

FEATURE ARTICLES

**DIFFERENTIAL USE OF THERMAL CONVECTION BY SOARING BIRDS
OVER CENTRAL ISRAEL**

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Abstract. Maximum altitudes of soaring migration for White Pelicans (*Pelecanus onocrotalus*), White Storks (*Ciconia ciconia*), Lesser Spotted Eagles (*Aquila pomarina*), and Honey Buzzards (*Pernis apivorus*) were measured in central west Israel and compared to the upper boundary of thermal convection and thermal intensity as predicted by the convection model ALPTHERM. The model predictions of upper boundary of convection explained at least 20% of the variance in maximum altitudes of migration for each species studied. Each species used thermal convection differently. White Pelicans, with the largest wing loading, used 54% of the thermal boundary layer, as calculated by dividing the maximum flight altitude by the modeled thermal depth. White Storks and Lesser Spotted Eagles used 69% and 65%, respectively; Honey Buzzards, with the lowest wing loading, used 95% of the thermal boundary layer. Mean lift rate of convection had a stronger effect on maximum altitudes of flight or the proportion of the thermal boundary layer used by Lesser Spotted Eagles and Honey Buzzards, than it did on storks and pelicans. Honey Buzzards, which combine flapping with soaring flight, were not confined to the thermal boundary layer. Changes in migration altitudes within a species and differential use of thermal convection between species were related to a combination of upper boundary of thermal convection, average lift rate, migratory behavior, wing loading, topography, and additional local meteorological conditions.

Key words: Israel, migration, soaring birds, thermal convection.