

Short communications

Flight behaviour of Western Sandpipers *Calidris mauri* in a hailstorm

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The adverse effects of severe weather conditions on birds have long been recognized. Severe hailstorms, for example, have caused mortality of adults (Felger 1903, Hamilton 1937, Mitchell 1896, Roth 1976) and possibly nest failures (Gilmer & Stewart 1984, Hanford 1913, Morton & Pereyra 1985). Impacts of hailstorms on shorebirds have included egg loss (Graul 1975, Mabee 1997) and mortality of adults (Mawby 1984). Flight or other behaviour of birds during hail storms is not well documented. In this paper I describe the flight behaviour of Western Sandpipers *Calidris mauri* during a hailstorm in coastal Washington.

On the afternoon of 29 April 2009 I was travelling by airboat on mudflats about 1 km south of the mouth of North River in Willapa Bay, Washington. I was on the bay to investigate Red Knot *Calidris canutus* migration. The sky had been partly cloudy for the previous hour or more but a bank of dark clouds then moved in from the east. At 1551 h we were within 100–150 m of the eastern shore when hail began to fall. I was able to continue observing shorebirds with my spotting scope for a moment until the hail storm intensified and significantly impaired visibility (i.e., due to the amount of hail falling, and the splashing caused by hail hitting water and mudflats). While waiting for the storm to pass we noticed a small flock of Western Sandpipers flying east toward shore. In the next 10 minutes we saw singles and flocks of Western Sandpipers ranging in size from several to >75 birds as they flew eastward, passing within 30 or 40 m of the boat; at least 200 birds were involved in these flights.

As the birds flew by I noted several interesting aspects of their behaviour. First, all birds were flying eastward toward shore. We were far enough from shore that with the amount of hail falling (and given that use of optics was not practical) it was not possible to determine the birds' destination. However, I suspect they flew to the edge of or into the low saltmarsh and perhaps were able to take cover there. Second, the formation of all flocks – regardless of their size – had a pronounced vertical structure, with leading birds above and trailing birds below. Third, the flight of all birds was very slow, some of them flying so slowly that they barely made progress. Fourth, all birds flew with their heads and bills held upward and rumps held downward (e.g. body position was part-way between that of normal flight and a position assumed

by other species while hovering).

About 10 or 12 minutes after the hailstorm began a lightning strike at close range drove us to leave the mudflats. By that time 2 cm of hail (the hailstones were 6–8 mm across) had accumulated on horizontal surfaces in the boat, and hail continued to fall as we departed. While heading to the boat launch we passed flocks of Dunlins *C. alpina*, Red Knots and Short-billed Dowitchers *Limnodromus griseus* that continued to forage on the mudflats, but we saw no Western Sandpipers.

I believe many of the flight behaviours were related. Specifically, the birds' body axis in flight served to minimize the surface area that was exposed to the hail, which was falling at an angle from the east. Such a posture was observed in all members of a Northern Pintail *Anas acuta* flock on the ground during a hailstorm, leading Leopold (1919) to surmise that the head-up posture reduced the surface area of the bill and head that would be impacted by falling hail. Given this body position it is not surprising that horizontal flight speed would be slow or that birds would follow below and behind one another in flight rather than in a line (e.g. trailing birds would be looking upward at the bird directly ahead).

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