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SEASONAL, AGE, AND SEX DIFFERENCES IN WEIGHT, FAT RESERVES, AND PLASMA CORTICOSTERONE IN WESTERN SANDPIPERS

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Abstract. Western Sandpipers (*Calidris mauri*) were followed throughout their annual cycle along the Pacific Coast of North America. Changes in body condition and corticosterone were tracked at two overwintering sites (Ensenada, Mexico, and San Diego, California), four migration stopover sites (Bodega Bay, California, Grays Harbor and False Bay, Washington, and Hartney Bay, Alaska), and a breeding site (Nome, Alaska). Adult males and females had elevated weight and fat scores during spring migration, breeding, and autumn migration relative to lean levels during winter. Although elevated mass and fat reserves may hinder escape from predators and are not necessary at wintering sites with benign conditions, the cost-benefit trade-offs with weight and agility shift during migration and breeding. Extra fat and muscle are necessary for fueling the long flight to and from the breeding grounds and serve as a hedge against unpredictable food and weather conditions on the breeding grounds. First-year birds weighed less and had lower fat reserves at smaller stopover sites than migrants at a large stopover site. Plasma levels of corticosterone revealed seasonal differences in the adrenocortical response to stress, although initial levels were fairly consistent across seasons. The highest stress response of the annual cycle in males was during autumn migration, in contrast to the lowest levels during early spring migration, breeding, and overwintering. Late-spring migrants and autumn premigrants had intermediate stress responses. An emerging pattern from this and other shorebird studies is that migrants with imminent flights of more than 1000 km have elevated corticosterone levels.

Key words: breeding, *Calidris mauri*, corticosterone, fat, migration, stress, Western Sandpiper.