

# **Natural History of Terrestrial and Marine Birds of the San Juan Islands**

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## **I. Introduction - Using the Life of Birds as a Learning Tool**

Birds are seen everyday, everywhere. They are easy to watch in our own backyard and with our families. The beauty and drama of their daily lives begins to draw us into their fascinating world. By observing animals going about their daily business we begin to understand how they live and how they are adapted to their environment. Connections to the intricate web of life begin to develop and we learn how all things are related. Every place on earth is unique in its own way and what better way is there to learn about life than in our own unique place.

## **II. The Unique Setting for Birds - The San Juan Islands**

### **Habitat Variety and Variety of Bird Species**

There are over 400 species of birds in Washington state, about 300 are found in the San Juan Islands. Comparing the Pacific Northwest states to other states, this is a huge number. This reflects in part, the great diversity of habitats in which these birds live. The San Juan Islands are even unique to the Pacific Northwest. Flying over the islands one sees shallow bays, rocky shoreline, large amounts of open sea water, freshwater lakes and ponds, rocky outcroppings, high elevations, large stretches of coniferous forests, urban areas, and pasture lands. Each of these areas supports different types of plants and animals with their special associations to one another. Habitat variation is a key to learning about the diversity of avian life and how they take advantage of their particular habitat or go elsewhere to live.

As part of the western Washington lowlands and Puget Sound basin, one would expect to find the same species in similar habitats in the San Juans as on the mainland. For many species this holds true but there are exceptions. Steller's jays are found on Orcas, Lopez, and Crane Islands and a few in the Gulf Islands and may have been introduced in the last couple of decades. Evening grosbeaks are only here for a few weeks in the spring and fall migration, but are found in the mid-elevations on the mainland throughout the year. Finding constant food resources and heavy predation may be an answer to their limited numbers. This very marine area is missing long sandy beaches and extensive muddy bays. Many shorebird species will choose the more suitable beaches of the coast for their seasonal spring and fall foraging. This is similar for large rafts of ducks, which find better forage in the lower Puget Sound region. House wrens, chipping and vesper sparrows are found throughout the San Juans as breeders, but are almost absent in the lower mainland. Just as interesting as the unique species found in the San Juan Islands is the lack of or limited amount of certain species found more plentifully in nearby areas.

## **Weather Influence on Habitat and Variety of Bird Species**

The San Juans lie in a rainshadow created by the Olympic Mountains to the south. As storm systems come in off the Pacific Ocean they bump into these mountains unleashing their load of precipitation, dropping up to 140 inches of rain a year on the outer coast in places like the Hoh Valley. As the lightened clouds travel northeast across the San Juans, they pick up little moisture over water like the Strait of Juan de Fuca, so rainfall in the San Juans is closer to 25 inches per year. This low rainfall favors more drought-resistant plants and many plant species that are plentiful on the mainland are either not found in the islands or are rare. Also, some plant species found in eastern Washington are found here like prickly pear cactus. This rainshadow creates habitats unique in the northern part of the Olympic Peninsula and the San Juan Islands and consequently, some bird species are either absent like black-capped chickadees, or fairly unique to Western Washington, like house wrens.

## **Seasonal Occurrence**

Not all 300 species of birds are year-round residents of the islands like mallard ducks or chestnut-backed chickadees. Instead, they occur on a seasonal basis, some just passing through to wintering or breeding grounds, some arriving only to breed, while a handful live here throughout the year. Winter is a wonderful time to learn about birds. There are fewer species and less confusion because insect eaters like warblers and flycatchers, have gone south where their food supply lives. One of the basic questions for birders is: Should a particular bird be here at this time of year? Many raptors from the north winter over on the islands and head north by April. This is also true of trumpeter swans, loons, and many duck species. Turkey vultures and osprey head south along with hummingbirds and swallows. The checklist in the back of *Birding in the San Juan Islands* by Lewis and Sharpe has a good reference of the seasonal occurrence of each species.

## **Migration Routes**

The San Juan Islands' physical location in the Pacific Northwest plays a major role in finding birds on a seasonal basis. Many birds move through this area, hopping from one island to the next, to get further north to their breeding grounds in the spring or further south to their food supply in the fall. They will avoid flying over large bodies of water because the water does not as readily give up its energy as land. The land releases its energy as columns of warm air or thermals, which birds will ride to save energy when flying during migration. Vancouver Island is a major destination for many north bound birds in the spring. Each fall, they pass back through to the San Juan Islands on their way back to southern wintering grounds. Habitat on Vancouver Island there is much like the mainland with high

mountains, a wet west side and dry east side and it is big, over 300 miles long and fairly wide. Every spring hundreds of Townsend's solitaires pass through the San Juans heading for the high, sub-alpine of Vancouver Island. Good spots to find migrating birds are points of land between large bodies of water. Birds hug the shoreline and head for these points before crossing over the water. They also head to high hills, ridge tops and bluffs like Chadwick Hill on Lopez Island to catch thermals and sail across to Whidbey Island and points south.

### **Introduced Species**

Most species of birds found in the Puget lowlands are native, that is, humans did not bring them here. The European starling is the most striking example of an introduced avian species. A native of Europe, they were placed in New York City in the 1890s and arrived in Washington State in 1945. By 1962, they were breeding in the San Juans in great numbers. They do well here as seen by their large flocks of over 1,000 birds. Their great success has been at the expense of other species. Being cavity nesters, they have taken over the space of native cavity nesting species like the purple martin and mountain bluebird. They have taken advantage of fragmented habitats which humans have created by logging, farming, mining and clearing for businesses and homesites. Many native species cannot out-compete introduced species in this fast changing environment and their numbers are dropping.

The sky lark was introduced to Victoria, British Columbia (1903) at about the same time as the European starling. Its numbers reached a high in the 1970s, but are now in sharp decline. Human influence, the loss of breeding habitat at American Camp, and predation by introduced red foxes and local pets have taken a toll in their population. The sky lark does not appear to have influenced other bird species by out-competing for food and habitat.

Besides starlings and sky larks, only a handful of species have been introduced to the islands. Ring-necked pheasants, wild turkeys, California quail, rock doves and house sparrows are all introduced. Their numbers go up and down depending on predation, habitat gain or loss, and to some extent, the weather.

### **Population Dynamics**

All life is adapted to their habitats. This process takes time in a very long sense of over thousands of years. All species are in a process of change as their environment changes around them. Some environmental changes have suited a species well, like gulls, starlings and crows. Their numbers are growing at a fast rate because they can more easily find food, defend themselves via large groups, and find good nesting areas. Humans have

altered the habitat by fragmenting it into smaller pieces, so crows and gulls can now out-compete other species like warblers who do not do as well in a fragmented environment. These species are not in decline solely due to habitat fragmentation, but also because of habitat loss in the neo-tropics where they winter and the heavy use of pesticides in these Southern Hemisphere countries.

Sea birds like tufted puffins that once nested on more isolated islands like Colville and Mandarte, are in serious decline with only a handful remaining in the islands. They dig nesting burrows in the softer soils which are favored by humans for homesites. Their burrows are crushed by foraging animals like cattle and sheep and are dug out by family dogs and cats. They are also caught as by-catch in fishing nets.

Many bird populations are in decline not only in the San Juans, but worldwide. Habitat loss of nesting and winter sites, pesticide use, and safe movement within and to and from their habitat are the main elements of this decline. Some birds do lose nesting habitat in the islands but for the most part, their decline stems from losses in the Southern Hemisphere. Long-term trends are still being established and projects like *Partners in Flight*, sponsored by the American Birding Association, are collecting numbers for specific breeding species in North America.

Many native species have not had enough evolutionary time to evolve the survival mechanisms necessary in this quickly changing landscape. Many species are in decline with only a handful taking advantage of these changes.

### **III. How to Look At and Think About Birds**

There are many guides and books on how to learn about and identify birds. They include the famous field marks system created by Roger Tory Peterson, photo-identification, and local and regional manuals. It is helpful to learn to think not only of field marks in species identification, but to look at form, function, behavior, relationship to habitat, art, and beauty to fully understand how avian life ties to all forms of life. One should learn to think like the subject they are studying.

- **How are birds different from other animals?**

#### **Physical structure**

Most birds are built for flying. Not only do they have feathers but most also have hollow bones and a shortened digestive track for lightness (they tend to eliminate before taking to the wing). There are over 9,000 bird species worldwide, each taking advantage of the diverse habitats on the planet. This means that even though they are all built basically the same,

structural variance from one species to the other allows them to take advantage of their habitat.

### **Behavior**

How do birds behave differently from other animals? The ability to fly allows birds the opportunity to find food that other species may not be able get. They can also migrate on a seasonal basis to find food for themselves and their young. They can fly to get away from predators and, on the other hand, catch food from the wing.

### **Habitat needs**

What every species needs to survive is food, water, shelter, and have it arranged so an animal can get to it all safely. How is a bird built to find these things and how is the habitat arranged to provide for these things? What other avian species live in the same habitat and how do they use it? How much habitat change can the species withstand before they are affected? How would a bird be affected by varying amounts of change? What change has happened in the San Juans in the last 100 years that would effect populations? What would happen if an oil tanker sank or a housing development was placed in the middle of the prairies at American Camp?

#### **• What things do birds need to do to pass on their genes?**

To be successful in life all species must pass on their genes. This starts at birth and continues on to the raising of young. A bird may not survive in a habitat for which it was not adapted. This idea of passing on successful genes is directly related to structure of the bird, its behavior and habitat. To successfully pass on ones genes, one must:

- Find food, shelter and water
- Migrate to another area for food
- Be strong enough to migrate
- Chase potential competitors away for food
- Defend self from predators
- Attract mate which might include:
- Chase potential competitors away from mate
  - Must be better singer
  - Must have new and bright feathers
  - Must be physically fit to chase competitors
  - Must be physically fit to perform display
  - Must display special breeding behavior
- Reproduce
- Raise young and protect young from predators
- Teach young to do all of the above or not, depending on species (some young birds spend little time with their parents)

What happens if there is failure to do any of the above? There can be limited failure to some aspects, but continued failure will mean the end of a species.

- **The Energy Balance - What Is It?**

All living things must maintain an energy balance - they must be able to take in energy or food, and balance energy spent for every activity. Every activity takes energy, even eating.

**Excess Energy**

What happens if too much food is taken in? The extra calories are converted to fat. This can be useful for winter energy reserves or for use in migration. It also takes more energy to move around with more fat so this could be a disadvantage.

**Starvation**

What happens if more energy is spent than taken in? Birds of prey are a good example. They start to miss their targets by usually only a bit, but the end result is still hunger with high energy use. The downward spiral begins. They may eventually die of starvation. Some birds spend a great deal of energy during migration and do not have the energy to evade their predators or even finish their migration.

- **Migration - Why do birds travel?**

Spring and fall are exciting times of year as birds are in route to or from breeding grounds. Some species are only seen in the islands at this time. They are going to new locations, which will provide enough food not only for themselves but their young as well. They are also seeking out a relatively safe place to raise their young. In the winter, they are escaping cold climates and searching for food. They can travel great distances, across oceans and continents, and must be built for extended travel. They must also know the way. Many birding checklists are developed on a seasonal basis and are basic to learn if a particular species is found in an area at a certain time of year. Keep in mind that birds can get lost or blown off course during storms and turn up in unlikely places.

- **How are birds built to best survive in their particular habitat?**

All animals are adapted to their habitat. Some are wading birds like great blue herons with large snowshoe-like feet built to walk on soft mud. Others have long probing bills to dig out food or strong talons to hold their prey. It is always best to think about how a bird makes a living when thinking about why it is built the way it is. It is also important to think what is the advantage of being built in a certain way or have a particular behavior for a particular habitat. Most times, body structure and behavior go hand in hand. These are major elements in species identification. What type of body structure is needed for finding, holding and eating various food types? How is a woodpecker different than a duck? Will an insect eater have a strong enough bill to crack open seeds?

### **Behavior**

Some birds are easy to see like a bald eagle. They sit out in the open and fly over fields and large bodies of water. Their wings are long and broad to take advantage of air currents to best suite their hunting style. Hawks of the forest are secretive because they need to sneak up on their prey. Forest hawks have short, rounded wings to fly between the branches of trees, something a bald eagle does not do. Kingfishers fly and hover over the shoreline and plunge headfirst into the water to catch food. Their wings are shaped differently to hover. Many birds will fly together in a flock for protection from predators. Not only does the large mass provide confusion, but also more eyes can watch for predators or more wings and feet can chase away the hunters from the hunted. Seasonal supply of food forces some birds to migrate. They must be strong fliers and built accordingly. Cold or hot weather must also be considered. Snowy owls have more feathers to keep warm in the frozen Arctic.

- **Learn from the familiar and compare: How do you identify birds?**

Getting a handle on the actual process of identifying species can be overwhelming and guides confusing. One of the best ways to begin is to start with what one already knows. Compare unknown birds to known birds like a robin, mallard, eagle or even Tweedy Bird. Color, posture, size, behavior and location are good comparisons. Some simple ideas like size and shape go a long way. Relative size is very important. The relative size of the bill length compared to head width can define a species. A short neck and full, round belly gives a stout appearance. Do read and understand the introduction to guides like the *Peterson Field Guide of Western Birds* and *National Geographic Field Guide to North American Birds*. The best way to learn is to go out in the field with a local person who enjoys sharing their knowledge of local bird life.

## **IV. Learning Terrestrial and Marine Birds**

The basis for learning how to identify birds follows. Many guides are on the market and several are suggested in the *Resources* section but only a few are needed. The concepts from Parts I and II are major aids in understanding some of the whys and hows of birdlife and should reveal many of the keys to a bird's identification.

The introductions of *Western Birds*, *National Geographic Field Guide to North American Birds*, and *Birding in the San Juan Islands* should be studied for learning how to identify birds and habitat types, and how to work in the field. These concepts are commonly used among all birders and suggest how to get handles on bird identification.

The San Juan Islands are often thought of in terms of land or terrestrial, and water or marine. By thinking of birds as living in these two major

habitat types the process of finding them in guides and identification will be much easier. Keep in mind that one habitat is not exclusive to the other; some birds will use both. Some marine birds will be seen on land such as when curlews are seen in fields and some terrestrial birds may be seen over water as when seen flying over San Juan Channel. When this happens it should always be asked how is this an advantage to passing on their genes, how are they built to use both habitats, or could this bird be misidentified, could it be lost? In general, does it make sense to see it here in this area?

### Terrestrial Birds in Their Habitats

The terrestrial areas of the San Juans in themselves are not necessarily unique to western Washington. The uniqueness comes from being surrounded by large bodies of salt water several miles wide separating the landmasses. There are sudden changes in altitude with a very close proximity of a variety of habitats from sea level to over 2,400 feet. The islands' location on a major flyway in spring and fall adds to particular features for avian life. These all create a unique situation for mating, foraging and the interaction of species. Always keep in mind the season, as many birds are only here part of the year. The key to understanding why each bird is here is generally habitat. Each species is designed for a specific area and can more successfully pass on its genes.

The following are some examples of terrestrial habitats and birds found in the San Juan Islands. *Birding in the San Juan Islands* has a very good description of these habitats and species.

### Higher Elevation

Mt. Constitution on Orcas Island stands at almost one-half mile high. Many species found on the mainland at this altitude are also found here like blue grouse, Clark's nutcracker and gray jays. Varied thrushes move up here in the summer to breed and are only found in lower elevations in non-breeding months.

### Rocky Slopes and Open Woodland

These areas tend to be drier and open. This is perfect for ground nesters like common nighthawks, a species that is fast losing ground and has become uncommon in the Puget lowlands. Other birds that may be found in this habitat include flycatchers, Savannah sparrows, and vesper sparrows.

### Coniferous Forest

Townsend's and black-throated gray warblers use the high tree tops as foraging grounds and for nesting. Winter months find flocks of chestnut-



backed chickadees, red-breasted nuthatches, brown creepers, and kinglets working these dense areas. Cooper's hawks are raptors of dense forests which prey on small birds.

### **Riparian Forest**

The islands were heavily logged by the turn of the 20th century. New forests surrounding ponds and wetlands are rich in bird life searching out insects. This is the perfect place for flycatchers, vireos, warblers, tanagers and grosbeaks.

### **Meadow and Pastures**

Large flocks of crows, starlings and blackbirds use their long bills to probe for insect larva in these areas. They pick insects off the cattle in pastures and their dung. Some long billed shorebirds will also use these areas. Red-tailed hawks, peregrine falcons, and eagles are often seen sitting on fence posts which are wonderful perches for spotting prey in the field.

### **Dry Grasslands**

Like pastures but not plowed each season, grasslands like Iceberg Point and American Camp are home to sparrows, buntings, and pipits in the fall, and are the first landfall for many passerines after crossing over 20 miles of open water in spring migration. Eagles hunt for rabbits and peregrine falcons for small birds. Swallows take to the wind snaring insects from these fields.

### **Lakes and Ponds**

Many of the ponds in the San Juans are man-made but are home to wintering ducks. Red-winged blackbirds and common yellowthroats abound. A handful of rails live in the marshy areas, as do wrens, ducks, coots and grebes. In very extreme weather a few sea birds may use ponds close to the sea but otherwise are rarely found here.

### **Town**

These areas are highly disturbed, that is, the natural protection and food resource has changed. Only a handful of species such as house finches, chickadees, band-tail pigeons, robins, and song sparrows do well here, many at bird feeders. Introduced species like starlings, rock doves, and house sparrows thrive as do crows and gulls. Wild turkeys are seen in Friday Harbor but red foxes have reduced their numbers. When the fox numbers go down maybe the turkey numbers will go up.

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### **Yards**

Many people are now planting food and cover for wildlife to draw them into their yards. Hummingbirds are seen at feeders, as are many of the finch species. Small hawks roam neighborhoods working feeders. Insect eaters are few in these areas.

### **Marine Birds in Their Habitats**

Like terrestrial areas, the marine habitat in the San Juans is not necessarily unique to western Washington but do have a unique character. The same combination of factors that make the islands unique for terrestrial habitats are also in effect here, with the addition of the close location to the Pacific Ocean. Storms blow some species to more protected waters or down from the northern latitudes, so many species found here will not be seen in the lower Puget Sound.

The uniqueness of the San Juan Islands marine waters is partly due to the fact that they are the richest in life in the greater Puget Sound Basin. The islands lie in a basin surrounded by mountains, the Cascades to the east, the Olympics to the south and the Coast Range on Vancouver Island to the west. These mountains are constantly being worn down and debris carried to the islands by prevailing currents. These materials become nutrients or food for the bottom of the food chain. Not only is there a huge supply of food for the photo- and zooplankton, but there is also a great deal of upwelling caused by the extreme tides. At times there can be over 13 vertical feet of water exchanged during a tide. This huge volume of water is squeezed through narrow channels and deep underwater canyons. This action acts like a giant mixer, constantly stirring nutrients up from the sea floor, remixing them and making a rich broth for the plankton. With such a broad base on the food chain, there is a great resource for small fish, which is food for the thousands of seabirds. The highest concentrations of wintering sea birds in Washington State are found throughout the San Juan Islands.

The following are some examples of marine habitats and birds found in the San Juan Islands. Again, *Birding in the San Juan Islands* has a very good description of these habitats and species.

#### **Open Water**

Many of the wintering loon, grebe, duck and alcid species will use open water like the Strait of Juan de Fuca, Haro Strait, Strait of Georgia and Rosario Strait. Good forage is found in these areas for the large flocks.

#### **Protected Water**

Quiet bays like Wescott Bay on San Juan Island or Deer Harbor on Orcas Island can become windswept when the wind changes. Birds will move to the lee of an island for protection but will still prefer many of these shallow bays. Loons, grebes, cormorants, geese, many of the dabbling ducks like wigeons and pintails and the diving ducks like goldeneyes and scoters can be found here.

**Fast Moving or Turbulent water**

Turbulence mixes the nutrients in these very rich waters. These nutrients are food for the small fish preferred by many sea birds. Cattle Pass between San Juan and Lopez Islands has one of the highest concentrations of sea birds like loons, grebes, common murre, rhinoceros auklets, and ancient and marbled murrelets, during the winter months.

**Rocky shorelines**

Shorebirds use the many miles of rocky shoreline to forage for food. Black oystercatchers, black turnstones, surfbirds, and greater yellowlegs can all be found here. Harlequin ducks, mergansers and goldeneyes also choose this area.

**Mud Bays**

There are only a handful of muddy bays as there are no major river estuaries on the islands. Deer Harbor on Orcas Island, Mud Bay on Lopez Island, and False Bay on San Juan Island are some of the few muddy bays. The small streams that feed them are utilized by herons, ducks, shorebirds, gulls, and eagles. At low tide, long-legged waders work small pools and probe the mud for food.

**Sandy Beaches**

There are few sandy beaches and most are often covered with people. Some of the upper beaches like above South Beach on San Juan Island will host dunlin, semipalmated plovers, killdeer, pipits, Savannah sparrows, white-crowned sparrows and golden-crowned sparrows.

**V. Conclusion**

Learning about birds is a wonderful way to learn about everything else around you. By putting something alive in the middle of any habitat and observing how it lives is what so many find interesting in life. We start to see more than birds. It is a great way to get outdoors and see the natural world. While watching and learning about birds, one should use a variety of written, drawing, and thinking skills. It can be as exciting as watching a bald eagle soar or as serene as watching a hummingbird feed. Most of all, it should be fun and it should teach us about the grandeur and beauty of nature.

**Resources**

The teacher's guide can be adapted for all grades, replacing the more abstract ideas used in higher education with work sheets, drawing and activities for the lower levels. The main element that must be used is fieldwork. Observations of live birds in their native habitat will not only hone identifying skills but it should also be the main element that ties together the concepts of how birds live. In the field, students should learn to take

notes and develop writing skills, draw what they observe, and discover the rhythm of nature. There are many more activities possible than listed in the sample activities. Many resources exist that have various teaching and study programs, such as the local and state Audubon chapters, Cornell University, American Birding Association, San Juan Nature Institute and Skylark Nature Tours. The Internet is full of information and ideas. Local Audubon chapters are always looking for material for their newsletters and young people to attend their walks.

There are many good resources. Check the local library for these and other books. Look in both adult and children's sections. Books on building nest boxes and birdhouses are also useful. There is also free Internet access at the library. Seek local experts for help. Many people have a good deal of information they have collected over a lifetime spent on the islands. Seek out this local knowledge. Do not limit yourself to experts only. Most people are happy to share their knowledge and time.

### **Suggested Printed Material:**

#### **Guides for North America**

National Geographic Society. Field Guide to North American Birds. Washington, D.C.: National Geographic Society, 1983.

Peterson, Roger Tory. A Field Guide to Western Birds. Boston: Houghton Mifflin, 1990.

Ehrlich, Paul, David S. Dobkin and Darryl Wheye. The Birder's Handbook: A Field Guide to the Natural History of North American Birds: Including All Species that Regularly Breed North of Mexico. New York: Simon and Schuster, 1988.

#### **Guides for Washington State**

Whal, Terence R. and Dennis R. Paulson. A Guide to Bird Finding in Washington. Bellingham, WA: Whatcom Museum of History and Art, 1993.

Washington Ornithological Society Field Card, 1993.

#### **Guides for the San Juan Islands**

Lewis, Mark G. and Fred A. Sharpe. Birding in the San Juan Islands. Seattle, WA: The Mountaineers, 1987.

Vernon, Susan. Wildlife of the San Juan Islands. Friday Harbor, WA: Archipelago Press, 1996.

**Organizations:**

Cornell University - Project Feeder Watch for Schools  
(home page: <http://birdssource.cornell.edu/features/pfw/>).

American Birding Association, Partners in Flight  
(home page: <http://www.americanbirding.org>).  
Washington State Department of Fish and Wildlife, Backyard Wild Sanctuary Program.

National Audubon Society, Audubon Adventures for School Age Children  
(see local chapter).

San Juan Islands Audubon Society - various programs and trips, (Contact the current president, Barbara Jensen (360) 378-3068).

Skylark Nature Tours, Friday Harbor, Washington.