Gabriola Streamkeepers—Water levels and quality

Observations at Coats Marsh, Gabriola Island

—with notes on Coats Marsh Creek, East Path Creek, and Stump Farm Streams.

References:

RDN Coats Marsh Regional Park, 2011–2021 Management Plan, Appendix A.

Coats Marsh hydrology .

Coats Marsh RP and 707 CP Trail Maps: Maps Y and Z.

Gabriola Stream and Wetlands Atlas .

Coats Marsh Species Checklists .

Coats Marsh – human disturbance of migratory ducks and geese.

Field observations—2018

THIS FILE (Field Observations 2018) IS A SUPPLEMENT TO:

"Observations at Coats Marsh, Gabriola Island" File: 673.

For an up-to-date list of supplements see here .

2018 NOTES

Regular visits ended, but not ceased altogether. Trying to lessen disturbance in duck breeding season.

May 3, 2018 Trilliums, common enough on the island, but not noticed in the park before. Not far from Coats Marsh Creek at the western entrance.

May 13, 2018 GaLTT broom bash in the western burn-pile clearing. Pied-billed grebes very vocal as we worked; a few mallard quacks. No visual observations.

Scotch broom (*Cytisus scoparius*) is widely regarded as a nuisance on Gabriola; yet, nobody-in-particular has responsibility "to do something about it". It has showy flowers, most sulphur yellow, but those of some plants have attractive bright blood-red patches, and others not-quite-white creamy flowers and still others an autumnal-looking blended red and gold colour.

Nice, but on the other hand, broom is a noxious invasive weed with a very bad attitude to native ecosystems. It spreads rapidly and uncontrollably in disturbed areas, often forming near monocultural thickets. That said however, in the two clearings on the north side

of the park it shares the space with several other invasive foreign weeds, notably thistles (Canada and bull), tansy ragwort, and ox-eye daisies. There are also substantial patches of stinging nettles (*Urtica dioica*) but I won't mention them because some say they're native plants.

During the GaLTT broom bash, while on my hands and knees cutting yet another broom plant, I fell to wondering what ecosystem exactly these particular plants were threatening. The clearings are not natural. Left completely to themselves they will eventually revert to being Douglas-fir forest, though I'll never live to see it. The proliferation of broom and many other exotics there are a symptom, not a cause of the disruption. Am I therefore by culling them just being a gardener, not as elsewhere, Drumbeg for example, a saviour?

The original purpose of the clearings was for burning tree stumps and other unusable logging debris. Though I doubt there'll be any more burning here, piling up broom cuttings is just carrying on the tradition.

The infestation of broom does, here and there, encroach beyond the greenswards into the bordering domain of salal, sword ferns, and mosses, but not at the moment alarmingly so. And there's also here a Himalayan blackberry, another villain that was noted in the 2011-2021 Park Management Report. It has spread hardly anywhere despite the species' reputation for

aggressively so doing, and despite being pretty-much left alone for many years.

Is it fair, I pondered on as I piled up my cuttings, to regard all ecosystems dominated by exotic species with derision? I no longer think so. Of the ninety plus species of wildflowers I've noted in the park, over sixty were found in grassy open areas like the clearings. And with these flowers come insects and seeds, and with the insects and seeds come birds and rodents. The clearings are the best places to see dragon and damsel flies; grasshoppers and an occasional alligator lizard; honeybees and bumblebees, butterflies (the exotic Essex skipper for example); finches that love the thistledown; flocks of towhees foraging for seeds; deer that rest in non-native grasses; and soaring swallows that hunt *en masse* there on summer evenings. And not everything is non-American, the bicolored flaxflowers do as well on bare patches as the dovefoot geraniums.

Exotic-species ecosystems or just weedy patches of wasteland? Who's to say? The case deserves scrutiny, and, as John Stilgoe says, "...sustained scrutiny can engender wonder and energize nascent curiosity. Exploring landscapes, however casually, is a therapy and magic of its own." And John Manley Hopkins, who wasn't but could have been thinking of something like the clearings and their flooded-by-beaver margins:

What would the world be, once bereft
Of wet and of wildness? Let them be left,
O let them be left, wildness and wet;
Long live the weeds and the wilderness yet.

May 25, 2018 (day 1042, 731+311): Cistern +217 mm SCB, Weir +116 mm WPB scale, NanRG cum. 1090.7 mm. No creeks running.

In the evening, about eight couple-of-week-old ducklings near the cistern, no parents around. Made measurement without frightening them out of their hiding place in the reeds, then out of nowhere two female hooded mergansers flew in headed directly for the cistern, apparently not noticing me in the woods. All looked well as I beat a furtive and somewhat apologetic retreat. These birds need secluded woodland ponds for breeding and the marsh needs to be kept that way if they are to prosper here.

A few other ducks around, only mallards recognizable at a distance. Red-winged blackbirds. Pied-billed grebes heard occasionally. All very peaceful.

Swallows above the reeds near the entrance. Violet-greens, but some looked more like tree swallows to me although it was hard to tell they moved so fast in the evening light. They perched more often than the violet-greens of previous years and showed clearly at times a metallic blue. But I'm wrong; the one *left* shows white around the eye; it at least isn't a tree swallow.

June 3, 2018

Pojar and MacKinnon, “Plants of Coastal British Columbia” is an indispensible guide, but it does sometimes present challenges. Try finding this one by flipping through the illustrations. It grows along the banks of Coats Marsh Creek. It’s *Nemophila parviflora*, grove-lover, merely a footnote in my edition of the book.

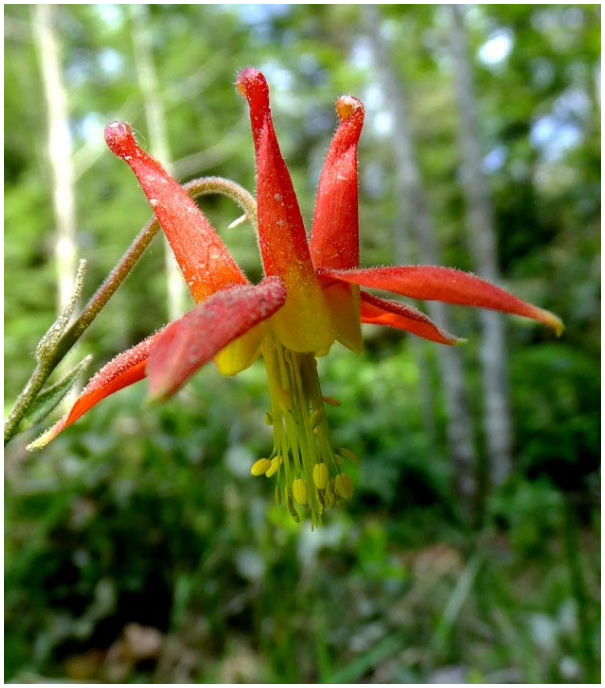
It could be worse though, Joseph K. Henry’s, “Flora of Southern British Columbia and Vancouver Island”, published in 1915 and prescribed for use in B.C. Schools contains not a single illustration in all of its 365 pages; but the glossary has 480 very technical entries. For me, using it is like trying to read a sheet of music as opposed to listening to somebody play it.

June 5, 2018 (day 1053, 731+322): Weir +110 mm WPB scale, NanRG cum. 1093.3 mm.

Solitary hooded merganser in the weir pool. Female, small, busy but what doing not obvious. Blue-eyed darners.

June 6, 2018 A few red columbines alongside East Path Creek, now dry. No field guide needed! Foamflowers along Stump Farm 1 Stream, easily overlooked.

Water level in the lake not measured but high. A beaver seen at the east end of the lake. First time ever.



Pied-billed grebe in breeding plumage. Like all the ducks, very wary. You can only see them this close by standing stock-still while they're on the surface and then moving slowly while they are submerged.

Above: Several large families far off across the lake. ~~These are almost certainly~~ Probably mallards, but not for sure. Gadwall hens look similar and have grey heads like this mother.

Below: Gang of juvenile dabblers? At the limit of my telephoto lens. Species?

Almost all grasses are unidentifiable species to me, but this one in the clearings is one exception. It stands in clumps, its culms over a metre tall. I'm venturing a guess that it's orchard grass (*Dactylis glomerata*), originally introduced and cultivated for making hay; a reminder that the lake was drained and farmed in the last century.

Another agronomically important species there, I think, is soft brome (*Bromus hordeaceus, B. mollis*) which was cultivated for hay and pasture.

Plants were introduced to Vancouver Island from Europe and Asia by farmers and by gardeners and landscapers, both deliberately and unintentionally. While some garden species were ornamental, had an attractive scent, or were used for flavouring food, others, like the herb-Robert in the park, were probably chosen because they were medicinal. They may now be just a weed that nobody needs anymore, but I still like them.

June 13, 2018

Yerba buena, always wondered about this native plant with its Spanish name. Found in the catchment area of the Stump Farm One Stream near the southern gate of the the Three Gates Trail. Nice find.

American robin, actually rare in the park. Occasionally you see a solitary one in summer being quite secretive. They appear year after year in the same location near the weir; a favourite nesting place I guess.

June 14, 2018

Duck families doing well this year. Are these guys gadwalls by any chance? Or “just” mallards? Probably the latter.

June 15, 2018

Work on grasses - addendum.

July 6, 2018 Lake water still high. Cinnabar moth caterpillars more numerous on the tansy ragwort than in previous years and doing a thorough job destroying plants they attack.

Tansy ragwort retains its toxins even after being up-rooted and left to die, which it does within a couple of days, so while it's alright to clear the grassy verges of roads and well-used trails leaving the plants behind—places where there's little chance of cattle, horses, sheep, goats, pigs, or deer foraging—it's not a good idea when tackling pastures or solitary woodland clearings. Animals tend to show little interest in living plants probably because of their bitter taste; contamination of hay is of most concern to the farmers and horse-owners that I've spoken with.

Close-knit family including seven half-grown ducklings on the lake. Mallards? most likely but not sure, white patch on flank but no obvious blue speculum, grey bill.

Flock of cedar waxwings.

July 17, 2018 (day 1095, 731+364): NanRG cum. 1143.3 mm.

THAT CONCLUDES THE THIRD YEAR OF OBSERVATIONS AT THE MARSH

July 22, 2018 (day 1100, 1096+4): Cistern +31 mm SCB, Weir –40 mm WPB scale, NanRG cum. 0.0 mm.

Many dabbling ducks; twelve in the weir pool alone. Mallards or gadwalls? Odds are in favour of mallards, but... bold white patches on wings in flight and no sign of blue specula or green heads. Short quacks. Orange on bills at the sides, and some with all-grey bills; however, steep foreheads usually lacking. No clear view of black undertails. Possibility of eclipse plumage no help. Juveniles around. Strong possibility I believe that both mallards and gadwalls breed here.

No grebes heard or seen.

August 3, 2018

Finally, a blue speculum. A mallard without doubt.

Both purple-flowered *Origanum marjorana* (margoram, sometimes called oregano as it was on p.F108) and white-flowered *Origanum vulgare* (oregano) blooming in the west burn-pile clearing.

The hedge-parsley, *Torilis* sp., in flower again in its customary place in the NE Arm spillway. No signs of it spreading elsewhere in the park, but in the last couple of years it has transitioned from "absent" or "rare" to "frequent" all over the island. There is a particularly large "infestation" in Drumbeg Park. It is clearly being spread along trails by trail users. The species is *Torilis japonica*, hooked bristles on the fruit and occasionally over a metre tall, not as earlier surmised *Torilis arventis* (pp.G116–117).

In Wisconsin, you are not allowed to introduce, possess, or transport this plant without a permit. At the present rate of spreading it will be common on Gabriola long before any action is taken to control it.

Burdock, another natural velcro, a sort of soft-leaved thistle. An exotic nuisance in some parts of Gabriola, but not in the park where it is rare. The burrs stick to the manes and tails of horses and become entangled in the wool of sheep; however, sheep find it more palatable than cattle or deer and help control it.

August 21, 2018 (day 1130, 1096+34): Cistern –139 mm SCB, Weir +140 mm WPB scale [NOTE?] –50 mm [baffle], NanRG cum. 1.2 mm.

Drainage pipe below the weir flowing. Weir scale reading odd. Too high? Beaver dam leaking maybe and there's an obstruction preventing water reaching the baffle. Levels at the baffle and at the pipe show no change in scale datum. Will sort out later. The level in the weir pool is in any case not important. The level maintained by the beaver dam has to ensure there's enough water in the lake to see it through a severe summer drought given that there's no water to replace evapotranspiration losses other than occasional summer showers.

All quiet wildlife-wise. Pileated woodpecker foraging among cones beneath the fir trees. Tree frogs. Hairy cat's ears blooming again - autumn dandelions? but I know as much about dandelion-like microspecies as I do about knitting socks. Sharp-shinned hawk.

August 24, 2018 (day 1133, 1096+37): Weir +198 mm WPB scale, 0 mm baffle, NanRG cum. 1.2 mm.

Traversed dam. Surface is firm, dry, and intact but there is a leak about half-way across, deep down. Easily heard but not seen.

Weir pool is rising 20mm/day according to the scale. Assuming 2300 m^2, inflow of about 0.5 litres/sec neglecting all losses. Debris is holding water back from the baffle, but the level is now at the sill (50 mm rise in 3 days).

Baffle has sprung a small leak about a foot down on the left side. Private property is still draining, usually drying-up this time of year. Coats Marsh Creek is running 250 m downstream of weir but not at the observation-point-culvert beneath the Marsh Trail.

August 27, 2018 (day 1136, 1096+40): Cistern –163 mm SCB, Weir +174 mm WPB scale, –160 mm baffle, NanRG cum. 2.4 mm.

Weir pool level falling again. Level now well below the sill again. Cistern fall of 4 mm/day is normal for this time of year. Have the beavers plunged the leak in their dam? Coats Marsh Creek still dry.

August 30, 2018 (day 1139, 1096+43): Cistern –183 mm SCB, Weir +219 mm WPB scale, +5 mm baffle, NanRG cum. 3.0 mm.

Major revision to the cistern datum (SCB)relative to the primary weir datum using a professional transit (see File 673 for details). Coats Marsh Creek running. About 30 American widgeons on the lake, small and extraordinarily shy.

August 31, 2018 (day 1140, 1096+44): Cistern –190 mm SCB, Weir +223 mm WPB scale, NanRG cum. 3.0 mm. No flow in Coats Marsh Creek. Guy and

Cheryl Moreau repeated yesterday's transit measurements and got essentially the same result (within two millimetres).

September 3, 2018 (day 1143, 1096+47): Cistern –207 mm SCB, Weir +230 mm WPB scale, NanRG cum. 3.0 mm. No flow in Coats Marsh Creek. Private drainage pipe still flowing, hinting to me that this water is coming from the marsh despite disagreement with property owner who stresses great care was taken in building the berm to ensure no seepage. The water is not heavily mineralized.

Widgeons, juvenile mallards, and a few solitary others including one male northern shoveller.

Several yellowlegs (*Tringa* sp.) in the reeds, observed for some time. Too far off and poor light for good photographs but little doubt that's what they were. Waders with bright white rumps in flight, long bills. Greater or Lesser? Couldn't tell.

September 11, 2018 (day 1151, 1096+55): NanRG cum. 27.4 mm. Rainy season has begun. No flow in Coats Marsh Creek.

September 12, 2018 (day 1152, 1096+56): Cistern –227 mm SCB, Weir +210 mm WPB scale, NanRG cum. 27.6 mm. No flow in creeks. Nothing seen on the lake. All very quiet; just conversing ravens, and an occasional piercing call from a flicker or a pre-occupied here-I-am call of an out-of-sight towhee punctuating the silence.

September 18, 2018 (day 1158, 1096+62): Cistern –211 mm SCB, Weir +226 mm WPB scale, NanRG cum.62.0 mm. Has rained last few days. No flow in creeks, but Coats Marsh Creek ponding with sporadic trickles. Nothing seen on the lake except insects, lots, especially bright red meadowhawks, some of which were in tandem while the female laid her eggs.

A good rose-hip harvest. Biophony full of the soft tweeting of busy little-birds-in-the-bush. Many more than before the rains. Some flocks mostly juncos, others mostly chickadees.

September 24, 2018 (day 1164, 1096+68): NanRG cum. 111.2 mm. Lethargic red-legged grasshoppers (*Melanoplus femurrubrum*) in the patches of now broom-less “wasteland” in the clearings.

September 28, 2018 (day 1168, 1096+72): Cistern –173 mm SCB, Weir +143 mm WPB scale, NanRG cum.111.2 mm.

The lake level rising while the weirpool level is falling and no flow in Coats Marsh Creek; perhaps the beaver dam leak has been plugged.

American widgeons in the weirpool, about eight. Wood ducks scattered over the lake, some solitary, some in couples, some in groups.

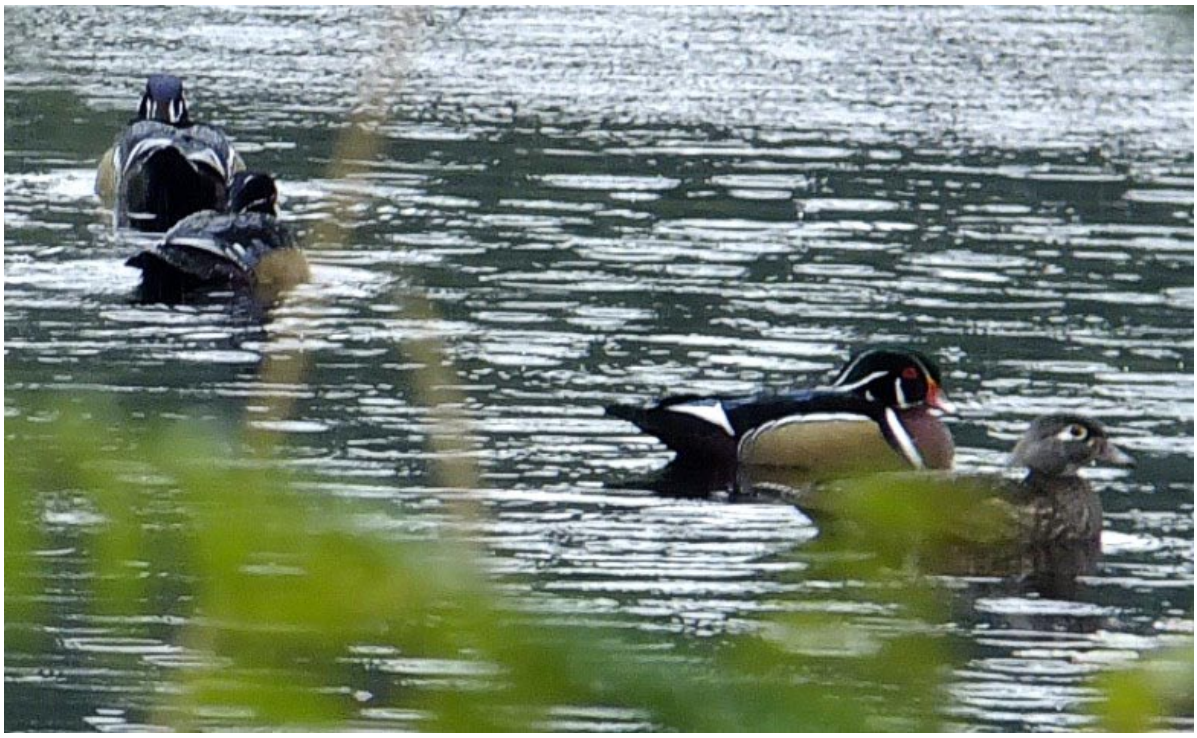
October 4, 2018 (day 1174, 1096+78): NanRG cum.121.2 mm.

Sunny, cool, no wind to rustle the reeds or canopy. Small flocks of songbirds heard everywhere in the quietness of the forest. The inquisitive chickadees will come within arm’s length to check you out if you stand still and talk quietly to them. Juncos, bushtits, song sparrows, probably kinglets too.

Snowy inkcaps (*Coprinopsis nivea*) on old horse dung on the Marsh Trail.

Still some dragonflies and damselflies about, mostly white-faced meadowhawks.

October 5, 2018 (day 1175, 1096+79): NanRG cum.125.6 mm.



Rain. Wood ducks out on the water.

Beautiful cluster of lepiota near the creek at the west end. Shaggy parasols, white spore print, single rings (*Chlorophyllum brunneum*). Salal making up for the lack of vine maples.

Mushrooms are almost always tricky to identify, but growing on old Douglas-fir cones? A cinch. *Strobilurus trullisatus*.

Mats of moss, Juniper haircap (*Polytrichum juniperinum*), dotted with the orange moss agaric (*Rickenella* or *Omphalina fibula*). This common mushroom only grows on moss. Opinions vary as to whether this is because it's saprotrophic (living off dead moss), symbiotic (to their mutual advantage), or the fungus is parasitic.

Staghorn jelly fungus (*Calocera cornea*) between the two southern gates on the Three Gates Trail enjoying the rain and a tree brought down in a snowfall last spring.

October 14, 2018 (day 1184, 1096+88): Cistern –170 mm SCB, Weir +101 mm WPB scale, NanRG cum.143.0 mm.

Lake level steady, weirpool level falling, no flow in creeks.

Juvenile mallards (I think I too frequently puzzle over these), northern shovellers, one or two wood ducks, and some ruddy ducks.

Only time ruddy ducks seen previously was September 14, 2017, (lower photo) and then only once, and so far off and in such bad lighting conditions that I hesitated to list them. But here today, more, although in equally far-off, poor photographic conditions. Same distinctive white male cheeks though, and one still with some summer reddish-brown (middle photo) and faint blue on his bill, so they've now on the list.

Sulphur tufts (*Hypholoma fasciculare*) on buried wood. Fresh, but note the dark veil remnants on the cap's margin. These are nasty toadstools, best left alone.

October 23, 2018 (day 1193, 1096+97): NanRG cum.143.0 mm.

Wood ducks still around. Break in the weather today.

Mushroom time. I wish people, presumably looking for edible ones, wouldn't just destroy those that aren't. Others might enjoy seeing them doing whatever they do in the ecosystem. Just replace them gills down, leave them be, show some respect, it's their world too.

The black elfin saddles (*Helvella lacunosa*) are suffering badly this year with mould (*Hypomyces cervinigenus*). The assaulted specimen below had a hollow stalk. My guess *Lactarius sanguifluus.*

October 24, 2018 (day 1194, 1096+98): NanRG cum.145.5 mm.

If that's not a rosy russula (*Russula sanguinea*), it ought to be. Wood ducks seen.

October 25, 2018 (day 1195, 1096+99): NanRG cum.158.7 mm.

Violet cortinarius (*Cortinarius violaceus*) adnate gills, small erect fibres on cap.

Common cute orange ones, smooth, no-brim pith-helmet caps, gills light orange, adnate, stalks a bit fibrous, initially pale, darker with age, a guess, common laccaria (*Laccaria laccata*).

Common but puzzling. Like violet cortinarius but without the deep violet. Pale-greyish-rose caps turning brown, folding right up with age, gills mauve, widely spaced, ascending adnate/short decurrent. Maybe western amethyst laccaria (*Laccaria amethysteo-occidentalis*), but then maybe not. Common laccaria again? Too many choices.

October 27, 2018 (day 1197, 1096+101): NanRG cum.178.0 mm.

A fairy ring, just before halloween. But I don't think they're fairy ring mushrooms. Long decurrent white gills, grey-brown cap, club-foot maybe (*Ampulloclitocybe clavipes*). Its relative *Infundibulicybe geotropa* is more often associated with fairy rings but I don't think they grow in BC.

October 31, 2018 (day 1201, 1096+105): Cistern –74 mm SCB, Weir +195 mm WPB scale, NanRG cum.206.4 mm.

Coats Marsh Creek full of connected puddles, but flow weak.

Lichens on the red alder under scrutiny. The continuous crust patterns on the bark are bark barnacle (*Thelotrema lepadinium*). The small greenish-grey with black undersides leafy lichens are waxpaper lichen (*Parmelia sulcata*). The tufts are probably *Ramalina farinacea* (top and bottom surfaces same, oval soralia along edges, no black tips) but they just might be *Evernia prunastri*.

November 4, 2018 (day 1205, 1096+109): NanRG cum.229.5 mm.

Probably western amethyst laccaria (*Laccaria amethysteo-occidentalis*), the last of them; all the other mushies are sodden and dead-bracken brown.

Much-tangled strands of what might be Methuselah's beard (*Dolichousnea longissima*). Good to see if it is, they prefer living in older-growth forests.

In the NE corner of Coats Marsh RP, off the Three Gates Trail near the Stump Farm site.

Close-up picture next page.

For wary lichenologists, I don't think this (*above and previous page*) is witch's hair, but I'm no wizard. Some hanging lichen however I think is (*left and below*). This species (*Alectoria sarmentosa*) is frequent on dead, standing saplings that did not survive the natural thinning process, and it's delightfully soft to the touch!

November 7, 2018 (day 1208, 1096+112): NanRG cum.229.5 mm. Weir +223 mm WPB scale.

Coats Marsh Creek ponded, but flow only of the order of 1 L/s.

A veteran cedar that I regularly pass on the West Entrance Spur measured at 4.9 metres circumference. Like all the cedars, showing red-flagging at the end of summer.

November and still dragonflies in the clearings, settling on my coat and in my hair as they tried to catch some sun; I can sympathise, it was only 7ºC. Autumn meadowhawks (*Sympetrum vicinum*).

Mushrooms not done yet. Dirty trichs (*Tricholma pardinum*), rather handsome, at the west entrance. Some pale-yellow, white-warted, and faintly-ringed jonquill amanitas (*Amanita gemmata*). Turkey tails (*Trametes versicolor*) worth a second look.

November 13, 2018 (day 1213, 1096+117): NanRG cum.251.8 mm.

Ring-necked ducks and at least one bufflehead are back.

November 14, 2018 (day 1214, 1096+118): NanRG cum.252.8 mm.

Coats Marsh Creek flowing more strongly. Pathway at the park entrance is flooded.

November 15, 2018 (day 1215, 1096+119): NanRG cum.253.0 mm. Weir +274 mm WPB scale.

November 16–22 (to day 1222, 1096+126): NanRG cum.269.6 mm.

Pacific willow at the Stanley Place entrance to Coats Marsh East submitted to the GaLTT Big-Tree Register. Time spent measuring height of trees, looking at the geology of gravel on the trails, mapping accurately the Ridgeway. All in preparation of a report to be submitted when it comes time to re-visit the Coats Marsh RP and 707 CP Management Plans.

Mycena purpurofusca? on bark of a Douglas-fir. Appressed-leaf lichen, *Hypogymnia physodes*? and lots of small white mushrooms, *Inocybe* sp.?

This one at least is easier. Orange jelly, *Dacrymyces chrysospermus*, on an alder brought down by heavy snow last winter.

Possibly antlered perfume, *Evernia prunastri*. but don't quote me. On an alder twig, blown down from on high.

There are more than a thousand species of lichen in BC, but not to panic if you're nervous about showing off your backcountry skills. You're only likely to come across a few hundred of them!

December 4, 2018 (day 1235, 1096+139): NanRG cum.382.6 mm. Weir +366 mm WPB scale.

Coats Marsh Creek, East Path Creek, Stump Farm Number 1 and 2 Streams, all running. NE Arm flow but not over spillway surface.

Final view of the old Stump Farm farmhouse. Once a home.

December 17, 2018 (day 1248, 1096+152): NanRG cum.500.8 mm. Weir +439 mm WPB scale. Very few ducks, but some noisy frogs.

December 18, 2018 (day 1249, 1096+153): NanRG cum. 515.1 mm. Cistern +295 mm SCB, Weir +475 mm WPB scale.

Lake level higher than ever seen before. Measured indicates +0.450 m relative to the weir datum using the old +0.155 m calibration for the height of the cistern datum above the weir datum, but more correctly this 0.450 m should be 0.662 m as noted in File 673 page C9. At the same time, the level in the weir pool at the scale was 0.172 m below the weir datum, so the beavers are holding back 0.834 m (hip level) of water.

Flow over the top of the beaver dam, outflow (pond leveller) pipe submerged, but the weir deck still dry. East Path culvert completely submerged. NE Arm spillway flowing strongly. “Nearly” a flood. A few more ducks than yesterday, buffleheads and widgeons.

Mosses of every hue called green thriving as they do every winter. Spongy cushions of it on dead alder especially striking, *Dicranum* sp.? As a good friend of mine once said of forest greenery, “Emily Carr got it right”.

December 20, 2018 (day 1251, 1096+155): NanRG cum. 541.4 mm.

Windstorm. Trees down all over the island blocking roads and driveways, bringing down power lines, but in the forest, only twigs, small branches, and lungwort (*Lobaria pulmonaria*) cluttering the pathways despite the vehemence of the gusts overhead.

Next file. Previous file.

2018 Addendum on grasses (all bract and no petal)

Please be aware that I am not an expert botanist, even an amateur one, and mistakes in the following are not just likely, they are certain.

Mostly weeds eh! But without fields of unmown grasses, we'd have little chance to see the wind.

There are over 200 species of grass (*Poaceae*)in British Columbia and botanists have identified just shy of 50 of them on Gabriola. Only a minority of the 200-plus species province-wide are said to have been introduced, but here on the Gulf Islands where farming was once the mainstay of the economy and human disturbance of ecosystems is rife, the proportion of non-native species of grass is much higher.

Of the approximately 50 species identified on the island, some 25, 55%, were introduced for seeding hayfields and pastures, mainly from Europe.

The consultants who compiled the 707CP Management Plan in 2010 found of 20 grass species in the park, 75% of them, were

agronomic species. The number for the Coats Marsh RP must be similar.

All of the grasses included in this addendum are from Coats Marsh, but most if not all can now be found in roadsides, footpaths, clearings, lawns, ditches, meadows, grassy verges, and unkempt fields almost anywhere on the island.

Grasses differ from most other wildflowers in that they use the wind rather than insects to distribute their pollen and so have no need for attractive petals. Many grass plants contain both stamens, which produce pollen, and ovary-bearing pistils, which produce the stigmata (stigmas) that are the receptive surfaces for pollen.

Having these organs maturing at different times by the same plant is one strategy for reducing self-fertilization and promoting cross-fertilization, and hence genetic diversity. However, some self-fertilization is inevitable with this arrangement, and weedy species are the ones that do a lot of this when provided with disturbed habitats they've already evolved to thrive in.

Colour, other than green, is provided briefly by the anthers — the part of the stamen suspended on a filament that waves in the wind and releases pollen - and by the bracts that enclose the flower while it is in bud. Anthers in our area are commonly pale yellow, orangey-brown, brown, or purplish, turning white or whitish when they've done their job. It may be that the colouring of anthers and pollen is a protection against ultra-violet light.

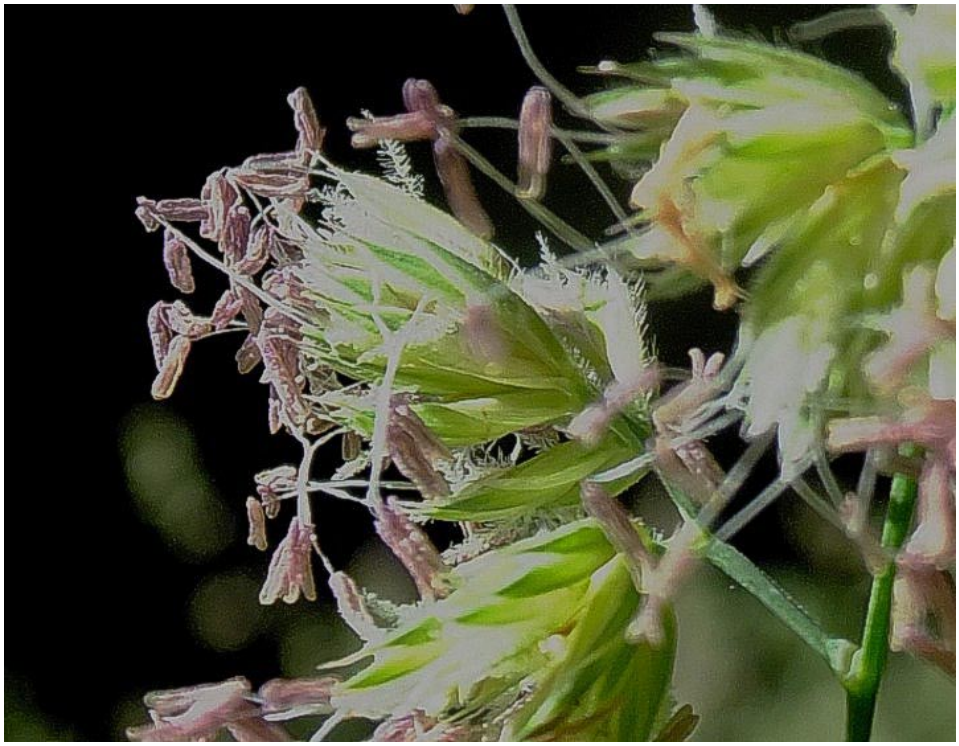
The bracts (glumes, lemmas, and paleae) turn white, off-white, tawny, or straw-coloured as they become seed-bearing husks after fertilization.

Colour however is almost never used by botanists for identification purposes. They rely on structure which has its own peculiar and initially intimidating vocabulary, but there is an exceptionally good illustrated key to *Poaceae* (grasses) in Pojar and MacKinnon, "Plants of Coastal British Columbia", 1994, pp.358–361.

9789 Orchard grass, cocksfoot (*Dactylis glomerata*, Fescue tribe)? Introduced.

If it's waist-high
and your feet are dry,
it's orchard grass.
But if it's
au dessus de ta tête,
and your feet are wet,
it's reed canary grass.

Above right: Purple anthers (male) dangling on very slender filaments are shedding pollen to the wind.



Left: flowers showing a few fish-boney stigmata (female), the plumose (feathery) white structures on short stalk-like styles.

Stigmata bear the receptive surfaces for pollen.

9833 Reed canary grass (*Phalaris arundinacea*, Canary grass tribe)? Probably indigenous but spread by humans, but some say introduced.

Very tall. Grows best in meadows that are flooded in winter. In summer, it forms extensive, crowded, single-species stands. Also provides privacy screens for ducks.

Inflorescence quite varied depending on its reproductive stage. Initially a spike-like panicle, but becoming more open later. Some plants have a distinct reddish tinge.

9650 Soft brome (*Bromus hordeaceus*, Fescue tribe)? Introduced. As school children were once expected to know, the margins of the lemmas are hyaline. Hairy. Unusual brown anthers.

9643 Ryegrass (*Lolium perenne*, Barley tribe)? Introduced. Showy anthers and curious stigmata that resemble tufts of cotton wool. Used in seed-mixes for lawns.

9664 Columbia brome (*Bromus vulgaris*, Fescue tribe)? Native. Droopy panicle. Very common in verges alongside trails and in the 4-foots, even in shade. Anthers yellow.

9644 Smooth brome (*Bromus inermis*, Fescue tribe)? Introduced. Widely used for hay and pasture.

9667 Common velvet-grass (*Holcus lanatus*, Oat tribe)? Introduced. Patches in the clearings, many not yet in flower (early June), but those that are quite showy with pale-yellow anthers and open purplish-tipped bracts ripening to copious off-white husks. Distinctive grey-green leaves.

9677 Creeping velvet-grass (*Holcus mollis*, Oat tribe)? Introduced. Patches in the clearings, although a woodland plant preferring damp places. Food for the Essex skippers (introduced). Young plants form a spike-like panicle before flowering, not always mentioned in descriptions, but then few try to identify wildflowers from their buds alone so why grasses. Hairy nodes. Some awns abruptly bent.





9753 Colonial bentgrass (*Agrostis capillaris*, Bentgrass tribe)and/or
9952 Redtop (*A. gigantea*)? Introduced. Likely lawn-grass escapees.
Delightful grasses, like star clusters, that invite your touch and
defy your camera's attempts to capture their three-dimensionality.





9930 Slender wheatgrass (*Elymus trachycaulus*, Barley tribe)? Native. Uncertain id.

9760 Blue wild-rye (*Elymus glaucus*, Barley tribe)? Native.

9982 Timothy (*Phleum pratense*, Bentgrass tribe)? Introduced. Said to be common in fields everywhere, but seldom seen in the park. ◊

Next file. Previous file.