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## NOTES

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**COMMENSAL FORAGING AND A "BEATER EFFECT"  
INVOLVING RUDDY TURNSTONES, SANDERLINGS,  
LEAST SANDPIPERS, AND SHORT-BILLED DOWITCHERS**

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Mixed species flocks of wintering shorebirds are common on Florida beaches where they may habituate to humans and tolerate close approach (Burger and Gochfeld 1991). Some species e.g., Short-billed Dowitchers (*Limnodromus griseus*) tend to group more often in single-species flocks and forage tactilely by probing the substrate (Mallory and Schneider 1979), while others e.g., Sanderlings (*Calidris alba*) forage either visually or tactilely and may defend territories or join single-species or mixed-species flocks (Myers et al. 1979a, Pitelka et al. 1980, MacWhirter et al. 2002). Ruddy Turnstones (*Arenaria interpres*) in winter have a diverse diet, are opportunistic feeders and scavengers, and turn over objects, including wrack vegetation while visually searching for invertebrates (Nettleship 2000). Sanderlings occasionally feed in association with Black Turnstones (*Arenaria melanocephala*) in winter on California beaches, foraging on substrate exposed by turnstones (Meyers et al. 1979b). A similar "beater" effect was observed on Monomoy Island, Massachusetts, in which Ruddy Turnstones dug shallow pits and Sanderlings foraged in the pits with the turnstones and after the turnstones had left (B. Harrington, pers. comm.). I report here on observations of commensal foraging among Sanderlings, Ruddy Turnstones, Short-billed Dowitchers, and Least Sandpipers (*Calidris minutilla*) in beach wrack vegetation, in which Sanderlings frequently used Ruddy Turnstones as "beaters," attacking prey exposed by turnstones tossing wrack.

At about high tide on 9 February 2003, at Bahia Honda State Park, Bahia Honda Key in south Florida, I watched for about 90 minutes a flock of mostly Sanderlings and Ruddy Turnstones, with lesser numbers of Least Sandpipers, foraging on the beach wrack near high tide. Their dispersion was very clumped with about 150 birds within about a 20 m section of beach. The Sanderlings frequently foraged in clusters around one or more Ruddy Turnstones; they seemed to take advantage of the typical turnstone behavior of flipping chunks of the beach wrack vegetation with the bill, thus exposing numbers of amphipods that hopped about. These were actively pursued by the Sanderlings as well as the turnstones. In one group I counted six turnstones and 28 Sanderlings, all within a 1 m section of beach wrack. The rate of foraging could best be described as frantic—a feeding frenzy with birds shuffling amongst each other making repeated stabs at hopping amphipods. Clumps of birds formed, dispersed, and reformed around the nucleus of turnstones. Least Sandpipers did not participate in the clumping, but foraged independently, remaining fairly well spread out, mostly at the periphery of the flock.

The following day at Curry Hammock State Park near Marathon, Florida, I watched another flock of Sanderlings and turnstones foraging. There the turnstones were not tossing beach wrack, but simply walking along the wrack striking at amphipods that were on the surface. The clumping of turnstones and Sanderlings was noticeably absent and both species appeared to be visually foraging independent of one another. Through my binoculars I could see thousands of beach fleas hopping about on the wrack. These observations are consistent with the hypothesis that prey was superabundant and available without the wrack-tossing by the turnstones.

I returned to Bahia Honda State Park on 14 February to try to photograph the foraging shorebirds, and at about 0915 I located a flock of about 300 Sanderlings, 75 Ruddy Turnstones, 60 Least Sandpipers, and 35 Short-billed Dowitchers actively foraging on beach wrack shortly after high tide, all within about 100 m of beach (Fig. 1). A few birds foraged at the water's edge or loafed, but more than 90% were actively foraging on the beach wrack. It was again a dynamic, moving feast. As on my previous visit to Bahia Honda, the turnstones were the nuclear species, tossing beach wrack and drawing in Sanderlings to the hopping fleas they uncovered. The dowitchers foraged with the Sanderlings and turnstones but were independent of the clumping effect as they foraged by probing rather than by visual means. The Least Sandpipers were again concentrated on the periphery of the flock, perhaps in response to exclusion by the larger species. There was some aggressive behavior by the turnstones and Sanderlings, with Sanderlings occasionally attacking other Sanderlings, and turnstones usually attacking Sanderlings. The attacks were mostly short chases and I was surprised at how little aggression occurred considering the proximity of the birds to one another and the shuffling about and general high rate of activity. However, territorial behavior and corresponding aggression vary inversely with prey density (Myers et al. 1979a), and prey were super-abundant in the wrack vegetation. When I picked up handfuls of wrack vegetation I exposed dozens of amphipods. When a turnstone tossed a batch of wrack, a flurry of activity occurred. Sometimes three or four Sanderlings would cluster around the head of a turnstone—almost bill to bill. Because exposed amphipods hopped in all directions and the Sanderlings chased them, the clumps of Sanderlings and turnstones were ephemeral, forming around one or more turnstones until a turnstone tossed a batch of wrack, and then dissipated as the assembled birds chased amphipods and reformed around one or more other turnstones.



**Figure 1.** Sanderlings attending Ruddy Turnstones in a commensal feeding association in which the Sanderlings take advantage of the Ruddy Turnstones' behavior of turning shells and bits of debris to reveal prey.

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