Marine Birds of Puget Sound

A presentation designed for Sound Water Stewards training by Jay Adams
Marine Birds include those avian species that have evolved and adapted to live on and around the sea.
In Puget Sound and the Salish Sea, marine birds includes these avian families (using font colors found on those families)

Gulls
Terns
Auks
Scoters

Loons
Grebes
Mergansers
Cormorants
These six gull species are common in our area

- Glaucous-winged Gull
- Ring-billed Gull
- California Gull
- Heermann’s Gull
- Mew Gull
- Bonaparte’s Gull
In terms of numbers, the most frequently-seen gull in our region is a hybrid — a cross between Glaucous-winged Gull and Western Gull. The resulting intergrade has no scientific name but is becoming known as “Olympic Gull”
Despite their differences in appearance, all these gulls share certain characteristics:

- They are opportunistic omnivores – eating almost anything, they expel inedible material in pellets
- They are able to drink seawater (special glands allow gulls to expel excess salt through openings their bills)
- They have webbed feet to enable efficient swimming
- They do not dive but rather feed from the surface
- Males and females are similar in appearance
- Gulls take multiple years (usually three to four) to mature, during which time they show a sometimes bewildering array of plumages (see next slide)
For example, see these photos of variously-aged Glaucous-winged Gulls:

- **First Winter**
- **Second Winter**
- **Winter Adult**
- **Breeding Adult**
Gulls vary significantly in where they breed and where they spend the winter, as can be seen on the range maps on the next couple of slides.
Bonaparte’s Gull, shown here, is the only North American gull that breeds in trees.
Similar to gulls in appearance, terns share breeding and feeding habitats with gulls. They differ from gulls in their diets and manner of feeding.
Unlike gulls, terns plunge-dive to feed. In addition, they eat only fish - so don’t look for them in fast-food parking lots.
Terns also prefer to nest and raise their young at the tips of sandy spits.
We typically see just one species of tern, Caspian Tern, in our region. The bird’s red bill, black cap, and harsh call give it away.

Although terns feed at sea on small fish and crustaceans, they drink only fresh water and have no glands to expel excess salt.
Caspian Terns commonly winter on inland fresh-water lakes.
Auks – also known as Alcids – is a family of seabirds that not only dive to feed but can swim to great depths (400 feet in some cases). And while underwater, they use their wings, not their feet, for propulsion.

Auks breed on land, most often on rocky ledges or in burrows in cliffs. The exception to this breeding behavior is Marbled Murrelet. See more about that species below.
These are the four Alcids most often seen on Puget Sound:

- **Common Murre**
- **Pigeon Guillemot**
- **Marbled Murrelet**
- **Rhinoceros Auklet**
Rhinoceros Auklet may be the most numerous of the Alcids in our area. This one is in breeding plumage. Note the orange bill, the Rhinoceros-like horn on the bill, and the two white stripes (actually feathers).
See how this Rhino Auklet (as the species is commonly known) spreads its wings as it begins its dive.
Rhinoceros Auklets nest in burrows such as these on Protection Island, just north of Port Townsend. This species feeds its young almost exclusively at night, a behavioral adaptation designed to avoid predators.
Common Murres, seen here in breeding plumage, nest on narrow cliff- or rock-side ledges. Murre eggs are elliptical, which helps prevent the eggs from rolling off the ledge and into the sea.

Common Murre in non-breeding plumage.
Marbled Murrelets, seen in non-breeding plumage on the left and in breeding plumage on the right, share most of the life-style habits of their fellow Alcids. What sets them apart from the other auks is their nesting behavior...
These murrelets nest exclusively on the wide, flattish branches high up in old growth trees. The birds will fly up to 40 miles inland to find the kind of nesting sites they require. Such sites are declining in number as a result of commercial logging and forest disturbance, from human and non-human forest users. Added to this, Marbled Murrelets lay just one egg each year. As a result, the species is endangered in Washington.
Pigeon Guillemot, seen in breeding plumage below and in non-breeding plumage on the right, may be Whidbey Island’s best-know marine bird, thanks in large part to the annual guillemot survey conducted by Whidbey Audubon. Many survey volunteers are SWS members.

Most Pigeon Guillemots nest in Belted Kingfisher-made burrows or other openings in the bluffs on the western side of the Island. A few can also be found on the old dock east of the Keystone Ferry Terminal. Recently-published data from the guillemot survey show the birds population numbers to be holding steady.

The next slide shows range maps for the non-Guillemot auks.
Alcids are known to feed on various species of so-called forage fish. Which species of fish are eaten by each Alcid species is not fully known, as the birds eat while underwater. We do see Alcids carrying fish, but these fish are meant to be fed to the young birds back on the cliff or in the burrow.
Three kinds of Scoters can be found in the Puget Sound area. The two pictured on the left, Surf Scoter above and White-winged Scoter below, are common. Black Scoter, shown below, is harder to find.

Scoters are part of a large group of sea ducks. All are migratory (see the range maps below), all dive to feed, and all tend to eat shellfish, especially mollusks. No wonder there are so many in Penn Cove.
Surf Scoter is the most common scoter in this area. This breeding-plumaged male is unmistakable. No other bird shows the combination of white and orange on a black body.
Common Loon
Summer plumage
Winter plumage

Pacific Loon
Summer plumage
Winter plumage

Red-throated Loon
Summer plumage
Winter plumage
Loons are typically longer-bodied than ducks. All three local species have pointed dagger-like bills. Their legs are set so far back on their bodies that, although they are excellent divers, they are unable to take off from land. For this reason, loons (like the Pacific Loon pictured here) nest close to the edges of large lakes and ponds so they can slip easily into the water to either feed or fly. Loons eat small fish, which they pursue and catch under water.
Horned Grebe
Summer plumage
Winter plumage

Red-necked Grebe
Summer plumage
Winter plumage

Western Grebe
Summer plumage
Winter plumage
Similar to loons, Grebes are actually more closely related to flamingos and pigeons. They are weaker fliers than are the loons. Their lobed, not webbed, feet make them relatively poor swimmers, too.

All grebes build floating nests on shallow ponds and lakes. They winter on open water. Finally, grebes, like loons, feed on small aquatic animals.
Until recent times, Western Grebes like the one pictured wintered off Windbey and Camano Islands by the thousands. Then within the past 10 or 15 years, their numbers crashed. A drop in the kind of fish they eat is one of the probable causes of the decline. Since 2017 however, the numbers are increasing again.
Horned Grebe
Red-necked Grebe
Western Grebe
Mergansers
Red-breasted Merganser
Male                 Female
Common Merganser
Male                 Female
Hooded Merganser
Male                 Female
All of the mergansers are fish eaters and all are divers. Their bills have serrated edges which helps them catch and hold prey. They differ, however, in where they nest, and the habitats they prefer.

Although Red-breasted Mergansers are the most marine of the three species, they nest on the ground in a variety of settings but always close to the water.
Common Mergansers prefer fresh-water lakes and rivers but they can be found in brackish water. They have been seen in Penn Cove, Freeland Harbor, and Dugualla Bay, as well as other Whidbey locations. They nest either on the ground or in tree cavities and sometimes nest boxes.

Hooded Mergansers are also more often found on fresh water, especially wooded ponds and swamps. They will forage in tidal creeks, too, so look for them off the East dike at Deer Lagoon or in the ponds at Earth Sanctuary. Hooded Mergansers also nest in tree cavities or nest boxes.
Cormorants
Three Kinds of Cormorants can be found on Puget Sound waters.

Double-crested Cormorant  
Pelagic Cormorant  
Brandt’s Cormorant
All three varieties feature long necks and tails, a hooked bill tip, and bare skin around the chin that is often colored, especially during breeding season.

Double-crested Cormorants show white crests and a bright orange chin-patch.

Pelagic Cormorants show red chins and white flank patches when breeding.

Brandt’s Cormorants chins turn blue. They also grow thin white plumes.
In addition, all cormorants are divers. To avoid competition, however, the different species have evolved to feed at different water depths, and eat different kinds of fish.
Double-crested Cormorants tend to fish in shallower waters, or nearer the surface. Pelagic Cormorants usually feed close to underwater rocks. Brandt’s Cormorant feeds at deeper levels, and on larger fish species.
Double-crested Cormorant
Pelagic Cormorant
Brandt’s Cormorant
Status, Threats, Conservation, Management

Habitat loss

Egg and young predation...
...by crows, ravens, jays

Predation by eagles

Predation of eggs and young by gulls

Entrapment in fishing gear
Status, Threats, Conservation, Management

Oiling  Forage fish declines  Coastal development

Deep-sea fishing  By catch of non-commercial species  Warming waters/acidification

Global Warming Predictions
**Birds on the Washington State Candidate Species, Sensitive, Threatened, and Endangered Lists**

<table>
<thead>
<tr>
<th>Candidate List</th>
<th>Sensitive</th>
<th>Threatened</th>
<th>Endangered</th>
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<tbody>
<tr>
<td>Western Grebe</td>
<td>Common Loon</td>
<td>American White Pelican</td>
<td>Marbled Murrelet</td>
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<tr>
<td>Brandt’s Cormorant</td>
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**Fish species on the state sensitive list**

Pacific Herring, thirteen kinds of Rockfish, Chinook Salmon
Population Trends (see this and the next two slides)

Glaucous-winged Gull
   WAOH: 1987 = 2763, 2015 = 2114
   2016 State of the Birds Report Score = 11

Bonaparte’s Gull
   WAOH: 1987 = 4, 2015 = 7
   2016 State of the Birds Report Score = 11

Caspian Tern
   WAOH: No Data
   2016 State of the Birds Report Score = 10

Common Murre
   WAOH: 1987 = 2, 2015 = 10
   2016 State of the Birds Report Score = 10

Rhinoceros Auklet
   WAOH: No Data
   2016 State of the Birds Report Score = 12

There are several way one can measure to what degree avian species numbers are changing or remaining stable. For the table on the left. WAOH means data from the Oak Harbor Christmas Bird Count for the years 1987 and 2015. So for example, the number of Glaucous-winged Gulls seen in 1987 totaled 2763. In 2015, the number was 2114. Note: Such numbers are not definitive, as some birds were no doubt missed on count day, or at least were not present at the usual Christmas Bird Count locations. The entry “no data” suggests those species are not generally present in winter when the count takes place.

For the 2016 State of the Birds Report, a score of 13 and above indicates that the species in question is threatened with possible extinction. Other data show that the numbers of ocean birds in North America has declined by as much as 70% since 1950.
Marbled Murrelet
WAOH: 1987 = 10, 2015 = 15
2016 State of the Birds Report = 15
Washington population declining at the rate of 8 per cent per year
Biggest threat: Breeding habitat destruction/fragmentation
DNR continues to resist adopting a meaningful management plan
State status = Endangered
Federal status = Threatened

Surf Scoter
WAOH: No Data
2016 State of the Birds Report = 14

Horned Grebe
WAOH: 1987 = 164, 2015 = 32
2016 State of the Birds Report = 13

Western Grebe
WAOH: 1987 = 100, 2015 = 32
2016 State of the Birds Report = 13
Washington Candidate Species
Red-breasted Merganser

WAOH: 1987 = 23, 2015 = 110
2016 State of the Birds Report = 8
Biggest threat: Sea Level Rise – Floating nests cold be driven too far inland

Brandt’s Cormorant

WAOH: 1987 = 3, 2015 = 16
2016 State of the Birds Report = 14
Washington Candidate Species
Cormorants are colonial birds. Sizes of colonies varies from year to year.
Possible important threat? Brandt’s Cormorant diet consists chiefly of Rockfish.
All 13 Washington Rockfish species are candidate species.
In Summary

Of 54 species of North American (including Mexico) marine birds, 57 per cent are in high crisis.

And of 164 species of coastal birds, 56 per cent are similarly in high crisis

http://www.stateofthebirds.org/2016/resources/species-assessments/
Puget Sound is facing unprecedented environmental changes. Not only is there evidence for a changing climate in the Pacific Northwest, but the global ocean that influences Puget Sound is undergoing acidification. Environmental changes associated with climate change and ocean acidification will continue, although there are still many unknowns that remain to be addressed. Climate change and ocean acidification have the potential to profoundly affect ecosystems, and many, if not all, of the Vital Signs are likely to be affected in one way or another.

There is compelling evidence of long-term change in the regional climate, water resources, and local sea level, even considering large natural variations. Already observed changes include higher air temperature, decreased glacial area and spring snowpack, earlier peak streamflows in many rivers, and rising sea level at most locations in and around Puget Sound.

Projections for future climate change depend in part on the ability to foresee greenhouse gas emissions, which will in turn be determined by society’s choices about energy sources and use. To forecast future climate, scientists use a range of low to high greenhouse gas emissions scenarios. All scenarios indicate continued warming in the Pacific Northwest in general, and Puget Sound in particular. However, natural variability will remain an important feature of global and regional climate, at times amplifying or counteracting the long-term trends caused by rising greenhouse gas emissions. There are still many unknowns that remain to be addressed. Climate change and ocean acidification have the potential to profoundly affect ecosystems, and many, if not all, of the Vital Signs are likely to be affected in one way or another.
Impacts on species

Direct changes to marine water quality will occur as seawater pH declines and corrosiveness increases. These changes will alter biological communities in Puget Sound. Species that build shells or other internal structures from calcium, such as molluscs, crustaceans, and echinoderms are affected by corrosive conditions, with negative consequences on shell formation, survivorship, or reproduction. Of the species likely to be affected, molluscs have so far received the most attention. Laboratory tests have shown impacts on Olympia oysters, pteropods (also known as sea angels and sea butterflies), red urchins, and northern abalone. Combining two or more stressors—for example, high temperature and low pH or aragonite saturation state—can cause more harm than either stressor alone. While most marine organisms can tolerate a range of environmental conditions, at some point their tolerance fails. Evidence of conditions in Puget Sound that exceed the tolerance of some native species—pteropods, for instance—have been detected.

Corrosive conditions are particularly of concern to the shellfish industry in Puget Sound, which depends on good water quality to grow oysters, clams, and mussels. Already, this industry has had to make changes to its culture practices to adapt to lower pH water.

Ecosystem-based models suggest that changes to crustacean abundance—especially copepods, a kind of zooplankton—will have a strong impact on overall food web structure. Not only would vital sign indicators such as the Marine Water Condition Index and harvestable shellfish beds be among those impacted by ocean acidification, but also planktivorous forage fish and those species higher up in the food web, such as salmon and marine birds that depend on forage fish for food.