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Corticosterone and Alternate Behavioral Patterns in Response to Unpredictable Events

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Recent evidence suggests that birds trigger alternate behavioral patterns in response to unpredictable environmental events such as severe storms. Simple models predict that when the metabolic costs of finding and processing food under severe environmental conditions exceed the energy to be gained from the available food, then the individual should pursue alternate behavioral patterns that maximise survival prospects during the environmental perturbation. These alternate patterns may involve finding a refuge and sheltering until the perturbation passes, leaving the area and seeking alternate habitat (e. g. irruptive type migration), or a combination of these two patterns — seek a refuge first and wait and see what happens, then leave if conditions do not approve. All these alternate patterns require that the individual retain sufficient fat reserves to either shelter from the storm, or to fuel a flight of tens to hundreds of kilometers. Laboratory experiments indicate that increases in secretion of corticosterone during negative energy balance activate increased activity and escape-like behavior in captive populations of Whitecrowned Sparrows, *Zonotrichia leucophrys gambelii* (1). This activity is consistent with irruptive type migration. Field studies confirm that elevated levels of corticosterone during inclement weather correlate with abandonment of nest sites in several species of sparrow (1), movements away from winter ranges (2, 3), and alter foraging patterns in seabirds (4). The steroid hormone corticosterone may play a major role in orchestrating alternate behavioral patterns to a variety of potentially "stressful" stimuli, especially those which involve some form of dispersal.

Literature: 1. Astheimer, L. B. et al. (1992): Ornis Scand. 23: 355—365. 2. Schwabl, H., Wingfield, J. C. & Farner, D. S. (1985): Z. Tierpsychol. 68: 244—252. 3. Evans, C., Ramenofsky, M. & Wingfield, J. C. (1993): Auk. 4. Smith, G. T., Wingfield, J. C. & Veit, R. (1994): Physiol. Zool. (in press).