



Counting Steller Sea Lions in Glacier Bay

Steller sea lions (*Eumetopias jubatus*) are a highly social pinniped species and large aggregations of sea lions occur ashore and in the water in Glacier Bay National Park and Preserve. Since the 1970s, the numbers of Steller sea lions have increased in the Glacier Bay region, with the most rapid growth occurring at South Marble Island, which was colonized by sea lions in 1985 (Mathews et al. 2011). Glacier Bay represents a dynamic “mixing zone” with sea lions from two genetically distinct population segments, eastern and western (west of 144°W), occurring there (Jemison et al. 2013). The western population segment is listed as endangered under the Endangered Species Act, whereas the eastern segment was delisted in 2013 (National Marine Fisheries Service 2013).

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Steller sea lions resting ashore in Glacier Bay National Park.

Steller sea lions use two distinct types of terrestrial sites: haulouts and rookeries. *Haulouts* are sites used by sea lions throughout the year, whereas *rookeries* are sites, typically offshore rocks, where females give birth (in June), nurse their pups, and where males hold territories. Sea lions forage on a wide diversity of prey species and take advantage of seasonal aggregations of prey. As prey shift locations seasonally, sea lions move with them to haulout sites nearby (Womble et al. 2008).

Methods

Steller sea lions are monitored in Glacier Bay using aerial photographic surveys at South Marble Island, the largest haulout site in Glacier Bay. In addition, sea lions are also monitored at Graves Rocks, a rookery located along the outer coast and at Tarr Inlet and Point Carolus, which are occupied seasonally (Figure 1). Graves Rocks is one of the newest rookeries in southeastern Alaska and transitioned from a haulout in the late 1990s.

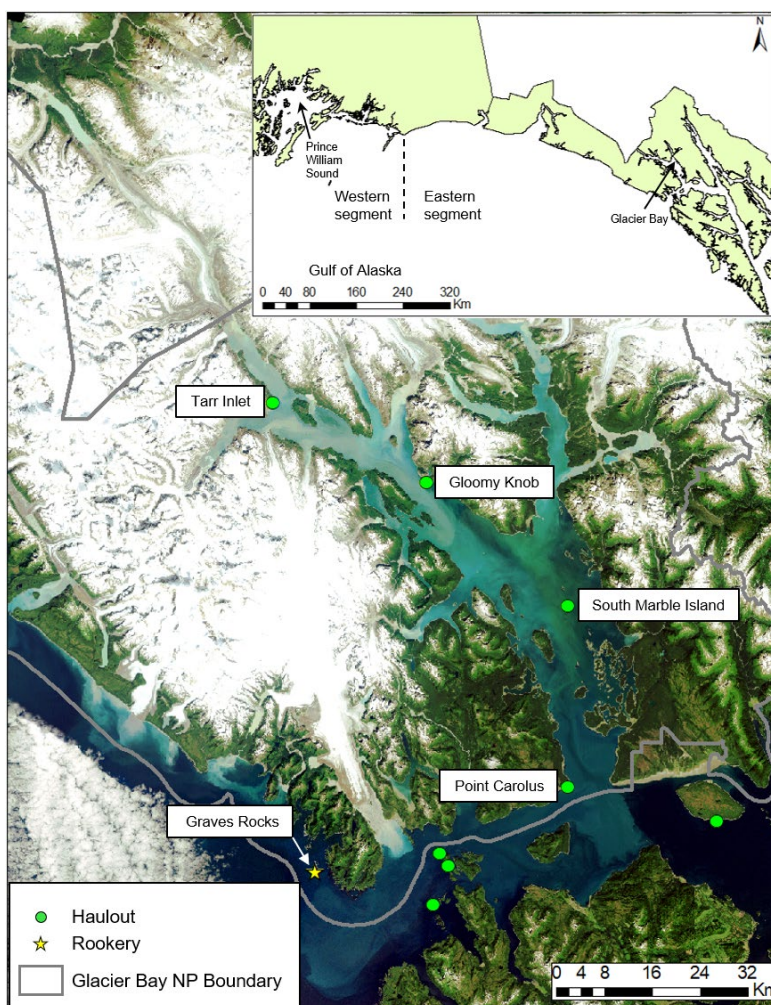


Figure 1. Steller sea lion haulout and rookery locations in Glacier Bay National Park and Preserve and surrounding area. Inset shows the division between the western and eastern population segments, divided by the 144°W parallel (dashed line).

A recent study combined counts of sea lions from aerial photographic surveys with opportunistic sightings of sea lions in the water from a small vessel (Gabriele and Lewis 2012, Keller et al. 2016) between 2001 and 2017. The model estimated the abundance of Steller sea lions at South Marble Island and then characterized the spatial distribution of sea lions in the water in Glacier Bay (Whitlock et al. 2020).

Results

Steller sea lion abundance increased in Glacier Bay over the survey period from 2001 to 2017 (Figure 2; Whitlock et al. 2020).

However, more recently in 2016 and 2017 there were decreases in the abundance of sea lions, which coincided with unusually warm ocean temperatures that persisted in the eastern Gulf of Alaska from 2014 to 2016. The probability of occurrence of sea lions in the water was greatest around South Marble Island

and near Point Carolus at the mouth of Glacier Bay. Point Carolus is primarily occupied by Steller sea lions during late summer and fall and is a highly productive foraging area due to seasonal aggregations of prey and the presence of a shallow glacial sill at the mouth of Glacier Bay that promotes localized upwelling and increased productivity. Glacier Bay represents a productive foraging region for Steller sea lions with high concentrations of forage fish and other seasonally available species such as salmon, thus creating favorable conditions for Steller sea lions from both the eastern and western population segments.

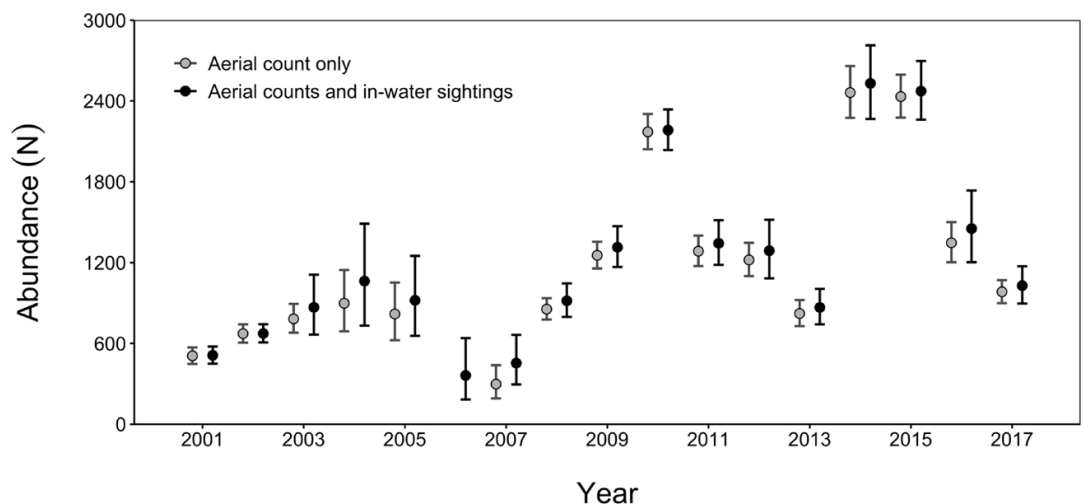


Figure 2. Estimates of Steller sea lion abundance at South Marble Island, Glacier Bay, Alaska with 95% confidence intervals (bars), based on models fitted using only aerial count data (grey) and both aerial and in-water sighting data (black).

Literature Cited

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