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Iris

The Alberta Native Plant Council Newsletter

In This Issue

Look for more information on the ANPC's website. **anpc.ab.ca**

Cover photo: Marsha Hayward
Yellow ladyslipper orchid (*Cypripedium parviflorum*).

Fascinating Ferns: Part 1

Marsha Hayward

It is true you know. Pteridophytes, or Ferns and Fern Allies (as they are otherwise known), are cool!

And they have been around for a long while.

Imagine exploring a Paleozoic Era forest 350 million years ago, filled with *Lepidodendron* (40-m tall giant clubmosses), which were ancient relatives of modern *Isoetes,* or tree-sized clubmosses called *Sigillaria,* which grew to 20 m in height! Or how about finding early Carboniferous *Selaginella* and hiding beneath the arched branches of the 10-m tall fern *Psaronius* and seeing 3-m long fronds swaying in the breeze. Subarctic palm trees? They WERE here. It is all true.

Jump to the present, or should I say the not-too-distant past. My first real memory of ferns occurred when I was a child clambering over Canadian Taiga Shield rocks in Yellowknife, Northwest Territories, with my older brother, where our family had been temporarily relocated after a devastating flood on the south shores of Great Slave Lake. My much taller and more-nimble older brother and I were explorers (or imagined ourselves to be). We clambered happily over the massive pink Precambrian granite boulders seeking out lost worlds, and we brought armfuls of polypody ferns back to our temporary residence to show our mother. Later, as a teen, I recalled seeing the same ferns on rocks of the Canadian Shield on the north shores of Lake of the Woods, and along the north shores of Lake Superior while travelling across Canada to visit family in southern Ontario.

I really got hooked on ferns when my children and I visited a unique native plant community of *Populus balsamifera* ssp. *balsamifera* and *Matteuccia struthiopteris,* ostrich fern, in northeast Alberta. My children (who were at the dinosaur-crazy age) had a lot of fun hiding in the six-foot-plus ferns and pretending they were escaping velociraptors.

There was a BIG problem, though. Ferns and their allies, although fascinating, can be extremely frustrating

Marsha Hayward

Hayward kids having fun in the ferns.

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to identify! It took me quite a while to understand all those terms such as pinnate (leaflets arranged on either side of a stem) and pinnae (primary division of a pinnate leaf). And they just continue dividing from there! Lots of once-, twice-, thrice-divided stuff.

I still think back to Dana Bush's "Blasted Birches" article in Iris and laugh (a little hysterically) whenever trying to figure out the "blasted botany" of ferns. Try figuring out the gametes stage, and heterosporous plants with megaspores and microspores! Even worse—there are the sori and sorus and the location and shape of the darn things on the back of ferns, or sori that hang out on a separate stalk from the fronds or sterile fronds (why would a fern do that anyway?). How about a cluster of sporangia that may or may not have a cover (indusium)? It's enough to give you a large headache.

And for anyone who has ever tried to figure out the many divisions of *Equisetum* stem sheaths and their branching—make SURE you are a calm person and can handle stress well. But that is for another article.

It is all true. Ferns and fern allies do strange stuff! But seriously, ferns and their allies also have amazing evolutionary adaptations, which makes them very cool, and they are extremely tough. Plus, you can find them just about everywhere in Alberta's boreal forest region.

And when you are out looking for native ferns and their allies, just remember that it is not hard to imagine yourself as being back in time—try 350 million years ago, when you wander through the unique plant community of six-foot tall *Matteuccia struthiopteris* var. *pensylvanica,* ostrich fern, and *Populus balsamifera* ssp. *balsamifera* in the Alberta boreal. * Look this plant community up in ACIMS for practice.

Rock Ferns

There are many species of rock ferns (as I call them) in Alberta. They love to hang out in and around rocky substrates of arctic-alpine climatic zones, and many are circumboreal species. Rock-loving ferns endure extreme heat, drought, severe cold and rock-splitting frost, driving rain that washes away all their soil as well as forest fires and floods.

Epiphytic on rocky surfaces, such as cliffs and rock outcrops (often with mosses), these ferns love granite, dolomite and limestone rock.

The Polypodiaceae Bercht. & Presl Family includes two *Polypodium* L., which are ferns that grow in very harsh conditions on rocks, or in shallow soil over rocks. Their Greek secret (if you will) is their unique rhizomes, which are creeping and branched into *poly* "many" *podium* "little feet." And these ferns do a great job of surviving in poor soil to no soil conditions on solid rock. Two species grow in northern Alberta—*Polypodium sibiricum* Siplivinsky, Siberian polypody, and *Polypodium virginianum* L., rock polypody.

Which is which? Pull out your microscope and good luck!

Polypodium sibiricum Siplivinsky, Siberian polypody, and *Polypodium virginianum* L., rock polypody, are real look-alikes. So much so, that it may take a microscope to see that *Polypodium sibiricum* has spores sized less than 52 microns, a lack of gland-tipped hairs on its sporangiasters, and uniformly dark brown scales on its stems (Kershaw et al. 2001). Both are considered rare.

Polypodium sibiricum has 25+cm long leathery fronds (slightly shorter than *P. virginianum*), which arise from their uniformly creeping rhizomatous stems (usually with dark brown scales), with abaxial surfaces. Their blades are 3-5 cm wide, are deeply lobed almost to the stem, and are once-pinnately divided with rounded tips. The *P. sibiricum* has rounded sori and is exindusiate (without an indusium), with a lack of glandular paraphyses (slender sterile filaments) among its leptosporangia.

Marsha Hayward

Siberian polypody (*Polypodium sibiricum*)

Polypodium virginianum has 35-40 cm long leathery fronds, which arise from reddish-brown creeping rhizomatous stems, with abaxial surfaces. Their blades are 2-7 cm wide, are also deeply lobed almost to the stem, and are once-pinnately divided with rounded tips. The *P. virginianum* also has rounded sori and is also exindusiate (without an indusium), with a lack of glandular paraphyses (slender sterile filaments) among leptosporangia. *If indusia are present, they are round-reniform (in both species).

Marsha Hayward

Rock polypody (*Polypodium virginianum*)

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Polypodium hesperium, western polypody, is another beautiful rock fern that is found primarily in the foothills and montane regions of western Alberta. This polypody is not as common in northwestern Alberta foothills ranges. The *P. hesperium* has shorter plants (5-15 cm) than the other polypody of Alberta, and straw-coloured stalks that are shorter than the blades.

Best place to find polypodies: along the Peace-Athabasca Delta/Wood Buffalo National Park rivers and close to Ft. Chipewyan in the pink Precambrian granite, and on dolomite or limestone rocky outcrops.

The Pteridaceae Reich. Brake Fern Family includes the genus *Cryptogramma* with the unfern-like looking species ***Cryptogramma acrostichoides***, parsley fern, and the ***Cryptogramma stelleri***, Steller's rock brake, occurring in Alberta. These beautiful rhizomatous ferns are found primarily on acidic rocks and are arctic-alpine species.

Marsha Hayward

Parsley fern (*Cryptogramma acrostichoides*)

The circumboreal *C. acrostichoides* ferns are unique in that they have strongly dimorphic leathery fronds (fertile and sterile fronds are separate) growing from a short, scaly rhizome with fibrous roots. The fertile 5-25 cm tall female frond is the tallest part of the plant. Their rolled-under linear-oblong leaflet edges have a dense covering of sori, which resemble somewhat the rolled-under edges of Labrador tea (except that they are much smaller). This dense sori covering and the species epithet "like *Acrostichium*" relates to a tropical fern genus with the same characteristics. There is no indusia.

The sterile male part of this fern looks very much like parsley leaves, with the stalk being longer than the leaves. This is part of the same plant, although it has a separate stalk and leaves which are 2-3 pinnate and are 3-17 cm long.

Cryptogramma stelleri, Steller's rock brake (formerly slender rock brake), is also dimorphic and resembles *Cryptogramma acrostichoides,* except that it is taller than *C. acrostichoides* (28 cm), with drooping and flatter-looking fertile fronds with fewer pinnae. The rhizome is very slender and is scaly. The male fronds are broadly obovate pinnules. The *Cryptogramma stelleri* fertile parts also have in-rolled leaves with sori on the underside of the female fronds.

Best place to find cryptogramma: foothills and alpine in western Alberta, often near waterfalls and subalpine creeks (in moist areas), as well as the Canadian Shield of the Kazan Uplands. This fern is often found hanging down over very moist calcareous cliff faces, in crevices, and within the undersides of moist overhangs amongst thick moist-area mosses.

*Two other unique rock ferns to look for in Alberta are *Pellaea gastonyi* (Gaston's cliff brake) and *Pellaea glabella* Mett. ex Kuhn (smooth cliff brake). *Pellaea glabella* is the more common of the two in Alberta. *Pellaea gastonyi* has been found in northwestern Saskatchewan, close to Lake Athabasca.

Watch for more articles about Alberta's ferns and fern allies. ♦

Predators, Parasites and Inquilines . . . Oh No

C. Dana Bush

We imagine that galls provide safe housing for their gallers, protecting them from cold, from desiccation, and from being eaten. After all, the galls themselves often have higher levels of tannins and phenolic compounds and lower levels of nitrogen, making them less palatable to insects, birds and mammals. And yet, we find the gallers are frequently eaten, and that the galls themselves are tiny communities of multiple species—some researchers consider them to be ecosystem engineers (Sanver and Hawkins 2000).

First, an introduction to the threats to the galling insect. Predators eat the galling larva directly. These may be insects or mites, or in the case of the goldenrod galls, they may be woodpeckers, rodents or squirrels, chewing through the woody gall for a tasty treat inside. Parasites are often ichneumon or chalcidoid wasps who use their long ovipositors to inject eggs into the galling larva, so that the larva provide food for their young (the parasite larvae eat them from the inside out). Inquilines invade the gall while the galler is alive and consume the gall tissue, but do not directly attack the galler. Successors are mites, spiders, beetles, thrips and springtails who live in a gall after the galler hatches or dies (Luz 2019).

The globose galls on the stems of goldenrod (*Solidago altissima*) are produced by the goldenrod ball gall fly (*Eurosta solidaginis*) (can we hold a tongue twister competition in Iris?). Goldenrod galls are common and easy to collect, and many entomologists have reared insects from these galls, finding the gall fly, many wasps of several different species, and mordellid beetles. A parasite attack, oddly, does not stop the growth of the gall and thus does not benefit the plant (Weis and Abrahamson 1985). Judd (1953) noted that up to half of the galls were empty because they had been drilled by woodpeckers or gnawed by rodents. Downy woodpeckers eat the gall fly, as well as either of two parasitizing wasp larvae, and the beetle larva, and these gall insects may be important food in the winter (Confer and Paicos 1985). Goldenrods sometimes have two galls on the stem; the upper one tends to be smaller and is attacked by a chalcid wasp, but the bottom, larger gall is more likely to be eaten by birds (Zurovchk and Shealer 1996).

Goldenrod galls
(Illustration by C. Dana Bush)

Willows frequently have dense pine cone-like growths on the tips of their branches. These are willow pine cone galls, caused by a tiny midge, *Rhabdophaga strobiloides*. The midge lays its eggs in the apical buds and forces the stem to stop growing, while the leaves form a ball around the galler who resides in a chamber in the centre. An Alberta study showed that over half the midges died from parasitism or birds, but unlike the goldenrod galls, birds attacked the smaller galls, and a variety of wasps attacked the larger galls (Van Hezewijk and Roland 2003).

A similar gall, the willow rosette gall or willow cabbage gall, is looser and often contains two or three galls at a node. This is formed by a related midge (*Rhabdophaga salicisbrassicoides*). Ants and aphids use galls, such as the willow rosette gall, as temporary shelters and as food for the aphids; all three of the insect species benefit from each others' presence in a positive feedback loop, the essence of mutualism (Savage and Peterson 2006).

Raising insects from the galls is simple. Place an intact gall (one without an exit hole) inside a transparent container and

Cabbage willow gall
(Illustration by C. Dana Bush)

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Predators, Parasites, Inquilines, from page 4

Willow pinecone gall
(Illustration by C. Dana Bush)

secure mesh or a nylon stocking over the top with an elastic. Most specimens should emerge in approximately three weeks. You may raise the galler and a selection of other insects.

To watch a galling insect or mite develop, carefully cut a side off the gall so that the larva is visible but intact. Trim the edges so the larva is clearly visible and the cut edges of the gall are flat. Place glue along the cut edges of the gall and press it against the wall of the jar. This way you can see the larva inside the gall as it develops (Farenga, Joyce, Ness and Wilkens 2003).

These are the two documents that I've found most useful for identifying galls:

Wong, H.R., J.C.E. Melvin, and A.M. Harper. 1977. *Common Insect and Mite Galls of the Canadian Prairies.* Fish. Environ. Can., Can. For. Serv., North. For. Res. Cent. Inf. Rep. NOR-X-196. Available at https://www.cfs.nrcan.gc.ca/bookstore_pdfs/12155.pdf.

This is a PDF of an old document. The black and white photos are blurry, but the general shape of the galls is apparent. It has a key based on plant family, location of gall, and shape of gall.

Russo, R.A. 2021. *Plant Galls of the Western United States*. Princeton University Press.

Hot off the press, this is a comprehensive guide with descriptions and photos, organized by plant family. No keys—it means flipping pictures.

References

Confer, J.L. and P. Paicos. 1985. Downy Woodpecker Predation at Goldenrod Galls. *Journal of Field Ornithology* 56(1): 56-64.

Farenga, S.J., B.A. Joyce, D. Ness and R. Wilkens. 2003. *Science Scope* 26(4): 62-65.

Judd, W. W. 1953. Insects Reared from Goldenrod Galls Caused by Eurosta Solidaginis Fitch (Diptera: Trypetidae) in Southern Ontario. *The Canadian Entomologist* 85(8): 294-96.

Luz, F.A. and M.de S. Mendonça. 2019. Guilds in insect galls. *The Florida Entomologist* 102(1): 207-210.

Sanver, D. and B.A. Hawkins. 2000. Galls as habitats: the inquiline communities of insect galls. *Basic and Applied Ecology* 1(1): 3-11.

Savage, A.M. and M.A. Peterson. 2007. Mutualism in a Community Context: The Positive Feedback between an Ant-Aphid Mutualism and a Gall-Making Midge. *Oecologia* 151(2): 280-291.

Van Hezewijk, B.H. and J. Roland. 2003. Gall size determines the structure of the *Rabdophaga strobiloide*s host–parasitoid community. *Ecological Entymology* 28(5): 593-603.

Weis, A.E. and W.G. Abrahamson. 1985. Potential Selective Pressures by Parasitoids on a Plant-Herbivore Interaction. *Ecology* 66(4):1261-1269.

Zurovchak, J.G. and D.A. Shealer. 1996. Mortality Sources of *Eurosta solidaginis* (Diptera: Tephritidae) Inhabiting Single versus Double-Galled Stems of Goldenrod. *The American Midland Naturalist* 136 (1): 94-100. ♦

Grassland Restoration Forum Events

How to Use Range Plant Community Guides and Recovery Strategies Manuals for Project and Reclamation Planning in Grasslands - Cassils Hall, near Brooks, AB. September 15, 2021.
This one-day, classroom-based course teaches participants how to use the Range Plant Community Guides and introduces the Recovery Strategies for Development in Native Grassland Manuals planning process. These tools will provide valuable context to interpret results of data collected for NEW AEP Conservation Assessments – Strategic Siting and Pre-disturbance Site Assessments for Industrial Activities on Native Grassland.

Grassland Assessment Training - Antelope Creek Ranch, near Brooks, AB. September 16, 2021.
Designed for students, agrologists, ecologists, land stewards, regulators, planners and reclamation practitioners, and anyone interested in learning more about native grassland ecosystems. This one-day, field-based course offers training on common plant identification, use of soils and landscape mapping (AGRASID and GVI) in relation to Alberta's Range Plant Community Guides and Range Health Assessment Manuals. Designed to classify and assess grassland plant communities, these tools are critical for pre-site assessments, reclamation design and restoration of native grassland.

A Walking Tour of the Stavely Research Ranch – west of Stavely, AB. September 21, 2021.
Led by Barry Adams, Rangeland Management Specialist - AEP (retired), this will be a unique and valuable demonstration of long-term effects of land management on foothills fescue grassland ecosystems in southwest Alberta.

Our Perennial Gathering! Grassland Restoration Forum Fall Information Session, Claresholm, AB. November 18, 2021. More information to follow closer to the date.

For information on the above events, visit https://grasslandrestorationforum.ca/. ♦

Rare Plant Profile:
Whitebark Pine, *Pinus albicaulis* Engelmann

Laurie Hamilton and Coleen Mahoney

Whitebark pine (*Pinus albicaulis* Engelmann)[1] is a long-lived conifer tree species in the Pinaceae Family that often lives more than 500 years, but can live over 1,000 years. Whitebark pine needles are in bundles of five and are 4-7 cm long. Mature trees can be 5-20 m tall, and may reach over 1 m in diameter at the base. Cones remain on the tree unless removed by animals.[2] Sizable crops of cones take 60-80 years to be produced.

Whitebark pine occur in high elevations in montane and subalpine habitats often on ridgetops or exposed upper slopes, in soils that are coarse, rocky and shallow over bedrock.[3] This pine is located along the Coast Mountain Ranges in B.C. and along the Rocky Mountains in Alberta and B.C., and in both cases continue south of the border to the Southern States. In Alberta, whitebark pine is found from Jasper and Banff National Parks, at its northern extent, to the Canada-US border on the southern edge of Waterton Lakes National Park.[4] It is considered a keystone species because its seeds are an important food source for a number of animals, it provides slope stabilization, and it facilitates the establishment and growth of other plants in the harsh, upper subalpine environment.[5] It plays an important function in headwater streamflow control by helping regulate snowpack and runoff.

Whitebark pine is provincially ranked as Vulnerable, nationally ranked, with some level of uncertainty, as Imperiled to Vulnerable, and globally ranked, with some level of uncertainty, as Vulnerable to Apparently Secure.[6] This tree is listed as Endangered in Alberta under the Alberta *Wildlife Act*,[7] and Endangered in Canada under the *Species at Risk Act*, due to the high risk of extirpation from the impending threat of disease.[8] Whitebark pine faces several threats including white pine blister rust (WPBR) (*Cronartium ribicola*), mountain pine beetle (*Dendroctonus ponderosae*), prolonged widespread fire suppression, and rapid global climate change.[9] However, WPBR is the most pervasive of the threats. Whitebark pine is not able to withstand the cumulative and rapid effects of threats, due in part to its life history traits such as the time to maturity, low dispersal rates, and its reliance on Clark's Nutcracker for seed dispersal.

Currently, Alberta is working on the long-term conservation of the whitebark pine through the provincial Recovery Plan, which addresses threats and identifies priority areas and actions for whitebark pine recovery.[10] One of the focuses of the recovery of whitebark pine lies in identifying trees that are potentially resistant to WPBR, which can then be used as seed sources for future recovery initiatives.

Lorna Allen

Whitebark pine (*Pinus albicaulis*)

Linda Kershaw

Whitebark pine with white pine blister rust

See **Rare Plant Profile**, page 7

Rare Plant Profile, from page 6

Jane Lancaster

Cones of whitebark pine

To learn more about rare plants of Alberta, visit the links provided in the footnotes, and stay tuned for the ANPC's second edition of the Rare Vascular Plants of Alberta book. This is one of many conservation initiatives that ANPC is working on. Please remember to renew your 2021 membership, as ANPC relies on membership dues and donations to support this and other conservation and education initiatives.

Endnotes

1 https://www.sararegistry.gc.ca/virtual_sara/files/cosewic/sr_Whitebark%20Pine_0810_e.pdf
2 Ibid.
3 Ibid.
4 https://open.alberta.ca/dataset/53325d9b-de10-42d7-986d-e2ed8956ee70/resource/077ec6b7-f3ed-46ae-89ee-66ef8da44760/download/2007-sar-statuswhitebarkpinealberta-nov2007.pdf
5 Ibid.
6 Vascular Plant Tracking List (https://www.albertaparks.ca/albertaparksca/management-land-use/alberta-conservation-information-management-system-acims/download-data/)
7 https://www.sararegistry.gc.ca/virtual_sara/files/cosewic/sr_Whitebark%20Pine_0810_e.pdf
8 Ibid.
9 https://open.alberta.ca/dataset/53325d9b-de10-42d7-986d-e2ed8956ee70/resource/077ec6b7-f3ed-46ae-89ee-66ef8da44760/download/2007-sar-statuswhitebarkpinealberta-nov2007.pdf
10 https://esrd.maps.arcgis.com/apps/Cascade/index.html?appid=d69f30908553449baef93beb7f7689e7 ♦

ALBERTA
Native Plant
COUNCIL

Iris is published three times a year by ANPC. The Council aims to increase knowledge of Alberta's wild flora and to preserve this diverse resource for the enjoyment of present and future generations.

If you have an announcement, article or other item, you are invited to submit it to the editor for publication. Items concerning native plants will be given highest priority.

The editors reserve the right to edit submissions, but will review changes with the authors whenever possible. Disputes will be resolved in favour of the audience.

Submission deadline for the next issue:
September 30, 2021

A subscription to *Iris* is included with membership in the ANPC. To join, contact the secretary, or check our website, www.anpc.ab.ca.

Whitebark Pine H5II Conference

The second conference on the research and management of high elevation five needle pines in western North America will be held virtually on October 5-7th. More information and registration at https://highfivepines.org/.

Science and Land Management Training and Education Centre (SALMTEC) Courses

SALMTEC has new course offerings for 2021. See https://www.salmtec.com/.

Blended/Online Course: **Grassland Vegetation Inventory: A User's Guide (W21)**

Through hands-on activities and examples presented in instructional videos, the GVI User's Guide Blended/Online Course provides participants with both an in-depth contextual and practical understanding of Alberta's Grassland Vegetation Inventory (GVI) using various real-world management scenarios. Registration for this course is open now.

This is in addition to their standard course offerings:

Online Course: **Wetland Policy Basics**, which provides an overview of the Alberta Wetland Policy Implementation process.

Snackable Learning Course: **Understanding ACIMS**, which provides guidance on how to use and apply tools provided by the Alberta Conservation Information Management System.

Snackable Learning Course: **Soil Information Viewer**, which provides guidance on how to use the tool and apply information stored in Alberta's Soil Information Viewer.

Online/Blended Course: **ABWRET-A (Alberta Wetland Rapid Evaluation Tool - Actual) (W21)**, which provides an in-depth understanding of the ABWRET-A tool through online, offline and interactive live streaming components. ♦

2021 Workshop Summary

Kristyn Mayner

We welcomed 8 presenters and 215 guests to our March 20, 2021 Workshop: Northern Native Plants and Ecosystems. Held online, we had attendees join from across Alberta and into neighbouring provinces as well as from a couple of US states. We built off the success of our online webinar program that similarly welcomed over 650 registrations and averaged approximately 120 attendees per event over the winter season.

We engaged members using a website called Mentimeter that allowed us to conduct polls and quizzes. Prizes were awarded to the top quiz participants, while we were able to settle several great botany debates and understand exactly how resilient our members are in the face of a mosquito onslaught during a boreal botany expedition.

The presenters for the day hailed from across Alberta, with their research extending into Yukon and Nunavut. Organizations such as the NAIT Centre for Boreal Research and the Royal Alberta Museum featured prominently in the schedule. Recordings of the presentations are available to members on the members-only portal of our website.
https://anpc.ab.ca/?page_id=6164
Password: Flower$

Dr. Jean-Marie Sobze	Make It Grow: Approaches to Propagate Difficult to Grow Native Species
Dr. Chibuike Chigbo	Creating a Lunchbox with Organic Amendments for Nursery Stock Seedlings
Melanie Bird	Donor Moss Sites Harvested for In-Situ Peatland Restoration: Do They Naturally Regenerate?
Trevor Floreani	The May Plant Count: Growing Citizen Science in AB
Brittney Miller	Yukon Ice Patches: a Miniature Jurassic Park?
Erin Cox	Discovering Bryophytes in Nunavut
Diana Tirlea	Discovering Past Landscapes Using Preserved Plant Material from within Ice Features in Jasper National Park
Margot Hervieux	Protecting Biodiversity in the Peace Region

What's more, we featured a fascinating tour of northern Alberta ecosystems in our lunchtime slideshow presentation, which is also available to watch on our website. We especially appreciate everyone who took the time to complete our workshop exit survey as it has provided us with invaluable information to steer our future programming for both indoor/virtual and outdoor events! We would like to extend our sincere gratitude to the day's presenters as well as the entire workshop organizing committee:

Melanie Bird, Kristyn Mayner, Kristen Andersen, Carole Dodd, Andrea Dechene, Jon Kozak, Diana Tirlea, Brittney Miller, Marsha Hayward, Norma Calvo, and Julie Figures. ♦

Meet the Current ANPC Board

On April 10, 2021, the ANPC held its 34th Annual General Meeting. The current Executive and Directors are:

Kristen Andersen, President
Natalie LaForest, Vice-President
Taylor Lowe, Secretary
Julie Figures, Treasurer
Marsha Hayward, Northern Director
Jon Kozak, Central Director
Liz Morrison, Southern Director
Kim Mackenzie, Nature Alberta
Laurie Hamilton, Director-at-Large

Welcome new and returning Officers!