

Pigeon Guillemot Study 2018 Breeding Season
Govinda Rosling Guillemot Research Group Regional Coordinator

Abstract~ An ongoing monitoring study of breeding Pigeon Guillemots was conducted in 3 different regions of the Salish Sea: South Sound, Whidbey Island, and Clallam County. Colony behavior, active burrows, prey selection to chicks, and frequency of deliveries were recorded and entered into a regional database; <http://www.pigeonguillemotdata.org/>

The breeding success of the Pigeon Guillemot has been correlated with overall health of the Salish Sea. Below is a table of the 3 regions that are monitoring Pigeon Guillemots, using the Whidbey Island study protocol. See table 1. Further peer reviewed reading on Whidbey Island Pigeon Guillemots can be obtained at <http://www.bioone.org/doi/abs/10.1898/NWN15-31.1> .

Pigeon Guillemot Monitoring 2018	Volunteer Hrs	Monitored Colonies	Number of Guillemots
Whidbey Island	1,503	24 (2 on US NAVY base)	1013
South Sound	1,204	42	480
Clallam County	583	7	742

Table 1. Pigeon Guillemot Monitoring 2018 in 3 Areas of the Salish Sea.

Introduction

Pigeon Guillemots (*Cepphus columba*) are black and white seabirds in the Alcidae family. They are small with an average wingspan of 23 inches, and weighing just over one pound. Pigeon Guillemots populate the north Pacific Ocean, ranging year round from arctic Alaska to southern California, with an estimated population of 200-300,000 The Pigeon Guillemot is a specialized underwater swimmer with a compact body, short wings and short tail. It dives from the water surface in pursuit of prey using its wings and feet for propulsion and steering. The adults consume their prey underwater, and prey brought to the surface is typically for delivery to chicks in their burrows.

Pigeon Guillemots are local residents of the Salish Sea, coming to the shores of Whidbey Island to breed in cliff burrows, from May to late August. Pairs return to the same area and generally re-use the same burrow from year to year. The average clutch size of the Pigeon Guillemot is two eggs: if the first eggs fail they will re-lay. Pigeon Guillemots have an average life span of 4.5 years. Breeding is attempted in the 3rd year, but more typical breeding in 4th and 5th years. An average of 40% survive to breeding age. The oldest recorded bird was 14 years. When the time comes to fledge, the young Pigeon Guillemot tumbles out of the cliff burrow and heads for the water, its wings not fully developed. They are more vulnerable to land predation (raptors, raccoons, crows etc.) than marine predation (octopi, killer whales). Pigeon Guillemots are also susceptible to water pollution, oil spills, and gill netting. The two main prey choice that the regional Pigeon Guillemots feed to chicks are small sized sculpin and gunnel/ prickleback type fish. Sculpin are a spiny fish type with a large head in the Cottidae family,

typically measuring less than 15cm. Their diet consists of small invertebrates. Gunnel/prickleback are an eel shaped fish in the Pholidae family. Although gunnel can be large, those chosen as Pigeon Guillemot prey are typically no more than 15 cm. Like sculpin, the diets of the gunnel fish consist of small invertebrates.

Pigeon Guillemots are an important species to be monitored. They are a visible marine organism that relies entirely on the marine environment in the Salish Sea. They are considered an indicator species of health by the Puget Sound Partnership. (<http://www.psp.wa.gov/vitalsigns/birds.php>) Pigeon Guillemots are high on the food chain; selecting small fish to feed chicks, and consuming small fish and invertebrates for themselves. These organisms in lower trophic levels of invertebrates, zooplankton and phytoplankton in turn are affected by changes in water quality (acidity, nutrients, temperature, light). Pigeon Guillemots feed and breed locally and their abundance and breeding success can echo the health of the Salish Sea. We need to find out how these birds are surviving year after year during the breeding season and continue gathering data of populations and breeding.

Materials and Methods

The Whidbey Island study took place from June 11th to September 7th, 2018. South Sound and Clallam County may differ slightly in survey start and finish times. Each of the colony sites were observed by volunteers for one hour per week, beginning no later than 9:00 a.m. 7 to 10x magnification power binoculars were the most common equipment used with additional sites employing spotting scopes, video cameras, and digital still cameras to aid in recording observations/prey identification. Population counts of Pigeon Guillemots were recorded.

Active burrows, (when a Pigeon Guillemot was observed entering that burrow) and prey deliveries (when a Pigeon Guillemot entered that burrow with prey) was recorded. Pigeon Guillemot prey that could not be identified, or prey that did not consist of sculpin or gunnel fish types (i.e. perch, cod, sand lance) were cataloged as "other." Frequency of deliveries, location of active burrows, and colony wide disturbances (anthropogenic or raptor caused, as well as other interactions between birds were also recorded as they occurred). This data is available online at <http://www.pigeonguillemotdata.org/>

The 2018 study included installing a camera inside two Pigeon Guillemot burrows; one at the Lanlgey Marina, and the second camera at Mutiny Sands; both on Whidbey Island. The burrow cameras were installed to monitor chick behavior, prey deliveries, and general time in the burrow during nesting season. They were installed before the breeding season on April 30th, and left until beyond the breeding season had ended, and retrieved on September 30th.

Results and Discussion

There are four compiled slides depicting life in the burrow; these include images of other avian visitors, prey deliveries and chick interactions. These still images can be viewed on the pigeon guillemot website <http://www.pigeonguillemot.org/in-the-news--outreach.html>

The data show the Whidbey Island Pigeon Guillemots had a population of 1013 birds. There was a total of 215 burrow visits; of those visits, 131 of them had prey delivered to chicks inside the burrow. This equates to approximately 42% of Pigeon Guillemots are attempting to breed. The 2018 season data resulted in less burrows with chicks, (compared to 143 in 2017

and 159 in 2016) However, the overall Whidbey Island population remains stable at around 1,000 Pigeon Guillemots, as well as the percentage of around 40% of the birds are attempting to breed. Whidbey Island's neighboring regions result a much lower percentage of guillemots attempting to breed. See Table 2.

2018 Regional PIGU Survey Data	Total population	Visits to Burrow	Visits to Burrow with Prey	Percentage of PG's attempting to breed
Whidbey Island	1013	215	131	42%
South Sound	489	59	47	24%
Clallam County	742	56	43	15%

Table 2. 2018 Regional summary of populations, visits to burrow, and visits with prey. Retrieved from <http://www.pigeonguillemotdata.org>

Prey composition: A large part of the Pigeon Guillemot study is to monitor the prey choice that adults are choosing to feed their chicks in the burrow. Figure 1 below reveals an overall view of prey choice of 3 data points; Whidbey, South Sound, Clallam County. Because these three regions vary in beach composition, substrates, fish habitat, the prey composition diversity seems to be reflected in this.

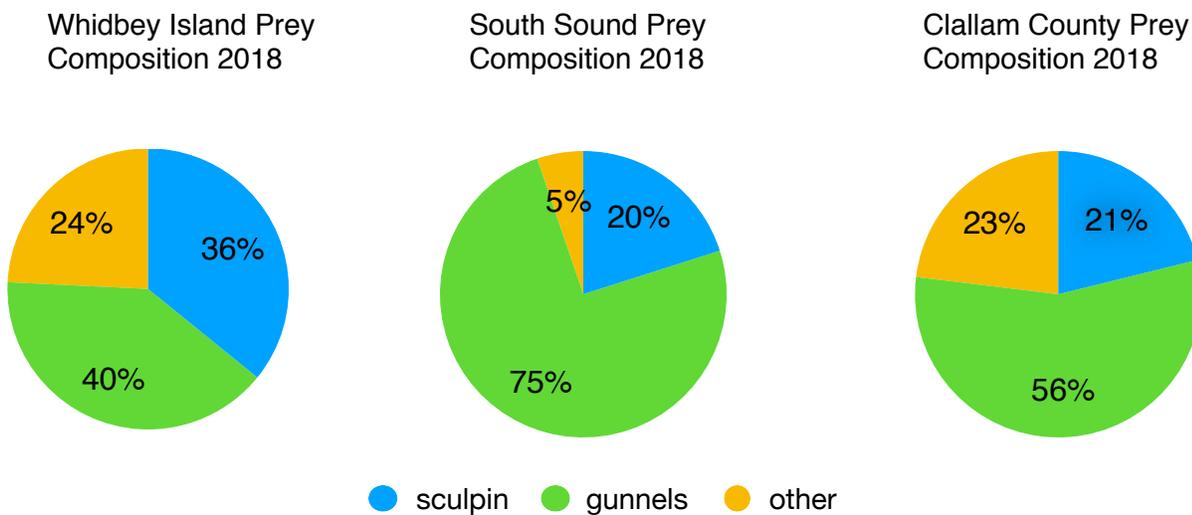


Figure 1. Prey composition in 3 regions of the Salish Sea 2018.

It is recommended that the Pigeon Guillemot study continue. By continuing the monitoring to other known colonies in the Clallam County, South Sound, and soon expanding to Vashon Island we can gain a better understanding and comparison to the regional population of Pigeon Guillemots. Long term monitoring in established sites gives us a baseline of data of what “normal” is, for when and if an ecological disaster occurs.

This data distribution is free and open to the public; just a few of the entities that benefit from the monitoring include the following:

- Washington Dept. of Fish and Wildlife
- Puget Sound Partnership
- Naval Air Station Whidbey Island
- Whidbey Audubon Society
- Olympic Peninsula Audubon Society
- Island and Clallam County MRC's
- Nisqually Reach Nature Center
- Vashon Island Nature Center
- Vashon Maury Island Audubon Society
- Langley Mainstreet Association