

**Marine Birds of Howe Sound**  
*– their present and change in populations*

*by Karl Ricker*

INTRODUCTION

Ornithological studies in Howe Sound began in the dark days of World War I. The early observations were intermittent, scattered in location and were hampered by lack of over-land transport. Coastal ferries, other commercial vessels, and private launches of usually small size provided the access for the government and academic biologists and a few other citizen scientists. Winter observations were few and probably hampered by inclement weather, and winter is the time of maximum concentration of marine birds in Howe Sound. However, we cannot discount the vigor of local communities on the outer islands of the Sound and bordering Sunshine Coast (Gibsons, Port Mellon) and the thriving isolated communities of Woodfibre, Britannia and Squamish in the inner Sound, and their ferry connections that provided a means for marine bird observations.

Easier over-land access for birders began in 1956, the rail connection to Squamish, and in 1958/59 the opening of the Howe Sound Highway No. 99 brought on more bird observations as well as concomitant industrialization of the port of Squamish, largely on its estuary. The industrial process was at work elsewhere on many estuaries and the biological threat became paramount; British Columbia's salmon stocks needed the estuaries as nursery grounds and the voices of concern reached a head; action to stave off the inevitable was needed.

In the early 1970s, a federal-provincial working group was established and they reviewed what estuaries of significance, to the anadromous fish, required study. A short list of 18 estuaries of most importance was drawn up that required urgent scientific review. Not unexpectedly, the Fraser was the most important and the focus of the first investigation began under the leadership of Dr. M. Waldichuk and his key researcher, Ms. L. Hoos. The second estuary on the list to review was the Squamish. As an observer to these reviews, it was obviously a thorough review process; they left "no stone unturned" in their quest to find the relevant scientific papers, reports

(unpublished) and memos. For birds, federal, provincial and other sources were gathered; the contents synthesized and reviewed; researchers were queried. Their efforts spurred others to begin or continue work on the marine bird populations. Clearly, the estuary crisis spawned a burst of investigations in Howe Sound. For the Squamish project the area of review coverage extended from its watershed to the seaward, roughly as far south as Lions Bay or farther. From the review, Hoos and Vold (1975) produced a first checklist of the birds of the Upper (inner) Howe Sound region, showing 188 species, of which 81 were marine in habitat. The list does not provide any notations on abundance or season of occurrences. However, the text of the report shows some information on these matters as well as a thorough list of references to the sources of information.

The estuary review was also the precursor to local citizen science initiatives beginning in 1980 for the inner Sound, but earlier (1971) by Tony Greenfield at the west side of the outer Sound. In 1979 he initiated the Sunshine Coast Christmas Bird Count that also covered Thornborough Channel from Port Mellon to Gibsons. In 1980 R.J. Cannings organized the first Squamish Christmas Bird Count. Meanwhile, the Provincial Museum was in the throes of compiling all known observations, historic to recent (1987), in their treatise “the Birds of British Columbia” (Volumes 1 & 2 issued: Campbell et al, 1990), those volumes needed for this project, with much useful information for the local scene. At the same time (1990/91) the Squamish Environmental Conservation Society began monthly bird counts on its inner estuary through the leadership of Jim Wisnia, which are still ongoing. Derek Sutton aperiodically reviews the cascade of data collected, producing summaries that note monthly population trends, usual appearances and notable absences. The monthly counts extend seaward to Watts Point in good, long-distance viewing conditions, but in rough weather, it is only a few hundred metres off the edge of the delta.

Wisnia (1997) compiled the first seasonal abundance checklist of the inner estuary using all reports listed in Hoos and Vold (1975) and the monthly count data, as well as random observations. Meanwhile, Greenfield (1997) had compiled a similar list for the Sunshine Coast and the west side of the outer Sound. For a few years before, and up to the closure of the Woodfibre pulp mill (2006), Chris Dale performed monthly counts of the birds seen in the daily ferry commute to work and along the shoreline at the mill site. This data was incorporated in an

update of the estuary checklist (Dale and Ricker 2007, re-issued with minor changes in 2012). The latest endeavour at the inner Sound by the re-named Squamish Environment Society, is an expanded checklist of birds in the Squamish watershed that extends seaward in Howe Sound to Anvil Island (Ricker and Dale, 2014). That is, the list goes seaward of the submerged sill that has a partial hydrodynamic control of the turbid fresh water out-flow of the Squamish River. So, some sea ducks and alcids that avoid diluted sea water are on the list, leaving a gap in checklist coverage to the eastern side of the outer Sound (Porteau to Horseshoe Bay).

In 2003, Lois Mangon instigated the Christmas Bird Count for Lower (outer) Howe Sound. The official count circle (radius 12.07 km) covers almost all islands at the mouth of the Sound, the important Christie Islet and Pam Rock area, and all northern embayments on Gambier Island, as well as short reaches of Thornborough Channel. Recently, random bird sightings are now being reported on e-bird, the entries are by a variety of birders, some professional and others on the amateur side. A typical example is the entry of 37 species surveyed on Passage Island, December 16, 2015, by Ken Wright. Obviously, e-bird will be a significant tool in the production of new and revised checklists, and a big help in assessing future population trends of marine birds in Howe Sound.

#### METHODOLOGY of ANALYSIS

The above-noted pool of checklists and Christmas Bird Counts are the basic sources to assess the population trends. Older data (pre-1971) is incorporated in the checklists and in “The Birds of British Columbia” (vol. 1 and 2). Time and other constraints dictated a simple methodology. That used by Bertram (2014) for assessment of marine birds in the Strait of Georgia are the Christmas Bird Counts, employing the averaging of counts for each selected species for two periods (1990s and 2000s) to provide a population trend. This project is using a similar methodology despite some limitations of the Christmas Bird Count. Critics argue, rightfully, that they are a one-day snapshot and a variety of factors will dictate if the count is too low or too high. By averaging the counts over a number of years, the irregularities in count numbers can be smoothed out. In this case, the period of 1980 to 2001 is averaged for each species and is then compared to the average for 2002/03 to 2015; not a balanced length of timeframes, but there is a

reason why so. The advantages of the Christmas Bird Count is consistency in area (always a 24.14 km diameter circle), the timeframe in the last two weeks of the year, and the field methodology, firm protocol on species recognition and recording of data. Also, for marine birds, the majority congregate in coastal locales in winter; an ideal time to conduct a census.

As noted in the Introduction, there are three Christmas Bird Counts in Howe Sound:

- 1) Sunshine Coast, which overlaps into Howe Sound at Thornborough Channel. Data for that specific locale will be on field sheets not easily retrievable for this project. The area of coverage is mainly west of Howe Sound.
- 2) Lower Howe Sound, now under the direction of Marya de Jong, with local leaders on Bowen, Keats and Gambier Islands. The count, begun in 2003, lacks an older set of data, presenting a challenge to overcome when assessing longer-term trends. The data for 2003 to 2015 was compiled and averaged by the writer.
- 3) Squamish, that is inner Howe Sound, now under the direction of Marcia Danielson. Data for the period of 1980 – 2001 was compiled and averaged by Wisnia (2002) while he directed the count. For the 2002 to 2015 period, the writer has compiled the data and calculated the average number present for each species of interest. Note: the 1992 count was cancelled. The marine component of the count was carried out on the commuter ferry from Darrell Bay to Woodfibre until the pulp mill ceased productive operation in 2005. Since then, a smaller power boat was used if the weather was favourable.

As an assist to the gaps noted above, two seasonal checklists were also used: “Sunshine Coast” (Greenfield, 2011) and “Upper Howe Sound and Squamish Watershed” (Ricker and Dale, 2014), and compared to older lists of each area (Greenfield 1997 and Wisnia, 1997). The lists indicate about 129 marine species in or near outer Howe Sound, 94 of which are also present in the inner Sound.

Obviously, the evaluation of 129 species would overwhelm the objectives of the report, and the abundance of several are too low or spotty to defy a numerical analysis. The list was reduced to 73 species, culling out those that cannot show an occurrence of “Uncommon” (i.e. 1 to 6 birds/day) or better for any month (or season) in the year. So, the “Accidentals” (one record

only), “Casuals” (less than 10 birds/year and not present every year) and “Rare” (less than 10 birds/year, seen every year) were dismissed.

The 73 bird species are listed on Table I showing their seasonal abundance, Lower Howe Sound (LHS) against Upper Howe Sound (UHS), the latter in **bold font**. The average count for each species for the timeframe noted is also shown and, again, the Upper Howe Sound averages are shown in bold font for both time periods. Because there are no average values for the older time period for Lower Howe Sound, the only recourse is to compare the younger data set to both checklists for the Sunshine Coast (1997 and 2011). This comparison is crude but the designation “Fairly Common” (FC) is valuable, indicating 7 to 20 birds, and providing a coarse comparison to the numerical average count.

## POPULATION TRENDS

Table 1 provides a guide to review the population trend for most species. It also shows a difference in habitat for many species: the preference for diluted waters at the head of Howe Sound by dabbling ducks and herons, as opposed to higher salinity waters of the Lower Sound by sea ducks, alcids, loons, grebes and, probably, the Brandt’s cormorant. The status in population changes are summarized on Table 2. The trends are suggestive for both ends of the Sound for the species noted, despite the overall decline in numbers towards the head of the Sound for some. Roughly, 20% of the species analyzed are increasing in numbers. Those of little change (i.e. quasi-stable in abundance) are scattered in location but the average for the entire Sound is about 16.5%. For sandpiper species that only appear in warm months of the year, and are in long-range migratory flights, there is little winter data. The data used to compile their trends are the checklists, showing that their presence is in low numbers. Some notes on the various groups of birds are in the following paragraphs.

### Swans, Geese and Marsh (Dabbling) Ducks

Generally, the populations for dabblers are increasing, and especially so for those in the Upper Sound, a product of restoration of natural features on the Squamish River delta. Similarly,

Canada goose numbers are increasing to nuisance levels whereas Trumpeter swans are reducing their presence at ground level, but hefty fly-by counts are maintained in peak migration seasons (November and March). The data for the outer Sound lacks the robustness of the inner Sound.

### Bay (Diving) and “Sea” Ducks

The counts on Barrow’s goldeneyes and surf scoters are very high for the outer Sound, and appear to have been that way for several decades, but scoter numbers for the inner Sound are drastically reducing, beginning in 1991. Reduction in herring spawn is said to be a possible reason for the decline which also affects the presence of scaup and red-breasted mergansers. Squamish Stream Keepers are now wrapping off creosoted pilings to prevent their toxicity from reaching herring eggs. The procedure is already showing positive results. Thus, some seabird declines may soon be reversed. Harlequin and long-tailed ducks, and white-winged scoters are in serious decline in the upper Sound but appear to be at steady-to-increasing trends in the outer Sound. The only bay duck currently showing a population increase in the upper Sound is the bufflehead.

### Loons and Grebes

Numbers on all species, with the exception of the pied-billed grebe are in decline. Numbers on all began significant decreases in the 1990s. The most spectacular decline has been the Western grebe, which began in 1991, and its decline has been noted throughout the Salish Sea as a 81-95% decrease in numbers (Bertram, 2014). The reduction is attributed to widespread oceanic fluctuations although some investigators also point to changing returns in the herring populations. Thus, the lower numbers in Howe Sound are a symptom of a widespread phenomenon. This grebe has not yet rebounded in numbers and is listed as a “Species of Special Concern” by COSEWIC. The decline in other grebe species in Howe Sound is also part of universal decreases seen elsewhere in the entire Salish Sea. Counts on loon species are also diminishing with significant reduction in numbers for the usual three species, beginning in 1994-1997 for the inner Sound. However, increasing trends are suggested by comparing Greenfields

checklists (1997, 2011), and a figure of a recent 12.6% increase for common loons is shown for the Salish Sea (Bertram, 2014).

### Cormorants

Happily, the counts on two of the three species are increasing, and the third, Brandt's cormorant (a southern species) may be up as well for the outer Sound. The inner Sound is not the habitat for the Brandt's which prefers up-welling oceanic salinities. There are important breeding sites in the Sound. Christie Islet and Pam Rock surveys show between one and 169 nests for the double-crested cormorant, with a recent record of 119 in 1987 (Campbell *et al*, 1990). For the same location, the number of nests for Pelagic cormorants has been 7 to 51 nests and 44 in 1987. Passage Island is also home to a nesting colony of the latter: 2 to 180 nests, but only 16 in 1987.

### Sandpipers, Plovers and Oystercatchers

Rocky shores species in this group of birds live in significant presence in the outer Sound but shores of the inner Sound, where such habitat exists, fail to show any birds during the Christmas Bird Counts. However, at least a few are present in other months of the year. Species preferring a soft sediment substrate, with minor exception, are long-distance migrants moving through in late spring and returning in mid- to late-summer. One notable species in this group is the killdeer, showing a decline in the winter season throughout the Sound. The 13 years of lower Howe Sound Christmas Counts also show the following: black oystercatchers and black turnstones are quite steady in numbers seen; surfbirds are in a decline; rock sandpipers have not been seen since 2007, and their numbers have reduced since the 1980s/90s. Comparing old and new checklists, the outer Sound has experienced a decrease in western and least sandpipers but has seen increases in dunlin, short-billed dowitchers, Wilson's snipe and red-necked phalarope. But, for inner Howe Sound, there are increases in western and least sandpipers, as well as long-billed dowitchers and Wilson's snipe. Spotted sandpipers, the most often seen in both regions, have increased in all seasonal counts in the Squamish region. However, populations of all sandpipers in the Howe Sound region are but 'small potatoes' compared to the hundred (or more)

thousands enumerated at the nearby Fraser Delta. Could we suggest that the richness of the latter (biofilm food sources) dissuades the birds' use of Howe Sound?

### Gulls, Terns and Jaegers

Christie Islet, a bird sanctuary, is the key area for the breeding of glaucous-winged gull populations in Howe sound. Nesting populations are enumerated aperiodically. Other colonies are found at nearby Pam Rock, Passage Island, and Grebe Islets (southeast of Horseshoe Bay). Surveys show a general increase to 1978, and a slight decrease thereafter (Campbell *et al*, 1990). The numbers vary from 10 nests at Pam Rock (1956) to 788 nests at passage Island (1978). Christie Islet and Pam Rock are also attractive locations for other species, notably surf scoters, Canada geese and shorebirds.

There are thousands of gulls elsewhere in the Sound; the large landfill near Brackendale on any day in winter can have several thousand birds, mainly glaucous-winged, moving in and out to confound the Christmas Bird Count. Another problem of the count is species recognition. Greenfield's (2011) counts are very exacting to the relative age of the gull and species identity. Other Christmas Bird Counts suffer a "loose" species identity, especially between herring and Thayer's gull (so noted by Campbell *et al*, 1990) and more recently with Thayer's and western x glaucous-winged gull hybrids. Estimation of population trends are confounded by the uncertainties. So far, all large gull species, taken as a whole, for the upper Howe Sound area show an increase of about 900 birds to about 4000 in total. Whereas the lower Sound count totals are about 650 birds and indicate possibly little change in numbers from the pre-2003 period.

For smaller gull species, the decline in mew gulls in the upper Sound is related to the closure of a sewer outfall on the Squamish Estuary where birds frequented prior to 2002. The decline in Bonaparte gulls in the upper Sound may be related to the decline in herring spawn and/or the lack of upswelling waters to bring food to the surface. In this regard, numbers are likely to be erratic in all counts within the sound. Terns also appear in the sound, late spring to early autumn; the Caspian tern is seen most often. Checklists indicate a low increase in the Caspian



and slight decrease for the common tern in the outer Sound; the latter is an accidental visitor at Squamish, while the status on the Caspian has not changed in the last several decades.

### Alcids

The species of special worry is the marbled murrelet because of forest harvest destroying its nesting sites, so documented near Squamish. Thor Halverson (pers. comm.) actually felled one such tree in the Furry Creek watershed, unknowingly, that such a nest with murrelets was present. Hence, the recent decline of murrelets in the upper Sound is not a surprise, while numbers in the outer Sound appear to fluctuate, as to be expected, and thus an overall significant decline there is not apparent. Common murrelets have not been seen in recent Squamish counts, whereas the population appears to be at a stable low level in the outer Sound. This is surprising because in the Salish Sea, the birds fly in long lines, of 15 or more birds, rather than in ones or twos. Pigeon guillemots are quasi-stable in very low counts throughout the Sound, and are usually seen alone, thereby being difficult to assess in a population trend.

### Other Birds

The data shows that the population of great blue herons has decreased in the outer Sound but increased at Squamish, despite the threat of a robust bald eagle population. A typical winter day on the Squamish Estuary will see 20-35 birds on one set of logs in the eastern marsh, and a total count of 30-45 birds for the entire estuary is not unusual. A small heronry on the forested slopes above the west side of the delta has not been re-occupied for years and a new site which might be elsewhere in the region has not been found. Kingfishers are at a stable low level population in both regions, and a slight increase at the inner Sound is shown by the data. The great egret might have an eventual increase in presence in its move northward from coastal and interior USA (Campbell *et al*, 1990). So far, the sightings are few and spotty in location although there are some scant records in Howe Sound.

## COMPARISON of POPULATION TRENDS ELSEWHERE

Fortuitously, a recent monograph on the Strait of Georgia, and of wider “Salish Sea” in content, sheds a very illuminating picture on the population trends of 37 species of marine birds and the status of 53 others with respect to the Migratory Act and Species at Risk designations (see Bertram, 2014). On Table 3, 34 Howe Sound species are compared to the average trends at eleven Christmas Bird Count locations in the Salish Sea (10 in Canada, one in Puget Sound). Three other species on Bertram’s tables are not seen in Howe Sound at Christmas time. The data, time-wise, is not quite comparable; the analysis data for the Salish Sea is slightly older (5 years) for each time period, but is considered sufficient to show a rough comparison between Howe Sound and the ‘outside’ waters. And, again, the lack of an older data set precludes a numerical comparison to outer (lower) Howe Sound. Some positive increases in population are common to both regions: pelagic cormorants, double-crested cormorants, Canada goose, American wigeon, mallard, green-winged teal, Barrow’s goldeneye, bufflehead and pigeon guillemot – the lattermost is based on only a few birds seen in the Howe Sound counts. There are seven other positive species trends in the Salish Sea (Table 3) which do not match the three other positives in Howe Sound. That is, there are 18 other species showing negative trends for both regions, the most significant losses being western grebes, Bonaparte gulls and common murre. So, roughly, what has happened with winter bird populations locally is manifest (with minor exceptions) in the big picture of population trends in coastal marine birds nearby.

## CAUSES of POPULATION CHANGES

Population changes with most birds are cyclical, as shown by graph after graph in Campbell *et al’s* (1990) treatise, but the duration of the cycle and its causes varies as to the species affected, or to the underlying species causing the change in the food chain. The changes and the causes are outlined by Bertram (1984). Locally, the decline in the Pacific herring is finger-pointed, and Bertram (2014) supports this view, although he also highlights the competitive atmosphere (seals, gulls, etc.) when herring are available. The seal population in Howe Sound is very robust, especially near the mouth of the Squamish River when fish are present. Other factors discussed by Bertram (2014) are: human threats (and the herring fishery), habitat alienation by a variety of

man-made expansions, toxic compounds (including creosoted pilings), oilings (bilge discharge and spills), bird harvest (still legal), and climate change.

Legal protective matters to stymie bird declines are the innumerable acts, creation of land reserves, quotas on bag limits and commercial fish catch, and various restoration and monitoring efforts. In this vein the Squamish Estuary has been at the forefront of habitat improvement and protective changes once the alarm on degrading estuaries was sounded in the early 1970s. A forceful Squamish Conservation Society and local Stream Keepers group have been instrumental in improving the protection and restoration of the Squamish Estuary and the monthly monitoring of its bird populations. A portion of the estuary is now a Nature Trust Conservation Area and another large part is the designated Squamish (Skwelwil'em) Wildlife Management Area. There are several provincial parks in the Sound and Christie Islet is a designated bird sanctuary. Furthermore, a very conscientious group of communities very carefully watch their islands in the outer Sound with their own monitoring efforts of local marine life. So, of the changes in population trends that are in evidence, the cause or cure is now beyond the hands of local endeavours. A mega-regional thrust to correct the changes is required at the international level.

## SUMMARY

Marine bird populations in Howe Sound have indeed changed over the last 40 years of monitoring. Geese are increasing, swans in the water are decreasing, but not in fly-overs; most dabbling duck species are increasing, whereas bay and diving ducks are stable or decreasing. Grebes and loons are decreasing, especially the stately western grebe. Two cormorant species are showing slight increases while the Brandt's has nearly disappeared. Contrary to outside regional trends, the great blue heron is increasing. Gulls are a mixed bag: glaucous-winged have increased, but their close relatives are quasi-stable-to-decreasing, while the small Bonaparte has been hit with a big decline. Sandpiper data is split between the rock-loving species that are quasi-stable in numbers in the outer Sound and the distant spring arriving migrants that continue to northern regions for their short breeding season. Data on the latter is sparse for the timeframe reviewed by this appraisal — the last two weeks of the calendar year. Among the oceanic alcid species, common murre and marbled murrelets have seen a significant decline. The Howe Sound region has about 130 marine bird species. The “health” of 73 species was appraised and

thirty-four of the most common were compared to regional trends in the Strait of Georgia, the comparisons made by using Christmas Bird Count data for both areas, although an older data set for outer (lower) Howe Sound is lacking. Howe Sound bird population changes mimic what has been found in the Salish Sea. Mega-restorative efforts on the Squamish Estuary, which has had, by far, the largest bird monitoring effort, probably accounts for the increase in dabbling ducks, geese, and great blue heron populations. Declines of 30 or more other species are not just local, being widespread, and corrective efforts will require an international effort.

### Acknowledgements

My introduction to the birds of Howe Sound began in the 1990s with the patient help of Jim Wisnia on monthly surveys of the Squamish Estuary and his extremely well-organized Christmas Bird Count. When he retired to Vancouver Island, the looming vacuum was filled by other local birders, the foremost being Chris Dale with his sharp eye, adeptness in using the electronic gadgetry and providing computer knowledge. He has helped in many ways with the preparation of this report.

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