Vol. 41 No. 2 June 2019

Sage Notes

Newsletter of the Idaho Native Plant Society • Promoting Interest in Idaho's Native Flora

Teaming Up to Recover MacFarlane's four-o'clock

By Karen Colson, U.S. Fish and Wildlife Service

MacFarlane's four-o'clock. Photo by Mark Lowry.

To say finding a MacFarlane's four-o'clock *(Mirabilis macfarlanei)* plant is difficult would be an understatement. First, many of the populations (scattered along the Salmon, Snake, and Imnaha river canyons in west-central Idaho and northeastern Oregon) inhabit remote areas with steep and rugged terrain not easily accessible. Second, this narrow endemic (limited to an approximately 500 square mile area) is extremely rare, only known from a scant 13 populations. Given the vast amount of potential canyon grassland habitat, it can be like looking for a needle in a haystack. But when you do see this plant it is a sight you will never forget! The showy, bright magenta flowers and mounds of emerald green, almost succulent leaves, light up the surrounding dry canyon grasslands.

Almost as impressive as what is visible above the soil surface is what's beneath. Long, thick tuberous rhizomes produced along extensive lateral roots allow MacFarlane's four-o'clock to form impressive, sprawling colonies.

Unfortunately, the plant's tendency to reproduce by rhizomes versus seedlings may be one reason the plant does not appear to colonize suitable habitat effectively. It could also be the fact that the flowers only have the potential to produce a single relatively large seed that may not disperse far from the plant, or perhaps a loss of habitat suitability is limiting germination. Whatever the reason, recruitment of new MacFarlane's four-o'clock plants has rarely if ever been observed, and despite many years of survey efforts in potential habitat, no additional populations have been located. To complicate survival even more, invasive non-native plant species are present in or adjacent to most of the known populations, which is one of the primary threats that led to Macfarlane's four-o'clock being added to the Endangered Species List in 1979.

Fortunately, a team of committed partners has been actively working together to design and implement a multifaceted approach to conservation and recovery of this federally threatened plant species. Team members include the Wallowa-Whitman National Forest (Jerry Hustafa and Gene Yates); the Bureau of Land Management (BLM), Cottonwood Field Office (Craig Johnson, Lauren Pfund, and Mark Lowry, retired); the U.S. Fish and Wildlife Service (Karen Colson, Idaho and Gretchen Sausen, Oregon); the Idaho BLM State Office and Coeur d' Alene District Office

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Letter from the President

I have been a member of INPS for more than 12 years now. I have found my membership to be very rewarding and feel that my life has been enriched by the association. Most of my best memories of the society are associated with annual meetings. Each time I attend, I meet new people and new plants. Not sure which is the best part. But, I am again looking forward to the upcoming July meeting at Ponderosa State Park. The Pahove Chapter has worked hard to make this meeting memorable.

I am intending to add another chapter to my book of "Life's Best Memories." I hope you have set aside a few days to meet with us and create your own memories. I extend my personal invitation. See you there!

Stephen Love
INPS President

Letter from the Editor

My tenure as editor for *Sage Notes* began with the December 2014 issue. It will end with the December 2019 issue. As editor, I have enjoyed interacting with numerous INPS members the past five years while trying to keep the newsletter relevant and true to the organization's mission to promote interest and appreciation in Idaho's native plants and plant communities, and to preserve this rich botanical heritage for future generations. *Sage Notes* serves as a common bond between all INPS members regardless if you live in Coeur d' Alene, Twin Falls, Pocatello, or any of the other more than 50 zip codes INPS members call home.

I want to thank everyone who submitted material for *Sages Notes* these past five years. The newsletter would not persist without many people willing to take the time and effort to share their botanical story. I encourage all INPS members to share their ideas, information, and experiences related to Idaho's flora and contribute an article to a future *Sage Notes*. Publication of the newsletter has been a team effort the past five years and I owe special thanks to several people who never wavered in their help and support. Jody Hull has shared her many talents in the design of nearly every *Sage Notes* issue since I became editor. Caroline Morris and Nancy Miller have improved drafts of each issue by their efficient and reliable reviews. Diane Jones has been responsible for posting the newsletter onto the INPS webpage. I am also grateful to other INPS members who have assisted with *Sage Notes*-related tasks from time to time.

Summer is now upon us. Grab that hand lens and enjoy Idaho's diverse and wonderful native plants. May it be a season rich in botanical wonder and rewards. And then do not forget to write it down and share your experience in a *Sage Notes* article.

Michael Mancuso
Sage Notes Editor

2019 INPS Annual Meeting

The 2019 INPS annual meeting will be held **Friday, July 12–Monday, July 15, 2019**. It will be hosted by the Pahove Chapter (Treasure Valley area) and based in scenic McCall, Idaho. Our activity base will be the Peninsula Campground at Ponderosa State Park next to Payette Lake. A list of Hotels/Motels in McCall as well as Campground and RV Parks in or near McCall, Idaho can be found on the INPS website.

Ponderosa Park requires a Park Pass, campsite/RV booking, or $5 entrance fee. INPS campsite reservers will receive separate supplementary instructions.
Directions to Ponderosa State Park:

- Located at 1920 N. Davis Ave. McCall, ID 83638
- 107 miles north of Boise via HWY 55
- 190 miles south of Moscow via HWY 95

Schedule of Events

Friday afternoon

12:00 pm-6:00 pm: Check in/registration/information packets at the Peninsula Shelter, Ponderosa State Park.
1:00 pm: Twin Peaks Nursery Tour (51 E. Lake Fork Rd., McCall, ID 83638)/Roseberry historic town tour.
3:00 pm-5:00 pm: INPS State Board meeting.
6:00pm-9:00 pm: Potluck at the Peninsula Shelter. Please bring food to share with the group. We will provide the main course: grilled BBQ burgers, veggie burgers and hotdogs with condiments.

Saturday

8:00 am-12:00 pm: Lichen/Bryophyte Workshops led by Roger Rosentreter and Alma Hanson. Field explorations around Ponderosa State Park to view some spectacular lichen and moss specimens. Please bring your hand lens. Short trip to a fen dominated by the moss *Helodium bladowii*.
1:00 pm-5:00 pm: Charlie's Garden Tour (tentative) led by Barbara Ertter.
8:00 am-5:00 pm: Granite Mountain—this moderate to strenuous hike will be led by Michael Mancuso and venture through meadow, montane forest, and subalpine forests plant communities on the way to the lookout on the summit, with views of the Salmon River and Seven Devils mountains. The hike will also provide an opportunity to see Tobias' saxifrage *(Saxifraga bryophora* var. *tobiasiae)*, a rare local endemic plant species.
6:00 pm-9:00 pm: Banquet Mexican Dinner (KB Burritos)/Business Meeting/Keynote Speaker—Barbara Ertter/Silent Auction at McCall Senior Citizen Center (701 1st Street).

Sunday

8:00 am-2:00 pm: Hike to No Business Lookout in West Mountains south of McCall (tentative). Field trip location may be changed.
8:00 am-2:00 pm: Hike to Lick Creek Summit (northeast of McCall) led by Kristin Williams and Anne Halford—a beautiful subalpine forest with open rock outcrops and seeps/ponds abound.
6:00 pm-9:00 pm: Dinner on your own.

Monday

Optional Field Trip: Meanders kayak/canoe trip, depending on Warren Road Construction.

Registration deadline is July 1. Please submit your registration form and payment so that we can serve you better during this annual meeting. The form and more information can be found on our website: https://idahonativeplants.org/statewide-annual-meeting/

All registrants will be emailed after July 1 with details about the Saturday & Sunday hikes difficulty levels and leaders, along with other new information.

Native Plant Appreciation Week

Idaho's native plants received recogniton for the many values they provide in an official proclamation from the governor's office this past April. INPS submits s a request to the governor's office for this declaration each year.

Executive Department
State of Idaho

The Office of the Governor
Proclamation

State Capital
Boise

WHEREAS, native plant species are an important part of Idaho's natural heritage, providing valuable aesthetic, economic and ecological contributions that make our state a special place to live; and

WHEREAS, Idaho enjoys amazing biodiversity, with a flora of more than 3,000 native plant species; and

WHEREAS, protecting native plant ecosystems is critical for protecting water quality, soils, and Idaho's natural beauty; and

WHEREAS, invasive species are a severe threat to our native plant ecosystems and biodiversity.

NOW, THEREFORE, I, BRAD LITTLE, Governor of the State of Idaho do hereby proclaim the week of April 21 through April 27, 2019, to be

NATIVE PLANT APPRECIATION WEEK

IN WITNESS WHEREOF, I have hereunto set my hand and caused to be affixed the Great Seal of the State of Idaho at the Capitol in Boise on this 12th day of April, in the year of our Lord two thousand and nineteen and of the Independence of the United States of America the two hundred forty-third and of the Statehood of Idaho the one hundred twenty-ninth.

BRAD LITTLE
GOVERNOR

LAWERENCE DENNEY
SECRETARY OF STATE

The First President in Yellowstone Was a Naturalist

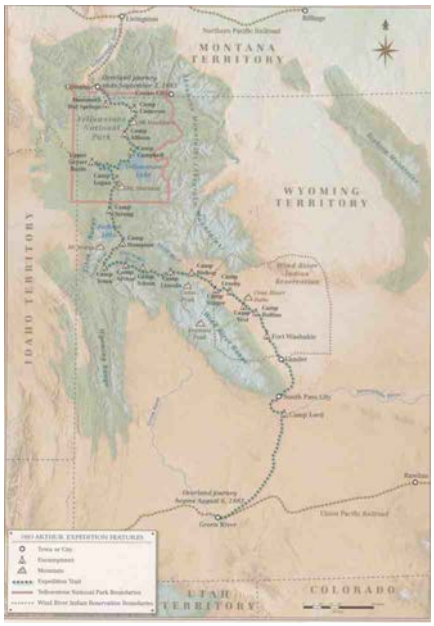
By Rick Williams, Curator of Botany, Ray J. Davis Herbarium; Sawabi Chapter

Historical Photos from *A President in Yellowstone* by Frank Goodyear III (2013), University of Oklahoma Press

Yellowstone National Park was established by an act of congress on March 1, 1872 under president Ulysses S. Grant's administration. In August 1883, President Chester A. Arthur travelled by horseback with a seventy-five man military escort, under the command of General Philip H. Sheridan, through the Tetons and Yellowstone. He was the first president to travel so far west and the first to visit the newly established Yellowstone National Park. As was typical of the period, natural history specimens were collected to document the flora and fauna encountered on the expedition. Three plant specimens collected by President Arthur in Yellowstone are now part of the holdings in the Ray J. Davis Herbarium at Idaho State University. •

Chester A. Arthur, the 21st President of the United States, was elected Vice-President under President James A. Garfield in 1880. He became president on September 20, 1881 following Garfield's assassination. Arthur was an avid outdoorsman, and a noted fly fisherman. The exceptional fishing opportunities provided on the Yellowstone trip were an enticement to the president. Photograph by Abraham Bogardus, c. "1881", held by the Smithsonian's National Portrait Gallery.

The expedition was organized by General Philip H. Sheridan (third from left), civil war hero, and commander of the U.S. military in the West. Through the presidential journey, Sheridan hoped to promote the expansion and protection of Yellowstone to the president and the nation. Following the expedition, Arthur (seated, center) became a strong proponent of the park, helping protect it from private development. Photograph held by Library of Congress, Prints & Photographs division.



President Arthur travelled by the Union Pacific railroad to Green River Wyoming, then north by horseback for almost 350 miles through the Tetons and Yellowstone to the Northern Pacific railhead Cinnabar, Montana. Photograph of map used by permission of University of Oklahoma Press.

Alpine forget-me-not (Myosotis alpestris) collected by President Chester A. Arthur in Yellowstone in 1883.

Wooly yellow daisy (Eriophyllum lanatum) collected by President Chester A. Arthur in Yellowstone in 1883.

MacFarlane's four-o'clock**.....***Continued from Page 1***

Craig Johnson holding a MacFarlane's four-o'clock tuber. Photo by Tonya Lyden.

(Anne Halford and LeAnn Abell, respectively); the Deschutes National Forest (Matt Horning and Chris Jensen); Ann DeBolt (Boise area botanist), Michael Mancuso (Mancuso Botanical Services); David Boose (Gonzaga University); the Idaho Natural Heritage Program; and the Rae Selling Berry Seed and Plant Conservation Program (formerly Berry Botanic Garden).

Although long-term, rangewide monitoring data indicate an overall stable population trend, the lack of apparent recruitment of new plants from seed is concerning. Therefore, an important part of the recovery strategy is augmentation of existing populations and creation of new populations to ensure long-term viability of this species.

Previous reintroduction efforts occurred at two locations and involved the successful transplanting of MacFarlane's four-o'clock rhizomes. The first occurred at Lucile Caves, a BLM designated Research Natural Area and Area of Critical Environmental Concern.

Surveying for MacFarlane's four-o'clock in Hell's Canyon. Photo by Gretchen Sausen.

Rhizomes were transplanted at this population (which is considered one of the known 13 populations) in 1988 using rhizomes obtained from private lands and again in 1998 using salvaged rhizomes from a nearby Highway 95 landslide. A second new population (not yet included in the total population count) was established by the BLM in 2015 by working cooperatively with a local private landowner to transplant 25 rhizomes from private property to the Lower Otto Creek Conservation Area located on BLM land.

Although the use of rhizomes appears to be a highly successful technique for establishing new plants, it does require removing rhizomes from existing populations. Therefore, the Team is currently pursuing nursery propagation of MacFarlane's four-o'clock plants and potentially rhizomes for use in outplanting projects. Ann DeBolt has been leading the effort to germinate seeds.

Excavating MacFarlane's four-o'clock rhizomes from private land to be transplanted at the Lower Otto Creek Conservation Area. Photo by Craig Johnson.

From 2018 to 2019, she successfully grew 77 MacFarlane's four-o'clock plants. These plants will be used by the BLM in a population enhancement project scheduled for fall 2019.

With the information gained through Ann's work, the Team will be expanding these propagation efforts through the use of the U.S. Forest Service and BLM Clarno Nursery located on the John Day River in Oregon. Seed stored at the Rae Selling Berry Seed Bank and new seed collections from this summer will be used for plant propagation at the Nursery in 2020. Results from a recent rangewide genetic study led by Matt Horning and Valerie Hipkins with the National Forest Genetics Lab are being used to help inform seed collection. The study indicated that Macfarlane's four-o'clock populations in all three drainages were genetically distinct from one another, but within each drainage genetic results were sim-

Ann DeBolt with MacFarlane's four-o'clock seedlings. Photo by Roger Rosentreter.

ilar, suggesting for example, that seed could be combined by drainage but not mixed between drainages. Results were encouraging in that they also showed significant genetic diversity within populations.

The genetic results, combined with information gained from a rangewide site and soil analysis conducted by Dr. David Boose and his students at Gonzaga University, will help ensure that we design and implement the subsequent reintroduction and population supplementation projects thoughtfully and effectively.

Other recovery activities include weed control, and rangewide trend and project effectiveness monitoring. For example, the Forest Service, in partnership with the Oregon Department of Agriculture, released the biological control agent, *Mecinus janthiniformis*, the toadflax stem boring weevil, at two MacFarlane's four o'clock populations infested with dalmatian toadflax. Although still present at these populations, toadflax density has been reduced by almost 70 percent. Where feasible, other invasive non-native plant species, such as cheatgrass, yellow starthistle, and rush skeletonweed are being controlled with chemical and mechanical treatments. In addition, the Team is exploring innovative survey techniques. Preliminary tests using Unmanned Aerial Vehicles (or UAVs) to detect MacFarlane's four-o'clock plants began in 2018 in cooperation with Empire Unmanned and will be continued by the BLM this summer.

Releasing stem boring weevil on dalmatian toadflax. Photo by Gene Yates.

Finding a MacFarlane's four-o'clock plant isn't easy, and neither is recovering this species. But just as impressive as the brilliant MacFarlane's four-o'clock plant itself, is the relentless dedication of everyone involved in this recovery effort. We are fortunate to have such a hard-working, passionate and innovative community of people who care and are willing to dedicate their time and efforts to ensure this plant is here to brighten our canyon grasslands for future generations to come. •

MacFarlane's four-o'clock along the Snake River. Photo by Matt Horning.

Know Your Plants

By Paul Allen, Sawabi Chapter

I LOVE keying plants. Not everyone shares this enthusiasm, but perhaps I may persuade a few.

Each plant is an invitation to intellectual adventure. When collecting a specimen, I think about Darwin's "mossy bank" and the unique niche that a certain plant has come to occupy. With hand lens or microscope the intricate and nuanced mechanisms of adaptation and reproductive specialization are wondrously revealed. In keying, I am compelled to become a keen observer and wonder at the bizarre assemblage of male and female flowers in the euphorbiaceae, or the distinctive trap like contrivance of a milkweed stigmatic slit. What interplay of happenstance and selective advantage has led to such diverse evolutionary constructs? Such musings have intrigued me for almost two decades now.

How do you identify a plant? Our old friends are sometimes so familiar to us that we think little of their distinguishing features. We just 'know' them. If the plant is not familiar, we might ask an expert. But how often is a botanist around when you need one? We might take a picture and submit it to iNaturalist or an online app. like Plant Snap. But your success is dependent on what few details are apparent in a photo. Results tend to be pretty speculative.

This article is about plant identification keys and the virtues of one in particular.

There are over 3,000 plant species in Idaho. Organizing them into groups with shared characteristics allows us to make sense of a blurry green landscape that, at first, may appear chaotic. Keying plants is a challenging, insightful, and rewarding process that requires careful observation and attention to detail. I'll often key plants that I think I know very well, only to discover new and fascinating insights prompted by the key.

Plant keying session at Idaho State University. Clockwise from bottome left: Karl Holte, Abby Steltzer, Don Carlson, Bob McCoy, Paul Allen.

Plant keying session at Idaho State University. Bob McCoy and Paul Allen consult the flora.

Some keys are very simple; perhaps organized into sections based on flower color, or growth form (tree, shrub, herb), or habitat (alpine, desert, aquatic). These are often called guides. We might thumb through a section of such a guide looking for something that looks similar to the plant in question. Admit it, we've all done this. And know that sometimes this is the most efficient way to get started on a project.

In capable hands, more sophisticated keys provide increased accuracy and secure identification. These keys are generally organized in a way that recognizes multiple shared characteristics. One makes a series of observations to answer questions often dictated by the author of the key. Those observations progressively limit the possible plant candidates until only one remains. When a pair of the questions are presented in a fixed order and allow only one of two possible answers to each question we call this a "dichotomous" key. These are the keys that most botanists were trained on and still use today.

When these keys are based on characteristics that reflect evolutionary relationships, they are called "synoptic" keys. Sections are typically arranged by taxonomic hierarchy (family, genus, species). It is assumed that the shared characteristics represent historical events. Use of such keys can offer rewarding insights into the driving forces and fickle fortunes of the evolutionary process. One is left to revel in the astounding diversity that the simple rules of natural selection have produced.

Keys that do not attempt to reflect evolutionary events are called "artificial" keys. Shared characteristics in these

keys may not imply a common ancestor. The advantage of these keys is their efficiency. The authors have ordered shared traits in such a way that candidate plants can be sorted with the fewest or most easily observable characteristics. Hitchcock and Cronquist's *Flora of the Pacific Northwest* is a well-respected tome of this genre. A handy artificial key for smart phones is called *Idaho Wildflowers* and it is available at the Apple App Store.

I wish to recommend a different kind of keying system; one that I find immensely rewarding and easy to use. I think it combines the virtues of other keys into one package.

The key of this type that I am most familiar with is called *FLORA ID* (http://flora-id.org). It is called an "interactive multi-access key" because the user may choose what observations to enter into the key and in what order. The program responds to your entries and adjusts its recommendations. It has been developed over a 25 year period and is promoted as "the most comprehensive wildflower app found anywhere." The key is very flexible, easy to use, and provides many features unavailable in most field manuals." Approximately 90% of all the known flowering plants that grow wild in a region, both native and introduced, are represented." That said, I continue to find occasional errors in the database. I think you will find that true of plant keys in general.

What I like:

(1) One may select any characteristic in any order, from over 50 lists of traits. This is perhaps the most useful feature of multi-access keys. There is no predetermined path to a solution. Standard keys demand answers to sequential questions to which you may not be able to provide an answer. You may have an incomplete specimen (no roots or no flowers). The specimen may not be at the required stage of development (no mature fruits). You may not have the tools to make a microscopic examination (are hairs on the leaf glandular?, what is the ovary position?). Choose the characteristics that are most obvious to you. If you see something unusual about the plant, you may narrow the possibilities quickly by entering that observation. Ignore observations you are unsure of. I once tried keying a lupine that lacked fruit pods. With a dichotomous key I quickly reached a dead end. In contrast, a multi-access key allowed me to choose from a long list of other distinguishing traits.

(2) Characteristics are defined with detailed scientific illustrations. This is a great teaching feature. Most of the drop-down menus provide pictorial diagrams illustrating the characteristics being queried. Terms are defined with a click of the cursor. No need for a glossary. I recall being uncertain if the inflorescence of the osier dogwood was an umbel or a cyme. At a key stroke I had clear illustrations of 15 different types of flower groupings.

(3) "With each choice the list of possible plants shrinks, getting to one species with about 3 to 6 characteristics" (quote from web page). THREE TO SIX CHARACTERISTICS! (OK, I usually average about 8, but think of how many hoops you must jump through in a standard key). It is fun to watch the number of prospective candidate species drop as you add data points. Candidate species are highlighted green and eliminated species are red, so it is easy to see which plants share the traits you have entered. I once wanted to know how many plant families in Idaho had both 4 petals and 6 stamens. I entered those two data points and it was immediately revealed that there are 6 families and 182 species that share those two attributes. Bet you didn't know that!

(4) There is an "Analyze" hot tab that suggests questions you might choose to answer. This feature is very helpful. The program instantly analyzes the remaining possibilities and a menu of queries appears that most efficiently eliminates all but one of the remaining candidate species. Choose an easy or unusual, but secure observation from this list. I was having trouble with a penstemon when the key suggested that I determine if the stamens extended beyond the corolla tube. They were. Voila: *Penstemon ellipticus*!

(5) Suppose you get to a dead end where none of the remaining species looks like your plant? You may simply add a "forgiveness level" which reinstates candidates which have only one discrepancy. This allows you to work around inaccurate observations as well as occasional mistakes in the formulation of the key. Once upon a time, I had failed to notice that *Phacelia hastata* possessed a helicoid inflorescence. Without knowing my error, I was able to restore the correct plant for consideration with this feature.

(6) You may easily confirm identifications by comparing with photos or descriptions. These are immediately available within the app. In the end, we always refer to a picture for confirmation or refutation.

(7) The key is updated regularly to comply with our rapidly evolving taxonomic nomenclature. Often the key will include and cross reference older names to avoid confusion. Who knew that dalmation toadflax was no longer a Scrophulariaceae, but had been moved to the Plantaginaceae?

(8) Plant book references with page numbers are provided for each species.

(9) The species list is alphabetized by either common or scientific name, or search by entering a name or string

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Asarum caudatum: Our Wild Ginger (Well, Not Really a True Ginger)

By David Giblin, Ph.D. University of Washington Herbarium, Burke Museum

This article originally appeared in Douglasia, the newsletter of the Washington Native Plant Society, and is reprinted with permission.

The use of common names in the study and appreciation of natural history lowers the barrier to learning by avoiding unfamiliar word combinations from a dead language (i.e., scientific names often based in Latin or ancient Greek). However, common names do carry with them the potential to confuse evolutionary relationships. For example, here in Washington we have the flying squirrel *(Glaucomys sabrinus)* and western gray squirrel *(Sciurus griseus)*, the orange-crowned warbler *(Oreothlypis cellata)* and the yellow warbler *(Dendroica petechia)*, and the cutthroat trout *(Oncorhynchus clarkii)* and brook trout *(Salvelinus fontinalis)*. In each instance the genus name differs for each common name pair. The case for common names shared by unrelated species at the level of genus is worse for plants because there are so many more of them than mammals (about 80x more), birds (about 40x more) and fish (about 10x more).

A case in point from our own flora is what we call "wild ginger" *(Asarum caudatum)*. Many people know edible ginger, *Zingiber officinale*, a rhizome (modified stem and not a root) commonly used to season dishes. *Zingiber* belongs to the monocot family Zingiberaceae (ginger family) and is native to tropical and subtropical forests of Southeast Asia. Edible ginger was well-known nearly worldwide long before John Lindley described *Asarum caudatum* in 1831.

Figure 1. Leaves and growth habit of wild ginger. Photo by Robert Flogaus-Faust.

Wild ginger is native from coastal areas of British Columbia to central California, and inland from southeastern British Columbia to northeastern Oregon, northern Idaho, and western Montana. It belongs to the Aristolochiaceae (Dutchman's-pipe family) a dicot family mostly native to subtropical and tropical areas worldwide. About the only thing that the genus *Asarum* and *Zingiber* have in common is the aroma produced by breaking or scratching the rhizomes. While this chemical convergence is interesting, it is of no taxonomic significance.

Figure 2. Wild ginger flower. Note the white pollen atop the anthers and the white interior coloration of the urn with purple markings. Photo by Walter Siegmund.

Though not a true ginger, *Asarum caudatum* is nevertheless a fascinating plant. Here in Washington it is a common understory species in forested areas across the state. Due to its rhizomatous nature, the plants tend to form somewhat loose mats. The simple, somewhat-glossy, palmately-veined leaves are distinctively kidney-(reniform) to cordate-shaped (heart-like) and arise from subterranean rhizomes (Figure 1). While the rhizomes are not useful for culinary purposes, some Native American tribes used the plant for treating headaches, intestinal pain, knee pain, indigestion, boils, tuberculosis, and colic, and as a general tonic (Moerman, 1998). To me, the most striking elements of this species are the distinctive morphology and color of its flowers.

Each flower is urn-shaped with three narrow appendages spreading horizontally and radially from the top of the urn (Figure 2). Note that these appendages are actually sepal lobes and not petals. In the genus *Asarum* the petals are absent or barely visible as scales. Inside the urn-shaped, basally fused portion of the sepals is a white background often with purple striping. Note that there are 12 anthers crammed in here as well. Finally, the flowers are typically hidden beneath the foliage, so you'll have to push aside the leaves to see all of this. "Hidden" flowers are not a typical presentation style by plants, so there must be an interesting story here.

It was long-thought that wild ginger flowers were fly-pollinated because the flowers have the color patterning

of flowers imitating or smelling like rotten flesh (carrion). However, field research has shown that most flowers are almost exclusively self-pollinated (Lu, 1982). Additionally, wild ginger flowers also exhibit a timing of pistil versus pollen maturation that is common among "selfing" species. Most plant species that are outcrossing (i.e., pollen fertilizes the ovules of different plants in the population) have the pollen mature first so that it does not fertilize flowers on the same plant. In the case of wild ginger, the female flower parts mature first (protogyny), so that when the pollen is mature each flower can receive its own pollen.

Perhaps another reason why wild ginger flowers are held close to the ground is because the seeds are dispersed by ants (myrmechory). Wild ginger produces fruits in the form of dry capsules, and if you open one up you will find small brown seeds, each with a fleshy appendage. This appendage provides nutrition to the ants that drag the seeds away from the plant and cache them in their underground colony—a convenient way for seeds to be dispersed and "sown."

Despite not being a true ginger, *Asarum caudatum* is a most remarkable member of our native flora that deserves close inspection on any forest walk. •

Literature Cited

Lu, K.L. 1982. Pollination biology of *Asarum caudatum* (Aristolochiaceae) in northern California. Systematic Botany 7(2): 150-157.

Moerman, D.E. 1998. Native American ethnobotany. Timber Press. Portland, OR. 927 pp.

***Know Your Plants**...Continued from Page 9*

of letters. When memory fails or scientific nomenclature is revised, switching to a list of common names can be useful (spotted knapweed = *Centaurea stoebe*).

(10) One doesn't need wifi or cell towers—it's all in the app.

(11) It can be set up on a laptop or android device for use in the field.

Do understand that I have no interest in this particular product beyond being an enthusiastic user. I own the FLORA ID keys for Idaho, Great Basin, and Plant Families of the World. There are many others to choose from.

I am fortunate to possess a good binocular microscope, dissecting tools, this interactive key, and a few good friends to share the experience. My pleasure in exploring Idaho's botanical heritage is so much better. •

Pahove Planting Committee's Work at Foote Park Interpretive Center

Article and Photos by Caroline Morris, Pahove Chapter

Need a new Idaho scenic treat? Visit Foote Park Interpretive Center (FPIC), a historical memorial park adjacent to Lucky Peak Dam and across the Boise River Canyon from Discovery Park near Boise. In 2018, a commemorative structure was built on this picturesque site to celebrate the lives of important early Boiseans, Mary Hallock Foote and her husband, Arthur DeWint Foote. Mary was a writer-artist, and Arthur was an engineer who designed the Treasure's Valley's irrigation canal system. The rubble remains of their "Mesa House," where they lived from 1885-89, bordering the FPIC structure.

Canyon view toward Boise from Foote Park.

Attending the FPIC's October 2018 opening ceremony, Pahove INPS member Caroline Morris saw that some attractive (native, naturally) plants would improve the area's flat, barren grounds. She spoke with the FPIC's co-founders, history buffs and money-raisers Mary Ann Arnold and Janet Worthington, who then consulted with the US Army Corps of Engineers (Corps) site manager, and we planned a future meeting. Meanwhile, Pahove volunteers were sought to convert the weedy patch into a suitable native plant display. Responders were Alice Crockett, Ann DeBolt, Vicki Henderson, Mary McGown, and I. We became the FPIC "Pahove Planting Committee" (PPC). Pahove's board of directors agreed to authorize and perhaps later fund part of PPC's work.

Pahove Planting Committee (PPC) members Ann DeBolt, Mary McGown and Vicki Henderson on a chilly morning at Foote Park.

Ellipse area planted by PPC, May 2019. Sign installed earlier by Foote Park Interpretive Center.

On March 29, 2019, the PPC met at the site with co-founders Arnold and Worthington, Corps Lucky Peak Park Manager Keith Hyde and Park maintenance staff. After introductions, we discussed PPC's interest in providing native plants to enhance the grounds adjacent to the FPIC shelter. PPC was allocated an elliptical area 35' X 25' located directly in front of the shelter for Phase 1 planting (Ellipse). The Corps would pre-approve our plan and plantings.

Vicki Henderson and husband Ed asked permission to video the meeting and site, some by drone, observing Lucky Peak photo restrictions. Check out their photos: https://www.flickr.com/photos/gardentronic/sets/72157708535378315/

Barbara Ertter of Pahove enriched our gathering by reading brief passages from Mary Hallock Foote's writings about flowering plants observed at the site/her homestead's vicinity more than a century ago.

The Corps had no site map, so Alice Crockett volunteered her husband, Alan "Mapman" Crockett, to prepare maps for PPC's needs. Ann DeBolt wrote a plant list for this exposed sunny, dry, windy location. Mary McGown created a fine landscape plan and was PPC's liaison with Corps maintenance staff, successfully persuading them to deliver and place around the Ellipse many gorgeous lichen-laden boulders. Ann, Alice and I weeded for hours, but the peacefulness helped! Ann and I bought plants at Native Roots and Pahove's sale, supplemented by home-grown hoary asters and some grasses. Ann 'borrowed' cages and stakes.

Just before our May 19 planting day, the weather kindly switched from hot/dry to cool/wet, so our 75 little natives had ideal early growth conditions. Planting was expedited by Alan Crockett's auger-drilled holes. We used cages to discourage possible wildlife foraging. Then decomposed granite chips (Corps' and Crocketts' donations) were spread around the Ellipse, without suffocating or endangering any plants. Water needs and provision are still to be determined.

PPC's plant list: gray rabbitbrush, bitterbrush, golden currant, arrowleaf balsamroot, hoary aster, hotrock penstemon, Munro globemallow, sulfur flower buckwheat, tufted evening-primrose (PPC's early blooming star), western yarrow, bluebunch wheatgrass, bottlebrush squirreltail grass, and Great Basin wildrye. Local sagebrush and rabbitbrush also are popping through the soil. 'Mary Hallock Foote's writings mention none of our strategic plant choices—times have changed.

Planting day. Planting was expedited by Alan Crockett's auger-drilled holes. 75 native plants were set into their new homes.

PPC's project beginnings were truly enjoyable. All participants really gave it 100%, with no arm-twisting.

If you read this before June 30, try to attend FPIC's public opening that afternoon from 1-3 pm. •

CALYPSO CHAPTER

When: Meetings are the first Wednesdays of March, April, May and October at 7:00 pm. Field trips take place during the spring, summer, and early fall months.
Where: Meetings are now being held in the Wildlife Building, North Idaho Fairgrounds, Coeur d'Alene.
Contact: Derek Antonelli, ds.ca.antonelli@gmail.com

Upcoming Events

June 27 to July 1: Selkirk Mountains Botanical Foray, sponsored by the University of Idaho's Stillinger Herbarium, contact Derek for details.
August 3: Crystal Lake, meet at Walgreens (US 95 and Appleway) at 8:00 am.
August 31: Selkirk Mountains hike, meet at Hayden Walmart at 8:00 am. Exact destination TBD.
October 2: Chapter meeting. Presentation topic TBD.

Past Events

Calypso Chapter members hiking at BLM's Blue Creek Bay property. Photo by Dave Noble.

Calypso Chapter supported Coeur d'Alene's Earth Day Celebration with an information table. Photo by Dave Noble.

LOASA CHAPTER

When: Meetings are held the third Thursday of each month at 7:00 pm.
Where: Taylor Building, Room 248, College of Southern Idaho, Twin Falls.
Contact: Bill Bridges, bridgesbill34@yahoo.com

PAHOVE CHAPTER

When: Meetings are held on the second Tuesday of each month from September–April at 7:00 pm. Dates, times, or topics are occasionally subject to change. Upcoming meeting information is sent to members via postcard and/or email. Events are also posted on the Pahove Chapter page of the INPS website: http://idahonativeplants.org/local-chapters/pahove/
Where: The MK Nature Center Auditorium, 600 S. Walnut Street, Boise.
Contact: For more information about activities please visit the Pahove Chapter page on the INPS website, or email Karie Pappani at pahove.chapter.president@gmail.com.

Past Events

Another season of presentations is behind us. As usual, we were enriched and entertained by our presenters, and we thank them for taking time to share their knowledge and experience with us.

Native Plant Sale

Pahove's annual native plant sale was a big success. Few plants remained after the two-day sale, and a stack of new membership applications were processed.

Board Position Opening: Pahove chapter is seeking a new board president. Our current president, Karie Pappani, has served the chapter exceptionally for 8+ years, and the time has come to select her successor. Interested individuals are encouraged to contact the board at pahove.chapter.president@gmail. com.

SAWABI CHAPTER

When: Meetings are held on the third Monday night of October, November, January, February, March and May. Programs begin at 7:00 pm and refreshments are available afterwards. Each meeting is preceded by a short presentation on the plant family of the month.
Where: The Middle Fork Room of the Pond Student Union Building, lower Idaho State University campus.
Contact: Paul Allen, pokyallen@hotmail.com.

Past Events

Portneuf Valley Environmental Fair

The Sawabi Chapter had a booth at the Portneuf Valley Environmental Fair held at Caldwell Park in Pocatello on April 20. The Park was filled with booths and over 5000 people attended the Fair. The initial weather forecast was for rain and wind. Though cloudy, we escaped the rain, with the breezes mild and the temperature moderate. A reasonably pleasant spring day.

We provided information about our chapter including summer plant walks and winter programs, and had a sign up for folks who wanted to be apprised through email of chapter activities. We had a few people from Idaho Falls and further north wanting to know if there was a local INPS chapter. We were glad to advise them the Upper Snake Chapter had recently reformed and that contact information was available on the INPS website. We had pictorial displays of native plants, information on developing a native plant garden, and a plant identification game. We also gave away about 70 native plants donated by Steve Love and Shirley Rodgers.

We are grateful to the many chapter members who made our booth a success by helping set up, take down, and staff the booth, including: Mel Nicholls, Geoff Hogander, Paul Allen, Steve Love, Shirley Rodgers, Karl and Ardys Holte, Linda Beroldi, Ty and Kristina Salness, Ron and Joan McCune, Abby Stelzer, and Cathy McPherson. Grant Thomas and Cheri Baker were the Fair Booth co-chairs.

Professor Karl Holte (with helmet hat) kicks off Sawabi's season of floral walks at the Cherry Springs Nature Trails near Pocatello. As usual, we followed up with a potluck supper at the Holte's nearby.

UPPER SNAKE CHAPTER

Contact: Kristen Kaser, kaser.kristen@gmail.com

Upcoming Events

July 6: Wildflower walk at Kelly Canyon.
August: Trip to the Teton Mountains, date/location TBD.

WHITE PINE CHAPTER

When: Meetings are held once a month except during the summer. Field trips can occur most any month. Please check the chapter website at www.whitepineinps.org for events which may be scheduled or finalized after *Sage Notes* is printed; or email the chapter officers at whitepine.chapter@gmail.com.
Where: Great Room of the 1912 Building, 412 East Third St., Moscow (between Adams and Van Buren) at 7:00 pm.
Contact: INPS, White Pine Chapter, PO Box 8481, Moscow, ID 83843 or whitepine.chapter@gmail.com.

WOOD RIVER CHAPTER

When: Meetings are generally held each month with field trips throughout the summer and lectures during the off season.
Where: Various places.
Contact: Kristin Fletcher at naturewalker7@gmail.com for general information and Lisa Horton at LisaHortonJewelry@gmail.com to be added to the chapter's monthly email list.

Upcoming Events

July 26 to 28: A camping trip to Ashton, Idaho, staying at Wood River Chapter VP John Shelly's cabin, with field trips radiating out from there, including Mesa Falls and others TBD. •

New Dues Structure for INPS

The INPS Board recently agreed to modify the dues members pay to belong to the organization. Starting with new memberships and member renewals for 2020, the INPS dues structure will change as follows:

Student	$10.00
Seniors	$15.00 (senior is 62 or older)
Individual	$20.00
Household	$25.00 (two people)
Sustaining	$40.00
Patron	$100.00

The last dues increase was in 2008. The increase in dues ranges from $3 to $5, depending on membership category, and in two cases (student and patron), there is no change. Primary reasons for the dues increase are to cover costs associated with printing and postage of the *Sage Notes* newsletter, to meet funding goals for the Education, Research, and Inventory Grant (ERIG) program, and to support other miscellaneous costs required to maintain the organization, including its on-line presence.

IDAHO NATIVE PLANT SOCIETY
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Idaho Native Plant Society Membership Form

Name _____

Address _____

City/State _____ *Zip* _____

Phone _____ *E-Mail* _____

Chapter Affiliation:

□ Calypso (Coeur d'Alene)
□ Loasa (Twin Falls)
□ Pahove (Boise)
□ Sawabi (Pocatello)
□ Upper Snake (Idaho Falls)
□ White Pine (Moscow)
□ Wood River (Ketchum/Sun Valley)
□ No Chapter

Membership Level 2019*:

□ New □ Renewal
□ Senior $10
□ Student $10
□ Individual $17
□ Household $22
□ Sustaining $35+
□ Patron $100+

****See Page 15 for new 2020 rates.***

I would prefer to receive ***Sage Notes***: □ Print □ Electronic □ Both

Send completed form and full remittance to:
Idaho Native Plant Society
P.O. Box 9451
Boise, ID 83707

Memberships run calendar year. New memberships enrolled after June 1 include the following year. ***Renew or join online:*** *https://idahonativeplants.org/membership/*

Sage Notes is published quarterly by the Idaho Native Plant Society. Past issues can be viewed online at: https://idahonativeplants.org/sage-notes/

Submissions: Members and non-members may submit material for publication. Relevant articles, essays, poetry, news, announcements, photographs and artwork are welcome. Authors, artists and photographers retain copyright to their work and are credited in *Sage Notes.* Send all submissions electronically to the editor at the link below. Please provide a phone number and/or email address with your submission. Submission deadlines are January 8, April 1, August 1 and November 1.

Advertising: Advertisements help reach environmentally-minded, native plant-loving customers and help support INPS. Prices: 1/8 page = $5, 1/4 page = $8, 1/2 page = $15. Submit ads electronically to the editor (JPG, TIFF, PSD or PDF files). Send payment to: Sage Notes Ads, P.O. Box 9451, Boise ID 83707.

Editor: Michael Mancuso, sage-editor@idahonativeplants.org