positions, a hunting technique that is characteristic enough of this species to be useful for identification purposes.

Short-tailed Hawks rarely perch on exposed tree branches, utility poles or wires, or fence posts. Instead they almost always perch at inconspicuous sites inside a thicket of large trees, or half hidden in leafy uppermost branches of the tallest tree overlooking patches of woods. These perches are used as roosts, for sunning, and for preening early and late in the day. Although this habit of selecting hidden perches makes the birds difficult to locate, it is sometimes possible to locate a Short-tail where one is suspected to be roosting by watching from outside the woods, and locating the hawk as it first leaves its hidden perch in the morning and soars for several minutes low over the area. Short-tails often begin their long soaring periods in summer between 0800 and 0900 hours, coincidental with warming air and development of thermals necessary for efficient aerial hunting.

The Short-tailed Hawk is dimorphic, with the dark color phase more common in Florida (Moore, Stimson, and Robertson, 1953. Observations of the Short-tailed Hawk in Florida. Auk, 70: 470-478). My observations in Everglades National Park since 1965 have resulted in sighting of approximately 4 dark-phase birds for each white-phase bird, based on approximately 70 total sightings during these years. The mated pairs I have seen consisted of these color combinations: dark male mated to white female, dark male mated to dark female, and white male mated to white female. Following are descriptions of the adult and immature (first-year) plumages of each color phase, with emphasis on useful field characters.

Adult, dark phase. A perched, dark Short-tail may appear uniformly



Ventral flight patterns of immature dark-phase (top) and white-phase (bottom) Short-tailed Hawks in Florida.

black, but actually is dark brown and sooty black, darkest on the head and underparts. The feet, legs and cere are bright yellow. There is greater plumage contrast in flight, with the underside of the tail, the primaries, and the secondaries light grey, palest (nearly white) at the base of the outer primaries. The wing linings are uniformly sooty black. There are numerous thin, dark bars across the light primaries and secondaries; a broader terminal bar on each of these feathers creates a dark border on the trailing edge of the spread wing. The underside of the tail shows a thin, but pronounced, dark subterminal bar, with two thinner and broken bars anterior to the subterminal. Feathers immediately posterior to the cere show varying amounts of white, a small white patch forming in some birds, a mark of little value for field identification of either color phase.

Adult, white phase. This plumage, as on dark-phase birds, is dark brown on the upper side of the tail, wings, head, and body. Where the dark phase is darkest, however, on the ventral body plumage and wing linings, this plumage is white. An occasional white-phase bird shows pale buff or yellow-brown on the flanks and flag feathers, although this color is not easily visible in the field.

A valuable field mark for white Short-tails is the distinctive head pattern, produced by the sharp contrast between solid, dark head and white throat and underparts. Accentuating the contrast, the dark color of the head extends uniformly to the edge of the throat and upper breast to create the impression of a dark hood. The lower edge of this hood, at its interface with the pure white breast, may be slightly reddish in tone, although this character varies from obsolete to pronounced on different birds.

The underside of the tail, the primaries, and the secondaries are similar to those of dark birds, although tail bars are more obscure, and often only the narrow, dark subterminal bar is apparent. Strong sunlight shining through the spread tail of a soaring white-phase Short-tail (and in some dark ones) creates the illusion of a reddish-brown tail, rather than pale grey. Seen from below, the primaries and secondaries are darker than the white wing linings, and the narrow dark bars are less conspicuous than in dark-phase birds.

Immatures. Immature plumages of the two color phases are less wellknown and are inaccurately or not at all described in most field guides. Ventral plumage patterns, of immatures, therefore, are illustrated here (Figure 1).

The immature dark Short-tail, at a great distance, may be indistinguishable from an adult, but when overhead reveals an obviously different color pattern. The throat, belly, under tail coverts, and wing linings are mottled with small whitish and brownish spots, contrasting with a completely dark breast. The amount of ventral mottling varies considerably and probably is a function of age, feather wear, and fading. Some birds are so dark that the contrast between the all-dark breast and the mottling is not conspicuous, while other birds show almost equal amounts of light and dark in the mottled portion of the plumage.

The other plumage difference in dark immatures is that the tail, seen from below, shows more bars than in the adults, as is typical of many immature *Buteos*. In Short-tails there are 5 narrow, dark bars, with the outer, subterminal bar only slightly broader than the remainder.

White-phase Short-tailed Hawks usually fledge during June, when they are pale orange-buff on the underparts, palest on wing linings and throat, and show no ventral markings except on a few narrow dark streaks on the sides of the breast. The orange-buff color apparently fades during the following months so that immatures seen in October are only faintly colored below, and by mid-winter appear white. These mid-winter immatures look superficially like white-phase adults, except for some light streaking on the sides of the dark brown head. This head streaking may be particularly concentrated at the auriculars. The tail is slightly more heavily barred than the white-phase adult's and is pale grey below with one narrow, dark, subterminal bar and one or two thinner, broken bars inside the subterminal.

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