British Columbia Coast
BirdWatch
The Newsletter of the BC Coastal Waterbird and Beached Bird Surveys

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COASTAL WATERBIRD DATA SUPPORTS THE IMPORTANT BIRD AREA NETWORK

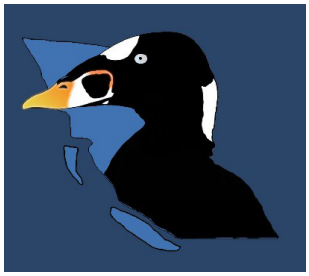
BY KRISTA ENGLUND AND KAREN BARRY

Approximately 60% of British Columbia's 84 Important Bird Areas (IBA) are located along the coast. Not surprisingly, many BC Coastal Waterbird Survey (BCCWS) sites are located within IBAs. Through the survey, citizen scientists are contributing valuable data to help refine boundaries of IBAs, update online site summaries (www.ibacanada.ca), and demonstrate that these areas continue to support globally significant numbers of birds.

One recent update involved amalgamating three Important Bird Areas near Comox on Vancouver Island into a single IBA called K'omoks. BCCWS data from up to 52 survey sites on Vancouver Island, Hornby and Denman Islands helped to identify areas of high bird use and provide rationale for the new boundary, which extends from approximately Kitty Coleman Beach Provincial Park to Deep Bay near Courtenay-Comox. BCCWS data also demonstrated that the K'omoks IBA supports globally or continentally significant concentrations of Glaucous-winged Gull, Thayer's Gull and Mew Gull. As this example illustrates, one of the key advantages of the BCCWS is that it enables observations from multiple observers spread across a large area, like an IBA, to be combined.

BCCWS data was also recently used to update the English Bay-Burrard Inlet and Fraser River Estuary IBA site summaries. Both sites have extensive coastline areas, with approximately 40 individual BCCWS sites in English Bay Burrard Inlet and 22 in the Fraser River Estuary, although not all sites are surveyed regularly. BCCWS data helped demonstrate the importance of English Bay-Burrard Inlet to Surf Scoters and Barrow's Goldeneyes. In the Fraser River Estuary, BCCWS data was particularly useful for demonstrating use of this IBA by globally significant numbers of Thayer's Gull, Red-necked Grebe and Western Grebe.

BCCWS surveyors have made great contributions to the BC Important Bird Areas program and we thank all past and present volunteers. For more information about the IBA program, visit www.ibacanada.ca or www.bcnature.ca or contact BC Nature's IBA coordinator at iba@bcnature.ca.



IN THIS ISSUE

Red-necked Grebe
(R. Hocken)

What is an Important Bird Area (IBA)?

An IBA is an internationally recognized priority for conservation based on a site's importance for sustaining threatened birds, birds found nowhere else, or significant concentrations of migrating, wintering or breeding birds. BC's IBA program is a partnership of Bird Studies Canada, Nature Canada and BC Nature.

BIRD STUDIES CANADA
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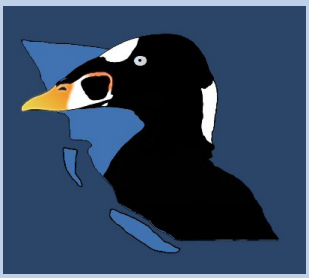


BC Coastal Waterbird Survey Updates and New Abundance Maps by Karen Barry

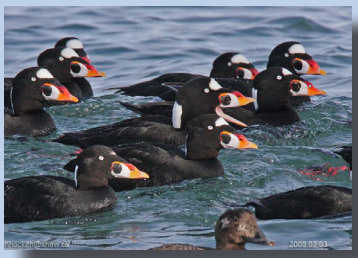
In September 2013, the BC Coastal Waterbird Survey (BCCWS) reached the 15-year mark. Since 1999, over 19,000 individual surveys have been conducted and entered into the database by volunteers! We are pleased to report that the program continues to expand. Over 200 volunteer observers participated in the last two seasons and the number of sites surveyed has increased steadily.

The objectives of the program are:

- To assess the size of nonbreeding waterbird populations in coastal BC, particularly the Georgia Basin;
- To assess changes in abundance and distribution of waterbirds;
- To assess and monitor the importance of specific sites for waterbirds; and
- To improve understanding of the ecology of coastal BC waterbirds, including responses to natural and human-induced change.

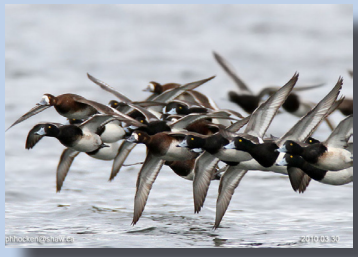
The data is generating reliable population trends analysis for 57 waterbird species. A power analysis has shown that the survey is detecting annual changes of 3% or less for 29 species of waterbirds. Based on a recent trends analysis of 13 years of data (1999-2013), we found that 35 species are undergoing significant declines, including Common and Pacific Loon, Horned, Red-necked and Western Grebes, Green-winged Teal, Northern Shoveler, Black, Surf and White-winged Scoters, Harlequin Duck, Long-tailed Duck, Greater Scaup, Double-crested Cormorant, Great Blue Heron, Glaucous-winged Gull, and Dunlin.

The BCCWS program continues to build scientific credibility through several published papers, and is now realizing the full suite of objectives initially developed at the start of the program. Coastal Waterbird data represent key baseline data for the abundance and distribution of BC waterbirds on a regional scale. This year, with assistance from BSC GIS staff and support from the Real Estate Foundation of BC, we completed new maps that identify "hot-spot" areas for waterbird abundance for a number of different guilds, or groups of similar waterbirds. A few examples are shown in Figures 1-5. Maps for all guilds and regions will soon be posted to our BSC website for easy access. The maps show average densities of birds from December to February each year from 1999-2012. Highest density areas appear red, and lower density areas appear yellow. Survey coverage is generally greatest on the south coast and therefore more data is available at those sites.



Surf Scoters (R. Hocken)

Glaucous-winged Gull (D. Bedry)



Greater Scaup (R. Hocken)

Great Blue Heron (D. Bedry)

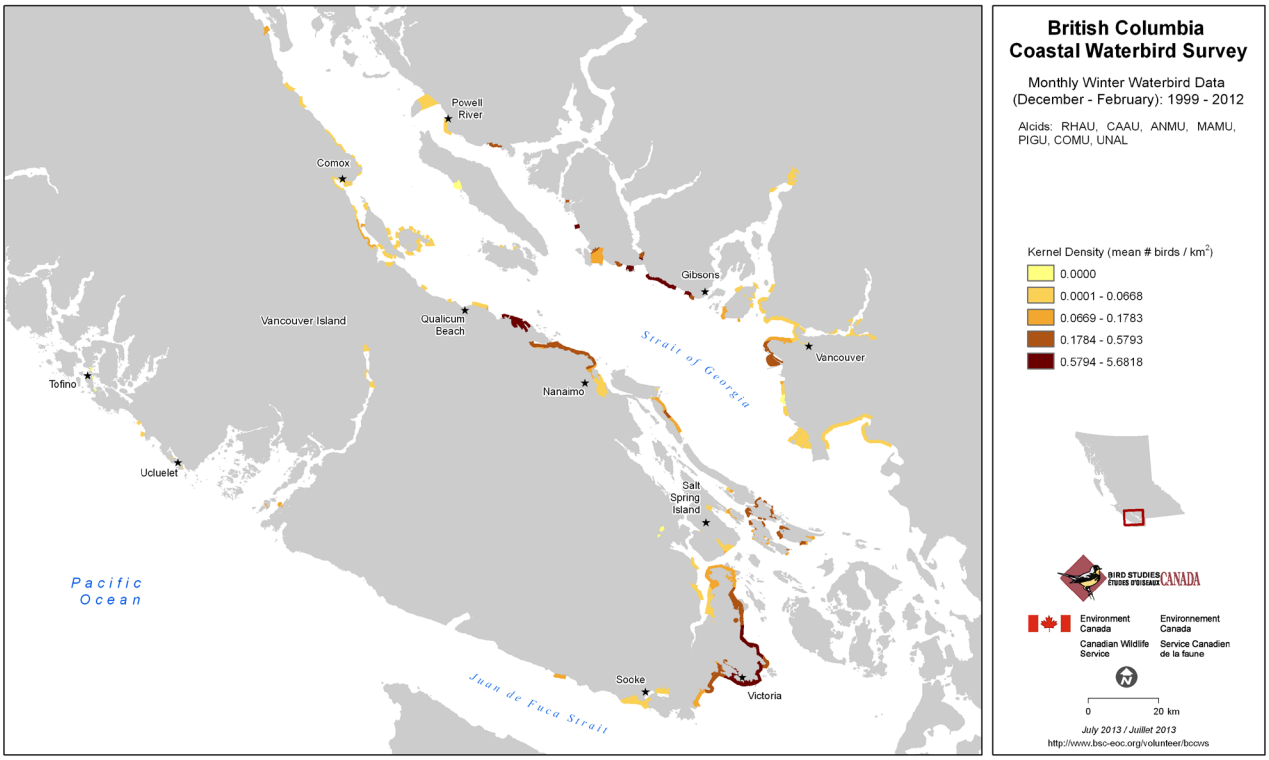


Figure 1. Alcid abundance at survey sites located on the South Coast from 1999-2012. Data was combined for Rhinoceros Auklet, Cassin's Auklet, Ancient Murrelet, Marbled Murrelet, Pigeon Guillemot, Common Murre and unidentified Alcid. Three areas stand out as the most important for alcids: Victoria, Parksville-Qualicum and the Sunshine Coast.

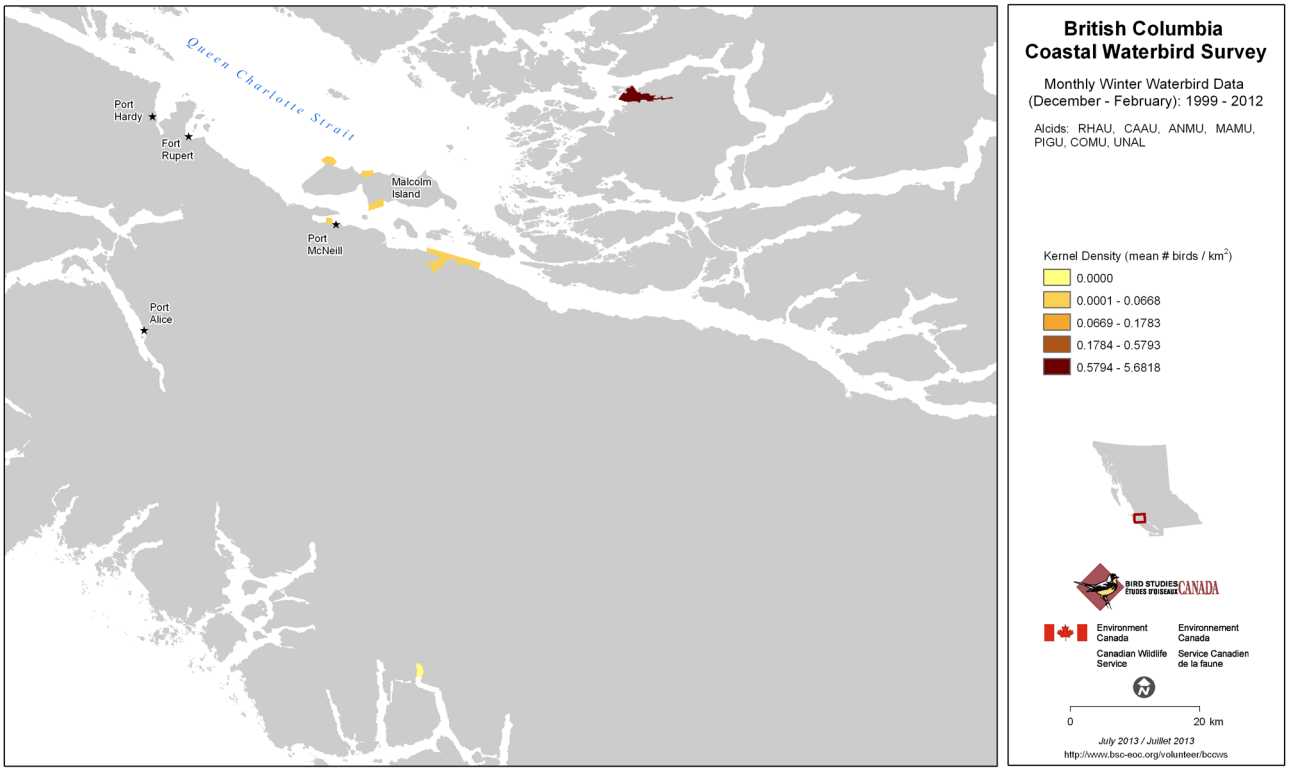


Figure 2. Alcid abundance at survey sites located on Northern Vancouver Island from 1999-2012. Data was combined for Rhinoceros Auklet, Cassin's Auklet, Ancient Murrelet, Marbled Murrelet, Pigeon Guillemot, Common Murre and unidentified Alcid. Although there are fewer active survey sites in this region, Viner River estuary in the Broughton Archipelago appears as a very important site for alcids.

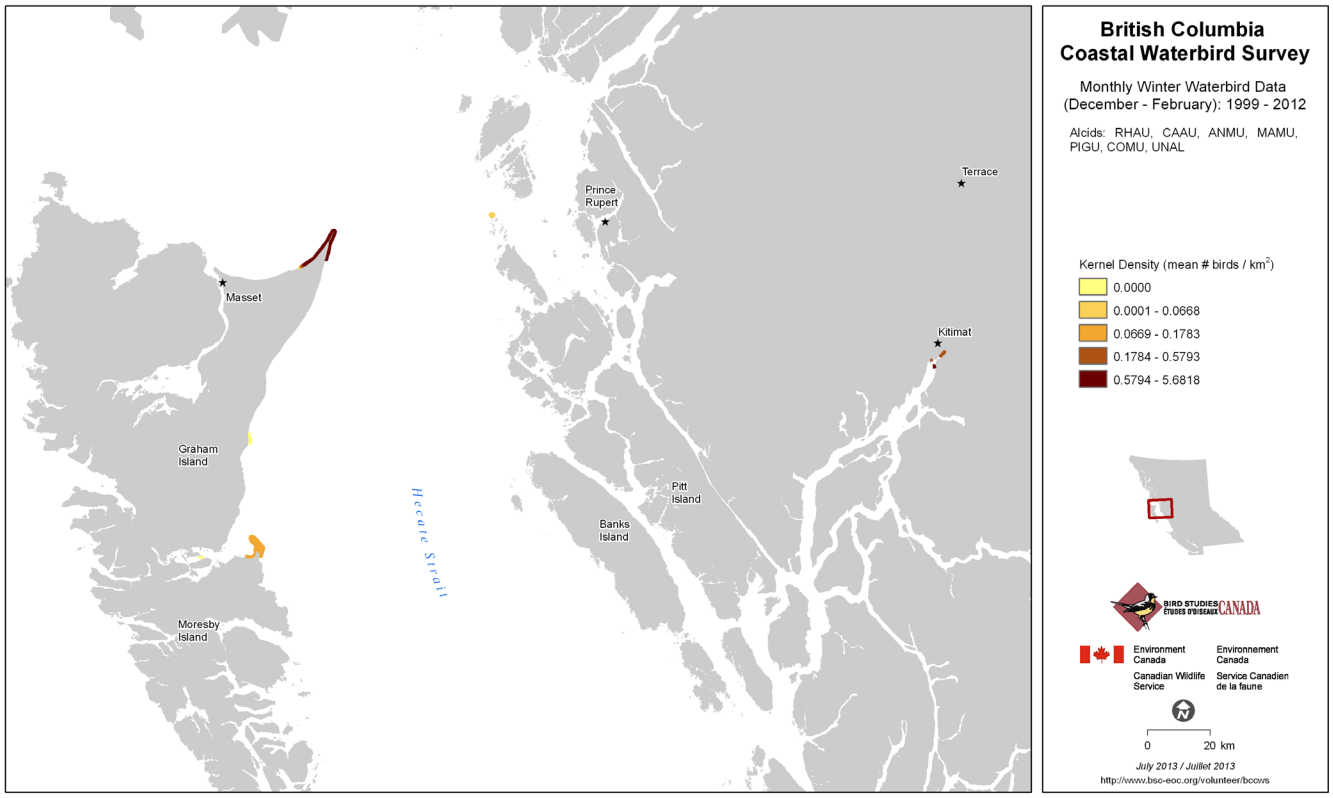


Figure 3. Alcid abundance at survey sites located on the North Coast from 1999-2012. Data was combined for Rhinoceros Auklet, Cassin's Auklet, Ancient Murrelet, Marbled Murrelet, Pigeon Guillemot, Common Murre and unidentified Alcid. Sites at North Beach-Rose Spit on Haida Gwaii support high numbers of alcids as well as sites in Kitimat.

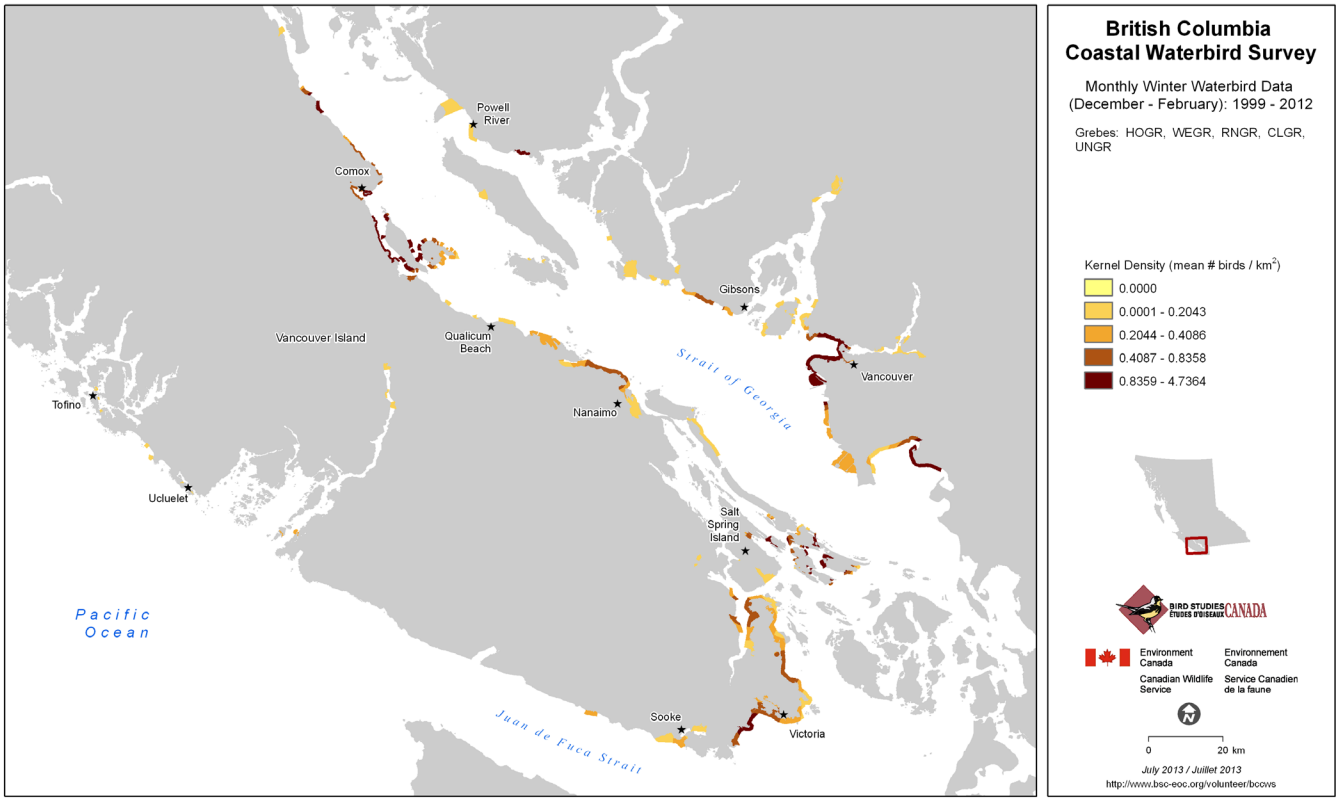


Figure 4. Abundance of all grebes at survey sites located on the South Coast from 1999-2012. Data was combined for Horned Grebe, Red-necked Grebe, Western Grebe, Clark's Grebe and unidentified grebe. Several sites are used by grebes on the mainland including White Rock and English Bay-Burrard Inlet. On Vancouver Island, the most important sites are around Victoria-Esquimalt, and the Baynes Sound-Hornby-Denman area. There are also a few other key areas on the Sunshine Coast and around Comox.

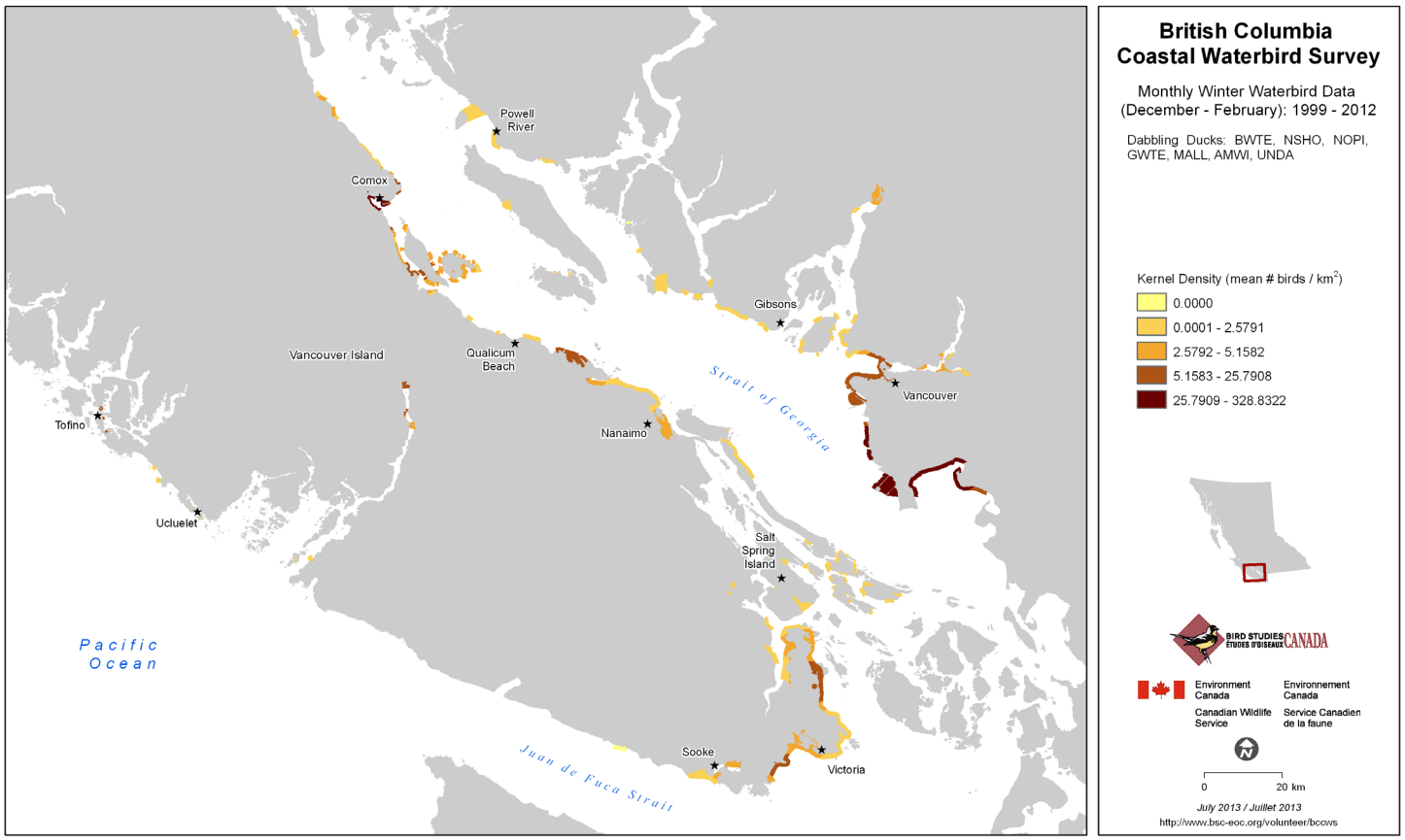


Figure 5. Abundance of all dabbling ducks at survey sites located on the South Coast from 1999-2012. Data was combined for American Wigeon, Mallard, Northern Pintail, Northern Shoveler, Blue-winged Teal, Green-winged Teal and unidentified dabbler. Dabblers are most abundant in Boundary Bay-Roberts Bank and near Comox. Other areas are moderately important such as Vancouver-Burrard Inlet, Victoria-Saanich, Nanoose and Baynes Sound.

Other applications of the BCCWS data include modelling studies with the Pacific Coast Joint Venture (www.pcjv.org), of which BSC is a partner, to predict energetic use of the Fraser River Delta in fall-winter. Habitat association models are being used to prioritize habitat conservation planning. For example, the Seaduck Model currently under development through Joint Venture partners uses the provincial Shorezone dataset and Coastal Waterbird Survey data to investigate relationships between coastal habitat characteristics and abundance of various seaduck species and predict the habitat use of seaducks and other waterbirds along the BC coast. The data is regularly used by government staff for regulatory purposes such as oil spill response planning and environmental assessments for proposed development projects. Other scientific and academic researchers are using the data to study specific research topics on various species.

BC Coastal Waterbird Survey data can be downloaded freely from Nature Counts (www.naturecounts.ca), a very useful online data warehouse managed by Bird Studies Canada. In addition to raw coastal waterbird data, our latest BCCWS trends information is also available through Nature Counts. Visitors can also access data from other monitoring programs such as Nocturnal Owl Surveys.

The interest and use of the data from this long term Citizen Science program continues to grow and we are grateful to all the volunteers who have contributed over the last 15 years. Sincere thanks to everyone who has supported and participated in this program, both past and present.

Eyes on the Beach: Results from the BC Beached Bird Program

By Karen Barry, analysis by Ana Gonzalez

Beached Pelagic Cormorant found at Goose Spit, Comox (A & S Martell and B. Stewart)

Juvenile Gull, found at Blackie Spit (A. Prentice)

Beached Porpoise found at Albert Head (D. Kramer)

The British Columbia Beached Bird (BB) survey has been coordinated by Bird Studies Canada since 2002, and continues to help us gain important insights into the patterns and causes of seabird mortality. Between 2002 and 2012, Beached Bird Surveys were conducted at over 100 sites throughout BC's coast although some sites have not been surveyed repeatedly. Currently, there are about 65 active beaches being regularly surveyed by volunteers (Figure 1). Survey coverage is generally highest in areas of the south coast such as Vancouver-Boundary Bay, Victoria and central Vancouver Island (Nanaimo – Comox). We are always interested to add new beaches to the survey network and most recently, new routes have been established by volunteers on Vancouver Island: in Duncan, Port Hardy and on the Saanich Peninsula.

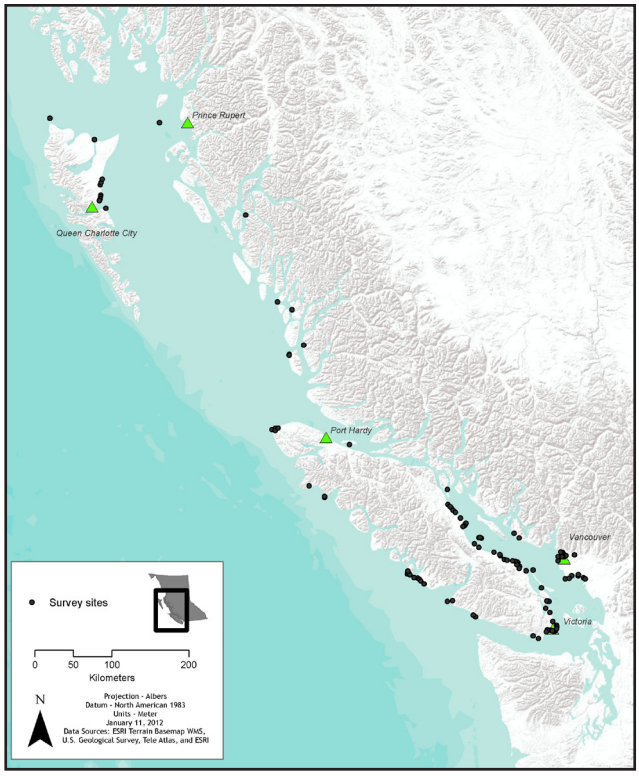


Figure 1. Location of beached bird survey sites.

Since 2002, the number of annual surveys submitted has generally been around 200 to 400 surveys per year although there was a low period in 2007 (Figure 2). We are happy to see that the number of surveys conducted has been steadily increasing since then.

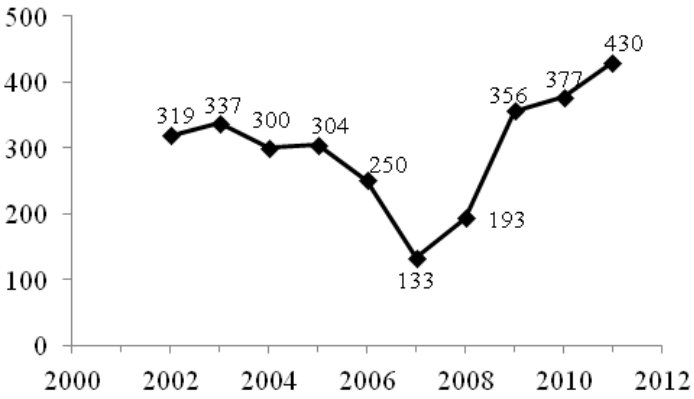


Figure 2. Total number of BC Beached Bird surveys conducted by year.

Beached bird survey results are typically referred to as deposition rates, although in actuality, these are encounter rates which is defined as the number of bird carcasses found per km of beach surveyed. We calculated mean carcass encounter rate as the number of carcasses per km for each survey in various regions. We found that carcass deposition patterns varied in different years, although deposition rates tended to be higher during the winter months. This is likely because more waterbirds are present on the BC coast during the overwinter period and also because storms are more frequent which can increase the probability of deposition. This seasonal pattern of higher beached birds during winter was also observed in data collected by Dr. Alan Burger who coordinated the BC Beached Bird program in the 1980's and 1990's.

From 2002-2012, highest carcass densities occurred in November 2009 with 1.3 carcasses/km (±3.5). High encounter rates also occurred in November 2008 with 0.8 carcasses/km (±1.49) and in November 2002 with 0.7 (±1.8). The high numbers recorded in November 2002 and 2009 were largely a result of a die-off of Northern Fulmar that occurred on the west coast of Vancouver Island. In the fall of 2002, 74 beached Northern Fulmar were found and in 2009, 169 Fulmar were found, all in the Tofino-Ucluelet region.

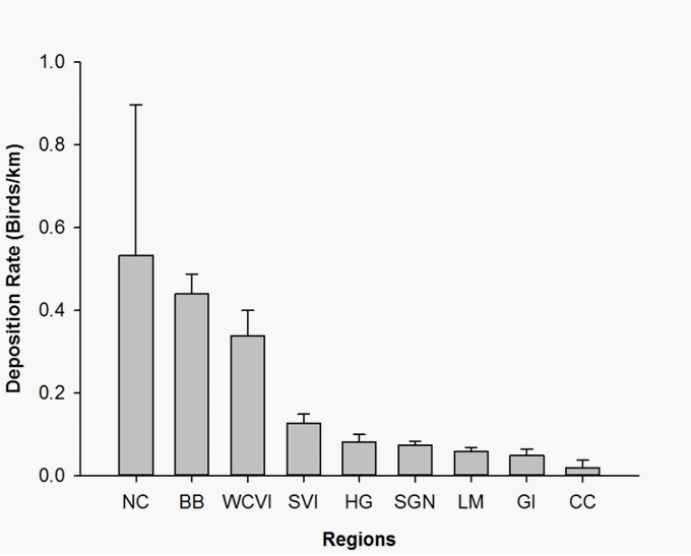


Figure 3. Mean carcasses deposition rate (birds/km) from 2002-2012 by region. NC = North Coast, BB = Boundary Bay, WCVI = West Coast of Vancouver Island, SVI = Southern Vancouver Island, HG = Haida Gwaii, SGN = Strait of Georgia North, LM = Lower Mainland, GI = Gulf Islands, CC = Central Coast

When beached bird numbers were combined for all years, we found that three regions had higher numbers of beached birds/km. Deposition rates were almost twice as high in the North Coast (NC), Boundary Bay (BB) and West Coast of Vancouver Island (WCVI) compared to other regions (Figure 3).

Species Composition

Surveyors reported a total of 1662 beached birds from 66 species and 12 families from 2002-2012. The most common groups of birds found were Tubenoses (fulmars and shearwaters), Gulls and Waterfowl (Figure 4). It can be very challenging to identify the species of a beached bird since the carcass is not always intact and it can be quite decomposed. Examining the foot type and taking measurements of the wing, tarsus (leg) and culmen (bill) can be used to help identify bird carcasses as described in the COASST Guidebook we provide to every volunteer. Overall, 79.2% of the carcasses recorded were identified to species, while many were recorded as Unknown. The most common species observed were Northern Fulmar making up for 26.2% of the total carcasses, followed by Glaucous-winged Gull (10.5%), Unidentified Gull (9.2%) and Common Murre (5.2%). Of the 15 Waterfowl species that have been recorded over this period, Greater Scaup (2.8%), White-winged Scoter (2.6%), Mallard (2.3%) and Surf Scoter (1.7%) were the most commonly found.

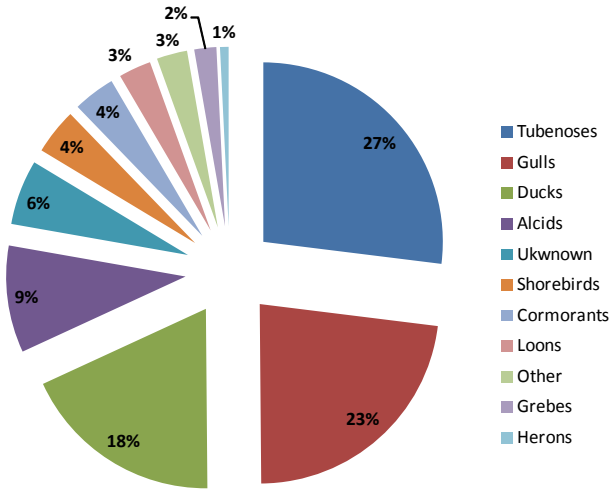


Figure 4. Species composition (in %) of all beached birds found from 2002-2012.

Results from the BC Beached Bird Program (continued)

Cause of Death

Cause of death can be very difficult to assess based on external appearance so it's always better for surveyors to record "Unknown" rather than hazard a guess. For this reason, cause of death was reported for only about 20% of all carcasses reported from 2002-2012. Since about 2009, we have been collaborating with Canadian Wildlife Service and BC Ministry of Agriculture to conduct post mortem exams on intact and fresh beach bird carcasses to gain a clearer picture on cause of death. Many volunteers have been assisting with this effort by collecting intact and fresh carcasses, and holding them in their freezer for a short time until we can arrange shipping to Vancouver. Post-mortem examinations have now been done on over 71 carcasses submitted by volunteers. Overall, the most common cause of death was drowning; however, this is due to a large number of Northern Fulmar that were submitted following a large die-off in the fall of 2009. Other causes of death included Aspergillosis (a fungal infection), starvation, entanglement, shot, other trauma and unknown. Even when a post mortem exam is done, there can be cases where the cause of death is not conclusive.

Beached Bufflehead, found at Albert Head (D. Kramer)

An additional 50 carcasses were collected in Boundary Bay in 2010 and 2011 during high frequency Beached Bird surveys during salmon fishing. Post mortem examination of these carcasses confirmed that over 40 of these birds, mostly Common Murre, Rhinoceros Auklet and Pigeon Guillemot, died as a result of gillnet entrapment. Obtaining conclusive information about fisheries bycatch has been important to document the occurrence and severity of this issue.

Oiling Rates

From 2002 – 2012, surveyors reported a total of 11 birds with oiled plumage although none of the oiled birds were found on beaches where oil pollution was detected. Over 50% of oiled birds (6) were found in Southern Vancouver Island (SVI) where five oiled birds were found at Bazan Bay and one at Beecher Bay. Two oiled Common Murre were found in Boundary Bay - Beach Grove and one oiled bird has been found at both English Bay and False Creek in Vancouver. Another single oiled Common Murre was recorded at Cribs Beach on the west coast of Vancouver Island. Most of the beaches where oil pollution was observed were in the Lower Mainland region. In most cases, the oil pollution was reported as "oil shine". Sticky tarballs were found only in a few surveys done at Florencia Beach South in Ucluelet and Lord Bight in Haida Gwaii. Reports of oiled birds seem to be declining. Other than the 11 oiled carcasses found during beach bird surveys since 2002, an additional two oiled birds have been reported from opportunistic surveys, one as recently as fall 2013, although lab results on the source of oil are not available.

Using previous Beached Bird data collected by Dr. Alan Burger in the 1980's and 1990's, we see an interesting trend that oiling rates (number of birds found with oil) is now lower than it was previously (Figure 5). One likely reason is that in 2003, Transport Canada initiated its National Aerial Surveillance Program to monitor shipping in Canadian waters (NASP, www.tc.gc.ca/eng/marinesafety/oep-ers-nasp-2195.htm).

Aerial surveillance is widely used internationally and known to be one of the most effective methods to detect oil spills at sea. The presence of the NASP surveillance aircraft, a bright red Dash-8 aircraft outfitted with state of the art equipment, acts as a deterrent by discouraging illegal discharges at sea. Another method now employed to detect illegal discharges at sea is advanced satellite surveillance. Satellite images are provided by Environment Canada's Integrated Satellite Tracking of Pollution (ISTOP) program which are used to identify oil-like signatures (anomalies) on the ocean's surface. These anomalies are then examined by an aircraft to confirm the spill, identify the source if possible, and gather evidence.

Beached Bird Surveys continue to provide useful insights about marine bird mortality, but perhaps more importantly the data provides a baseline to understand the "normal" level of mortality along our coasts. Many volunteers do not find beached birds regularly – or ever – on their beach routes. Nevertheless zero data is key! In the event that a serious mortality event occurs, whether it be from an oil spill, a disease outbreak or another environmental change, Beached Birds are excellent indicators and volunteer surveyors act as an early warning system. We are grateful for all the volunteer contributions to this Citizen Science program and wish to thank all past and current surveyors for their support and participation!

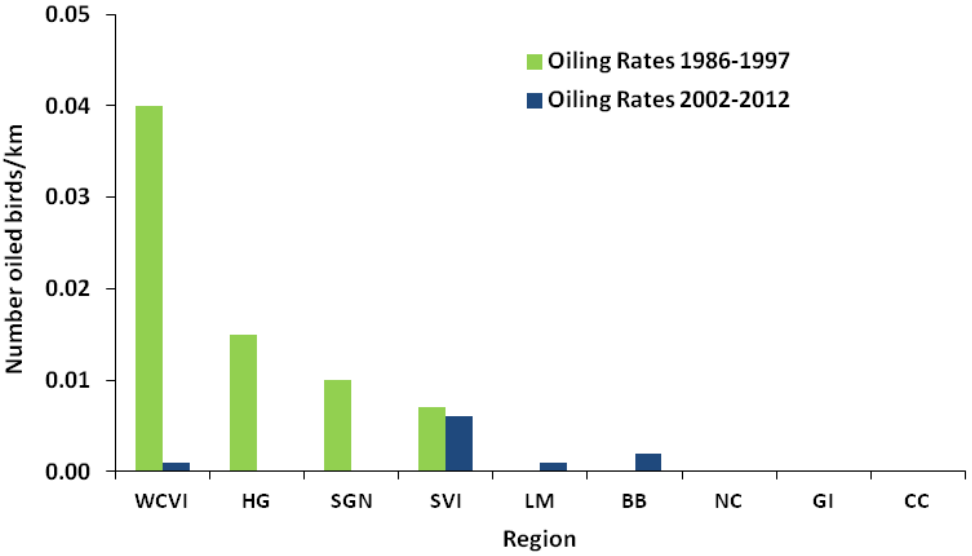


Figure 5. Comparison of number of oiled birds found by region from 1986-1997 (green bars) and 2002-2012 (blue bars). WCVI = West Coast of Vancouver Island, HG = Haida Gwaii, SGN = Strait of Georgia North, SVI = Southern Vancouver Island, LM = Lower Mainland, BB = Boundary Bay, NC = North Coast, GI = Gulf Islands, CC = Central Coast

National Aerial Surveillance Program (NASP) surveillance aircraft (Dash-8)

Wings on Combers Beach (D. Choquette)

Breeding Success of Common Loons in Canada: Is the West Really Best?

By Doug Tozer, Kathy Jones and Karen Barry, Bird Studies Canada

On the BC coast, we enjoy seeing Common Loons during the winter months and every spring we bid them farewell when they leave to breed on freshwater lakes farther inland. Based on our 13-year analysis of BC Coastal Waterbird data, wintering Common Loons seem to be declining in the Strait of Georgia. But how are they doing during the breeding season? Bird Studies Canada's (BSC) Canadian Lakes Loon Survey (CLLS) aims to answer just this question.

The volunteer-based CLLS was initiated in Ontario in 1981 and expanded nationally in the early 1990s. CLLS participants select lakes of their choice to survey. A minimum of three visits are made during the breeding season—one in June, July, and August—to determine number of territorial pairs, hatchlings per pair, and six-week-old chicks per pair. Here in BC, breeding Common Loons have been monitored by volunteers since 1990, when one lake was monitored, increasing to over 50 lakes per year on average by the 2000s!

The early focus of the CLLS was assessing the effects of acid rain on breeding loons. Food availability for loons is lower in acidic lakes, and acid-related biomagnifcation of toxic mercury up the food chain leads to physiological damage in loons. As a result, they incubate their eggs and feed their chicks less. The CLLS data confirmed the link between acid rain and reduced loon chick survival early-on, leading in part to the development of the Canadian Acid Rain Control Program established in 1985 and the Canada-U.S. Air Quality Agreement signed in 1991.

Despite significant reductions in emissions in the past 30 years, acid deposition continues to occur at amounts well above historical levels right across the country. However, acid deposition is lower in western than eastern Canada due to prevailing winds, which probably makes the west best for breeding loons. A recent analysis of CLLS data across Canada indicates that the annual number of fledglings per pair is highest in the west and decreases eastwards. This may be due to acid-related biomagnification of methyl mercury up the food chain to adults and chicks in eastern lakes. As mentioned above, loons with high mercury blood levels are known to incubate their eggs and feed their chicks less often, plus chicks with high mercury burdens are at higher risk of predation. It also may be that food availability is lower in lakes affected by acid rain.

Common Loon pair with chicks (B. Peyton)

Another significant finding from the recent analysis is that the annual number of fledglings per pair is decreasing over time (Figure 1). This could be due to continuing mercury and/or acid rain deposition that exceed critical levels for healthy wildlife. An unexpected observation was that the decline in fledglings over time was greater in the west than in the east. Explanations for the steeper decline in the west are unclear. It suggests that factors other than acid rain are important for reproductive success of Common Loons since acid rain deposition is currently not known to be increasing faster in the west compared to the east. It is possible that increasing mercury deposition in the west from increasing Asian emissions, increasing wildfires that release mercury stored in plants, or increasing temperatures may cause more mercury to make its way up the food chain.

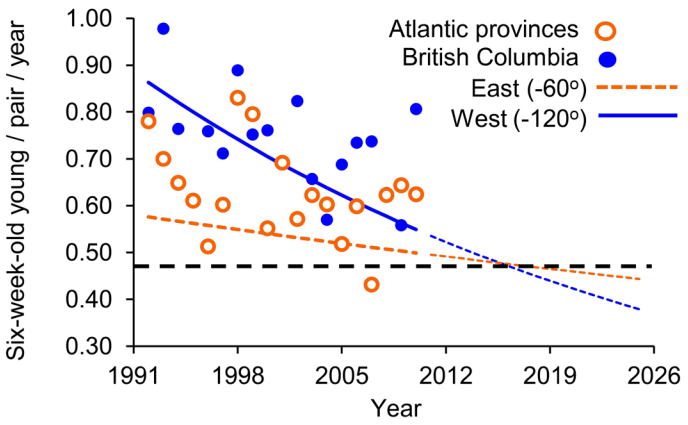


Figure 1. Number of fledglings per pair per year over time.

Other factors negatively influence the breeding success of Common Loons in Canada. For instance, many loon surveyors have observed disturbance of nesting sites as a result of boats, canoes, jet skiis, water level changes, and artificially elevated numbers of nest predators like racoons. As well, fishing lines and garbage can entangle loons. These factors can be very influential locally, however, acid rain and associated biomagnification of mercury are likely the strongest factors influencing breeding success at the scale of the entire country. Thus, generally the west may really be best, as far as production of loon chicks is concerned, but the steeper decline in breeding success over time in the west compared to the east makes one wonder just how long the west will be best.

For more information on this topic, check out our online report (www.birdscanada.org/volunteer/clls/resources/CLLSsummary.pdf) or our recent article in the Winter 2013 issue of BirdWatch Canada magazine. Or for a more-detailed analysis, take a look at our scientific paper in BSC's journal Avian Conservation and Ecology, Volume 8 (www.ace-eco.org/vol8/iss1/art1/).

Anyone interested in joining the CLLS please contact Kathy Jones via: Ph. 1-888-448-2473 ext. 124 or Email: volunteer@birdscanada.org. We would love to have your participation and we thank all those who have contributed to this program!

Common Loon on its shoreline nest (J. Howard)

Juvenile Common Loon in winter plumage (P. Kusmin)

Adventures on Triangle Island

By Catherine Jardine, Bird Studies Canada

"Pile your gear over there…. just watch out for the elephant seal!" were the words that greeted me as our helicopter powered down slowly on the sandy shore of one of British Columbia's most inaccessible natural gems, Triangle Island.

Like the smallest in a set of Russian dolls, Triangle Island is the last in a string of progressively diminutive islands trailing out into the Pacific Ocean from the North West tip of Vancouver Island. Despite its small size the island is a booming seabird metropolis and nursery. The island hosts approximately 500,000 breeding pairs of Cassin's Auklets (over 50% of the global population), 40,000 breeding pairs of Rhinoceros Auklets and the largest colonies of Tufted Puffins and Common Murres in British Columbia. Not to mention abundant Fork-tailed and Leach's Storm-Petrels and Canada's largest Steller's Sea lion rookery. This impressive resume has led to a 25 year long research and monitoring initiative on the island, run by Dr. Mark Hipfner of Environment Canada and Simon Fraser University (http://www.sfu.ca/biology/wildberg/bertram/triangle/trgindex.html).

I'd been given the rare and coveted opportunity to join this project and spend 10 days in the Seabird capital of British Columbia. I couldn't quite stop smiling as I skirted Ernesto, the affectionately named elephant seal, slumbering on the thick wrack line. Slinging my pack off my shoulder I looked up at the emerald faceted slopes of salmonberry and tufted hair grass. In the late morning light the slopes were empty, for the largest seabird colony in B.C. it was quiet…..very quiet. The wonder of Triangle slumbering peacefully under our feet.

In these daylight hours Puffin Rock is the highlight of Triangle. This large saddle shaped "sub-island" is separated from Triangle's main island by a thin gap of ocean-kissed beach. Puffin rock is one of my new favorite places, mainly because it is covered in Puffins. Tufted Puffins lounge outside their burrows in hummock hammocks and wiz through the air like 1940's fighter pilots, their blond hair-dos slicked back from their foreheads. Like all birds on Triangle in June they are focused on the task at hand, rearing another cohort of Pufflets to accent the green slopes of Triangle in years to come.

One is not to be fooled by its name though; Puffin Rock has much more to offer. The West cliff faces are carpeted with a yodeling colony of Common Murres, poised like dominos ready to topple into the sea at the first sign of an approaching Eagle. The Pelagic Cormorants, with their comfy grass nests clinging precariously to the cliff sides, coo to each other, offering a rare opportunity to hear their surprisingly beautiful voices. The Glaucous-winged Gulls float gently above, the ruby feet of Pigeon Guillemots inlay the black sea-battered rocks and Peregrine Falcons manically chase off any Bald Eagles that have the audacity to wander too close.

Northern Elephant Seal (C. Jardine)

Common Murre (C. Jardine)

The rest of the island can seem dull in comparison, until twilight begins to fall and an amazing natural history spectacle begins. Thousands of Rhinoceros Auklets, bobbing in rafts off shore, rise from the ocean as the sun sinks beneath it. The birds arc towards Triangle Island forming massive spinning wheels in the sky, skimming over the cliff faces in the misty evening light. As the gyres of birds buzz overhead, obscuring the stars in passing, the vibrations from their wings beats reverberate through the air. As the sun sinks deeper the Cassin's Auklets emerge from their burrows to begin their spirited singing and the Petrels take flight, calling as they go. Soon the cool night air is filled with the crackling sounds of life. The cacophony of seabirds surrounds us, they "*thump*" down on our hut roof and clamor and crash through the thick vegetation moving to and from their burrows. The sheer commotion of life is awe-inspiring as these land-awkward birds toil away to produce the next generation of birds for us to monitor, maintain and marvel at.

Triangle Island is closed to the public to help ensure its pristine condition for years to come. It is an Important Bird Area (http://www.ibacanada.ca/site.jsp?siteID=BC006), is part of the Scott Island marine area that is in the process of being designated as a Marine National Wildlife Area, and was recently designated as one of fifty Mission Blue Hope Spots (http://mission-blue.org/hope-spots-new/), recognizing it's importance as a global biodiversity hotspot. Photography seldom reflects the cohesive wonder of a place, but it is my hope that these photos offer a small glimpse into a phase in the life of B.C.'s seabirds that few are able to experience.

BirdLife IBA IMPORTANT BIRD AREA

Stellar Sea Lions on Triangle Island (C. Jardine)

Tufted Puffin (C. Jardine)

Common Murre Colony (C. Jardine)

Forage Fish: A Critical Link in Marine Food Webs

By Krista Englund, Karen Barry and Ramona de Graaf

What are Forage Fish?

Forage fish are small (25 cm length), extremely abundant, schooling fishes that are prey or "forage" for thousands of species of marine predators, including birds. Forage fish that occur in the coastal waters of British Columbia include Pacific herring, Pacific sand lance, surf smelt, anchovy, sardine, capelin, and eulachon, although some are less numerous now or only occur irregularly. They play a critical role in the marine ecosystem, converting zooplankton into a meal for those higher in the food web, including Humpback whales, sea lions, seals, Harbour porpoise, salmon, herons, seabirds and many other species. Many are also fished as a source of food, roe, oil or fish meal for aquaculture or agricultural operations.

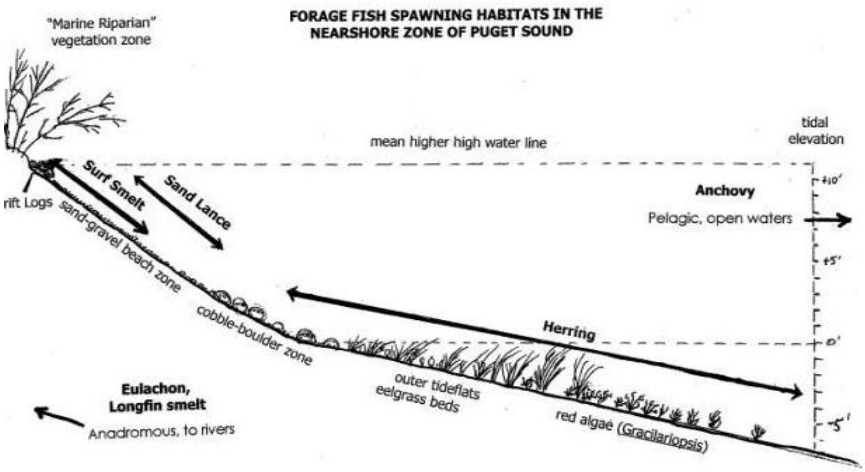


Figure 1. Forage fish spawning habitat in the nearshore (source: D. Pentilla)

Key Habitat: Nearshore Environments

Nearshore habitat is critical for the survival of many forage fish species (Figure 1). Herring spawn on marine vegetation such as eelgrass and seaweeds and even intertidal cobbles. Pacific sand lance and surf smelt spawn high up the beach near the log line; while summer spawning by Northern anchovy occurs in surface waters just a few hundred meters from shore. Fall spawning capelin were present on intertidal beaches in the southern Strait of Georgia until they disappeared in the mid- 1970s, possibly due to increasing sea temperatures. Eulachon are the anadromous member of the smelt family (spawn in rivers) and have experienced long-term declines in many rivers from California to Alaska. Pacific sardines are migratory, moving annually between spawning grounds in southern California and rich feeding areas off the west coast of Vancouver Island.

Rhinocerous Auklet with sand lance (A. Reding)

Forage Fish and Birds: Did you Know?

- Numerous groups of birds feed on forage fish, including alcids, gulls, cormorants, loons, grebes and seaducks.
- Thousands of birds gather during the herring spawning season (February to May) in southern BC to feast on herring or their eggs.
- An estimated 55–87% of the midwinter population of Harlequin Duck exploited herring spawn in the northern Strait of Georgia in the years 1995–2001.
- Scoters have been shown to switch their winter diet from bivalves to herring eggs to take advantage of this important seasonal resource.
- Pacific sand lance is called the "quintessential" forage fish; at least 40 species of birds are known to prey on them.
- Sand lance are very important to the success of Rhinocerous Auklet chicks.

More Than Just a Pretty Beach

The primary threat to surf smelt and Pacific sand lance is considered to be modification of their beach spawning habitat from development and shoreline armouring. Such modifications can physically bury habitat, remove riparian vegetation, and disrupt sediment transport by disconnecting beaches from sediment sources (erosion of cliffs), causing 'beach starvation' when fine sediments are not replenished naturally. Diversion of sediment-bearing streams through culverts can also starve beaches of spawning sediment. Removal of marine riparian vegetation is another problem because this vegetation provides shade for incubating summer surf smelt eggs and provides an important source of organic material and food (leaf and insect drop) to coastal marine areas. Foreshore resource uses such as high density oyster, clam, and goeduck licenses can impact sensitive forage fish spawning habitats.

Citizens Taking Action

Due to the high importance of shoreline habitat, and a general lack of understanding of forage fish ecology and comprehensive mapping of forage fish habitat, action is urgently needed. The BC Shore Spawners Alliance, a project of Sea Watch Society, and Emerald Sea Biological have been engaging Citizen Scientists to help monitor beach spawning and offer training, expertise, mapping, presentations, assistance with survey design and educational materials to municipalities, government agencies & conservation organizations. Many local conservation organizations and individuals are also working individually to monitor or restore nearshore ecosystems. To learn more or take part in a forage fish monitoring project, contact Ramona de Graaf at foragefish.bc@gmail.com or visit "Friends of Forage Fish" on Facebook.

BC Coastal Waterbird Survey Helps!

Because of their dependence on forage fish, monitoring marine bird abundance and distribution through the BC Coastal Waterbird Survey is also a valuable way that Citizen Scientists can help monitor the health of our marine ecosystems.

Photo credits: Ramona deGraaf, Dan Pentilla, Ian Birtwell

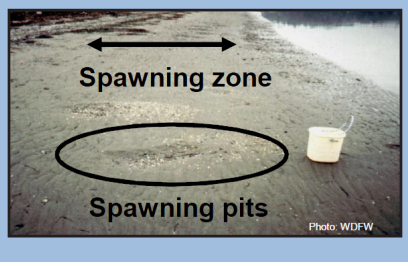
SURF SMELT (*Hypomesus pretiosus*)

Grow to 22.2 cm long; spawn on small gravel/coarse sand beaches using surf *"swash"* during high tide at or within meters of the log line

Eggs on the rocks

PACIFIC SAND LANCE (*Ammodytes hexapterus*)

"Needlefish" or "Sand Eel" adults live up to their name by burrowing themselves in the sand in subtidal depths to avoid predators; grow to 20 cm long; spawn in sand pits on sandy/gravel beaches



PACIFIC HERRING (*Clupea harengus pallasi*)

Grow to 33 cm long; spawn on marine vegetation or cobble

Tsunami Debris Hits BC's Coast

By Krista Englund, Karen Barry and Karla Robison

On March 11, 2011 a magnitude 9.0 earthquake rocked northern Japan, claiming more than 15,000 lives and damaging more than 100,000 buildings. The subsequent tsunami washed an estimated 5 million tons of debris into the sea, 70% of which sank off the coast of Japan. The remaining 1.54 million tons floated into the Pacific Ocean, a significant portion of which is expected to end up in the "North Pacific Garbage Patch" and a smaller amount is expected to reach North American shores, dispersed from Alaska to California.

The majority of the debris arriving on our coast is expected to be small and consist of plastics, Styrofoam, driftwood, rope, fishing nets and buoys. Large objects that float well and are subject to direct forcing by the winds (e.g. "high windage items") started to arrive along the BC coast during the winter of 2011-12. Scientists predicted that low windage debris would arrive gradually in the first half of 2013, peak by March 2014 and continue for several years. Figure 1 shows locations where potential and confirmed debris has already been detected along the coast of BC.

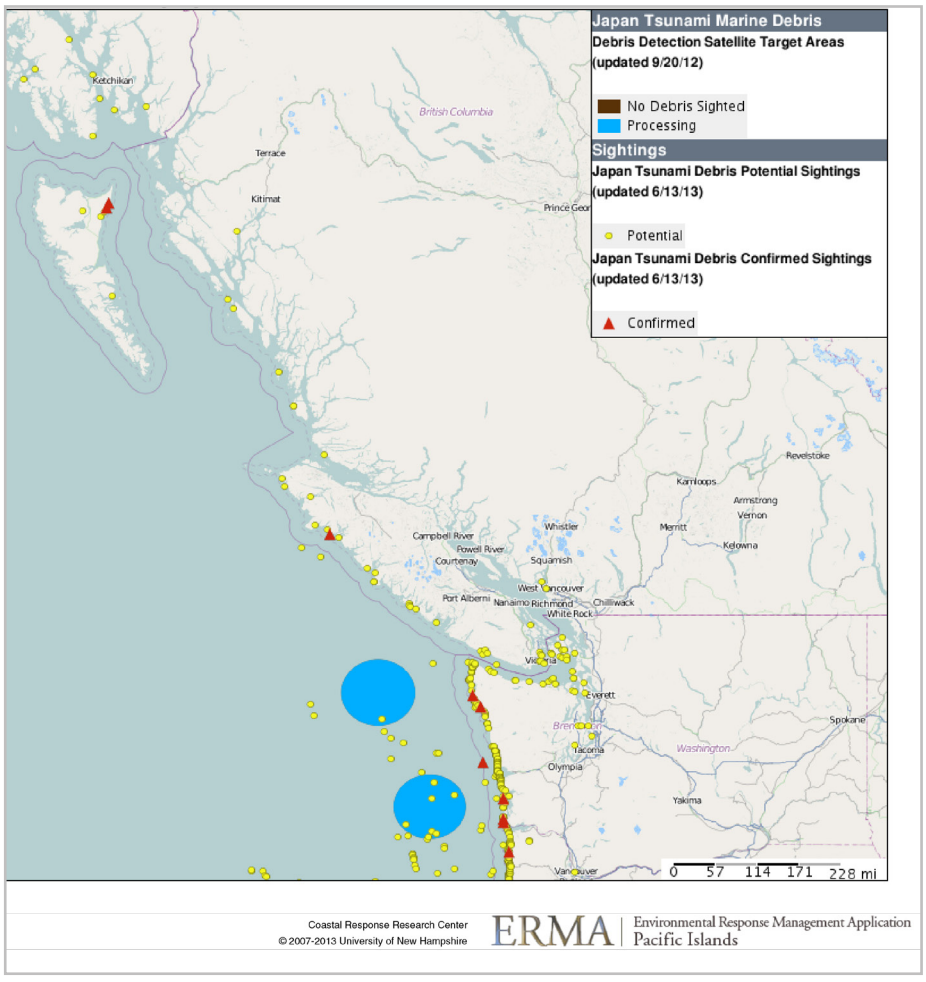


Figure 1. Potential and confirmed debris sightings (source: NOAA). This map includes all debris reported to NOAA as possible tsunami debris since Dec 2011. Confirmed sightings (red triangle) indicate objects that were traced back to the tsunami impact area. Potential sightings (yellow circle) indicate objects that may be linked to the tsunami based on location, type and markings but lack an identifier (serial number, contact information) that confirms its origin.

Specific locations across BC have been selected to regularly monitor and assess debris accumulations. Ucluelet on the west coast of Vancouver Island is one such location. In order to quantify tsunami debris, and distinguish it from typical marine debris, the District of Ucluelet initiated a 1 km shoreline monitoring survey at Wyndansea Beach in June 2012. The monitoring survey is part of a National Oceanographic and Atmospheric Administration (NOAA) Marine Debris Program shoreline monitoring project and its purpose is to document marine debris trends over time. The monitoring plot in Ucluelet is the largest monitoring site in British Columbia and is the only site where accumulation surveys are conducted on a monthly basis. During the first year of monitoring, the amount of debris observed dramatically increased in November 2012 and March 2013.

Additional observations from the survey indicate that only a small portion of the debris items collected at the 1 km Ucluelet survey area have been identifiable from Japan and other Asian counties. However, many pieces of lumber that arrived in March and April 2013 showed unmistakable

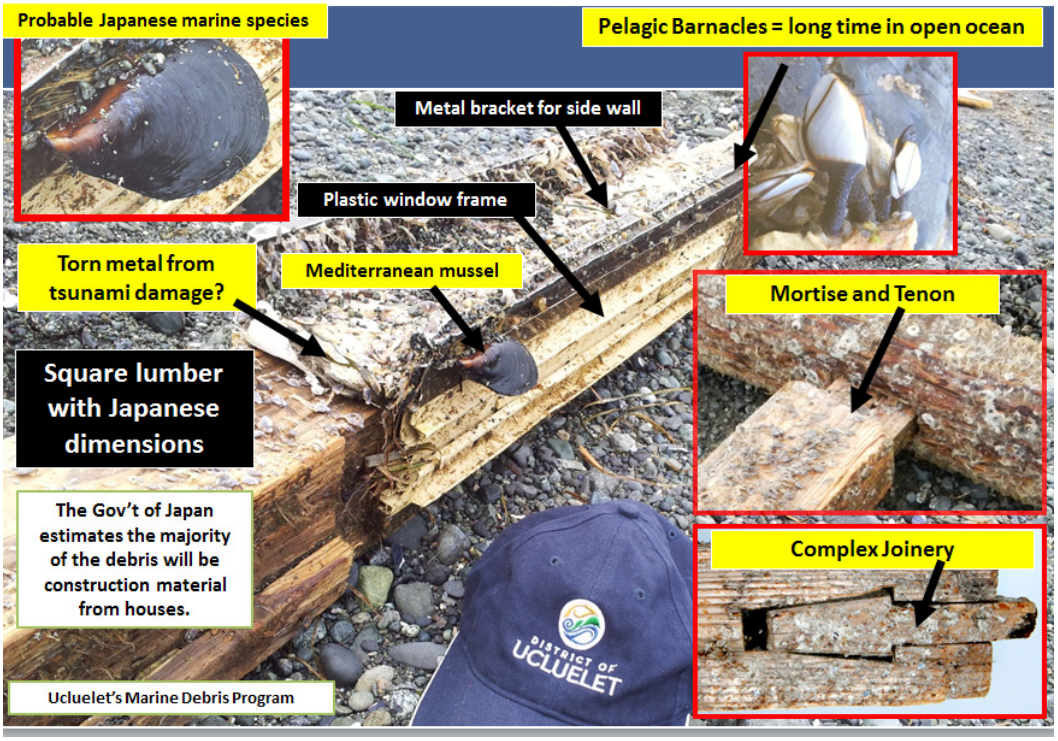


Figure 2. Debris found in Ucluelet likely to have originated from Japan (Source: Ucluelet's Marine Debris Program)

Figure 3. Rose barnacle

signs of Japanese construction and measurements, which fit the pattern of Japanese posts, beams and lumber items (Figure 2).

In addition to disposal challenges, some of the debris has the potential to have longer lasting impacts, such as transporting aquatic invasive species to BC shores. Karla Robison, Ucluelet's Environmental and Emergency Services Manager and volunteers have found a number of possible Japanese post and beam lumber fragments to which several probable Japanese 'biofouling species' were attached, including Mediterranean mussels (*Mytilus galloprovincialis*), Thatched barnacles (*Semibalanus cariosus*), and Rose barnacles (*Megabalanus rosa*) (Figure 3). These observations were shared with Dr. James Carlton, Professor of Marine Science at Williams College in Massachusetts and founder of the National Science Foundation (NSF) Rapid Response research program for Japanese Tsunami Marine Debris (JTMD). These were the first pieces of JTMD material with probable Japanese species to be recognized in British Columbia, and the first JTMD wood to land in North America with living Japanese biofouling. Other probable Japanese 'biofouling species' found in Ucluelet and surrounding area include Japanese oysters (*Crassostrea gigas*), Shipworms (*Teredo navalis*), and Bryozoans (moss animals).

Communities along the coast of British Columbia are being aided in their cleanup efforts by a gracious donation of $1 million provided to the Government of Canada from the Government of Japan in March 2013. In BC, this funding will be administered by the Ministry of Environment (MOE) and made available to assist coastal communities, through local governments and First Nations, with tsunami debris cleanup activities.

Cleaning up marine debris will continue to be a joint effort involving a large number of individuals and organizations, including federal government agencies (e.g. DFO, Parks Canada), provincial government agencies (e.g. MOE, BC Parks), coastal local governments, coastal First Nations, the Governments of California, Oregon, Washington and Alaska, NOAA, the Consulate General of Japan, and numerous other partners (e.g. Surfrider Foundation, The Great Canadian Shoreline Cleanup, Maritime Museum of BC, Canadian Red Cross).

To find out how you can help, please visit www.shorelinecleanup.ca. For further information on tsumani debris, please visit:
www.env.gov.bc.ca/epd/tsunami-debris/
www.marinedebris.noaa.gov/tsunamidebris/

Project Update: Integrating human & wildlife habitat values through urban planning and policy development

By Karen Barry

In May 2013, Bird Studies Canada (BC office) started a new project, funded by the Real Estate Foundation of BC (REFBC), to work with local government to improve conservation of birds and habitats in areas where high human-use overlaps with internationally recognized Important Bird Areas (IBAs). The goals are to advance the IBA program and enhance overall biodiversity conservation in the Lower Mainland, on the east coast of Vancouver Island, and in the Okanagan. This project expands on a previous project conducted by BSC in 2011-12, also funded by REFBC. The current project will focus on developing policy recommendations and best practices, increasing recognition of IBAs in local government policy, developing tools for conservation planning, and facilitating use of bird data in local planning. This new project with local governments will serve to strengthen the success of local conservation initiatives and contribute to global biodiversity conservation.

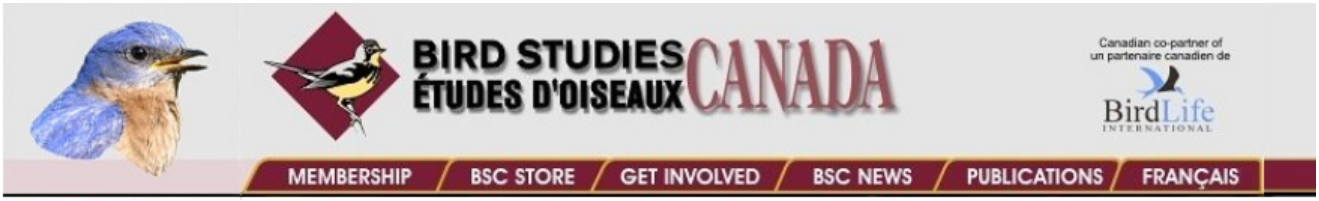
Although the project is still in the early stages, there have been several excellent opportunities to work with local governments. For example, we provided data and input to the Capital Regional District's draft Management Plan for the Island View Beach Regional Park adjacent to the Sidney Channel IBA. We have also submitted several policy recommendations to the City of Surrey for their updated Official Community Plan and to the City of Vancouver for their new Community Plan for the Grandview-Woodland Neighborhood. In May 2013, Vancouver City Council passed a motion to develop a Bird Friendly Strategy as part of Vancouver's Greenest City goals. This Strategy recognizes the importance of conserving and enhancing urban green space for birds, wildlife and overall biodiversity, as well for ensuring community health and well-being. As part of this new Strategy, BSC and many other partners have been working with Vancouver to develop bird-friendly Landscape Guidelines and Building Guidelines, and to expand birding ecotourism. We also submitted information on birds and habitat for the City of Vancouver's Biodiversity Conservation Strategy and we are providing recommendations to Burnaby's Environmental Sustainability Strategy.

In September, BSC attended the Union of British Columbia Municipalities' (UBCM) Tradeshow and Exhibition and hosted an information booth to promote the products from this project. We reached a number of local governments across the province and interest was high on topics such as declining species (e.g. swallows), impacts of cats, habitat loss, building collisions, impacts from non-native Canada Geese, as well as general interest in birding. We are very grateful for the continued support of the Real Estate Foundation of BC. For more information about this project, please contact Karen Barry (BCprograms@birdscanada.org).

Surfbird (R. Hocken)

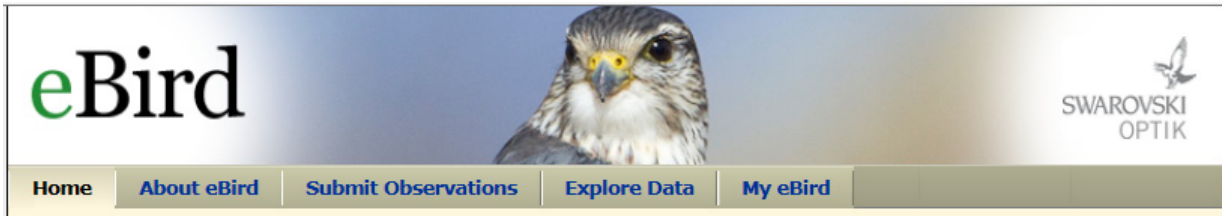
IBAs in British Columbia are a partnership program of:

USEFUL WEB RESOURCES



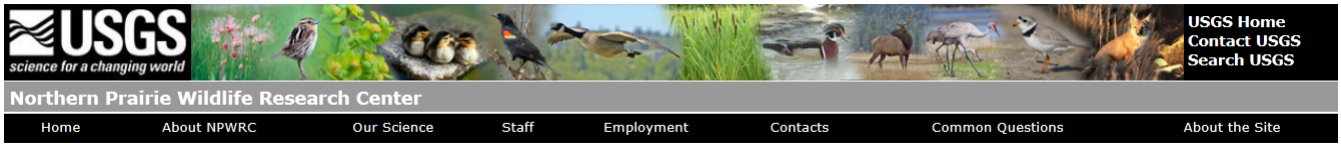
BSC Coastal Bird Identification Guides
http://bit.ly/1hG9H20 or http://www.bsc-eoc.org/volunteer/bccws/index.jsp?targetpg=bccwsresources&lang=EN

With help from Russ Cannings, BSC's BC Office developed bird identification guides for some of the more challenging waterbirds seen along BC's coast, namely adult and juvenile gulls, shorebirds, female ducks, cormorants, and wintering loons and grebes. These guides have photos of the most commonly found species in their difficult plumage along with tips for correct identification.



Ebird Counting 101 and 201
http://ebird.org/plone/ebird/news/bird-counting-101

Need some help estimating large flock sizes? Check out the shorebird estimation guide on BSC's website (see link above), or check out the "Counting 101" and "Counting 201" guides on www.ebird.ca. These resources provide strategies for counting large flocks along with photos of different flock sizes to help you practice and hone your skills.



Species, Age and Sex Identification of Ducks Using Wing Plumage
www.npwrc.usgs.gov/resource/birds/duckplum/index.htm

Subtle differences in wing feather color and feather texture can be used to distinguish young ducks from adult ducks, and males from females. This guide documents procedures that were developed over a 30 year period by experts who examined the wings of ducks contributed voluntarily to the U.S. Fish and Wildlife Service by hunters.

Surveyor's Scrapbook

Gonzales Bay, Victoria (N. Boyle)

Sandstone formation, Galiano Island (N. Boyle)

Northern Harrier (C. Jardine)

Bald Eagle (C. Handley)

Winter on Calvert Island (C. Handley)

Guided beach walk (R. Lawson)

Printed on FSC 100% post-consumer fibre. Please pass this on when finished!

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The BC Coastal Waterbird and Beached Bird Surveys thank the following organizations for their support: