

PUGET SOUND VITAL SIGNS

VITAL Sign ORCAS

Orcas, or killer whales, are among Puget Sound’s most distinctive and charismatic creatures. They are icons in Pacific Northwest culture and top predators of the wider Salish Sea ecosystem. The Orcas Vital Sign tells us about the population status of the endangered Southern Resident killer whales and the occurrence of all orcas in Puget Sound and throughout the Salish Sea. The combination of a declining food supply and impacts from pollution, vessel traffic, and noise continues to threaten the survival of Southern Resident killer whales. Additionally, there is emerging science on the impacts of inbreeding for Southern Resident killer whale survival, which indicates that we need to do more now than before to recover populations.



Photo credit: Center for Whale Research

Related Strategies

- Awareness of Effects of Climate Change
- Climate Adaptation & Resilience
- Education Partnerships
- Funding
- Oil Spills
- Research & Monitoring
- Responsible Boating
- Stewardship & Motivating Action
- Strategic Leadership & Collaboration

Vital Sign Reporter

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| VITAL SIGN > INDICATOR | PROGRESS | STATUS |
|---|---------------------------|--------------|
| Orcas | | |
| Number of Southern Resident killer whales | GETTING WORSE | BELOW TARGET |
| Occupancy/residency of orcas in Puget Sound | INDICATOR TO BE DEVELOPED | NO TARGET |

KEY VITAL SIGN MESSAGES

- Prey availability, contaminants, and vessel noise/disturbance are factors that affect a variety of marine mammal species, including baleen whales, dolphins, porpoises and pinnipeds. Benefits provided to Southern Resident killer whales through mitigation of these factors can also help these other species, all of which contribute to a thriving and healthy Salish Sea ecosystem, and in turn a healthy Southern Resident killer whale population. More information on population trends of other marine mammals within the Salish Sea can be found in the [Puget Sound Marine Waters Report](#).
- Over the past several years, the **Southern Resident killer whale population has continued to decline** with the population peaking in 1995 with 98 whales to a current count of 73 whales in 2023. In contrast, the mammal-eating Bigg’s killer whale population continues to steadily increase at what is likely a near maximum rate.
- Year-round, Southern Resident killer whales depend heavily on [Chinook salmon](#) for food, meaning **salmon recovery and orca recovery are closely linked**. However, Chinook salmon populations show little sign of recovery and factors such as climate change impacts, predation on salmon from other species, harvest in fisheries, habitat degradation, hatchery programs, and hydropower operations are changing salmon densities, timing, size and/or caloric content, reducing prey availability for Southern Resident killer whales.
- Southern Resident killer whales spend a considerable portion of the year outside of the Salish Sea, where they feed on Chinook salmon from Puget Sound and other regions of Washington and Oregon (including the Columbia Basin) as well as other areas, like the Fraser River in British Columbia (a stock of primary importance) and the Klamath River in California. **Therefore, improving prey availability throughout their range is fundamental to resident orca recovery.**
- Southern Resident killer whales' use of the Salish Sea, particularly in spring and summer, has steadily declined over the past several years. Conversely, Bigg’s (transient) killer whales’ use of the Salish Sea has dramatically increased.

- In the Salish Sea, underwater noise and disturbance from commercial and recreational vessels leads to Southern Resident killer whales foraging less efficiently for salmon. Studies have shown that vessel disturbance decreases the chances of successful prey capture, relative to stationary vessels, and results in fewer and less time spent in foraging dives, with females more likely shifting to non-foraging behavior. **Reducing vessel noise that masks echolocation and communication to improve access to prey and increasing salmon supply are both crucial for orca recovery.**
- When Southern Resident killer whales can't find enough to eat, they must burn their own fat, thereby increasing circulation of harmful pollutants picked up from the Salish Sea and elsewhere. **Science suggests that poorer body condition increases the orcas' vulnerability to disease and hinders reproduction.** The [Toxics in Aquatic Life](#) Vital Sign raises concern over the presence of human-made contaminants throughout the food web.
- Because disease can cause increased morbidity and mortality in orcas, reducing pathogens in their environment through improved marine water quality should complement reduction of the key threats to Southern Resident recovery, which include decreased prey, contaminants, and vessel disturbance.
- A [recent study](#) revealed that **inbreeding depression is limiting Southern Resident killer whale population growth** and the population will further decline if genetic isolation and typical environmental conditions continue.

BACKGROUND DOCUMENTS

Indicator Targets

2030 and 2050 Recovery Target

- [Number of Southern Resident killer whales target fact sheet](#)
- [Memo to Science Panel with rationale](#)

2020 Recovery Target

- [Leadership Council Resolution 2011-17: Adopting a 2020 ecosystem recovery target for orcas](#)
- [Orca 2020 Target Briefsheet](#)

OTHER RESOURCES

- [2021 Southern Resident Killer Whales \(Orcinus orca\) 5-Year Review: Summary and Evaluation \(NOAA Fisheries\)](#)
- [Puget Sound Marine Waters 2021 Overview](#)
- [Encyclopedia Of Puget Sound](#)
 - [Entries related to killer whales, harbor porpoises, and harbor seals.](#)
 - [Status and trends for West Coast transient \(Bigg's\) killer whales in the Salish Sea](#)
- [Summary of Key Research Findings about Underwater Noise and Vessel Disturbance \(Washington State Academy of Sciences\)](#)
- [Inbreeding and Inbreeding Depression in Southern Resident Killer Whales \(NOAA Fisheries\)](#)
- [Southern Resident Orca Task Force website](#)
 - [Orca Task Force Final Report and Recommendations](#)
 - [Orca Task Force Year 1 Comprehensive Report and Recommendations](#)
- [Recently Published Reports](#)
 - [Economic Impact of Killer Whales in the Salish Sea](#) (Earth Economics, supported by the Seadoc Society)
 - [Southern Resident Killer Whale Vessel Adaptive Management 2022 Legislative Report](#) (Washington Department of Fish & Wildlife)

CONTRIBUTING PARTNERS

The following U.S. organizations monitor killer whales in Puget Sound:

- [NOAA Fisheries](#)
- [The Center for Whale Research](#)
- [Oceans Initiative](#)
- [Orca Network](#)
- [Orca Behavior Institute](#)
- [Orcasound](#)
- [SR³](#)
- [The Whale Museum](#)
- [Wild Orca](#)

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