TABLE 4. Relation between sizes of feathers, their barbs, and ocelli.

Size of feathers (cm)	Size of aftershaft (cm)	Size of barbs (cm)	Size of head (cm)	Size of brown ocellus (cm)	Size of green ocellus (cm)	Size of blue ocellus (cm)	Feathers embedded (mm)
32	11	8	10	5.0	2.0	1.5	2.0
50	15	8	11	6.0	2.0	1.5	2.0
80	33	14	10	4.5	3.0	2.0	3.0
98	33	14	10	5.0	3.5	2.5	3.5
150	42	12	10	3.5	2.5	1.5	4.5

without ocelli showed faster growth from the fourth to eighth week than plumes with ocelli.

Table 4 shows that the size of the after shaft of plumes increased with plume size. Sizes of barbs were not proportional to plume size. Heads of plumes showed no remarkable difference in size with size of plumes, but instead the size decreased beyond a feather length of 50 cm. Brown ocelli are largest (6 cm wide) in smaller-sized plumes, i.e., 50 cm, and they decrease with plume length. Green and blue ocelli are largest (3.5 and 2.5 cm, respectively) in medium-sized (98 cm) plumes, then the sizes decrease with further plume length. Embedment of plumes is directly proportional to plume size.

COLLECTION AND EXPLOITATION OF FEATHERS

Because Peacock plumes have decorative, domestic, religious, and commercial value, they are collected on a large scale. Village boys collect molted plumes found scattered in fields, farms, on roofs of houses, etc. They sell these plumes to a retail buyer who visits the villages periodically. The buyer transports bundles of hundreds of feathers on donkeys and sells them to a wholesale dealer. The dealer sorts plumes according to sizes and prepares bundles of 200 each. Bundles of sorted plumes are sold to a large-scale wholesale dealer who sells them to wholesale buyers in various states of India. A large quantity of plumes is exported.

Plume quality could be increased by providing supplementary cheap grain to local Peafowls; this would increase growth of plumes and, through rapid satiation and a consequent decrease in strife, decrease plume wear. Plumes may be collected regularly at rest sites without damage by exposure to dust, rain, and animals. Since a large number of plumes are usually destroyed by rats and woolen cloth moths, i.e., *Trichophaga*, *Tineola*, and *Tinea* sp., etc., plumes should be stored carefully to avoid pests. They should be sorted carefully so that all sizes can be utilized in the best way possible. Otherwise, a large number (particularly small ones less than 50 cm) are neglected and destroyed. Methods of safe transportation should be initiated so that no damage occurs during transport.

I am grateful to local farmers who gave me facilities to perform observations and collect feathers on their farms. I am also grateful to Y. D. Singh, Superintendent of Jodhpur Zoo, who provided me with facilities in the zoo for observational works. I thank S. D. Mishra, Dean of Science Faculty, University of Jodhpur, for valuable guidance in my work.

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Accepted for publication 13 September 1973.

THE FOOD OF NESTING DOUBLE-CRESTED AND PELAGIC CORMORANTS AT MANDARTE ISLAND, BRITISH COLUMBIA, WITH NOTES ON FEEDING ECOLOGY

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The widespread view that cormorants are a menace to fisheries deserves continuing reappraisal. This is particularly relevant to the Double-crested Cormorant (*Phalacrocorax auritus*) against which control measures have been considered (McLeod and Bondar 1953), and in at least one case actively carried out (Gross 1950). A curious feature of such policies is that they have been considered and carried out in spite of mounting evidence that Double-crested Cormorants, either in marine or fresh-water habitats, seldom take commercially valuable fish (Lewis 1929; Mendall 1936; Scattergood 1950; McLeod and Bondar 1953; Palmer 1962). Although predatory animals are now objects of increased sympathy, the original question of whether cormorants, and fish-eating birds in general, are a threat to fisheries remains worthy of scientific inquiry. Since little is known of the diet of cormorants inhabiting the Pacific Coast of North America, this brief paper partially fills the gap.

During the course of a 3-year study (1969–71) on the brood-rearing capabilities of Double-crested Cormorants and Pelagic Cormorants (*P. pelagicus*), there were frequent opportunities to gather information on food habits. Cormorant chicks which were disturbed during weighing or banding activities frequently regurgitated their stomach contents. These regurgitations were collected and later identified and

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TABLE 1. Prey species of nesting Double-crested and Pelagic Cormorants, based on the regurgitations of their chicks.

Food species	Double-crested Cormorant		Pelagic Cormorant	
	Individual specimens (%)	Weight (%) in g	Individual specimens (%)	Weight (%) in g
Penpoint Gunnel (*Apodichthys flavidus*)	130(23.8%)	2542.6(35.7)	5(4.9)	64.7(11.1)
Crescent Gunnel (*Pholis laeta*)	124(22.8)	1130.5(15.9)	36(34.9)	215.7(37.1)
Shiner Seaperch (*Cymatogaster aggregata*)	85(15.5)	1459.4(20.5)	–	–
Striped Seaperch (*Embiotoca lateralis*)	7(1.3)	248.2(3.5)	–	–
Snake Prickleback (*Lumpenus sagitta*)	63(11.5)	726.8(10.2)	4(3.9)	42.3(7.3)
Pacific Sandlance (*Ammodytes hexapterus*)	112(20.5)	331.1(4.6)	32(31.1)	109.7(18.9)
Staghorn Sculpin (*Leptocottus armatus*)	15(2.7)	419.4(5.9)	3(2.9)	76.8(13.2)
Pacific Herring (*Clupea pallasii*)	7(1.3)	109.9(2.7)	–	–
Shrimp sp.	–	–	20(19.4)	39.7(6.8)
Flathead Clingfish (*Gobiesox maeandricus*)	–	–	3(2.9)	32.8(5.6)
Three-spine Stickleback (*Gasterosteus aculeatus*)	2(0.4)	5.1(0.1)	–	–
Oncorhynchus sp.	1(0.2)	66.4(0.9)	–	–
Anchovy (*Engraulis morax*)	1(0.2)	4.6(0.1)	–	–

analyzed. The species of fish referred to in this paper follow the nomenclature of Clemens and Wilby (1967). The preponderance of food samples from Double-crested Cormorants reflects the greater number of nests of this species under study and the apparent tendency of Double-crested chicks to regurgitate food more readily than Pelagic chicks.

The results indicate that commercially valuable fish comprise only a negligible proportion of the diet of Double-crested and Pelagic Cormorants (table 1). Most of the prey species are characteristic of the littoral-benthic zone (Clemens and Wilby 1967). These include Penpoint and Crescent Gunnels, Snake Prickleback, Staghorn Sculpin, Shrimp sp., and Clingfish. During summer, Shiner Seaperch and Pacific Sandlance frequent shallow water in large schools, and are probably caught while in this zone. This information plus my own observations indicate that both Double-crested and Pelagic Cormorants are bottom feeders along the southern coast of British Columbia. Occasionally, I have observed Double-crested but seldom Pelagic Cormorants attracted to noisy flocks of gulls feeding over deeper water. These instances of opportunism probably explain the small proportion of herring in the diet of this bottom feeder. Missing from this list of prey items are flatfish, which I have observed taken by Double-crested Cormorants at the mouth of the Fraser River.

Although both Double-crested and Pelagic Cormorants show a strong preference for shallow feeding grounds, neither species is a food specialist. Using a coefficient of food specialization proposed by Orians and Horn (1969), which measures the probability that two units of food picked randomly will come from the same prey species, this value is 0.213 for Double-crested and 0.216 for Pelagic Cormorants. The use of weight as a unit rather than individual specimens reflects the belief that the proportion by weight of a prey item is more critical to the nutrition of the predator than the proportion of individual specimens. Table 1 indicates how these values vary for a given prey species. These indices of specialization are presented with some caution. For example, the data in table 1 are clumped samples of prey items caught by many different adult cormorants. Thus, it is possible that individual birds might show greater specialization. During the collection of these data, it was noticed that samples of Snake Prickleback seemed to come from specific nests. Low levels of diet specialization are characteristic of other populations of Double-crested Cormorants (Lewis 1929; Mendall 1936; Scattergood 1950), of Great Cormorants (*P. carbo*) (Steven 1933; van Dobben 1952), and Shags (*P. aristotelis*) (Steven 1933; Lumsden and Haddow 1946).

The diet and apparently similar feeding habits of Double-crested and Pelagic Cormorants indicate that the two species may be competitors. The data on diet alone produce an index of niche overlap of 0.571, based on the method of Orians and Horn (1969) and computed in the same fashion as above. This hypothetical level of competition would be reduced considerably if the feeding habits of the two species were somewhat different, if there were some differences in the sizes of shared prey items taken by the two species, and if the two breeding seasons were not synchronous. I have no data on feeding habitat but observations near the breeding colony indicate Pelagic Cormorants have a preference for rocky bottoms. On the basis of data available (table 1), the average size of shared prey items taken by Double-crested Cormorants is larger in four of the five cases. The size differences

are particularly large in Penpoint and Crescent Gunnels. The peak of the breeding seasons in the two species are separated by about 4 weeks (van Tets in Drent et al. 1964). For these reasons, it is probable that a more extended study of the feeding ecology of these species would indicate a level of competition far lower than that computed above.

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Accepted for publication 14 May 1973.

BIRD RECORDS FROM HONDURAS

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During the period from April 1970 through September 1972, Brown resided at Trujillo, Department of Colón, on the north (Caribbean) coast of Honduras. Records and collections mentioned herein, unless expressly stated otherwise, are his; most of these observations were made at Punta Caxinas, a sandy point on the north side of Trujillo Bay, 15 km NW of Trujillo. All reports affect the status of the species in Honduras, as published by Monroe (Ornithol. Monogr. no. 7, 1968). Specimens obtained are deposited in the Collection of Birds, University of Louisville (UL), Louisville, Kentucky.

Sula dactylatra. Blue-faced Booby. An adult was observed flying over Trujillo Bay on 15 September 1970 and, presumably the same individual, sitting on the beach at Punta Caxinas on 17 September. There is no previous record from Honduras.

Haematopus palliatus. American Oystercatcher. One was noted at Punta Caxinas on 23 May 1970; a group of five was recorded there on 26 July 1972. Only one previous report for the country exists.

Charadrius alexandrinus. Snowy Plover. Formerly considered rare or accidental in Honduras, this species is fairly common in winter at Punta Caxinas, with six observations between 10 November and 21 February.

Charadrius wilsonia. Wilson's Plover. Likewise considered rare, this species is common from Punta Caxinas to the mouth of the Chapagua River, 24 km E of Trujillo, with eight sightings between 4 July and 24 February.

Pluvialis dominica. American Golden Plover. One bird in nonbreeding plumage was observed on 15 April 1971 on the grassy airstrip at Puerto Castilla, 11 km NNW of Trujillo. There are no other Honduran reports.

Numenius americanus. Long-billed Curlew. Considered accidental in Honduras heretofore, this species was recorded on three occasions: single birds at Punta Caxinas on 23 May 1970, and 11 km N of Trujillo on the outer beach on 17 September 1970; and a group of three on the beach between the mouths of the Chapagua and Aguán rivers on 24 February 1972.

Stercorarius parasiticus. Parasitic Jaeger. A jaeger, probably this species, was recorded at Punta Caxinas on 9 April 1971. Two were seen there on 18 June 1971, of which one was collected (UL 3766); it proved to be an immature of undetermined sex.

Larus delawarensis. Ring-billed Gull. Monroe and seven other observers noted an immature along the beach at Tela, 175 km W of Trujillo on 29 December 1971. Brown recorded an adult at Punta Caxinas on 8 February 1972 and an immature at Puerto Castilla from 19 to 29 February. These are the first records of the species from Honduras.

Larus atricilla. Laughing Gull. The first specimen (UL 3765), an immature of undetermined sex, was obtained at Punta Caxinas on 8 February 1972.

Sterna hirundo. Common Tern. Formerly considered rare in Honduras, this species is common at Punta Caxinas, with extreme dates of 8 February and 17 September. The first Honduran specimen (UL 3763), an adult of undetermined sex, was taken on 18 June 1971; it represents *S. h. hirundo.*

Sterna albifrons. Least Tern. A breeding colony consisting of about 50 pairs is located at Punta Caxinas, with extreme dates of occurrence 23 May and 19 September. A lone, intact egg (UL 3767) was collected on 4 July 1972; incubating birds were noted on 26 July, at which time an adult female (UL 3762) and another egg (UL 3768) were taken. The female contained two enlarged ova, 16 and 7 mm in diameter, and has been identified by Dr. George