Brief IBS trend analysis methods as of January 13, 2016

Trend analyses were performed for 46 different species captured at Inglewood. The following describes the analyses that were performed for each species.

95%-migration windows were determined for each season (spring/fall) based on all new capture records for the respective species. A 95%-migration window describes the period in a specific season within which 95% of all individuals of a species were caught historically. Trend analyses were restricted to these windows to focus on the data rich periods. This technique reduces the amount of days with zero captures and avoids disproportional impact of unusually early or late captures on the analyses.

Daily captures were first standardized with respect to daily net hours to account for variation in net opening times. Net hour totals only included focal nets, which were defined as nets with at least one historic capture. After standardization the captures were normalized to represent the expected number of captures for each day under the condition that all focal nets were open for exactly six hours. For days where all focal nets remained closed, no capture data was provided to the subsequent model to reduce the amount of false negatives.

Normalized captures from all years were used in a single hierarchical model that modelled the daily captures as a function of year, day, and day^2. The model was implemented in R using the library for Integrated Nested Laplace Approximation (INLA). The observation error distribution was specified as ‘negative binomial’ and auto-regressive process error terms were included for day and year. To obtain mean estimates for the trend associated with year as well as for the average daily abundance within a season (annual abundance index), the posterior probability distributions produced by the model were sampled 10000 times. Confidence limits and significance levels for each estimate were calculated based on the distribution of samples. Because the model provides linear trend estimates for the logarithm of captures, percent population changes per year were obtained through back-transformation.