

**Analysis of Pigeon Guillemot  
Prey based on  
Photographs  
from  
Laskeek Bay, Haida Gwaii**



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## Abstract

Multiple studies have been conducted on Pigeon Guillemot chick diets in North America but none has been conducted in Haida Gwaii, British Columbia. From 2016 to 2019, the Laskeek Bay Conservation photographed Pigeon Guillemots holding prey in their bills (usually in early July), before they return to their nest sites to feed the chicks, in various areas of Laskeek Bay, Haida Gwaii. Over this time, 525 photos of 156 different fish, of a suitable quality for identification purposes, were captured. This report provides a preliminary analysis of fish identifications obtained from those photographs.

The fish comprised four distinct groups; gunnel-like (50.0%), sand lance-like (25.0%), sculpin-like (16.7%), and rockfish-like (2.6%). A small number (unknown 5.8%) could not be assigned to any group. The proportions of the three main groups varied among years with the sculpin-like group increasing with each year (2016: 8%, 2019: 27%). Pacific Sand Lance and Penpoint Gunnel were the only species that could be definitely identified to species owing to the likely occurrence of several very similar species among other gunnel-like and sculpin-like fish. However, the majority of photographs yielded identifications to group level.

The proportions of different groups varied significantly between two locations around East Limestone Island (Lookout Point and Boat Cove) but no difference was found when comparing East Limestone Island to the rest of Laskeek Bay. The length of the fish was variable with both the gunnel-like group and the sand lance-like group longer on average than the sculpin-like group.

The main groups of fish found in Pigeon Guillemot diets at Laskeek Bay were similar to those found in other studies in North America, but the percentages of those fish groups varied among sites. Our results support what has been concluded in other studies, that Pigeon Guillemots, when rearing chicks, show variation in their diet among years and within their range. We speculate that Pigeon Guillemot chick diet is likely directly related to the availability and abundance of local fishes.

## Introduction

The Pigeon Guillemot *Cephus columba* occurs in coastal waters more or less throughout British Columbia, with the total breeding population of the province currently estimated at 10,000-25,000 breeders (<https://wildlife-species.canada.ca/bird-status>; accessed 14 October 2020). The species normally feeds in shallow water within a few kilometers of shore and the diet comprises mainly benthic fishes. Nests are located in rock crevices, or sometimes in man-made structures, within a few tens of metres of the sea (Ewins 2020). Nestlings are fed at the nest by the parents for about 35 days and, during this period, food items delivered to the chicks are transported to the nest carried crosswise in the bill. Birds about to deliver fish frequently land on the sea adjacent to their nest site or sometimes perch on the ground close to the site before entering the nest cavity. In either case, they give an opportunity for photography that allows pictures to be taken of the fish being carried.

The Pigeon Guillemot is a common breeding bird in Laskeek Bay, Haida Gwaii, where the Laskeek Bay Conservation Society runs a research camp each summer on East Limestone Island. A few hundred Pigeon Guillemots are thought to nest on East Limestone Island and in 2001, ten nest boxes were placed at a suitable location to discover whether Pigeon Guillemots would adopt them. Once it had been established that Pigeon Guillemots would use the boxes, 18 more boxes were added in 2010. Recently, 15-20 boxes were used each year, with periodic inspections undertaken by Laskeek Bay staff and volunteers to monitor clutch size, brood size and nestling growth (e.g. Pilgrim et al. 2020). This regular monitoring is designed to provide annual indices of conditions in the nearshore marine environment to complement observations of other local marine birds having contrasting ecology.

To supplement observations of breeding biology and phenology, in 2016, the Laskeek Bay Conservation Society began to photograph Pigeon Guillemots carrying prey in their bills in an attempt to catalogue what organisms they were feeding to their chicks. The hope was that future changes in prey stocks would be reflected in guillemot diets, allowing us to assess changes in the inshore ecosystem. Photographs were obtained annually from 2016, commencing once it was noticed that guillemots were holding prey in their bills (usually in early July). In this report we provide a preliminary analysis of fish identifications obtained from photographs taken in Laskeek Bay.

## Locations

Photos of the Pigeon Guillemots carrying fish were taken in several areas of Laskeek Bay (Figure 1), mostly in the vicinity of Pigeon Guillemot breeding colonies. Most photos (48%) were taken near East Limestone Island; especially the SE tip of the island, hereafter referred to as the Lookout Point area and the central west side of the island, hereafter referred to as the Boat Cove area.

Photos were also taken in several other areas of the bay, including the Skedans Islands (mainly in the waters immediately east of the western most Skedans Island), the waters very close to the east side of Reef Island, the waters around the Lost Islands and in a few other parts of the bay, as opportunities presented themselves.

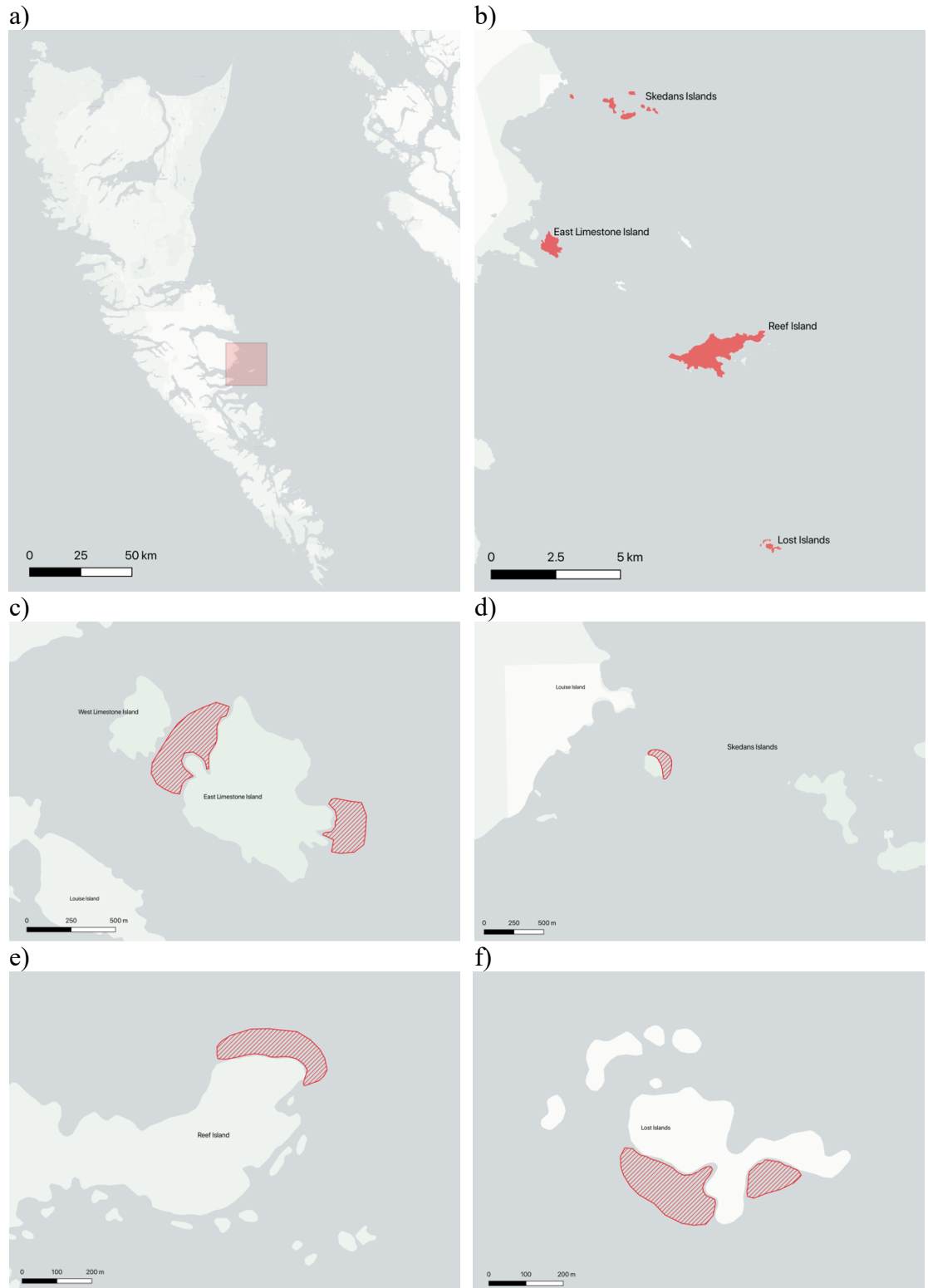


Figure 1. Map of the study area with Pigeon Guillemot photo locations highlighted a) Haida Gwaii b) Laskeek Bay c) East Limestone Island (Boat Cove area in the west and Lookout Point area in the east) d) Skedans Islands e) East point of Reef Island and f) the Lost Islands

## Photography

### Photography Effort and Locations

Photography effort was not equal from year to year or over the Pigeon Guillemot chick rearing period, when it was possible to capture images of Pigeon Guillemot holding prey in their bills (Table 1).

Table 1. Amount of effort spent on photographing Pigeon Guillemot holding prey

Year	Number of days Photographs were Taken	Approx. Hrs Spent	Proportion of Total Effort (%)
2016	4	4	10.5
2017	6	14	36.8
2018	4	7	18.4
2019	5	13	34.2

The proportion of identifiable fish in photographs varied over the photography locations (Table 2).

Table 2. Proportion of photos captured of fish in their photo locations

Photography Locations	Number of Identifiable fish in Photographs	Proportion of Total (%)
East Limestone I (Unknown areas)	7	4.5
East Limestone I (Boat Cove)	43	27.6
East Limestone I (Lookout Point)	26	16.7
Laskeek Bay (Unknown areas) *	30	19.2
Lost Islands*	9	5.8
Reef Island*	12	7.7
Skedans Islands*	25	16.0
Hotspring Island†	4	2.6

\*Islands considered to be within Laskeek Bay

†South of Laskeek Bay, within Gwaii Haanas

Most pictures (71%) were taken between 09:00-12:00 h, with smaller numbers between 16:00-19:00 (21%; Figure 2). Photography took place only when the weather was considered to be good; no rain, light winds, a sea state of two or less on the Beaufort Scale.

Photographs were mainly taken with a Nikon D90 camera using a Nikon DX 18-105mm lens or a Nikon ED 300mm lens, though in 2019 a Nikon P900 with a fixed 20-2000 mm lens was also used.

Most photographs were taken from a 16 ft aluminum boat. Typically, the boat and three to four crew would go to one of the photography locations. The boat would be positioned amongst or

near the Pigeon Guillemots sitting on the water, waiting to visit their nesting areas, with the engine turned off. The boat had a modern four stroke engine that is very quiet when operating and the presence of the boat had little noticeable effect on the bird's behavior when at an approximate distance of 50m from them. One of the crew took photographs while the others observed birds on the water and tried to spot ones that were holding prey. Once one was spotted, the photographer would attempt to capture the best image possible of the prey. At times, the boat would be repositioned amongst or near the birds in an attempt to view other areas where there were more photographic opportunities.

On several occasions' photographs were taken from land on East Limestone Island; on Lookout Point while the birds were waiting to enter the nest boxes, as well as in Boat Cove while birds were sitting on the water. On these occasions, two or three people would position themselves on land in the vicinity of an aggregation of guillemots. Observers would monitor the birds until one was spotted with a fish, at which time the photographer would capture the best image possible of the prey item.

Though most photographs reviewed here were taken while the photographing team were on the water, we should emphasize that opportunities to capture quality images from land are many and could be utilized to a greater extent.

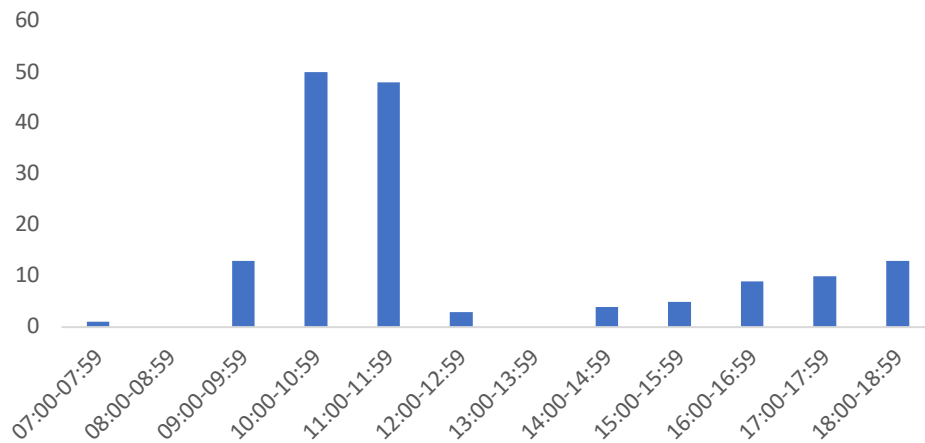


Figure 2. Time of day when photography of Pigeon Guillemot took place in Laskeek Bay

### Identification from photographs

Approximately 600 pictures were taken from 2016 to 2019. These were not all pictures of different fish; multiple pictures were taken of most fish that were seen (mean 3.7 photos/fish). Certain photographs had to be discarded for various reasons:

- The image was unclear; blurry.
- The Pigeon Guillemot was holding the fish in such a way that its shape was distorted, making it not possible for the fish to be placed in a group.

- The majority of the fish's body was under the water with the areas above the water offering no clues to what species our grouping the fish should be placed in.
- The birds head or body was angled or turned in such a way that only a small piece of the fish's body could be seen.

Once unusable pictures had been removed, we were left with 525 photos of 156 different fish (Appendix 1).

Determining the identity of fish species from the remaining photographs, some being less than ideal, was challenging; subtle markings were often not visible, fins were often pressed against the body, the body was often bent (action photographs). Also, the typical way that Pigeon Guillemots hold their prey (pinching behind the head) often restricts the view of the fishes' head, hiding key ID features for certain species. The holding of the prey on or near the head can also, at times, make the body shape difficult to discern as the head can be flattened making it appear larger than it actually is, as well as making the eyes bulge giving the appearance of a different fish type.

Due to the challenges mentioned above it was not possible to make an accurate identification of the prey to the species or genus level for many fish. However, some taxa could be identified fairly confidently because there are no similar fish in the area, and for those fish it was possible to give the fish a "likeliest assignment" placing it in a species, genus or family. However, in other cases, in order to analyze the photographs without making assumptions as to what family or species the fish belonged to, the fish were placed into morphologically similar groups.

### **Grouping of Fishes**

Grouping was mainly done by body shape and colouration - these were the features that were most clear in the photographs. The groups were: gunnel-like, sand lance-like, sculpin-like and rockfish-like. Nine fish could not be assigned to any of these groups and were classified as 'Unknown'. A key to the fishes found in the photographs was developed and can be found in Appendix 2 and identification points can be found in Appendix 3.

#### *"Sand lance-like"*

A Pacific Sand Lance (*Ammodytes hexapterus*) is a slender elongate fish coloured metallic blue or green above and silvery white below (Figure 3, Appendix 3). Maximum length is approximately 200mm. It has a long low dorsal and anal fin, a forked tail fin and a projecting lower jaw. When seen closely it has many diagonal creases close together along its sides and a longitudinal fold along the lower area of its sides (Appendix 2).

When the shape of the fish is clear (it is very slender) and the colours visible, it can be said with a high level of certainty that it is a Pacific Sand Lance because no similar fish occur in the area. Unfortunately, the slenderness of the body is not always easy to see, leaving the possibility that it may be another similar fish. Therefore, it was necessary to create the "sand lance-like" category. "Sand lance-like" fish were long and slender with a colouration that was dark above (upper ~1/3 of body) and a lighter colour below. Most of these fish were likely Pacific Sand Lance,

unfortunately, the fine details (diagonal lines on body, fold on underside), which are defining features, are only visible (mostly due to image quality) in some photos. The other fish in this group are: Pacific Herring (*Clupea pallasii*) and Surf Smelt (*Hypomesus pretiosus*) – these fish were not identified in the photos, but photos not showing enough detail left the possibility that they might have been present.



Figure 3. Pacific Sand Lance being held by Pigeon Guillemots in Laskeek Bay

### *Gunnel-like*

The gunnel-like category (Figure 4) refers mostly to two families: *Stichaeidae* (pricklebacks) and *Pholidae* (gunnels). These two families are very similar in appearance; they both have elongated, laterally compressed, eel-like bodies, long dorsal and anal fins, with many having rounded heads and relatively small pectoral fins (Appendix 3). Maximum size for most species is less than 300mm. A list of species included in this category are listed in Appendix 4.

When a member of this group is in hand, or a very high-quality picture is available, they can be separated using a couple of key ID features: the gunnels have shorter anal fins and only one lateral line and prickleback dorsal fins are usually lined with small spines. Some members of these families have distinct body markings, unfortunately the appearance of these marking can be highly variable (at times, not even visible) and cannot be seen in most of our photographs. Head markings also provide some of the defining features of some gunnel-like species, but unfortunately, Pigeon Guillemot often hold the fish near the head (covering the head and angling the fish in a certain way) obscuring the head markings.

Identification to the gunnel-like group was largely done by body shape, other features being difficult to confirm in most of the photos. At times, the length of the anal fin could be seen, allowing a distinction to be made between the pricklebacks and the gunnels. Colour was also distinguishable, with colours from brown (yellowish to brown) to red, unfortunately each species comes in red, green and brown forms – this is not uncommon in intertidal fishes – the colour often associated with the colour of algae where the fish spends its time (Burgess 1978). The one exception, at least at times, is the Penpoint Gunnel that occurs in a dark wine-red colour that can be considered unique.





Figure 4. Members of the gunnel-like category being held by Pigeon Guillemots in Laskeek Bay

### *Sculpin-like*

The Sculpin-like category (Figure 5) are, most likely, largely composed of the family Cottidae (Sculpins), though another family in the area with some similar features is the Agonidae (includes: starsnouts, poachers) and this family cannot be ruled out in some of the less clear photographs. These families can easily be told apart when seen up close or in a detailed picture from the correct angle. A list of species included in this category are listed in Appendix 4.

Many members of the families Cottidae and Agonidae share several common identifying features; large fan-like pectoral fins, drab colours (many with a banded appearance) above and white below and a tapering body, most growing to a maximum of 130 – 150mm. The sculpins often have a larger head and a stouter body, though this is not always easy to see in a photograph.

Identification to the Sculpin-like group was largely done by body shape (relatively larger head with a tapering body) and colouration (body/tail has series of dark blotch's and/or bands), though, at times, the large mouth, large pectoral fins and gill covers with spines are visible and allow identification to Cottidae (Appendix 2).



Figure 5. Members of the sculpin-like category being held by Pigeon Guillemots in Laskeek Bay

### *Rockfish - like*

Rockfish are common in the Laskeek Bay area and juveniles (Figure 6) are frequently seen swimming in guillemot foraging areas (personal obs.). The shape of these fish varies but many have a “bass-like” shape, most have rounded pectoral fins and a square cut or rounded caudal fin (rarely forked). The dorsal fin of this group is a single fin with a section with spines and section with rays. All rockfish in the Laskeek Bay area are members of the genus *Sebastes*.

Identification to the Rockfish-like group was done by body shape and then further assignment to *Sebastes* sp. included the shape of dorsal fin (front is spinous portion and rear soft-rayed) (Appendix 2) and colour. Fish included in this category were most likely Rockfish, but a rockfish-like category was created to allow for some uncertainty.



Figure 6. Juvenile rockfish being held by Pigeon Guillemots in Laskeek Bay

### *Unknown*

This group consists of those that do not fit into one of the before mentioned groups nor do the features in the photos allow identification to genus or species. There are nine fish that could not be identified. Given that there was very few of these fish found in photographs and that they were not all similar to one another, it can be concluded that whatever species were involved were not common prey items.

### **Haida Gwaii Fish**

Haida Gwaii is a remote archipelago, that may or may not contain the same fish communities that occur in the waters that are directly adjacent on the mainland coast of British Columbia. No doubt the fish communities are very similar but there may be certain fishes that are absent from the area.

Many fish identification guides for the BC coast give the geographic range of the various species (i.e., found from California to Alaska). However, even though Haida Gwaii may be included, along with its adjacent area of the BC coast, we cannot assume that the species actually occurs in the archipelago. This is especially true of the gunnel-like and sculpin-like categories due to the large number of species that are possible.

*See Appendix 4 for a list of fish species that may possibly occur, according to fish guide books that are for the British Columbia coast, and would have been included in the gunnel-like and sculpin-like categories.*

According to local experts and people who have done fish related work in the area, almost nothing has been done in Haida Gwaii to study fish that are of no commercial importance (personal communications with NGP). The one exception is Eelgrass surveys that have been conducted annually since 2004 at 13 sites in Gwaii Haanas National Park, during which fish species have been recorded. This presence information can be referred to as a means of determining likelihood of the species being found in other areas of Haida Gwaii.

*See Appendix 4 for a list of fish that fit into the groups (gunnel-like and sculpin-like) that were found in the Gwaii Haanas Eelgrass surveys*

### **Prey Length Measurements**

Estimates of prey lengths were made by adjusting the photograph size until the gape (from commissural point to tip of culmen) of the bird was approximately 50.0 mm. This size was based on Bedard's (1969a) measurements for 11 Alaskan, British Columbian and Californian Pigeon Guillemots (44.9 mm). Once the photographs were adjusted to size, an approximate length measurement of the prey species was made. Measurement was only made when most of the body of the fish was visible and when the PIGU gape was measurable. These measurements are approximate but can provide us with an idea of the prey size that is typically fed to the Pigeon Guillemot chicks.

### **Results**

#### **Proportion of Fish Groups Photographed**

When looking at all fish (n=156) across all years in all locations, the gunnel-like type was the most frequent, comprising 50.0% of all classified fish, followed by sand lance-like (25.0%), sculpin-like (16.7%), unknown (5.8%) and rockfish-like (2.6%) (Figure 7).

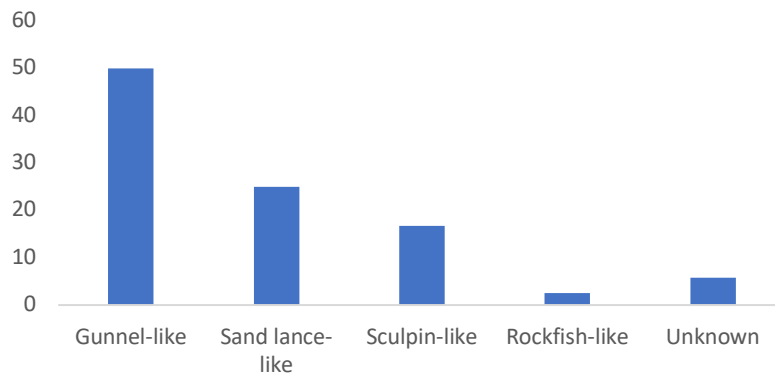


Figure 7. Proportion of fish groups photographed in Laskeek Bay from 2016 - 2019

Rockfish were recorded in only two (2017 and 2019) of the four years that photographs were taken. This is most likely due to all locations not being consistently used as photographing locations each year; three of the four photographs of this group were taken in the Skedan's Islands (only used as a photographing location in 2017 and 2019) and the fourth was taken at an unknown location in Laskeek Bay (this location may not have been used in any other years).

Subsequent analyses were only conducted on the three main groups: gunnel-like, sand lance-like and sculpin-like.

### Annual variation

In three of the four years, the gunnel-like group was the most photographed; in 2017, 2018 and 2019 this group made up at least 50% of the photos for each year. In 2016 it was much lower making up only 31% (Figure 8). The sand lance group was the next most frequent, making up 62% in 2016 and ranging from 19 to 33% in other years. The number of Sculpins captured in photos increased with each year they were taken, going from 8% in 2016 to 27% in 2019. A significance difference was found between the three main groups when comparing years ( $\chi^2_6=17.25, P<0.05$ ).

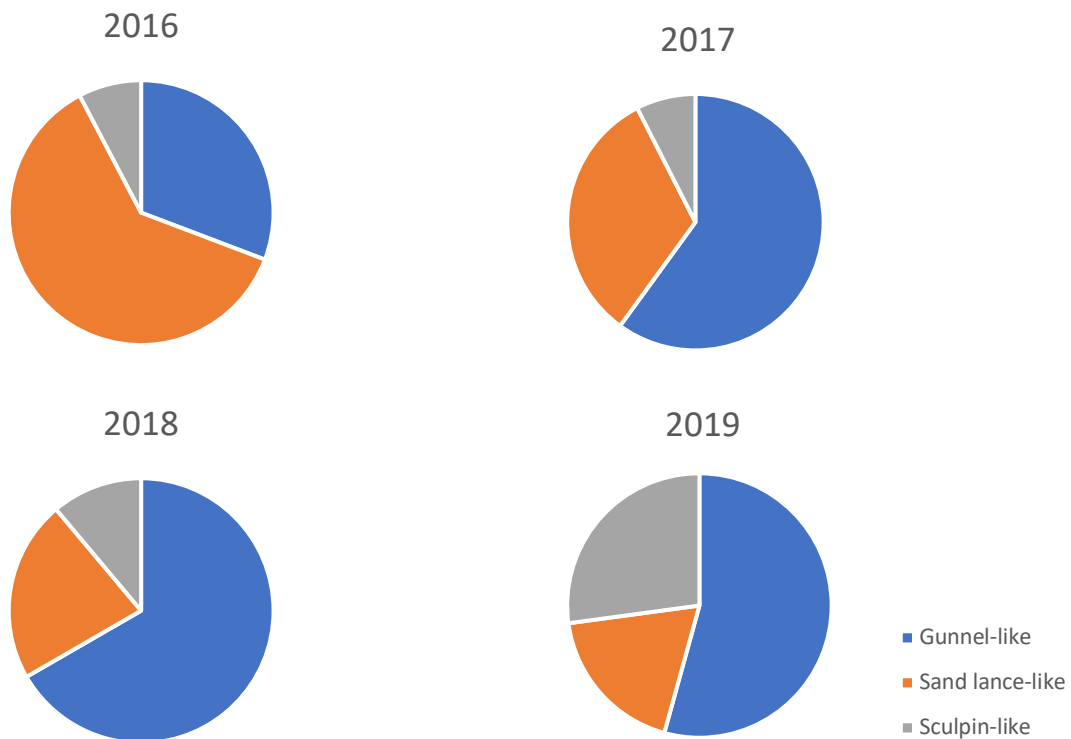


Figure 8. Comparison of the proportions of fish groups photographed each year in Laskeek Bay

## Places

### East Limestone Island

When comparing the two main colony areas (Lookout Point and Boat Cove) located next to East Limestone Island, gunnel-like was the most photographed in both locations, followed by sand lance-like and then sculpin-like in the Boat Cove area. In the Lookout Point area, proportions of sand lance-like and sculpin-like were similar (Figure 9).

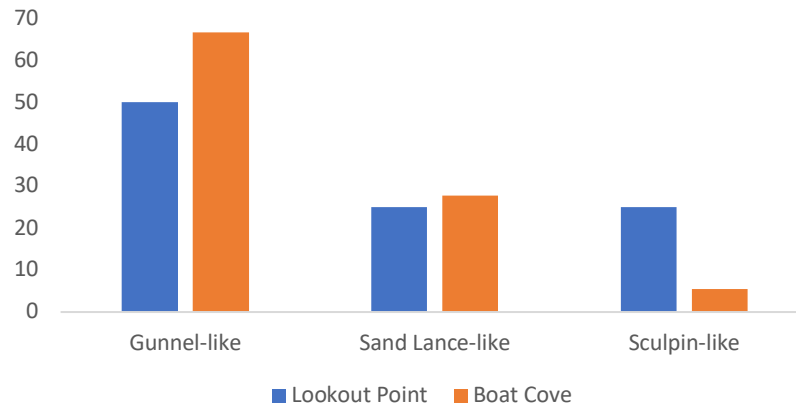


Figure 9. Comparison of the proportions of fish groups photographed in the Boat Cove and Lookout Point areas of East Limestone Island, Laskeek Bay

Notably, nearly 17% more of the Pigeon Guillemot prey photographed in Boat Cove was the gunnel-like group (Lookout Point 50.0%, Boat Cove 66.7%). Sand lance was within 3% between locations. Sculpins were much lower in Boat Cove (5.6%) than Lookout Point (25.0%).

When comparing the three main groups in Boat Cove to Lookout Point there is a significant difference ( $\chi^2_2 = 14.28$ ,  $P < 0.05$ ).

### Laskeek Bay

When combining all photograph locations in Laskeek Bay, other than the areas around East Limestone Island (ELI), the gunnel-like group was the most numerous, followed by the sand lance-group and then the sculpin-like group. This is the same pattern that can be seen in the waters around East Limestone Island (Figure 10). Although the waters around East Limestone Island contained higher numbers of the gunnel-like group (ELI: 63.4%, Laskeek Bay: 47.1%) while the rest of the bay had higher levels of sand lance-like group (ELI: 22.5%, Laskeek Bay: 30.0%) and the sculpin-like group (ELI: 14.1%, Laskeek Bay: 22.9%). However, comparing the three main groups around East Limestone Island to other areas of Laskeek Bay there was no significant difference ( $\chi^2_2 = 5.44$ ,  $P = 0.07$ ).

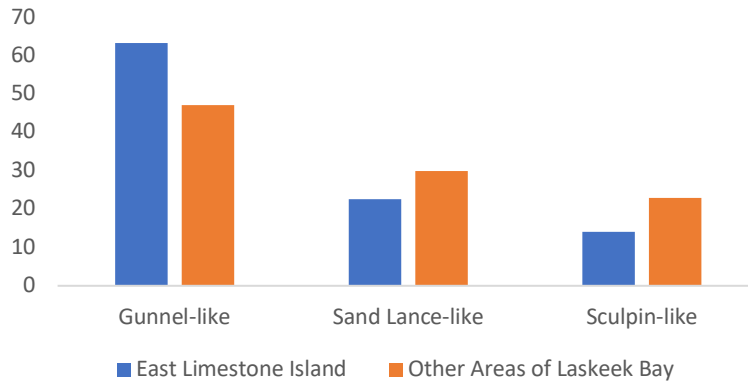


Figure 10. Comparison of the proportions of fish groups photographed in the area of East Limestone Island and the other areas of Laskeek Bay

### Length

Average length of fish in Laskeek Bay (including East Limestone Island) varied between groups and a wide range of sizes was found in both the gunnel-like group and the sand lance-like group (Table 3). Both the gunnel-like group and the sand lance-like group were longer on average than the sculpin-like group (ANOVA  $F_{2,77} = 11.34$ ,  $P < 0.05$ ; Tukey's pairwise:  $P < 0.05$ ).

Table 3. Measurements of the fish lengths in Laskeek Bay

Fish Group	Average Length (mm)	STD Dev.	Mode	Range
Gunnel-like (n=44)	103.1	24.5	100	70-170
Sand lance-like (n=14)	113.6	19.7	120	85-160
Sculpin-like (n=20)	81.8	7.7	85	70-95

### Discussion

The prey photographed in Laskeek Bay comprised of similar groups to those reported in chick diet studies in other areas of British Columbia and Alaska (British Columbia: Drent 1965a, Koelink 1972; Alaska: Oakley 1981, Kuletz 1983, Oakley 1990), though the percentages of those groups vary. The studies in British Columbia (Mandarte Island) found that the commonest fish in chick diets were gunnels/pricklebacks (Drent: 38%, Koelink: 64%), similar to Laskeek Bay (50%). However, the proportion of sand lance, were much lower at Mandarte Island (Drent: 5%, Koelink: 6%, compared to 25% in Laskeek Bay). In Alaska, lower levels of gunnels/pricklebacks than Laskeek Bay were recorded (Oakley 1981: 1%, Kuletz: 23%, Oakley 1990: 19%), but those studies reported similar levels of sand lance (Oakley: 26%, Kuletz: 38%,

Oakley 14%). Sculpins levels varied within and between the regions and different amounts of various other fishes were found in each.

Pigeon Guillemots, when chick rearing, show much variation in their diet among years and within their range (Kuletz 1983, Ainley and Boekelheide 1990, Oakley 1990). They probably choose the prey that is most abundant, readily available and able to be consumed (spines or large fish don't go down so well) in the vicinity of their nesting areas. Their forage range, during the breeding season, usually does not exceed 7 km of the colony (Thoresen and Booth 1958, Drent 1965, Follett and Ainley 1976, Oakley 1981, Kuletz 1983, Nelson 1987).

Assuming that Pigeon Guillemots choose the most abundant and easily available fish, variation in the diet of the chicks must reflect changes in relative abundance and accessibility of local fish stocks. The mixture may be affected by habitat variables, such as the abundance of kelp and sea grass, slope, and substratum type. These factors often explain a significant proportion of the variation in the presence and abundance of most fishes (Dean 2000) and could explain the presence of certain species in other studies that have not been found in the Laskeek Bay study.

It is possible that pigeon guillemots may prefer narrow bodied prey, as they have small, narrow bills compared with other fish-eating auks (e.g. puffins, murre; Bedard 1969). In Laskeek Bay, there was an overwhelming preference for fishes with an elongated body or something similar (tapered) and few prey were selected that were thicker bodied or of a more 'rounded' shape. A similar pattern can be seen in Alaska and elsewhere in BC (Koelink 1972, Oakley 1981, Kuletz 1983, Oakley 1990), although some studies show higher proportions of flatfish and rockfish (Drent 1965: 10% flatfish, Ainley and Boekelheide 1990: 56% rockfish). In those studies, there may have been fewer fish available with the desired body shape resulting in the selection of thicker fish. In regards to size, other studies found that the typical lengths of fish consumed were between 60-150mm (Drent 1965, Follett and Ainley 1976, Oakley 1981, Vermeer et al. 1993d). This is consistent with what we found in Laskeek Bay.

The areas of Laskeek bay where Pigeon Guillemots were photographed with prey were usually within approximately 200 m of a rocky shoreline, surf grass and different types of algae are abundant, various substrata exist and there is a variety of slopes available. Kelp forests are located in areas within the vicinity of the foraging areas and the biological communities are healthy and occupied by an abundance of organisms. No known studies have been conducted on noncommercial fish species in the bay, so levels of abundance of different fish types would be speculation.

More research is needed, especially concerning what fishes are actually present and more abundant at the time of the Pigeon Guillemot prey capture. The authors recommend that future research should include monitoring of the fish community at the same time as the Pigeon Guillemots are capturing prey for the chicks. This would allow researchers to have a better idea as to whether the Pigeon Guillemots are actually selecting certain fish types as prey (choosing to seek out certain prey items, even when other prey is more abundant) or are simply taking fish that are the most abundant and easily captured. It would also allow better interpretation of guillemot diets as a means of monitoring relative fish abundance.

## Acknowledgements

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**Appendix 1.** All Identification photographs listed by number with categories for photo location, date, time, group classification, likeliest assignment and length

<b>ID #</b>	<b>Photo Location</b>	<b>Date</b>	<b>Time</b>	<b>Group Classification</b>	<b>Likeliest Assignment</b>		<b>Length (mm)</b>
1	ELI - Boat Cove	2017-07-12	18:00-18:59	Gunnel-like (brown)	N/A	N/A	Not possible
2	Laskeek Bay	2019-07-02	11:00-11:59	Gunnel-like (brown)	N/A	N/A	Not possible
3	ELI - Boat Cove	2018-07-04	10:00-10:59	Gunnel-like (brown)	N/A	N/A	95
4	ELI - Lookout Point	2019-07-08	10:00-10:59	Gunnel-like (brown)	N/A	N/A	Not possible
5	ELI - Lookout Point	2019-07-09	09:00-09:59	Gunnel-like (brown)	N/A	N/A	Not possible
6	Laskeek Bay	2017-07-10	10:00-10:59	Gunnel-like (brown)	N/A	N/A	100
7	ELI - Boat Cove	2017-07-10	16:00-16:59	Gunnel-like (brown)	N/A	N/A	80
8	Laskeek Bay	2019-07-02	11:00-11:59	Gunnel-like (brown)	N/A	N/A	120
9	ELI - Boat Cove	2017-07-02	14:00-14:59	Gunnel-like (brown)	Prickleback Family	<i>Stichaeidae</i>	85
10	Laskeek Bay	2019-07-08	10:00-10:59	Gunnel-like (brown)	N/A	N/A	85
11	ELI - Boat Cove	2017-07-02	18:00-18:59	Gunnel-like (brown)	Prickleback Family	<i>Stichaeidae</i>	Not possible
12	Laskeek Bay	2017-07-02	15:00-15:59	Gunnel-like (brown)	N/A	N/A	150
13	ELI - Boat Cove	2018-07-04	10:00-10:59	Gunnel-like (brown)	N/A	N/A	90
14	Laskeek Bay	2019-07-08	11:00-11:59	Gunnel-like (brown)	N/A	N/A	Not possible
15	ELI - Lookout Point	2019-07-09	10:00-10:59	Gunnel-like (brown)	N/A	N/A	85
16	ELI - Boat Cove	2018-07-01	14:00-14:59	Gunnel-like (brown)	Prickleback Family	<i>Stichaeidae</i>	Not possible
17	ELI - Boat Cove	2017-07-02	18:00-18:59	Gunnel-like (brown)	N/A	N/A	95
18	ELI - Boat Cove	2018-07-04	10:00-10:59	Gunnel-like (brown)	N/A	N/A	85
19	Laskeek Bay	2019-07-08	11:00-11:59	Gunnel-like (brown)	Prickleback Family	<i>Stichaeidae</i>	Not possible

20a	ELI - Lookout Point	2019-07-09	10:00-10:59	Gunnel-like (brown)	N/A	N/A	90
20b	ELI - Lookout Point	2019-07-09	10:00-10:59	Gunnel-like (brown)	N/A	N/A	100
21	Skedans islands	2017-07-02	16:00-16:59	Gunnel-like (brown)	N/A	N/A	85
22	East Limestone Island (ELI)	2018-07-16	10:00-10:59	Gunnel-like (brown)	N/A	N/A	85
23	ELI - Boat Cove	2017-07-02	18:00-18:59	Gunnel-like (brown)	Prickleback Family	<i>Stichaeidae</i>	80
24	Laskeek Bay	2019-07-08	11:00-11:59	Gunnel-like (brown)	N/A	N/A	125
25	ELI - Boat Cove	2018-07-16	10:00-10:59	Gunnel-like (brown)	N/A	N/A	Not possible
26	ELI - Boat Cove	2017-07-02	18:00-18:59	Gunnel-like (brown)	N/A	N/A	Not possible
27	Skedans islands	2019-07-08	10:00-10:59	Gunnel-like (brown)	N/A	N/A	105
28	ELI - Boat Cove	2017-07-11	12:00-12:59	Gunnel-like (brown)	N/A	N/A	125
29	ELI - Boat Cove	2017-07-02	18:00-18:59	Gunnel-like (brown)	Prickleback Family	<i>Stichaeidae</i>	95
30	Skedans islands	2019-07-08	10:00-10:59	Gunnel-like (brown)	N/A	N/A	Not possible
31	ELI - Lookout Point	2019-07-09	10:00-10:59	Gunnel-like (brown)	N/A	N/A	90
32	ELI - Boat Cove	2017-07-02	18:00-18:59	Gunnel-like (brown)	Prickleback Family	<i>Stichaeidae</i>	100
33	ELI - Lookout Point	2019-07-09	10:00-10:59	Gunnel-like (brown)	N/A	N/A	90
34	ELI - Boat Cove	2017-07-11	10:00-10:59	Gunnel-like (brown)	N/A	N/A	95
35	ELI - Lookout Point	2019-07-09	11:00-11:59	Gunnel-like (brown)	N/A	N/A	120
36	Skedans islands	2019-07-08	10:00-10:59	Gunnel-like (brown)	N/A	N/A	95
37a	Skedans islands	2019-07-08	11:00-11:59	Gunnel-like (brown)	N/A	N/A	100

37b	Skedans islands	2019-07-08	11:00-11:59	Gunnel-like (brown)	N/A	N/A	Not possible
38	Skedans islands	2019-07-08	11:00-11:59	Gunnel-like (brown)	N/A	N/A	95
39	Skedans Islands	2019-07-08	11:00-11:59	Gunnel-like (brown)	N/A	N/A	95
40	Skedans islands	2019-07-08	11:00-11:59	Gunnel-like (brown)	N/A	N/A	100
41	Skedans islands	2019-07-08	11:00-11:59	Gunnel-like (brown)	N/A	N/A	90
42	Skedans islands	2019-07-08	11:00-11:59	Gunnel-like (brown)	N/A	N/A	Not possible
43	Skedans islands	2019-07-08	11:00-11:59	Gunnel-like (brown)	N/A	N/A	Not possible
44	Skedans islands	2019-07-08	11:00-11:59	Gunnel-like (brown)	Prickleback Family	<i>Stichaeidae</i>	100
45	Skedans islands	2019-07-08	11:00-11:59	Gunnel-like (brown)	N/A	N/A	Not possible
46	Skedans islands	2019-07-08	12:00-12:59	Gunnel-like (brown)	N/A	N/A	95
47	ELI - Boat Cove	2018-07-01	11:00-11:59	Gunnel-like (brown)	N/A	N/A	100
48	Reef Islands	2017-07-10	10:00-10:59	Gunnel-like (brown)	N/A	N/A	100
49	ELI - Boat Cove	2017-07-03	16:00-16:59	Gunnel-like (red)	N/A	N/A	Not possible
50	ELI - Lookout Point	2019-07-09	09:00-09:59	Gunnel-like (red)	Penpoint Gunnel	<i>Apodichthys flavidus</i>	Not possible
51	ELI - Boat Cove	2017-07-11	11:00-11:59	Gunnel-like (red)	Penpoint Gunnel	<i>Apodichthys flavidus</i>	Not possible
52	East Limestone Island (ELI)	2018-07-16	09:00-09:59	Gunnel-like (red)	Penpoint Gunnel	<i>Apodichthys flavidus</i>	Not possible
53	ELI - Boat Cove	2017-07-03	16:00-16:59	Gunnel-like (red)	N/A	N/A	Not possible
54	Laskeek Bay	2019-07-08	10:00-10:59	Gunnel-like (red)	N/A	N/A	Not possible
55	ELI - Lookout Point	2019-07-09	10:00-10:59	Gunnel-like (red)	Penpoint Gunnel	<i>Apodichthys flavidus</i>	160
56	ELI - Boat Cove	2017-07-11	11:00-11:59	Gunnel-like (red)	N/A	N/A	Not possible

57	ELI - Lookout Point	2019-07-09	10:00-10:59	Gunnel-like (red)	Penpoint Gunnel	<i>Apodichthys flavidus</i>	165
58	ELI - Boat Cove	2017-07-03	16:00-16:59	Gunnel-like (red)	Penpoint Gunnel	<i>Apodichthys flavidus</i>	165
59	Laskeek Bay	2019-07-08	10:00-10:59	Gunnel-like (red)	N/A	N/A	Not possible
60	ELI - Boat Cove	2017-07-11	11:00-11:59	Gunnel-like (red)	Penpoint Gunnel	<i>Apodichthys flavidus</i>	Not possible
61	ELI - Boat Cove	2017-07-03	17:00-17:59	Gunnel-like (red)	N/A	N/A	Not possible
62	Laskeek Bay	2019-07-08	11:00-11:59	Gunnel-like (red)	N/A	N/A	115
63	ELI - Boat Cove	2017-07-11	12:00-12:59	Gunnel-like (red)	Penpoint Gunnel	<i>Apodichthys flavidus</i>	Not possible
64	ELI - Boat Cove	2016-07-12	09:00-09:59	Sand Lance-like	Pacific Sand Lance	<i>Ammodytes hexapterus</i>	135
65	ELI - Boat Cove	2017-07-20	15:00-15:59	Sand Lance-like	N/A	N/A	Not possible
66	Reef Islands	2019-07-01	11:00-11:59	Sand Lance-like	Pacific Sand Lance	<i>Ammodytes hexapterus</i>	95
67	Laskeek Bay	2019-07-08	11:00-11:59	Sand Lance-like	Pacific Sand Lance	<i>Ammodytes hexapterus</i>	Not possible
68	Lost Islands	2016-07-09	17:00-17:59	Sand Lance-like	N/A	N/A	Not possible
69	ELI - Lookout Point	2017-07-10	10:00-10:59	Sand Lance-like	N/A	N/A	Not possible
70	ELI - Boat Cove	2017-07-20	15:00-15:59	Sand Lance-like	Pacific Sand Lance	<i>Ammodytes hexapterus</i>	Not possible
71	Reef Islands	2019-07-01	11:00-11:59	Sand Lance-like	Pacific Sand Lance	<i>Ammodytes hexapterus</i>	85
72	Laskeek Bay	2019-07-08	11:00-11:59	Sand Lance-like	Pacific Sand Lance	<i>Ammodytes hexapterus</i>	Not possible
73	Lost Islands	2016-07-09	17:00-17:59	Sand Lance-like	Pacific Sand Lance	<i>Ammodytes hexapterus</i>	160
74	ELI - Lookout Point	2019-07-09	10:00-10:59	Sand Lance-like	Pacific Sand Lance	<i>Ammodytes hexapterus</i>	105
75	ELI - Boat Cove	2017-07-02	18:00-18:59	Sand Lance-like	N/A	N/A	Not possible
76	ELI - Boat Cove	2018-07-04	10:00-10:59	Sand Lance-like	N/A	N/A	Not possible
77	Hotspring Island	2016-07-05	18:00-18:59	Sand Lance-like	N/A	N/A	Not possible

78	Skedans islands	2019-07-08	10:00-10:59	Sand Lance-like	N/A	N/A	Not possible
79	ELI - Lookout Point	2019-07-09	10:00-10:59	Sand Lance-like	N/A	N/A	Not possible
80	ELI - Boat Cove	2019-07-11	09:00-09:59	Sand Lance-like	N/A	N/A	Not possible
81	ELI - Boat Cove	2018-07-04	10:00-10:59	Sand Lance-like	N/A	N/A	Not possible
82	Hotspring Island	2016-07-05	18:00-18:59	Sand Lance-like	N/A	N/A	105
83	Laskeek Bay	2019-07-08	10:00-10:59	Sand Lance-like	N/A	N/A	105
84	ELI - Lookout Point	2017-07-10	11:00-11:59	Sand Lance-like	N/A	N/A	120
85	Reef Islands	2019-07-01	11:00-11:59	Sand Lance-like	Pacific Sand Lance	<i>Ammodytes hexapterus</i>	85
86	ELI - Boat Cove	2017-07-02	18:00-18:59	Sand Lance-like	N/A	N/A	Not possible
87	ELI - Boat Cove	2018-07-04	10:00-10:59	Sand Lance-like	Pacific Sand Lance	<i>Ammodytes hexapterus</i>	120
88	Laskeek Bay	2019-07-08	11:00-11:59	Sand Lance-like	Pacific Sand Lance	<i>Ammodytes hexapterus</i>	Not possible
89	ELI - Lookout Point	2019-07-09	10:00-10:59	Sand Lance-like	Pacific Sand Lance	<i>Ammodytes hexapterus</i>	120
90	Reef Islands	2017-07-10	11:00-11:59	Sand Lance-like	N/A	N/A	120
91	Reef Islands	2017-07-10	11:00-11:59	Sand Lance-like	N/A	N/A	Not possible
92	Reef Islands	2017-07-10	11:00-11:59	Sand Lance-like	N/A	N/A	Not possible
93	Reef Islands	2017-07-10	11:00-11:59	Sand Lance-like	N/A	N/A	Not possible
94	Reef Islands	2017-07-10	11:00-11:59	Sand Lance-like	N/A	N/A	Not possible
95	Reef Islands	2017-07-10	11:00-11:59	Sand Lance-like	N/A	N/A	Not possible
96	Reef Islands	2017-07-10	16:00-16:59	Sand Lance-like	N/A	N/A	115
97	Laskeek Bay	2019-07-08	10:00-10:59	Sculpin-like	N/A	N/A	70
98	ELI - Lookout Point	2019-07-09	10:00-10:59	Sculpin-like	Sculpin Family	<i>Cottidae</i>	70

99	East Limestone Island (ELI)	2018-07-16	09:00-09:59	Sculpin-like	Sculpin Family	<i>Cottidae</i>	75
100	Laskeek Bay	2019-07-08	10:00-10:59	Sculpin-like	N/A	N/A	80
101	ELI - Lookout Point	2019-07-09	10:00-10:59	Sculpin-like	Sculpin Family	<i>Cottidae</i>	85
102	ELI - Lookout Point	2019-07-09	10:00-10:59	Sculpin-like	Sculpin Family	<i>Cottidae</i>	80
103	Reef Islands	2019-07-01	10:00-10:59	Sculpin-like	Sculpin Family	<i>Cottidae</i>	85
104	Laskeek Bay	2019-07-08	10:00-10:59	Sculpin-like	N/A	N/A	90
105	Laskeek Bay	2019-07-08	11:00-11:59	Sculpin-like	N/A	N/A	95
106	Laskeek Bay	2019-07-08	10:00-10:59	Sculpin-like	N/A	N/A	85
107	Laskeek Bay	2017-07-02	16:00-16:59	Sculpin-like	N/A	N/A	75
108	ELI - Boat Cove	2017-07-11	10:00-10:59	Sculpin-like	N/A	N/A	Not possible
109	Laskeek Bay	2019-07-08	10:00-10:59	Sculpin-like	N/A	N/A	Not possible
110	ELI - Lookout Point	2019-07-09	07:00-07:59	Sculpin-like	N/A	N/A	Not possible
111	Laskeek Bay	2019-07-08	11:00-11:59	Sculpin-like	N/A	N/A	85
112	Laskeek Bay	2019-07-08	11:00-11:59	Sculpin-like	N/A	N/A	85
113	Laskeek Bay	2019-07-08	11:00-11:59	Sculpin-like	N/A	N/A	75
114	Laskeek Bay	2019-07-08	11:00-11:59	Sculpin-like	N/A	N/A	70
115a	East Limestone Island (ELI)	2018-07-15	09:00-09:59	Gunnel-like (brown)	N/A	N/A	85
115b	East Limestone Island (ELI)	2018-07-15	09:00-09:59	Gunnel-like (brown)	N/A	N/A	Not possible

115c	East Limestone Island (ELI)	2018-07-15	09:00-09:59	Sculpin-like	N/A	N/A	Not possible
116a	ELI - Lookout Point	2019-07-09	10:00-10:59	Sand Lance-like	Pacific Sand Lance	<i>Ammodytes hexapterus</i>	120
116b	ELI - Lookout Point	2019-07-09	10:00-10:59	Sculpin-like	Sculpin Family	<i>Cottidae</i>	80
117a	ELI - Boat Cove	2018-07-04	10:00-10:59	Sand Lance-like	Pacific Sand Lance	<i>Ammodytes hexapterus</i>	Not possible
117b	ELI - Boat Cove	2018-07-04	10:00-10:59	Gunnel-like (brown)	N/A	N/A	80
118a	Skedans islands	2019-07-08	11:00-11:59	Gunnel-like (brown)	N/A	N/A	Not possible
118b	Skedans islands	2019-07-08	11:00-11:59	Gunnel-like (red)	N/A	N/A	170
118c	Skedans islands	2019-07-08	11:00-11:59	Sand Lance-like	Pacific Sand Lance	<i>Ammodytes hexapterus</i>	Not possible
119a	Skedans islands	2017-07-02	16:00-16:59	Gunnel-like (brown)	N/A	N/A	70
119b	Skedans islands	2017-07-02	16:00-16:59	Sculpin-like	N/A	N/A	85
120a	ELI - Lookout Point	2019-07-09	10:00-10:59	Gunnel-like (brown)	N/A	N/A	Not possible
120b	ELI - Lookout Point	2019-07-09	10:00-10:59	Sculpin-like	Sculpin Family	<i>Cottidae</i>	80
121a	Lost Islands	2016-07-09	17:00-17:59	Sand Lance-like	N/A	N/A	Not possible
121b	Lost Islands	2016-07-09	17:00-17:59	Gunnel-like (brown)	N/A	N/A	Not possible
122a	Lost Islands	2016-07-09	17:00-17:59	Gunnel-like (brown)	N/A	N/A	Not possible
122b	Lost Islands	2016-07-09	17:00-17:59	Gunnel-like (brown)	N/A	N/A	Not possible
122c	Lost Islands	2016-07-09	17:00-17:59	Sand Lance-like	N/A	N/A	Not possible
122d	Lost Islands	2016-07-09	17:00-17:59	Sand Lance-like	N/A	N/A	Not possible
122e	Lost Islands	2016-07-09	17:00-17:59	Sculpin-like	N/A	N/A	Not possible
123	Laskeek Bay	2019-07-08	09:00-09:59	Rockfish-like	Rockfish	<i>Sebastes</i>	95



124	Skedans islands	2017-07-02	14:00-14:59	Rockfish-like	Rockfish	<i>Sebastes</i>	100
125	Skedans islands	2017-07-02	15:00-15:59	Rockfish-like	Rockfish	<i>Sebastes</i>	85
126	Skedans islands	2019-07-08	11:00-11:59	Rockfish-like	N/A	N/A	90
127	ELI - Boat Cove	2019-07-11	09:00-09:59	Gunnel-like (brown)	N/A	N/A	100
128	ELI - Boat Cove	2016-07-12	09:00-09:59	Gunnel-like (brown)	N/A	N/A	Not possible
129	ELI - Boat Cove	2018-07-04	11:00-11:59	Sculpin-like	N/A	N/A	90
130	Skedans islands	2019-07-08	11:00-11:59	Sculpin-like	N/A	N/A	95
131	Laskeek Bay	2019-07-11	11:00-11:59	Sculpin-like	N/A	N/A	Not possible
132	East Limestone Island (ELI)	2018-07-16	10:00-10:59	Gunnel-like (brown)	N/A	N/A	Not possible
133	ELI - Boat Cove	2018-07-01	15:00-15:59	Unknown 1	N/A	N/A	N/A
134	ELI - Lookout Point	2019-07-09	11:00-11:59	Unknown 2	N/A	N/A	N/A
135	ELI - Boat Cove	2016-07-12	09:00-09:59	Unknown 3	N/A	N/A	N/A
136	Hotspring Island	2016-07-05	18:00-18:59	Unknown 4	N/A	N/A	N/A
137	ELI - Boat Cove	2018-07-01	14:00-14:59	Unknown 5	N/A	N/A	N/A
138	Hotspring Island	2016-07-05	18:00-18:59	Unknown 6	N/A	N/A	N/A
139	ELI - Lookout Point	2019-07-09	10:00-10:59	Unknown 7	N/A	N/A	N/A
140	Laskeek Bay	2019-07-08	11:00-11:59	Unknown 8	N/A	N/A	N/A
141	Laskeek Bay	2016-07-10	10:00-10:59	Unknown 9	N/A	N/A	N/A

**Appendix 2. Key to Photographed Fishes of Laskeek Bay**

1a) Body elongated ..... 2  
 b) Body not elongated ..... 8

2a) Body is a darker colour on top 1/3 – 1/2 of body and is white below, change between the colours is abrupt ..... 3  
 b) Body is more uniform in colour, not striking difference between upper and lower half of body ..... 4

3a) Body is a darker colour on top 1/3 – 1/2 of body and is white below..... **Sand Lance-like Fish**  
 b) Body is metallic blue or green above and silvery white below, as well as having diagonal creases close together along sides of body and/or has a longitudinal fold along lower side of body ..... **Pacific Sand Lance**

4a) Body is yellow to brown in colour ..... 5  
 b) Body is light red to dark red in colour ..... 7

5a) the length from the snout to the beginning of the anal fin and the anal fin to the end of the tail fin is visible or easily estimated ..... 6  
 b) the length from the snout to the beginning of the anal fin and the anal fin to the end of the tail fin is not visible or easily estimated..... **Gunnel-like Fish (Brown)**

6a) Length from snout to anal fin is greater than half of the body length ..... **The Gunnels (Pholidae)**  
 b) Length from snout to anal fin is equal to or less than half of the body length ..... **The Pricklebacks (Stichaeidae)**

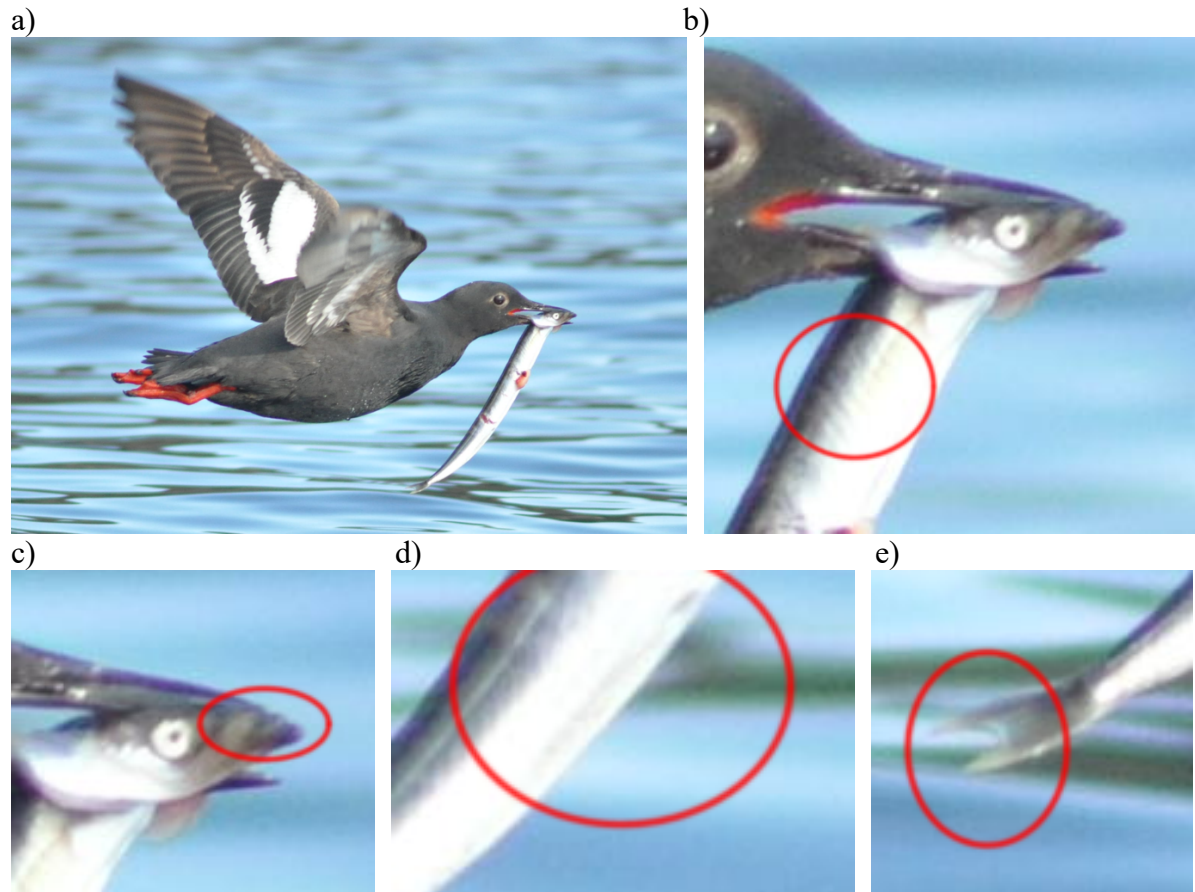
7a) Body is dark wine-red in colour ..... **Penpoint Gunnel (Apodichthys flavidus)**  
 b) Body is a red colour other than dark wine-red ..... **Gunnel-like Fish (red)**

8a) Head larger than thickness of body, body tapers to a narrow tail ..... 9  
 b) Head not larger than thickness of body ..... 10

9a) Fish body is banded or blotched with dark brown colours with other features not visible ..... **Sculpin-like Fish**  
 b) Fish body is banded or blotched with dark brown colours and/or has a gill cover with spines and/or has a large mouth and/or has large fan-like pectoral fins ..... **Sculpin Family (Cottidae)**

10a) Body has a “bass-like” shape with other features not clearly visible ..... **Rockfish-like**  
 b) Body has a “bass-like” shape with a single dorsal fin that has spine section in the front (close to head) and a ray section in the back ..... **Rockfish Genus (Sebastes)**

**Appendix 3** Photographs of fish groups with identification points highlighted



Pacific Sand Lance being held by a Pigeon Guillemot in Laskeek Bay. These pictures exhibit a) entire fish with slender elongate body and colour pattern (metallic blue or green above and silvery white below) b) diagonal creases close together along the side of body c) projecting lower jaw d) longitudinal fold along lower side of body and e) forked tail fin.

a)



b)



c)



d)



Members of the gunnel-like (brown) category being held by Pigeon Guillemots in Laskeek Bay. These pictures exhibit a) elongated, laterally compressed body b) small pectoral fins c) anal fin extending along lower side of body and d) anal fin beginning less than half way from snout to tail (Stichaeidae).

a)



b)



Members of the gunnel-like (red) category (probably Penpoint Gunnel, *Apodichthys flavidus*) being held by Pigeon Guillemots in Laskeek Bay. These pictures exhibit a) large size of the fish (relative to other fish photographed being held by the Pigeon Guillemots) b) the deep wine-red colour (typical of the Penpoint Gunnel) and the long dorsal fin with a narrow width (fin is not folded over in this picture).

a)



b)



c)



Members of the Sculpin family (Cottidae) being held by Pigeon Guillemots in Laskeek Bay. These pictures exhibit a) large head with body tapering off to a slender tail with a body that is banded or blotched with dark brown b) relatively large pectoral fin c) large mouth and a gill cover with spines (could possibly be 1 to 4 spines).

a)



b)



c)



Members of the Rockfish-like category being held by Pigeon Guillemots in Laskeek Bay. These pictures exhibit a) body shape b) dorsal fin with spine section (closer to head) and ray section and c) relatively large body (thick) when compared to other fish photographed being held by Pigeon Guillemots.

## Appendix 4

Gunnel-like species found along the BC coast at the same latitudes as Haida Gwaii

<b>The Pricklebacks (Family: <i>Stichaeidae</i>)</b>		<b>The Gunnels (Family: <i>Pholidae</i>)</b>	
<b>Common Name</b>	<b>Scientific Name</b>	<b>Common Name</b>	<b>Scientific Name</b>
Mosshead Warbonnet	<i>Chirolophis nugator</i>	Penpoint Gunnel	<i>Apodichthys flavidus</i>
Decorated Warbonnet	<i>Chirolophis decoratus</i>	Rockweed Gunnel	<i>Xererpes fucorum</i>
High Cockscomb	<i>Anoplarchus purpureus</i>	Crescent Gunnel	<i>Pholis laeta</i>
Slender Cockscomb	<i>Anoplarchus insignis</i>	Saddleback Gunnel	<i>Pholis ornata</i>
Whitebarred Prickleback	<i>Poroclinus rothrocki</i>	Longfin Gunnel	<i>Pholis clemensi</i>
Pacific Snake Prickleback	<i>Lumpenus sagitta</i>		
Rock Prickleback	<i>Xiphister mucosus</i>		
Black Prickleback	<i>Xiphister atropurpureus</i>		
Ribbon Prickleback	<i>Phytichthys chirus</i>		
Longsnout Prickleback	<i>Lumpenella longirostris</i>		

Sculpin-like species found along the BC coast at same latitudes as Haida Gwaii

<b>The Sculpins (Family: <i>Cottidae</i>)</b>		<b>The Poachers (Family: <i>Agonidae</i>)</b>	
<b>Common Name</b>	<b>Scientific Name</b>	<b>Common Name</b>	<b>Scientific Name</b>
Blackfin Sculpin	<i>Malacocottus kincaidi</i>	Northern Spearnose Poacher	<i>Agonopsis vulsa</i>
Brown Irish Lord	<i>Hemilepidotus spinosus</i>	Pygmy Poacher	<i>Odontopyxis trispinosa</i>
Buffalo Sculpin	<i>Enophrys bison</i>	Sturgeon Poacher	<i>Podothecus accipenserinus</i>
Cabezon	<i>Scorpaenichthys marmoratus</i>	Tubenose Poacher	<i>Pallasina barbata</i>
Calico Sculpin	<i>Clinocottus embryum</i>		
Darter Sculpin	<i>Radulinus boleoides</i>		
Dusky Sculpin	<i>Icelinus burchami</i>		
Fluffy Sculpin	<i>Oligocottus snyderi</i>		
Great Sculpin	<i>Myoxocephalus polyacanthocephalus</i>		
Longfin Sculpin	<i>Jordania zonope</i>		
Manacled Sculpin	<i>Synchirus gilli</i>		
Mosshead Sculpin	<i>Clinocottus globiceps</i>		
Northern Sculpin	<i>Icelinus borealis</i>		



Padded Sculpin	<i>Artedius fenestralis</i>		
Prickly Sculpin	<i>Cottus asper</i>		
Roughback Sculpin	<i>Chitonotus pugetensis</i>		
Roughspine Sculpin	<i>Triglops macellus</i>		
Red Irish Lord	<i>Hemilepidotus hemilepidotus</i>		
Ribbed Sculpin	<i>Triglops pingeli</i>		
Rosylip Sculpin	<i>Ascelichthys rhodorus</i>		
Saddleback Sculpin	<i>Oligocottus rimensis</i>		
Sailfin Sculpin	<i>Nautichthys oculofasciatus</i>		
Scalyhead Sculpin	<i>Artedius harringtoni</i>		
Sharpnose Sculpin	<i>Clinocottus acuticeps</i>		
Silverspotted Sculpin	<i>Blepsias cirrhosus</i>		
Slim Sculpin	<i>Radulinus asprellus</i>		
Smoothhead Sculpin	<i>Artedius lateralis</i>		
Soft Sculpin	<i>Gilbertidia sigalutes</i>		
Spinyhead Sculpin	<i>Dasycottus setiger</i>		
Spinynose Sculpin	<i>Radulinus taylori</i>		
Spotfin Sculpin	<i>Icelinus tenuis</i>		
Staghorn Sculpin	<i>Leptocottus armatus</i>		
Threadfin Sculpin	<i>Icelinus filamentosus</i>		
Tadpole Sculpin	<i>Psychrolutes paradoxus</i>		
Thornback Sculpin	<i>Paricelinus hopliticus</i>		
Tidepool Sculpin	<i>Oligocottus maculosus</i>		

Gunnel-like species that were found in the Gwaii Haanas Eelgrass surveys

<b>The Pricklebacks (Family: <i>Stichaeidae</i>)</b>		<b>The Gunnels (Family: <i>Pholidae</i>)</b>	
<b>Common Name</b>	<b>Scientific Name</b>	<b>Common Name</b>	<b>Scientific Name</b>
Black Prickleback	<i>Xiphister atropurpureus</i>	Crescent Gunnel	<i>Pholis laeta</i>
High Cockscomb	<i>Anoplarchus purpureus</i>	Penpoint Gunnel	<i>Apodichthys flavidus</i>
Mosshead Warbonnet	<i>Chirolophis nugator</i>	Rockweed Gunnel	<i>Xererpes fucorum</i>
Slender Cockscomb	<i>Anoplarchus insignis</i>		
Pacific Snake Prickleback	<i>Lumpenus sagitta</i>		

Sculpin-like species that were found in the Gwaii Haanas Eelgrass surveys

<b>The Sculpins (Family: <i>Cottidae</i>)</b>		<b>The Poachers (Family: <i>Agonidae</i>)</b>	
<b>Common Name</b>	<b>Scientific Name</b>	<b>Common Name</b>	<b>Scientific Name</b>
Brown Irish Lord	<i>Hemilepidotus spinosus</i>	Northern Spearnose Poacher	<i>Agonopsis vulsa</i>
Buffalo Sculpin	<i>Enophrys bison</i>	Pygmy Poacher	<i>Odontopyxis trispinosa</i>
Cabezon	<i>Scorpaenichthys marmoratus</i>	Sturgeon Poacher	<i>Podothecus accipenserinus</i>
Calico Sculpin	<i>Clinocottus embryum</i>	Tube-nose Poacher	<i>Pallasina barbata</i>
Fluffy Sculpin	<i>Oligocottus snyderi</i>		
Great Sculpin	<i>Myoxocephalus polyacanthocephalus</i>		
Longfin Sculpin	<i>Jordania zonope</i>		
Manacled Sculpin	<i>Synchirus gilli</i>		
Padded Sculpin	<i>Artedius fenestralis</i>		
Prickly Sculpin	<i>Cottus asper</i>		
Roughback Sculpin	<i>Chitonotus pugetensis</i>		
Red Irish Lord	<i>Hemilepidotus hemilepidotus</i>		
Rosylip Sculpin	<i>Ascelichthys rhodorus</i>		
Saddleback Sculpin	<i>Oligocottus rimensis</i>		
Scalyhead Sculpin	<i>Artedius harringtoni</i>		
Sharpnose Sculpin	<i>Clinocottus acuticeps</i>		

Smoothhead Sculpin	<i>Artedius lateralis</i>		
Spinynose Sculpin	<i>Radulinus taylori</i>		
Staghorn Sculpin	<i>Leptocottus armatus</i>		
Tidepool Sculpin	<i>Oligocottus maculosus</i>		