Appendix A from J. S. Sedinger et al., “Carryover Effects Associated with Winter Location Affect Fitness, Social Status, and Population Dynamics in a Long-Distance Migrant”


Methods for Assigning Individual Brant to Wintering Locations in Baja California

Because brant may stop at numerous sites while traveling to and from terminal wintering areas during fall and spring migration (Reed et al. 1998; Lindberg et al. 2007), we defined winter residency periods as sedentary periods between fall and spring migratory shifts, specific to each wintering area. To define winter residency, we used a subset of all resight data that included only birds resighted at more than one wintering site during a winter and assumed that movements of these individuals among winter locations represented the timing of migration or winter residency of the entire study population. We assumed that the greatest number of unique resights (individuals observed only once) in a particular winter location occurred during migration events and, conversely, that the lowest number of unique resights occurred when brant were sedentary, that is, when brant had reached their terminal winter locations. Our rationale was that individual brant that were “resident” at a winter location were more likely to be resighted multiple times at their wintering location than were transients. While the number of unique encounters varied substantially with date, unique encounters occurred continuously throughout each winter at each location. We were unable to provide equal resighting effort across sampling dates or sampling locations. We thus used the proportion of unique resights to total resights to indicate periods of movement among areas and, conversely, stationarity of brant within wintering locations. We used a threshold of 10% unique resights over 10-day periods to define either migration periods (more than 10% of total resights were unique) or winter residency periods (up to 10% of total resights were unique). We used the earliest calendar dates for consecutive 10-day blocks with less than 10% unique resights to define the start of the wintering period and the latest calendar date for the same consecutive 10-day blocks to define the end of the wintering period in each location. On the basis of these criteria, we defined wintering periods as follows: December 8–February 5 for Bahía San Quintín and January 7–February 16 for Laguna Ojo de Liebre and Laguna San Ignacio. Individuals observed during the defined periods were assigned to the appropriate wintering location. Individuals that were observed during winter but only outside of the defined time periods were assigned to the state “unknown wintering area.”

Literature Cited Only in the Appendixes