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California Condors soaring into opaque clouds.—At 1430 on 24 March 1965 I saw an adult California Condor (*Gymnogyps californianus*) soaring south about 100 feet above a north-south ridge line in the Sespe Condor Sanctuary in Ventura County, California. The altitude of the ridge top was about 4000 feet above sea level. When the condor reached my position it began circling for altitude. It then headed northwest, gained altitude, and went out of sight into opaque stratus clouds at an altitude of approximately 5000 feet. Later in the afternoon an equipment operator, William Nun, reported seeing five condors "circle into the clouds" about 2 miles south of where I saw my bird.

Fred Harris (pers. comm.), a sailplane instructor at Tehachapi, California, watched a condor rise within a thermal and enter the base of a cumulus cloud at an altitude of 15,000 feet in 1967. Heintzelman (1974, Auk 91: 849) points out that few observations of this phenomenon are recorded.—JOHN C. BORNEMAN, *2208 Sunridge Drive, Ventura, California 93003.* Accepted 31 Mar. 75.

Feeding segregation in the Arctic and Common Terns in southern Finland.—The competitive exclusion principle suggests that two species cannot exactly overlap in their ecological requirements if they coexist in the same areas (Hardin 1960). One species will be more efficient in using the same limited environmental resources and therefore eventually replace the other.

The Arctic (*Sterna paradisaea*) and Common (*S. hirundo*) Terns breed sympatrically in the Baltic Sea and the aim of this study was to compare the food composition of the tern species in the middle archipelago zone of southwestern Finland (60° 35′ N, 21° 10′ E), where both tern species nest side by side on the same rocky islets.

The Arctic and Common Terns are spatially segregated for their first 2 years of independent life and also later for some months in winter time (Salomonsen 1967, Elliott 1971). The segregation may lead to differences in the ecological requirements of the species prevailing also in their sympatrical breeding areas. For this reason, it is hard to say how important the role of the competitive exclusion is in the breeding ecology of the Arctic and Common Terns and it should be more convenient to ask how much overlap of resource use is tolerated by the species (Cody 1974).

The Baltic differs from oceanic environments in having insignificant tides, low salinity, low productivity, and low number of species (Janson 1972). Climatic conditions are less severe in the Baltic than on oceanic coasts. For these reasons, the Finnish archipelago as a feeding environment greatly differs both from oceanic coasts and inland lakes where most of the studies on breeding ecology of terns have been done.

TABLE 1

NUMBERS AND FREQUENCIES OF VARIOUS TYPES OF FOOD IN PELLETS OF YOUNG ARCTIC AND COMMON TERNS IN SOUTHERN FINLAND, 1968–70

	Arctic Terns (n = 294)				Common Tern (n = 227)			
			Frequency				Frequency	
	No.	%	No.	%	No.	%	No.	%
Gasterosteidae (mainly *G. aculeatus*)	638	63.6	243	81.3	386	54.6	161	70.9
Pisces varii (mainly *Alburnus alburnus* and *Perca fluviatilis*)	55	5.5	46	15.6	224	31.7	151	66.5
Crustacea	63	6.3	54	18.4	7	1.0	7	3.1
Insecta	236	23.6	169	57.7	85	12.0	70	30.8
Mollusca	11	1.1	11	3.7	5	0.7	5	2.2
TOTALS	1003		523		707		394	

Food was analyzed from regurgitated pellets collected at nesting sites in June and July 1968–70. Pellets give an accurate representation of the diet composition in the Finnish archipelago (Lemmetyinen 1973a).

Although the feeding habitats overlapped greatly, the Common Tern preferred shallow eutrophic bays with limited water area and low transparency. In an area where 15 Arctic Tern and 10 Common Tern pairs nested within less than 1 km from the bays under observation, Common Terns made 75 visits and Arctic Terns 10 visits to the bays under observation. A pair of Common Terns under observation also directed most fishing trips (78%, n = 18) to a shallow bay with extensive reed beds.

Arctic Terns fished more commonly on shores with sparse vegetation and higher water transparency. When insect swarms (especially chironomids and *Hymenotera*-species) were abundant, Arctic Terns were also seen to catch them above small eutrophic lakes and bays but they seldom fished there.

The three-spined stickleback (*Gasterosteus aculeatus*) was the most important food species for both tern species (Table 1). This fish occurs abundantly in shore waters from May to middle July and especially Arctic Terns seemed to be dependent on it (Lemmetyinen 1973b). On the other hand, Common Terns consumed significantly more fish of other species, especially cyprinids (Table 1) than Arctic Terns ($P < 0.001$).

Although the overlap in prey size was great in the tern species, the food of young Common Terns comprised fish with a larger size distribution than that of Arctic Terns and about 20% of the food of Common Terns consisted of longer items than those eaten by Arctic Terns (Fig. 1). This agrees with the results presented by Ashmole (1968) that birds of similar feeding habits show a correlation of average prey size with bird body and bill sizes (Hespenheide 1971, Lack 1971, MacArthur 1972, Cody 1974). The average weight of the Common Tern is about 120 g and that of the Arctic Tern 105 g (von Haartman et al. 1967–72). The bill length varies 34–41 mm in the Common Tern and 30–34 mm in the Arctic Tern (Kivirikko 1948).

The fish fauna available to terns in shore waters was investigated by hauling a bag seine from offshore onshore about 60 m (Lagler 1970). The length of each

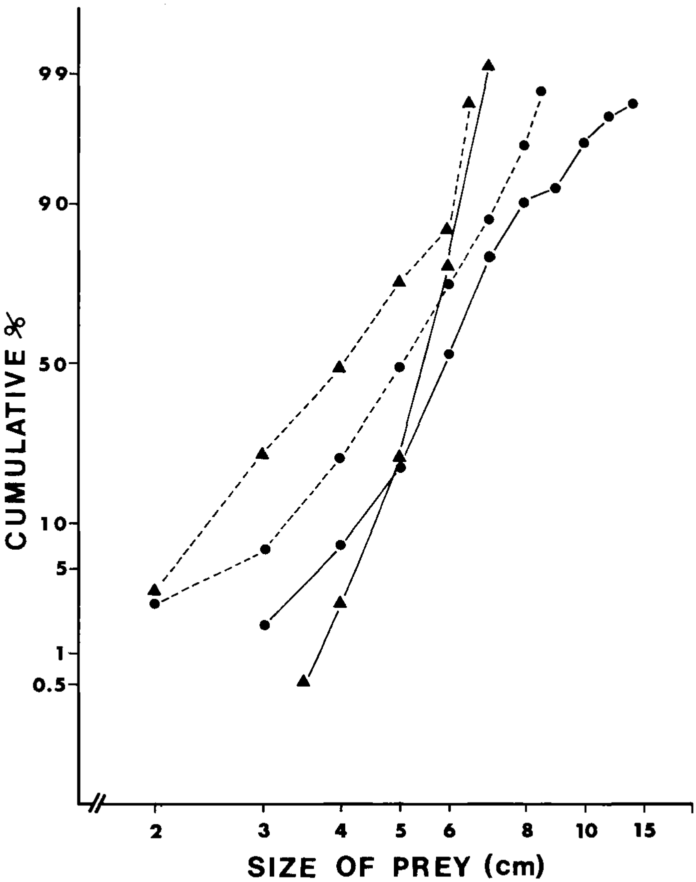

Fig. 1. Size frequency distributions of prey fish (*Gasterosteus aculeatus* and Cyprinidae spp.) taken by the Arctic (triangles) and Common Terns (circles). Broken lines = food eaten by chicks < 6 days old (▲, n = 86, ●, n = 73) and solid lines = food eaten by chicks ⩾ 6 days old (▲, n = 375, ●, n = 164). Data are plotted on logarithmic probability paper, so that a straight line corresponds to lognormal distribution. Fish sizes are calculated on the basis of ventral spines of sticklebacks and pharyngeal bones of cyprinids. Materials are based on the data presented by Lemmetyinen (1973a, Tables 11 and 12).

wing of the seine was 16 m and the height 1.0–1.7 m. Mesh sizes were 5–10 mm in the wings and 2 mm in the back end.

The difference in fish diet between the tern species may partly reflect the fish present in their different feeding habitats (Table 2). The bleak (*Alburnus alburnus*) and the perch (*Perca fluviatilis*) were the most abundant prey fish in eutrophic bays, but the three-spined stickleback and the minnow (*Phoxinus aphya*) dominated on stony shores. The average weights of the fish caught by seine from littoral

TABLE 2
NUMBERS AND FREQUENCIES (F) OF VARIOUS FISH SPECIES IN SOUTHERN FINLAND IN JUNE 1970[1]

	Stony shores (n = 22)		Eutrophic bays (n = 8)	
	No. of fish	F	No. of fish	F
Clupea h. membras	17	1	–	–
Esox lucius	1	1	–	–
Phoxinus aphya	982	9	–	–
Rutilus rutilus	14	1	12	1
Scardinus erythrophthalmus	–	–	26	1
Alburnus alburnus	239	2	1098	8
Gasterosteus aculeatus	2248	22	49	5
Pungitius pungitius	125	13	–	–
Perca fluviatilis	2	2	377	2
Pomatoschistus minutus	39	3	–	–

[1] The samples were collected with a haul-ashore seine.

zone were as follows: bleak 5.3 g (n = 90), perch 3.0 g (n = 90), three-spined stickleback 1.3 g (n = 90), and minnow 1.1 g (n = 23).

In addition, the food of Arctic Terns included about six times as many crustaceans (*Gammarus*, *Idotea*) and about two times as many insects as that of Common Terns. This agrees with the results presented by Boecker (1967) and Hopkins and Wiley (1972) on oceanic coasts. Boecker observed that in the years when fish are scarce in the North Sea the Arctic Tern is able to utilize crustaceans more effectively than the Common Tern.

What are the factors causing the Common Tern to prefer fishing in eutrophic bays? When terns are feeding chicks the time spent in fishing activities can be divided mainly into two phases: the travel time, spent in flying between the young and suitable foraging places, and the hunting time, including search and pursuit spent in catching fish specimens (cf. Orians 1971). Because the Common Tern with greater body weight catches larger food items than the Arctic Tern it may derive advantage by fishing in shallow eutrophic bays where larger fish are more plentiful. This decreases hunt time without significant increase in travel time. In general, eutrophic bays are found about 1–2 km apart in the middle zone of the archipelago.

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Fishing behavior of Common Grackles.—On at least 223 occasions from 16 May to 6 June 1974 and 28 March to 23 June 1975 I watched Common Grackles (*Quiscalus quiscula*) fishing at the campus pond, University of Massachusetts, Amherst. Great-tailed Grackles (*Cassidix mexicanus*) (Skutch 1954) and Common Grackles (many authors) have been reported fishing previously, but little information is available on the method by which live fish are captured in flight (Beeton and Wells 1957) or from the shore (Pellet 1926, Snyder 1928, Darden 1974).

I watched the grackles around the pond between 0800 and 1600. They landed frequently on a high point of land, a reed, a rock, a tree limb (Bent 1958) overlooking the pond, or on a piece of floating wood (Follett 1957) and then flew to fish either at the water's edge or over the pond.

The grackles spent no more than a few minutes at any one spot along the shore. They were attracted to water disturbances that I think were made by fish swimming near the surface, although movements of crayfish, toads, frogs, tadpoles, or insects (Hamilton 1951, Bent 1958) cannot be excluded. At times the grackles waded into the water with their tails elevated (see also Forbush 1929) and plunged their heads under the surface for food. Although Common Grackles have been reported to catch up to three fish in succession before flying away (Snyder 1928,