



Age-specific survival, breeding success, and recruitment in Common Murres of the California Current System

Development of effective conservation and management measures for at-risk species is facilitated by understanding age-specific demography and the relative influence of various factors on population growth rates. Seabird species are of particular conservation concern because of their vulnerability to a variety of human activities such as direct (bycatch) and indirect (prey depletion) effects of fisheries, disturbance at nesting colonies, global climate change, oil spills, and other factors.

Common Murres feed primarily on small crustaceans, market squid, and a wide range of pelagic schooling fish including anchovy and juvenile rockfish. The Common Murre population on the Farallon Islands suffered historical declines due to egg collecting, gillnet bycatch, oil spills and human disturbance and they continue to be severely affected by interactions with humans. Murres are often the most numerous species affected by oil spills and consume a significant proportion of the forage biomass in the California Current System, placing them in direct competition with human commercial fisheries. Coupled with historic population declines, these interactions make this a species of conservation concern and one that warrants detailed estimates of demographic traits for population dynamics modeling.

In a paper published in *The Auk*, we estimated age-specific demographic traits of Common Murres (*Uria aalge*) in the eastern North Pacific Ocean. We studied 375 individually-marked murres at Southeast Farallon Island, California from 1986 to 2004. We used multi-state capture-recapture statistics to estimate age-specific survival, recruitment, breeding propensity, and breeding success of Common Murres. We also created a

population model and determined which parameters have the greatest influence on population growth. Variation in adult survival had the greatest influence on population growth rate, but juvenile survival was also important. Increased juvenile survival since 1999, a period of cooler and more productive oceanic conditions, is probably largely responsible for the population growth observed during this period.

Main Points

- Effective conservation and management of at-risk species requires understanding their demography.
- Increased juvenile survival since 1999, a period of cooler and more productive oceanic conditions, is probably largely responsible for observed recent population growth.
- The age-specific parameter estimates presented here provide the basis for future population modeling efforts, including damage estimates from oil spills.

Paper Citation

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