



HABITAT ACQUISITION TRUST

WETLAND

protection & stewardship

*The Red-winged Blackbird (*Agelaius phoeniceus*) is a common wetland visitor.*

What Are Wetlands?

The word “wetland” is a relatively new term replacing the word swamp in common scientific usage only in the second half of the twentieth century. It describes land that is saturated with water for enough time that it changes the combination of plants and soil that are present.¹ Water, climate, and surrounding geology are the main factors that determine whether a wetland will form, and what it will look like.

Are there different types of wetlands?

To the untrained eye, wetlands may appear all the same - wet and boggy. In reality, wetlands are as unique as fingerprints and organizing them into categories is a difficult task. Wetlands can be wet year-round, for a few months, or even just for few hours each day. Some may even go through long droughts and remain dry for years. Wetlands can contain fresh or salt water, be deep or shallow, host ancient cedar trees or tiny carnivorous sundews. In BC, the Wetland and Riparian Ecosystem Classification Project has identified over 100 unique wetlands and related ecosystems.

How do wetlands function?

Wetlands are usually downstream from other ecosystems. As a result, they receive much of the nutrients, plant material, and energy that are washed downhill. When all this material gets to the wetland, it slows down or may stop moving completely, and becomes part of the wetland's metabolism. You'll rarely see too many pests, exposed soil, or rampaging floodwaters in a natural wetland.

Why protect wetlands?

Wetlands are capable of hosting wildlife and benefiting water quality in a way that is much larger than what you might estimate for their size.² It is only recently that wetlands have been acknowledged for their potential in addressing environmental, economic, and social challenges. Wetlands act like a giant sponge absorbing and slowly releasing the water that passes through. They filter out pollutants, store water for times of drought, slow down soil erosion, and act as protective buffers against flooding.³ They even help to mitigate climate change by storing vast amounts of carbon in the form of decomposed material, or peat. If the peat is drained, the organic matter dries up and begins to decay, releasing the stored carbon into the atmosphere in the form of CO₂ and contributing to greenhouse gas emissions.²

Why restore wetlands?

Restoring wetlands is important because so much wetland habitat has been lost to drainage for agriculture, forestry and infilling for development. Wetlands are among the most rare and biodiverse ecosystems in the world, and globally, the most economically valuable. Despite our knowledge of their tremendous value, wetland loss continues. This rate of loss for wetland areas is 3 times the global average annual rate of loss of natural forests. Latest research indicates a global 35% decline in marine, coastal and inland natural wetland areas since 1990. In settled areas of Canada, 70% of our wetlands have already been destroyed or degraded.⁹

Did you know?

Protecting 1 acre of wetland can save a city up to \$300,000 in artificial water treatment systems⁴

Stewardship Series

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Becoming Wetland Warriors

If you haven't visited Stoneridge Wetland, you must see this beautiful hidden gem. Located just outside of Victoria in View Royal near Thetis Lake Regional Park, Stoneridge Wetland is a semi-open marsh covering about two acres. A branch of Charlton Creek flows into the northwest corner of the wetland. It is replenished primarily from precipitation and storm drain run-off from the neighboring communities. The run-off is treated with a simple filtration system before entering the marsh. It provides nesting sites for mallard ducks (*photo below*), northern pintail, hooded merganser and bufflehead as well as cedar waxwings, heron, owls, and woodpeckers. A group of habitat stewards supported by View Royal have taken wetland stewardship into their own hands. In 2016, an aquatic invasive plant Parrot's Feather (*Myriophyllum aquaticum*) began infesting the wetland. It is suspected the plant entered via the storm drain system. Thanks to the hard working volunteers and the municipality, the native plant community is being restored. Today, Stoneridge Wetland is home to many native waterfowl, songbirds, bats, amphibians and much more.

For more visit: stoneridgewetland.ca



Wetland Invaders



Yellow Flag-Iris

Iris pseudacorus is an eye-catching perennial that creates dense stands in wet areas, excluding native species and threatening plant and animal diversity. Yellow flag-iris invades ditches, irrigation canals, wetlands, stream and lake shorelines, and shallow ponds. It has floating seeds that travel quickly in waterways.



Reed Canary Grass

Phalaris arundinacea is an extremely aggressive invasive species that plagues natural areas in this region. It is a perennial cool-season grass that grows up to 2 meters tall. This plant spreads by creeping rhizomes, and is a successful invasive due to its high viability rate and lack of dormancy.



Himalayan Blackberry

Rubus armeniacus (syn. *Rubus discolor*) is abundant along rivers and wetland edges in this region, often blocking wildlife access. Riverbanks covered with blackberry often hint at degraded conditions and may mask eroding banks. Himalayan blackberry out-competes native vegetation primarily by smothering.

Wetlands are nature's kidneys

Wetlands are often referred to as *Earth's kidneys* for good reason. In the body, kidneys provide the crucial function of filtering our blood, while in nature wetlands filter water from creeks and storm drains before it moves toward the ocean. As they slow water movement they provide an important ecosystem service. Acting as a sponge, wetlands soak up excess nutrients like nitrogen and phosphorous which, if left to enter waterways, can lead to dangerous algae blooms. These blooms deprive our creeks and rivers of oxygen and sunlight, suffocating life beneath the surface.

What's more, if an invasive species is introduced into a wetland, it can quickly take over and threaten the function of the ecosystem. Invasive plant species like yellow flag-iris, reed canary grass, and Himalayan blackberry can suppress the growth of native plants causing loss of diversity, impact the wetlands ability to filter water, and even change the water flow.

Want to become a Habitat Steward of your local natural area? Check out the **BC Wildlife Federation Wetlands Education Program** for workshops and training opportunities.

What you put down the drain matters

Just like our kidneys, too many toxins can be deadly. Even though we can thank wetlands for providing us with free water filtration, many of the creatures that reside in wetlands are sensitive to changes in water chemistry. Amphibians, for example, breathe and absorb water through their thin permeable skin, which means they also absorb chemicals the water may contain.

Take care to prevent toxic substances from washing into wetlands such as: oils, gasoline, paint, medications, detergents, fats and grease, pesticides, fertilizers, manure, soil, and sediment.

To learn more about painting without pollution, going Pesticide Free, being Septic Savvy and other helpful resources, check out:

crd.bc.ca/education



Not your Average Frog

American Bullfrogs (*Lithobates catesbeianus*), native to eastern North America, were introduced to the west coast in the 1930s by landowners and farmers with misguided dreams of making a fortune on frog legs. Soon after introduction, the frogs spread rapidly through wetlands and ponds given that females will lay up to **20,000 eggs at a time**, and most local predators find bullfrog eggs and tadpoles unpalatable.

In their native habitat, bullfrog populations are kept in check by larger predators like alligators and snapping turtles. On the west coast they **lack enough effective predators**, so our local fauna are being impacted by increasing bullfrog populations. Research on stomach contents of local bullfrogs shows they will attack and consume virtually any organism that can be swallowed, including their own species. Prey includes insects, spiders, crayfish, fish, frogs, salamanders, newts, snakes, lizards, turtles, birds, and even small mammals.^{5,6}

Bullfrogs lay eggs typically in May to early August, which is later than our native frog species. Bullfrog egg masses appear as large slimy jelly (like raw egg whites) on the surface of the water with thousands of little black eggs inside. The eggs hatch in a few days and tadpoles remain in the ponds until the following spring. Managing these creatures is no small task. The **best stewardship strategies** include:

- Learn your frogs! **Consult ID guides** of eggs, tadpoles, and adults. Listen for calls and croaks
- Don't **move adult frogs, tadpoles or eggs** from one wetland, pond or lake, to another
- Report suspected bullfrog sightings to the **BC Report Invasives App** or online form
- Avoid **converting** temporary wetlands into permanent ponds, this includes deepening existing ponds to hold water throughout the summer which just encourages more bullfrogs
- Provide native frog habitat: **plant native plants** around the edges and leave large pieces of wood



Need help identifying a frog, tadpole, or egg mass? Want more information? Send us an email hatmail@hat.bc.ca

Plants in Wetlands

How do plants survive in such wet places? Plants that thrive in saturated sites like wetlands are called **hydrophytes** (hydro=water, phyte=plant). Hydrophytes have adapted to life in wetlands using special features like internal air compartments in the leaves that keep them floating on the surface. Photos of wetland plants below from top to bottom: Swamp Lantern or Skunk Cabbage (*Lysichiton americanus*), Water Smartweed (*Persicaria amphibia*), and Common Silverweed (*Potentilla anserina*).



When can I start digging?

When creating a wetland, selecting an appropriate site is the most important step in the process. There are several considerations that need to be made when deciding on a location and many of those require a professional understanding of historical drainage changes, hydrology (how the water moves through the land), soil type, and the ecology of the surrounding landscape. Fortunately, there are Wetland Restoration Specialists available for on-site visits and consultation to help you each step of the way. Below we have provided a list of factors that need to be considered as you work with a professional on the project.

1: Choosing a location. There are a few important things to consider when choosing a location. First, ensure the area is not an existing important habitat already. Second, assess whether the site is suitable for wetland restoration. Wetlands are most easily restored where slope is less than 6% and there is naturally sufficient moisture. If the location is too steep, it will be more difficult to retain water, and there is a greater risk of erosion as water leaves.

2: Assessing your soil texture. The purpose of this is to determine how water will be maintained in the wetland and how water will enter and exit the wetland.

3: Determining the depth of the water table. Where is the natural level of groundwater at that location? Does it change seasonally? If you have standing water year round then the water table is at the surface. Remember that this can change throughout the year as precipitation changes.

4: Deciding on the depth of the wetland. The depth will define the type of flora and fauna that will be attracted to your wetland. Year-round water can potentially host invasive bullfrogs, whereas seasonal wetlands are usually safer habitat for our native frogs. Shallow wetlands (less than 1.5m deep) provide very important habitat.

5: Creating habitat with native plants. An oasis for frogs means providing excellent hiding spaces from predators. Plants around the edge like sedges as well as those covering the water surface such as yellow pond lilies are critical in keeping the water clean and cool. Where wetlands have been drained, native wetland plants rapidly colonize restored wetlands.

6: Maintaining the space for habitat. Managing any incoming invasive species is important while native wetland plants are getting established.

For the Love of Peat

Peatlands, a type of wetland, are characterized by a layer of accumulated peat (partially decayed matter) beneath their surfaces. Sphagnum moss (sometimes called **peat moss**) is the main component of peat. You may have heard the term "peat" before at your local gardening store as it is valued in horticulture for its ability to retain moisture and oxygen, and for its natural fungus suppression abilities. However, peat is **not a renewable resource** since it is mined from naturally occurring peatlands, some of which have taken hundreds of thousands of years to form. Horticulturalists have discovered numerous alternatives to peat moss that are more sustainable including blends of composted leaves, coconut fibre (coir), worm castings, and pine bark.

To learn more about how you can enhance the wetland habitats on your property, visit our website at hat.bc.ca

Wetlands



Stewardship Series 10

If you would like to build or enhance a wetland, contact HAT at hatmail@hat.bc.ca or visit hat.bc.ca for more information.

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Photo Credits:

TC is Todd Carnahan, MC is Marc Cacovic, and AM is Aimee Mitchell.

Information Credits:

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Wildlife that depend on wetlands to survive

Wetlands are wonderfully well equipped to provide wildlife with a place to live. Directly or indirectly, almost all wildlife depends on wetlands. Some examples of the species most closely associated with wetlands include:

- ▶ Birds, many of which are migratory and will nest or feed in wetlands at various times of the year, including many species of seabirds, shorebirds and waterfowl
- ▶ Frogs, newts, toads and salamanders, many of which are species-at-risk
- ▶ Mammals such as bats, mice, shrew, voles, muskrat, mink, river otter, beaver, elk, deer and bear, which live or periodically hunt and graze in wetlands
- ▶ Many species of fish, including juvenile Pacific salmon and cutthroat trout, which may use wetlands for the first years of their life.
- ▶ A multitude of invertebrates including worms, insects and crustaceans that control ecosystem processes in wetlands and supply food for higher consumers such as birds, mammals and fish.¹



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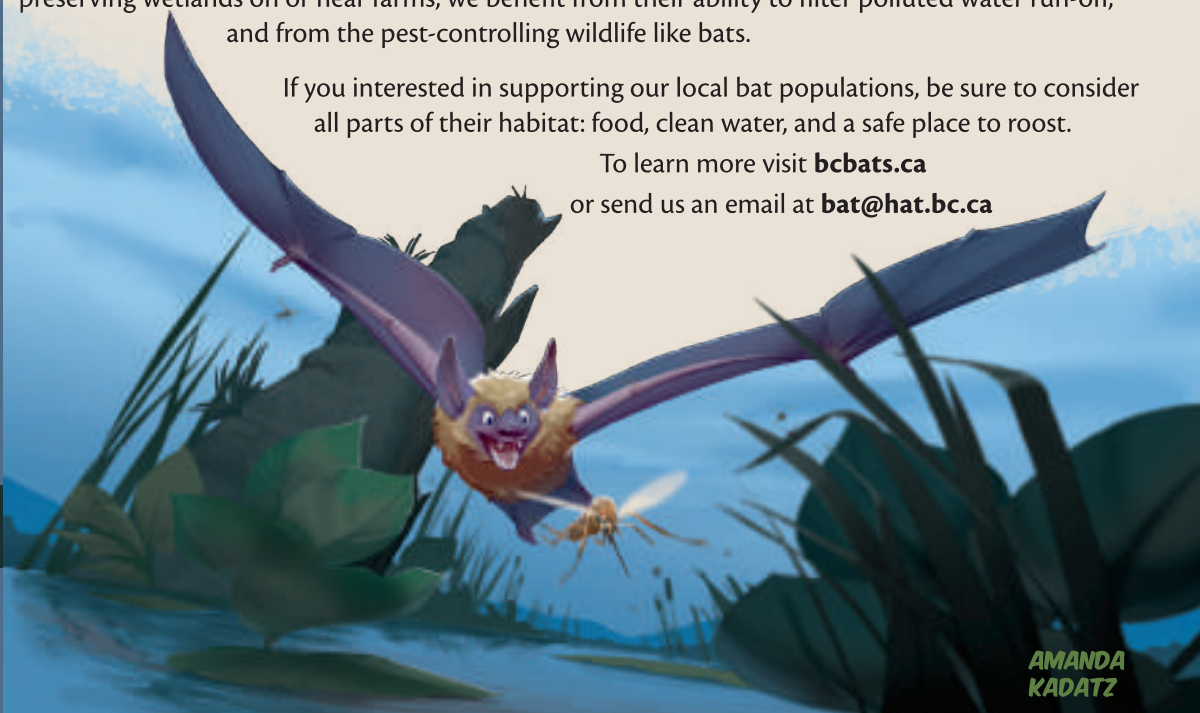


What do bats, wetlands, and farms have in common?

You will rarely see a bat far from fresh water. Bats love to eat the insects that thrive above the surface in warmer months. Wetlands are a particularly important dining spot as they provide an abundance of night-flying bugs that our local bats depend on such as **mosquitoes, moths, and beetles**. Female bats can eat their body weight in insects each night — that is about 3,500 insects! Bats also keep common agricultural pests in check. It is estimated that losing bats worldwide would not only be devastating to local ecology, but would lead to agricultural losses in the billions of dollars.⁸ That is because wetlands have what typical farms often lack — habitat complexity, species diversity, and as a result, the ability to deal with environmental change. By protecting and preserving wetlands on or near farms, we benefit from their ability to filter polluted water run-off, and from the pest-controlling wildlife like bats.

If you interested in supporting our local bat populations, be sure to consider all parts of their habitat: food, clean water, and a safe place to roost.

To learn more visit bcbats.ca
or send us an email at bat@hat.bc.ca



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KADATZ

Habitat Acquisition Trust helps your community care for wildlife and their habitats. Your support will help enable habitat restoration, provide nature education to youth, and protect wetlands where wildlife and plants can thrive.

Charitable # 889626545RR0001. All donations over \$10 are tax-receiptable. Make cheques payable to Habitat Acquisition Trust or HAT.

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