Fall 1992

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NORTHWESTERN NATURALIST 73:57–58 AUTUMN 1992

LARIDS, SCOLOPACIDS, AND PASSERINES EXPLOITING EPHEMERAL PREY AT TALAN ISLAND, RUSSIA

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We report an unusual multispecies foraging assemblage that included larids, shorebirds and passerines which exploited a highly concentrated and ephemeral prey source over a period of three days in July and August 1988. During studies of breeding biology, food-habits and host-parasite ecology among a diverse colonial avifauna at Talan Island in the northern Sea of Okhotsk (59°18′N; 149°02′E) we observed the formation of mixed-species flocks during extreme high tides of 31 July, 1 August, and 13 August 1988.

The first assemblage involved a maximum of 60 birds, including about 45 black-legged kittiwakes (*Rissa tridactyla*) and 15 slaty-backed gulls (*Larus schistisaugus*). Feeding activity was intense within 1–3 m of the shore. All birds swam slowly while vigorously dipping and picking minuscule prey items from the surface of the water. The duration of foraging by this flock was not determined. As birds dispersed, we were able to collect numerous pupae and late instar larvae (3–7.3 mm in length) of small dipterans that were washed from the shoreline during the high tide.

Detailed observations were made on flocks that assembled in early August. In the first flock, feeding activity extended over 140 min in the late morning to early afternoon of 1 August. This flock was initially composed of adult *R. tridactyla* feeding along 30 m of cobble beach at a distance of <1 m from shore. As before, there was a gentle surge that washed pupae and larvae from the cobble beach. Whitish larvae and black pupae were visible up to 10–15 m from shore. Within 30 min of initial feeding activity there were 19 adult *R. tridactyla*, and 12 adult and 3 first year *L. schistisaugus*. At 75 min there were 52 *R. tridactyla* and 21 *L. schistisaugus* vigorously picking larvae and pupae from surface film. Other species of marine birds were not observed. Agonistic interactions between kittiwakes and gulls were not observed. During the peak of foraging activity, feeding intensity by individual birds ranged from 17–31 dips per 30 sec interval ($N = 5$; $\bar{x} = 25$). At about 135 min the flock began to disperse, and gulls departed prior to the kittiwakes.

The final assemblage lasted for 90 min and was similar to those previously described, being composed of 71 adult *R. tridactyla*, and 12 adult and a young of the year *L. schistisaugus*. However, we also observed 3 ruddy turnstones (*Arenaria interpres*), 10 wood sandpipers (*Tringa glareola*), 4 common sandpipers (*Actitis hypoleucos*) and several white wagtails (*Motacilla alba*) simultaneously feeding among the cobbles in the splash zone adjacent to the larids. All species were feeding on dipteran larvae and pupae. Although all birds were in close proximity, we observed no agonistic interactions.

During the course of our observations, it became apparent that the pupae and larvae of a fly were concentrated under a carcass of an adult largha seal (*Phoca largha*) that had washed onshore during a storm on 19 July 1988. Thousands of larvae and pupae formed a dense mat associated with the carcass and these became available to the birds during subsequent high tides when the insects were washed from the cobble beach. Pupae were collected, allowed to hatch and later the adult flies were preserved in 70% ethanol. Adults were subsequently identified as the kelp flies *Coelopa* (*Fucomyia*) *nebularum* and *C.* (*Fucomyia*) *stegnegeri* of the family Coelopidae (see Vockeroth 1987).

This apparently constitutes the first report of *R. tridactyla* and *L. schistisaugus* feeding on dipteran larvae associated with carrion, although the former has been reported to forage on carcasses of marine mammals (see Cramp and Simmons 1983). Kittiwakes typically forage in offshore, pelagic environments where they exploit fish or crustaceans (Ainley and Sanger 1978; Hunt et al. 1983; and others). Insects have rarely been reported in the diets of kittiwakes. Belopol'skii (1957) found unidentified insects of terrestrial origin in food samples collected from kittiwakes in the Barents Sea. Swartz (1966) recorded lepidopterans, unidentified larvae, and ectoparasites (acquired during preening) from birds at Cape Thompson, Alaska. Similarly, insects were rarely reported in the diets of *L. schistisaugus* at Talan Island where most were larval and adult muscid flies, associated with nesting areas, rather than coelopids (L. Kondratieva, pers. comm.).

Exploitation of this focal prey source represents highly opportunistic behavior by these marine larids. That the source was ephemeral is suggested by the short duration of the foraging activity that coincided with periods of high tides and ceased following depletion of the focus of dipteran larvae. The importance of this feeding association was minimal for the colony at Talan because the

number of kittiwakes observed during each of three events represents far less than 1% of the adult breeding population on the island.

Kelp flies are usually associated with decomposing kelp along seacoasts throughout the Holarctic (Vockeroth 1987) and are likely to be abundant in the shoreline habitats. Shorebirds and some passerines are often found foraging in these situations. Scolopacids and wagtails associated with the assemblage are likely to prey on these dipterans even when larvae are not highly concentrated (see Cramp and Simmons 1983). However, it would appear that only very dense aggregations of larvae and pupae would attract substantial numbers of marine birds. In these circumstances it is possible that *R. tridactyla* initially located the prey and that *L. schistisaugus* responded to the apparent feeding activity. This is indicated as kittiwakes were the first birds observed feeding near shore and thus appear to have been the nucleus for the two flocks of larids observed in August. Additionally, although the greatest concentration of larvae and pupae occurred among the cobbles of the beach, foraging by larids (only in the water) and scolopacids and wagtails (only on the beach) was apparently segregated.

Acknowledgments.—We thank Wayne N. Mathis of the National Museum of Natural History for identification of the coelopid flies. We acknowledge Luba Kondratieva, Alexi Pinchuk, Lena Golubova and Olga Kalashchnikova for assistance in the field. Field studies (by EPH) at Talan Island were conducted under the Interacademy Exchange Program of the National Academy of Sciences. Logistic support in the Soviet Union was provided by the Institute of Biological Problems of the North, Far Eastern Scientific Center, Academy of Sciences of the USSR (now the Russian Academy of Sciences), Magadan, USSR. This manuscript was improved by comments kindly provided by Doug Siegel-Causey, John Piatt, and Daniel Varoujean.

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Corresponding editor: C. J. Ralph.