



Seabird Youth Network

Class Two: Feeding and Diet

Seabirds have adapted to eat food from the sea, and much of their physiology and behavior has been shaped by their diet.

WHAT DO THEY EAT?

Seabirds eat primarily **fish, squid, and crustaceans**.

A few species will eat *carrion*, or take other seabird eggs or chicks.



Eulachon:

- Also called hooligan and candlefish
- Popular prey species for seabirds because of their high fat content.
- Up to 15% total body weight is fat!
- If they are caught and dried, they can be used as a candle! Hence, their name — candlefish.

Eulachon. © Tom Kline, via Creative Commons.

- Some species of seabird have a fairly *specialist* diet, e.g. the least auklet eats primarily zooplankton.
- Other species are *generalists*, e.g., the thick-billed murre will eat fish, crustaceans, zooplankton, and squid.



Least Auklet. © John Gibbens.

Definitions:

Specialists: eating one or very few types of food.

Generalists: eating a variety of prey (depending on what is available)

Carrion: dead flesh

HOW DO THEY CATCH FOOD?

Seabirds have four basic feeding strategies:

1) Surface feeding

Many seabirds feed on the surface of the ocean, only dipping their head into the water to catch prey.

Ocean currents, or the vertical migration of some prey species (such as squid) concentrates prey near the surface of the water and makes them available to seabirds.

Surface feeders either feed:

(a) **While flying**, e.g., storm petrels.

These species either: (i) **grab food** from the water in mid flight (like the frigate bird), (ii) **patter and hover** on the water's surface (like some species of storm petrel), or (iii) **skim the surface** of the water (like the skimmer).



Black Skimmer. © MurrayH77, via Creative Commons.

Black Skimmer:

- Breeds in North and South America.
- Lower bill dragged in water. Bill shuts when it touches something in the water.
- Eats fish, insects, crustaceans, and molluscs.



White vented storm petrel. © NKS Swampie, via Creative Commons.

White vented storm petrel:

- Breeds on islands off Chile.
- Appears to “walk on water” in search of zooplankton and fish.

(b) **While swimming**, e.g. fulmars, shearwaters.

The bills of these species are often adapted for catching prey. Albatross have a hooked bill to catch prey such as squid. Prions have filters (lamellae) that filter plankton from the mouthful of water.



Northern Fulmar. © Ryan Shaw, via Creative Commons.

Northern Fulmar:

- Breeds in subarctic regions of N. Atlantic and N. Pacific.
- Two color morphs: Light (almost white), and Dark (grey, as in photo).
- A tubenose (family Procellariidae).
- Produces stomach oil that can be used against predators (will matt the plumage of other birds), and is a rich meal for their chick.
- Starts breeding between 8-12 yrs.

2) Pursuit Diving

Some species swim underwater in pursuit of prey. These species have the advantage of accessing a greater area to find food than the surface feeders or plunge divers.

Many also have **specialized adaptations for conducting long, deep dives.**

For example, the emperor penguin can dive to depths of more than 1500ft. Scientists have shown that they can lower the rate of their heartbeat when diving in order to conserve oxygen and allow longer dives. During one 18 minute dive, one penguin decreased its' heart-rate to 3 beats per minute!

Pursuit divers swim underwater either using:

- (a) **Foot propulsion** (cormorants, grebes, loons)
- (b) **Wing propulsion** (penguins, auks, diving petrels)

Feet and wings that are specially adapted for underwater travel are usually less efficient for other uses. For example, the legs of loons are located far back on their body (near the tail) for efficient swimming under water, and they have a hard time walking on land. And, puffins have short, narrow wings (like flippers) that are excellent for swimming underwater, but they have to work very hard when flying.



Tufted Puffin. © JDurston2009, via Creative Commons.

Tufted Puffin:

- Breeds in North Pacific.
- Nests in burrow (dug with feet and bill) or crevice between rocks.
- Carries whole fish back to chick at the colony, held crosswise in the bill.
- Bill adapted to hold fish; raspy tongue holds fish against spines on the palate (top of the bill).
- May dive deeper than 80 feet to catch fish!

3) Plunge diving

These species dive into water from flight to catch prey. They include the gannets, boobies, tropic birds, and some terns. This is the most specialized form of feeding, and it can take years for individuals to learn efficient foraging. Some plunge-divers are dependent on marine mammals (such as dolphins) and predatory fish (e.g., tuna) to push prey to the surface.

4) Kleptoparasitism, scavenging and predation

Kleptoparasites steal food from other seabirds (e.g., frigate birds and skuas). This method of hunting usually supplements other methods of foraging.

Scavenging. Some birds, such as gulls, feed on seabird and marine mammal carrion, and many species have learned to scavenge offal or bycatch from commercial fishing boats and processors.



Southern Giant Petrel:

- Breeds in Southern Hemisphere.
- Aggressive predator and scavenger; whalers used to call them “gluttons”.
- Feeds on carrion (especially seals and penguins). Capable of killing other birds. Also eats squid, krill, offal, and discarded fish from commercial fishing boats.

Southern Giant Petrel feeds on carcass of Southern Fur Seal. © JDurston2009, via Creative Commons.

Predation: gulls, skuas, and giant petrels will often take eggs, chicks and even small adults from seabird colonies. The great skua will often take adult puffins and gulls, and the giant petrel will even tackle an albatross! Yikes!

HOW DO THEY FEED THEIR CHICK?

All seabird catch food out at sea, and then have to carry the food back to their chick at the nest-site. They carry their food using four main methods:

1) Whole prey:

Many species carry whole prey in their bill. These species maximize the value of the meals by choosing large and nutritious prey species. Murres and many species of tern carry single prey items back to their chick, whereas puffins may carry over 30 items in their bill!



Common Tern:

- Circumpolar distribution
- Plunge-dive (from heights of about 3-10ft), and dive no deeper than 50cm underwater.
- Has the longest migration of any bird. Travelling from the Arctic to spend winters in the Antarctic (11,000 miles of more!).

Common Tern carrying fish. © David Gibbon, via Creative Commons.

2) Regurgitation:

Some species of seabird, such as kittiwakes, regurgitate the content of their stomach for their chick.



Black-legged Kittiwake:

- Breeds in North Atlantic and North Pacific.
- Breed in large colonies, on cliffs. Nest is made of mud, seabird and moss.
- Lays 1-3 eggs
- Often feeds in flocks. Catching food at the surface, or just below the surface of the water.

Black-legged Kittiwake. © Brandon Birder, via Creative Commons.

3) Throat or gular pouch:

Some species have a pouch (or sac) under their tongue or in their throat that they store whole prey for their chick. Least Auklets can carry more than 700 zooplankton in their pouch.

4) Stomach oil:

Some species feed their chick stomach oil. This oil is created from partly digested prey. It is very energy rich, about 9,600 calories per gram. In comparison, most cheeses only have 3 to 4.5 calories per gram! These incredibly high-energy meals are important to small birds, such as the storm petrel, that only feed their chick once every 24 hours (at nighttime).