

Hoar frost on Canada buffalo-berry, Shepherdia canadensis.

#### LETTER:

I am a newer subscriber to your newsletter and I would like to provide a compliment on the latest newsletter of December 2021. The article on 'Naturalization' was very well written and I thank you for the most needed information on this subject in the Edmonton area. I also really enjoyed the article titled A Plant for Every Reason. It was suited for my low level of understanding of native plants and the complex terms normally I read about any plants. I like this author's style and would enjoy seeing more articles written by him or others in the same way.

Thank you for your newsletter as it has opened up my eyes to some of the wonderful wildflowers and plants and the great natural species we have in Alberta. I have since planted 3 wildflower plants in my garden last year and not surprisingly, these plants survived the winter past and some of my other perennials did not.

Keep up the great work!

Regards, Caron Bishop

WN: The authors of the articles you mentioned very much appreciated your comments! We look forward to seeing some photos of your native wildflowers next spring/summer.

# From Your Editor:

Happy New Year!

Welcome to the Wildflower News for January. We here at the Edmonton Native Plant Society hope this finds you in good health and spirits ready to enjoy, as best as can be in these times, whatever the New Year brings.

WN is really pleased that we now have over 1350 subscribers gardeners, botanists, and ordinary people interested in growing and learning about Alberta's native flora!

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# **Recommended Reading**

Websites of the Month

## **Native Plants in Local Gardens**

From Manna Parseyan's December garden: Monarda, *Monarda fistulosa*; giant hyssop, *Agastache foeniculum*; yellow evening primrose, *Oenothera biennis*; and nodding onion, *Allium cernuum*.



WN: Very attractive with their light dusting of snow and snow 'bonnets'

From Brenda Bohmer: We planted a mix of native grasses in a roadside native grass restoration project adjacent to my farm in the Camrose County. The blue grama grass, *Bouteloua gracilis*, seems to be doing the best so far.



WN: One of the all-time favourite and easily recognisable grasses! So happy to hear it's done well for you and your restoration project.

EVENTS - if you would like us to list your event that involves native flowers, please email us at engedmonton@gmail.com by the 20th of the previous month.

Wednesday, January 12 - Swamplands: Tundra Beavers, Quaking Bogs, and the Improbable World of Peat

Join Edward Struzik as he discusses his latest book and adventures through peatlands the world over, including many across Canada's North.

Time: 12:00 - 1:00 PM MST

Register at: <u>https://www.eventbrite.ca/e/january-2022-wetland-knowledge-exchange-webinar-tickets-211286903817?</u> fbclid=lwAR24WUN8D5uhN0EHnNlwHyl6ppalvsi73IQK9uf76NeMQItBojxoDxUdtTQ

Monday, January 17- Bunchberry Meadows: a Magical Place presented by Natasha Stairs and Planting at Bunchberry, the ENPS Rehabilitation Project presented by Cherry Dodd.

Two short presentations on Bunchberry Meadows Conservation Area highlight the features that make it unusual and tell the story of the Edmonton Native Plant Society's projects to re-introduce native wildflowers to the land at the entrance of the property.

Please register in advance: <u>https://us02web.zoom.us/meeting/register/tZcvdu-trDMtHdwSbpkgzeB4Y1zauw-afZo0</u> After registering, you will receive a confirmation email containing information about joining the meeting.

# Wednesday, February 2 - The DIY Seed Series Part One! Canada's Wild Seeds: Growing our Biological Gold

A presentation by the North American Native Plant Society on tips and tricks for growing native plants from seed with professional seed biologist Melissa Spearing, whose passion is for helping all gardeners, growers and native species thrive in advance of a rapidly changing climate. Some of the topics she will cover include: Do you want 10 plants, 100? What species are easy, challenging, sporadic. Starting seeds inside vs. sowing outside – what's best for success? Myths and variation in wild seed longevity: how to optimize your post-harvest techniques and store seeds like modern seed banks do.



Time: 5:00 - 6:30 PM MST

Register at: <u>https://www.eventbrite.ca/e/the-diy-seed-series-canadas-wild-seeds-growing-our-biological-gold-tickets-195097861957</u>

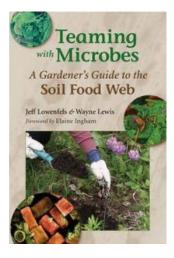
#### NEWS... If you have a news item involving native plants that you would like posted, please email us at <u>engedmonton@gmail.com</u>

## New Federal Government's Plans to Protect Nature from a Nature Canada info-mail.

Since the September election, over 50,000 letters nationwide were sent to the newly-elected government asking for a plan to halt and reverse nature loss. The Prime Minister has since publicly tasked government ministers with mandates that outline federal priorities such as protecting 25% of land and ocean by 2025, and 30% by 2030; assisting Indigenous communities in establishing Indigenous Protected and Conserved Areas; protecting old-growth forests; recognizing the "right to a healthy environment" in Canadian law; and creating at least one new urban park in every province and territory.

It is most important that decision-makers realize that Canadians are relying on them to follow through with these promises.

**Teaming with Microbes: A Gardener's Guide to the Soil Food Web** by Jeff Lowenfels, Wayne Lewis (2010) A book review by Kate Wilson.



I find the value of this book is that it offers something for readers looking for a solid introduction to the nutrition cycling and microbial basics of plant health, while the conversational language make it readable for those who don't have, or want to have, an overly technical approach.

The book starts as a kind of exploration by the authors, who were "typical suburban gardeners" when they stumbled upon the work of Dr. Elaine Ingam. She's a renowned leader in soil microbiology and founder of Soil Foodweb Inc, which helps landowners and farmers restore their soil's biology. She was a game-changer for our understanding of the soil food web, particularly in the late 1980s by finding a way to measure the amount of bacteria and fungi in a soil sample.

The authors started learning about discoveries over the past few decades that put practices such as rototilling into question. What they discovered was the intricate relationship between plants and the living soil ecosystem that has evolved into a food web as old as plants themselves.

The next chapters are clear enough – and filled with 'gee-whiz' photos – for those just beginning to intuit the unseen and interdependent life forms that inhabit the soil, but also in-depth enough for those who are ready to broaden their knowledge of native plant functioning. They inform not only the importance of roots and allowing time for mycorrhizae to establish, but why the microbial network is an inherent part of nutrient cycling for the health of plants and the habitat they grow in.

I've always had some awareness of the invisible ecosystem that thrives beneath our feet, but what this book offered was a sense of its magnitude and precision. There's a chapter dedicated to each of the cornerstones for root and plant functioning: the bacteria, the protozoa that feed on them, and fungi – mycorrhizal fungi being the flagbearers of the

fully evolved food web. *Myco-* means fungus and *rhiza-* means root in Greek, and their relationship is like the delivery system that gets food from a farmer's storage shed onto our grocery shelves, where we simply reach out and take it.

Without an established mycorrhizal network, at least for perennials, shrubs and trees, plant growth is weakened and just not at its best. In fact, 92% of land plant families interact with mycorrhizal fungi. As one reviewer wrote, "the authors boil the message down to one sentence: No one ever fertilized an old-growth forest".

Plants continuously exude sugars and proteins which soil bacteria use as food, in return transforming elements from the soil and air such as nitrogen into forms the plant can utilize. Mycorrhizal fungi amplify the nutrient cycling, and the entire food web is disrupted when one or more of the components is disturbed or eliminated.

A shift in understanding for me was that plants don't take nutrients directly from the minerals and rocks their roots encounter. They rely on the work of soil bacteria and fungi. Plants didn't have to evolve ways to extract nutrients from rocks, writes Dr Ingham in the forward. "All they had to do was put out the right flavour of root exudates to grow the organisms that make the enzymes that solubilize the nutrients they need from sand, silt and clay."

The last chapters of the book deal with practices for organic gardening, so are less useful in terms of native plants in native soil.

There's a growing repertoire of soil food-web books, and I found this was one of the more robust and comprehensive. I find that's what brings home a deeper understanding of any subject. Whether adding a new species to your native bed or exploring a remnant prairie, the value of this book's deeper dive is that it starts to instill an intuitive understanding – and response – to nature's connections, rather than piecemeal bits of knowledge.

Grasses of the Edmonton Region by Patsy Cotterill. Photos by author unless otherwise noted.

On December 13, in another of the ENPS' Zoom presentation series, grassland ecologist Lysandra Pyle presented on the subject of the Grasses of the Edmonton Region.

She observed that temperate grasslands and savannas are among the least protected plant communities in the world, with a large number of their species therefore at risk.

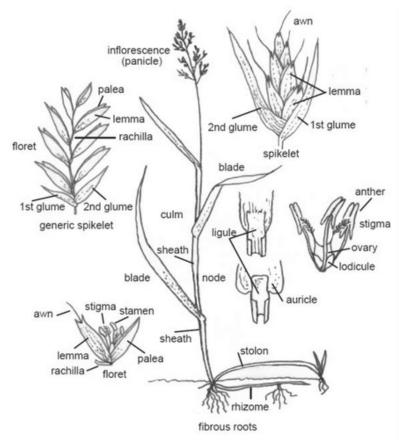
Here in the Edmonton region most grasslands that are protected are semi-native, that is, a mixture of native and nonnative species, in a matrix of tame pastures. They support a generalist grassland fauna. Historically, the City of Edmonton's grasslands were probably of (plains rough) fescue; now, natural or semi-natural stands of grassland are pretty much confined to saline, sandy or badland soils, as loamy soils have been used for cropping.

Apart from "prairies" at Nisku and Fort Saskatchewan, natural grasslands worth visiting include some on the sandy soils near Gibbons and Gibbons badlands along the Sturgeon River, Natural Areas such as Opal and J.J. Collett (near Lacombe), Pipestone Creek near Gwynne and, farther afield, at Donalda and Big Knife Provincial Park.

When asked about the effects of grazing on grassland Lysandra replied that grassland health can be improved at low stocking rates. She noted that wicking of non-native smooth brome with herbicide can be done when the grass is taller than the surrounding ground cover in the spring. (Non-native smooth brome and Kentucky bluegrass are frequent major components of our remnant grasslands.) However, in the U.S. some land managers have concluded that certain non-native grasses are to be tolerated as better alternatives to some other weeds!

The presentation was well-attended, suggesting there is considerable interest in grasses. Accordingly, and because we didn't cover the grass family in the wildflower course that was offered a couple of years ago, I have decided to take a look at some of our commoner grasses in the next few WN issues. I should add that many grasses can be recognized easily by eye once they are known; for a confident identification, however, some examination of floral structure is required, for which a x10 hand lens is a necessity, and a dissecting microscope nice to have, as well, of course, as a key. Some grass manuals also provide a vegetative key, very useful if you are an ecologist who has to be in the field before the grasses, the majority of them summer-flowering, head out. However, I suspect most of us can wait until the grass flowers, at least to make our initial acquaintance with the species. Like almost all plants, grasses are faithful to their habitat and its nuances, so that a wetland or a woodland habitat, for example, will automatically reduce your options as to species.

The picture below indicates some of the terms you will need to know to use a key or follow a description.



## Grasses of the Edmonton Region: Part 1.

#### The local bluegrasses or meadow grasses, Poa species.

The genus *Poa* gives its name to the grass family as a whole, Poaceae (formerly Graminae). With over 70 species (including a few hybrids) in North America, and with extensive apomixis and polyploidy in the reproductive system, *Poa* species are not easy to distinguish from one another. They cannot, however, be ignored: our most abundant and obvious grass is a *Poa*. Kentucky bluegrass, *Poa pratensis*, is well known as a lawn and pasture grass in cooler regions of North America, as well as an invasive weed to those of us trying to grow native plant gardens or manage a "prairie" remnant. Of the 23 *Poa* species in Alberta, 12 are alpine (including two that are also montane), of which half are rare; and six are non-native, including three species that are common locally and need some description: *Poa pratensis, Poa annua* and *Poa compressa*. This leaves five species of which two are decidedly southern grassland denizens, meaning there are only a further three species with which we need only to be concerned with in the Central Parkland region, all native: *Poa palustris, P. interior* and *P. secunda*.



Prow-shaped leaf tip.

One character, although not always easily recognized on some of the finer-leaved plants, that defines all Poas is that the leaf tip is prow-shaped, as in the prow of a boat. The inflorescence is a panicle, that is, with branches bearing the stalked spikelets; these are usually flattened from side to side and consist of two to several florets borne on a short stalk above the two basal bracts or glumes. In many species there is a tuft of cobwebby hairs at the base of the lemma, so that its presence or absence is an important distinguishing characteristic. The distribution of hairs or otherwise on the veins and between-vein areas of the lemma is also significant. (The lemma and palea are the two bracts that surround the reproductive parts (anthers and pistil) proper in the floret.)

Kentucky bluegrass, *Poa pratensis*, is rhizomatous, and this character, along with its broad, flat, spreading basal leaves makes it an excellent sod grass, widely used in cooler parts of the world as a lawn and pasture grass, although it is native only to the temperate regions of Eurasia. (Over 60 commercial cultivars have been developed.) It grows 30-80 cm tall, its stems usually in tufts, has flat leaf blades 2-4 mm wide, and pyramid-shaped inflorescences (panicles) whose lower branches are usually in a whorl of five. The spikelets are flattened, 3-6 mm long and consist of 2-5 florets. The lowermost lemmas in each floret are 2-4.6 mm long, keeled, and distinctly nerved; the keel and the marginal veins, particularly, bear white hairs. The base of the lemma (or callus) has a tuft of cobwebby white hairs. As can be seen in the picture, the upper portions of the lemmas are often purplish, with a transparent (hyaline) tip. When a large patch of the grass is in flower, these lemma tips give the sward a bluish hue, hence the North American name

of Kentucky bluegrass. (It was widely imported into the eastern U.S. states during settlement, as a forage grass.) Its name in Britain is smooth meadow-grass.

The plants that we commonly encounter are the non-native subspecies, subsp. *pratensis*. However, two native subspecies exist, although they are apparently uncommon: ssp. *alpigena* and ssp. *agassizensis*. Whether it would be possible to replace the non-native, introduced subspecies with native ones in our grasslands is an intriguing question and one that I believe requires further study.



Left, *Poa pratensis* with panicles not yet fully expanded, at Bunchberry Meadows on 2021-06-11. The prow-like tips of the leaf blades can be observed in this picture.

Below, photo by Stefan lefnaer, of spikelet of *Poa pratensis*. Note the upper and lower glumes, the 4 florets with purple and transparent (hyaline) tips, and in the third pane the keel on the lemma and the cobweb of hairs at the base.



Canada bluegrass, *Poa compressa*, is also a non-native perennial that is strongly rhizomatous, sending up solitary shoots to 60 cm from long rhizomes. It shares a lot of features in common with *Poa pratensis*, especially qualitatively, and so can be hard to distinguish from the much commoner species. However, its narrower, more congested panicle, with 1-3 erect and shorter branches, gives it a different look that may attract attention. The branches bear very short, stiff bristles, a character known as scabrous, whereas those of many *pratensis* specimens are smoother. Its slender, ovate spikelets, which tend to have more florets (up to 7) than *pratensis*, also add to the congested appearance of the panicle. However, it is the easily observed flat (as opposed to cylindrical) stem that is its main distinguishing feature. It is often sown for soil stabilization and locally it occurs occasionally on disturbed ground that has been cultivated. Recently it has appeared in numbers in the planted eco-islands in Wagner Natural Area in a field that was last cultivated with timothy grass.





Flat-stemmed or Canada bluegrass collected in Wagner Natural Area, 2020-09-04;

left, whole plant minus roots;

right, showing slender-ovoid spikelets, mostly with seven florets, and flat stems.

Annual bluegrass, *Poa annua*, is best recognized by its habitat, and its low, sprawling habit. (Erect flowering stems grow up to 20 cm tall.) It occurs commonly along wet, often muddy, trails and in places like boat ramps, as it appears resistant to trampling. It is native to Eurasia, but has spread throughout much of the world. An annual, as it name

indicates, it grows from a tuft of fibrous roots, although it can occasionally also produce stolons. The panicles range from 1-7 cm long and have 1-2 smooth branches at each node. The lemmas differ from those of the previous two species in having no web of hairs at the base, although the keel, marginal veins and often the lateral veins are white-hairy. Annual bluegrass is among the earliest of our Poas to flower, often showing ripe anthers during the May Count at the end of May. By contrast, Kentucky bluegrass reaches peak flowering around mid-June.



Left, mounted specimen of annual bluegrass, collected at Lynn Lake, Manitoba 1974-07-24.

Right, specimen of inland bluegrass, Clyde Fen Natural Area, collected 2003-07-27.

Inland bluegrass, *Poa interior*, is another tufted grass, lacking rhizomes or stolons, but is a perennial, native to North America. It produces several stems in the clump, up to 80 cm high. The panicles can be long, up to 15 cm, and are lance-shaped to ovoid with 2-5 branches up to 8 cm long at each node. Although the range of spikelet size is similar to that of *Poa pratensis*, the spikelets contain only 2-3 florets. The web of hairs at the base of the lemmas is scant; the keels and marginal veins are short-hairy. The lemma tips are usually bronze-coloured. This species prefers drier soils, and locally seems to be most common on sandy soils, although often with some shade. *Flora North America* (page 576) notes: "It is sometimes difficult to distinguish from *P. palustris* (p. 574), but differs in having lemmas with wider hyaline margins and straight or gradually arched keels, a densely tufted habit, and scantly webbed calluses."



Left, specimen of fowl bluegrass, showing tall stems growing from a tuft of roots, collected in "Winterburn Dunes," Edmonton, 2004- 07-13.

Right, panicle of fowl bluegrass in Riverlot 56 Natural Area, 2009-07-24.

Fowl bluegrass, *Poa palustris*, is a tall (to 120 cm), tufted, loosely growing perennial grass that is also frequently stolon-bearing. It is a common grass of wet places, marshes, shores, wet meadows and ditches. The panicles are long, up to 20 cm, and open at maturity with whorls of 2-9 wide-spreading branches. There are 2-5 florets per spikelet, but the lemmas are small at 2-3 mm. The lemma callus is sparsely to moderately webbed and the keels and marginal veins are short-hairy. The lemma tips are characteristically bronze-coloured, incurved and blunt, with narrow hyaline margins. *Poa palustris* is native to cool-temperate North America and northern Eurasia, but has been introduced into parts of North America, often for soil stabilization and waterfowl feed. It resembles *Poa interior* but can be distinguished from it by its habitat, looser growth habit, better developed webs and narrow hyaline margins on the lemmas.



Left, herbarium specimen of *Poa secunda* from saline area at Van Es Prairie, near Cooking Lake, 2004-07-05.

Right, close up of part of panicle of a specimen from Medicine Hat, 2003-06-22.

Sandberg's bluegrass, *Poa secunda*, is a native, tufted perennial growing 15-120 cm tall. Leaf blades are up to 3 mm wide, and can be flat, folded, or inrolled. The panicle can reach 25 cm in length, and is narrowly lanceolate to ovate, contracted except at flowering time, with 1-3 branches of varying lengths per node. The spikelets are 5-10 mm long with 3-5 florets; they are somewhat rounded in contrast to the distinctly flattened spikelets of most other Poas, and this is a distinguishing feature. The lemmas are large at 3.5-6 mm and have a wide hyaline border; they are weakly keeled, the keels and marginal veins and the spaces between the veins bearing hairs. The web is lacking. In our area, the species is mostly found in saline wetlands or areas of solonetzic soil, but it is more common further south and occupies more diverse habitats. It is a highly variable species that includes four taxa that were recognized as separate species in *Flora of Alberta* (1983): *P. canbyi*, *P. juncifolia*, *P. nevadensis* and *P. sandbergii*. Two subspecies of *P. secunda* are all that are now recognized, subsp. *juncifolia* and subsp. *secunda*. Complicated, eh? As I've mentioned, distinguishing *Poa* species is not easy, but hopefully readers will now be able to recognize the genus *Poa*, at least. Full descriptions and images of all these species can be obtained by searching *Flora North America* and the species' scientific name, or from other online sources.

I am inclined to mention one other species, not local, that demonstrates the typical characteristics of Poa very well. It is alpine bluegrass, *Poa alpina*, which is so common that it will be seen by all visitors to the mountains, north and south, and thrives at montane altitudes low and high.



Left, panicle in flower showing typical Poa-type spikelets with keeled glumes and lemmas, at Prospect Creek, Cadomin, 2010-07-29.

Right, alpine bluegrass specimen from near Nordegg, 1981-06-28, showing short, broad basal leaves with prow tips, and short stem leaves.

## References

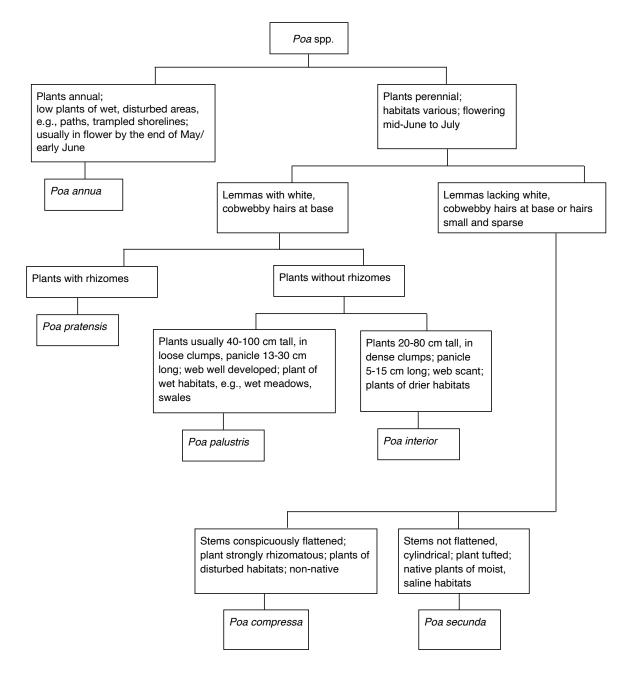
Kershaw, Linda and Lorna Allen, 2020. Vascular Flora of Alberta: An Illustrated Guide. Self- published. Kindle Direct Publishing.

Moss, E.H. 1983. Flora of Alberta. 2d ed. edited by J.G. Packer. Toronto, University of Toronto Press.

*Flora of North America.* Treatment of *Poa* occurs in volume 24. To obtain online information, search on scientific name followed by Flora of North America.

Specimens from P. Cotterill Herbarium

Key to species described above, modified from Kershaw and Allen:



Note: I usually look first for rhizomes (a grass forming patches is indicative of the presence of rhizomes or stolons) which if present would allow separation of *Poa pratensis* and *Poa compressa* off from the other species without the need to look at floral morphology. These two species could then be separated by the flattened stems of *Poa compressa*. The presence of a conspicuous lemma web would confirm the much more common *Poa pratensis*.

*From Judith Golub*: This past summer, Sue Panteluk started messaging me photos she took at the restoration plots during the length of the 'heat dome'. She was out there quite frequently at nine to ten o'clock at night making sure the plants weren't drying up in the prolonged and excessive heat of the day. After coming across the sleeping bee in the harebell, she began looking for more, and found all sorts of interesting characters. Interestingly, she wrote, on hotter evenings more bees were seeking refuge in the flowers. "I'm seeing sleeping/sheltering bees everywhere. I'm finding it fascinating that the bees are using the flowers as shelter in heat, winds and rain." She gave some of the photos charming captions, that I thoroughly enjoyed, and that brightened up my day. I thought I would share them with you (with Sue's permission, of course!) and brighten up these cold, and often grey, January and February days for you as well. I will use some this month and some next month.

Sleeping Bees and Native Wildflowers at Bunchberry Meadows by Sue Panteluk



Snoozin' in the harebells...





When you feel a storm coming, grab the closest stamen and hang on!



Tucked in for the night in the gaillardia.

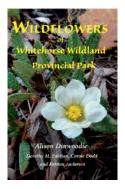


Snoozing in the fireweed.

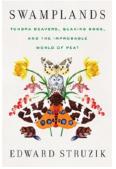


After the storm...Bedraggled bee in the goldenrod.

# **Recommended Reading:**



*Wildflowers of Whitehorse Wildland Park* - This book is now available for purchase at the Wildbird General Store, 4712 - 99 Street, Edmonton.



Swamplands - Tundra Beavers, Quaking Bogs, and the Improbable World of Peat by Ed Struzik "Swamplands highlights the unappreciated struggle being waged to save peatlands by scientists, conservationists, and landowners around the world. An ode to peaty landscapes in all their offbeat glory, the book is also a demand for awareness of the myriad threats they face. It urges us to see the beauty and importance in these least likely of places. Our planet's survival might depend on it."

From epl: https://epl.bibliocommons.com/v2/record/S5C2430405

# Websites of the Month:

# Nature Alberta Chit Chat

Six speakers presented in a PechaKucha storytelling style. Storytellers were: Steph Weizenbach, Nature Alberta; Geoff Holroyd, Beaverhill Bird Observatory; Dave Ealey, Wagner Natural Area Society; Martin Osis, Alberta Mycological Society; Laureen Echiverri, Boreal Avian Research & Conservation Association; John Acorn, Nature Alberta Patron.

If you missed this when it was first shown, it is now available on NA's YouTube: <a href="https://naturealberta.ca/nature-alberta-chit-chat/">https://naturealberta.ca/nature-alberta-chit-chat/</a>

# Nature Network Speaker Series: Exploring the Science Behind Citizen Science - January 25 at 7:00 pm.

Participating in citizen science using apps like iNaturalist and eBird is great fun. But what happens to your photos after you press the send button? How do your observations contribute to science and support conservation? In this presentation, conservation biologist Dr. Richard Schneider will pull back the curtain and explain how it all works. He'll also discuss the different forms that citizen science can take and provide tips for maximizing the value of your contributions.

Visit the Nature Alberta Event page for the Zoom link and passcode.

# Wild Ones Presents: "Native Plants, Phytoremediation & Green Infrastructure: How Native Plants Can Be Used to Improve Environmental Quality"

Some of you might find this interesting. It is focused on Arkansas, where the presenter lives and works, but he did mention some grasses and plants that do grow here. Blue Grama and Canada Wild Rye are on his list of useful plants for remediation. The science is universal and the abilities of plants to deal with all sorts of toxic chemicals is fascinating.

https://wildones.org/phytoremediation-with-eric-fuselier/ Suggested by Natasha Stairs.

# Wild Lands Advocate

Alberta Wilderness Association's newsletter is available online: https://albertawilderness.ca/publications/wild-lands-advocate/

# Lifetime ENPS Membership

You can now become an Edmonton Native Plant Society member for life. Memberships are \$20 and can be purchased by emailing <u>enpgmembership@gmail.com</u> or visit one of our booths at plant events in your area. Aims of the Edmonton Native Plant Society:

- Promote knowledge of the Edmonton area native plants.
- Conserve our native plant species and their habitats.
- Preserve native plant species and habitat for the enjoyment of present and future generations.
- \* Educate individuals, business and local governments about native plants.

Please send compliments, concerns and complaints to <u>engedmonton@gmail.com</u>. To unsubscribe, or subscribe, email <u>engedmonton@gmail.com</u>

> Cherry Dodd, editor Judith Golub, publisher www.edmontonnativeplantgroup.org



Whitemud Creek in winter