

## Killer whale predation as the cause of death in gray whales, Alaska case review

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A marked increase in gray whale (*Eschrichtius robustus*) mortalities along the west coast of North America led to the declaration as an Unusual Mortality Event (UME) in 2019, which has persisted into 2022. A goal of the UME process includes the evaluation of potential causes of mortality. In 2021, an investigative team formulated criteria in a Case Definition format for the evaluation of killer whale predation as a cause of death in gray whales. Information was first collected on killer whale hunting tactics and associated gross lesions observed on gray whale carcasses, which include missing tongue and/or jaw, peeled skin with blubber, semilunar bite wounds/tissue defects, broken bones/contusions and rake marks. Each of these five lesions was evaluated relative to mortality (is the lesion likely to result in death?), observability (is the lesion externally visible?), and specificity (is the lesion specific to killer whale predation and, if not, what are the differentials?). Based on these characteristics, lesions were then categorized as either primary or secondary/ancillary and, either singly or collectively, assigned one of four levels of certainty relative to the likelihood of resulting in mortality, including probable, suspected, improbable, and could not be determined. Findings were then organized into a draft Case Definition. Four biologists independently reviewed all Alaska gray whale stranding reports with photos using the draft Case Definition from the UME time period (2019-2021, n=114) and pre-UME time period (2016–2018, n=52), discussed findings, and modified the Case Definition accordingly. An additional category (non-consensus) was added to account for cases where a consensus among reviewers was not reached. The proportion of gray whales categorized as “probable” for killer whale predation as the cause of death did not increase in Alaska gray whales during the current UME (14.9%) compared to pre UME period (15.4%).