

SAGE NOTES

Newsletter of the Idaho Native Plant Society

50th
ANNIVERSARY

of the
ENDANGERED SPECIES ACT
December 28, 1973 - 2023

*Special Issue:
Idaho's Plants and the
Endangered Species Act*



*Packard's
milkvetch*



*Water
howellia*



Whitebark pine



*MacFarlane's
four-o'clock*



*Slickspot
peppergrass*



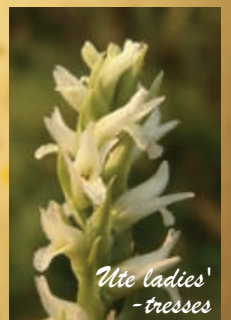
*Christ's
paintbrush*



*Spalding's
catchfly*



*Goose Creek
milkvetch*



*Ute ladies'-
tresses*

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Letter from the President

President Richard Nixon signed the Endangered Species Act (ESA) into law on December 28, 1973. The Act aims to protect and recover species at risk of extinction and aid the conservation of ecosystems and habitats needed by the species. The ESA continues to be one of the cornerstones of our nation's conservation ethic. To commemorate the ESA's 50th anniversary, this issue of *Sage Notes* highlights several Idaho rare plant species that have directly benefited from ESA-related conservation activities. Before passage of the ESA, conservation laws in the United States were generally restricted to animal species. The ESA expanded recognition and protection to include plants, too. The need has never been greater. There are currently 941 plant species federally listed as Endangered or Threatened in the United States, with approximately 40% of them endemic to Hawaii.

Here in Idaho, we have five listed Threatened species—Spalding's catchfly (*Silene spaldingii*), Macfarlane's four-o'clock (*Mirabilis macfarlanei*), slickspot peppergrass (*Lepidium papilliferum*), Ute ladies'-tresses (*Spiranthes diluvialis*), and whitebark pine (*Pinus albicaulis*). They all receive regular funding for conservation projects from the U.S. Fish and Wildlife Service (USFWS), the agency responsible for implementing the ESA.

I will highlight one species here that I have personal experience with, MacFarlane's four-o'clock. It was listed as Endangered by the USFWS in 1979, thus becoming the first member of Idaho's flora to receive ESA designation. At the time, MacFarlane's four-o'clock was known from one population in Hells Canyon with fewer than 100 individuals. In subsequent years, new MacFarlane's four-o'clock populations were discovered, livestock management was improved where populations did occur, and monitoring found population numbers and habitat conditions to be stable. This improved conservation outlook led the USFWS to reclassify MacFarlane's four-o'clock from Endangered to Threatened status in 1996. Conservation work for MacFarlane's four-o'clock continues with ongoing monitoring, field surveys, outplanting of new populations, propagation research, and weed control efforts.

This history of conservation projects would not have been possible without the ESA. It is clear the ESA has played a major role in improving the conservation outlook for many of Idaho's rarest plant species. Keeping the ESA strong and effective will require

the support of everyone who values and enjoys our rich biological heritage and who wants to ensure this treasure can be passed on to future generations.

Finally, I want to say thank you to everyone who has participated in protecting and working to recover Idaho's listed plant species, from agency biologists and support staff to citizen scientists and advocates.

Michael Mancuso
 INPS President

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2024 INPS Annual Meeting/Campout

By Derek Antonelli, Calypso Chapter President

The Calypso Chapter of Coeur d'Alene is excited to host the 2024 Idaho Native Plant Society Annual Meeting and Campout. We have selected historic Farragut State Park as the venue for the event. The gathering will take place from Friday, June 14, through Monday, June 17. Mark your calendars accordingly.

Location: Farragut State Park, the largest state park in Idaho, is located on the shores of Lake Pend Oreille (<https://parksand recreation.idaho.gov/parks/farragut/>). Located in the middle of the Idaho Panhandle, it has a rich and diverse flora. It also has a long, varied history. It was the homestead of John and Carrie Leiberg in the late 1880s. John completed extensive botanical surveys in the area and Carrie was a frontier doctor. During World War II over 300,000 sailors completed their basic training at Farragut. In the 1960s Farragut hosted the Boy Scout World Jamboree attended by thousands from around the world.

Camping: We have reserved the Thimbleberry Group Campsite at Farragut State Park. This huge site will provide us with an opportunity to keep the Annual Meeting participants together in one location. The site amenities include a lighted restroom with flush toilets, numerous picnic tables, ample spots to set up tents in wooded areas, and a large field in which to park RVs. The site has a source of potable water, but no water or electric hookups for RVs. If you need to have hook ups for your RV, you can make your own reservation at one of the Farragut's many nearby campgrounds. There were still over 100 reservable campsites available at Farragut SP as of late October. We expect those to go quickly in the spring.

At the Thimbleberry Group Campsite, we have no practical limit on the number of people camping, but we have a limit of 60 overnight vehicles, and trailers count as separate vehicles. (I know it's weird, but those are the rules.) As a result we will charge a single \$30 fee for each vehicle for all three nights. If four campers all come in a single vehicle there is only a single \$30 fee. Pickup campers, vans and motor homes count as one vehicle. Since trailers are counted in our 60-vehicle limit, they will be charged a \$30 fee in addition to the \$30 fee for the tow vehicle. Just think of it as free camping but with a parking fee.

Idaho State Park Passport: Because it is a state park, every vehicle is required to have an Idaho State Park Passport. It can be purchased for \$10 online or by mail at the time of vehicle registration renewal, or it can be purchased in person from any county DMV office. If you come in a vehicle that does not have a Park Pass, the park will charge \$7

for each day you are there—more for non-Idaho residents.

Events: We will have our traditional potluck on Friday evening. Saturday evening will be our annual meeting and banquet—we do not yet know the meal fee—to be held at the Athol Community Building five miles from Farragut State Park. We expect to have distinguished author and naturalist, Jack Nisbet, as our keynote speaker.

Activities: We have ideas for hikes and field trips in development for both Saturday and Sunday. Ideas include:

- A short hike through the western red cedar forest in Rathdrum Mountain Park. There's a possibility of seeing the phantom orchid there.
- Numerous trail hikes throughout Farragut State Park itself. Over 200 species of plants have been found within the park.
- A Lost Lake hike near Sagle. Rattlesnake-fern is one of the many plants found along this trail.
- A hike at the BLM's recreation site located at Blue Creek Bay just south of Coeur d'Alene.
- An Ice Age Floods driving tour. The massive floods started at Farragut State Park when the glacial dam burst.
- A talk and walk at the Leiberg home site.
- A challenging hike to both north and south Chilco Peaks.

Pre-Registration: Our planning is highly dependent on knowing how many participants will be coming to the Annual Meeting. To give us a good idea of how many might show up, we hope you will pre-register for the meeting. There is no cost to pre-register, and pre-registration is easy: just send us an email at INPSAnnualMeeting@gmail.com. You should include your email address, the number of participants in your party along with their names, if you will be staying at the group camp site, how many vehicles including trailers your party will be bringing. There is no obligation to attend from pre-registering—hopefully you can come, but if you can't make it, that's okay. There is no requirement to pre-register, but our activities will be available on a first-come first-served basis. Pre-registration lets you get in line early.

The costs for the annual meeting fall into four areas: a registration fee for each individual attending, an Idaho State Park Passport, a camping fee for each vehicle (including trailers) at the group site, and a meal fee for each meal ordered for the Saturday evening banquet.

We should have a great Annual Meeting. Hope to see you in picturesque northern Idaho! •

16th Annual Idaho Botanical Foray

By Derek Antonelli, Calypso Chapter President, with special account by Kristin Kaser

The Stillinger Herbarium at the University of Idaho hosted the 2023 Idaho Botany Foray, July 13 to 17. The Botany Foray has occurred every year since 2008. Idaho's major herbaria sponsor the Idaho Botany Foray on a rotating basis. Those herbaria are located at Boise State University, College of Idaho, Idaho State University, and the University of Idaho. The foray is essentially a giant



The 2023 Idaho Botanical Foray had 23 participants from throughout the state and around the world. Photo by Steve Martin.

plant collecting expedition by professional botanists and interested amateurs. The hosting herbarium selects a location within Idaho that been under-collected in the past. The goal of the botanical survey is to increase the understanding of Idaho's plant diversity and document the distribution of Idaho's plant species.

This year the foray was conducted in the Cabinet Mountains just north of Lake Pend Oreille. We set up camp at the Huckleberry Dispersed Campsite located along Trestle Creek. The campsite is nestled in the moist western red cedar forest found along the creek. We borrowed portable picnic tables from Idaho Fish and Game to provide a platform for pressing and preserving our collected plant specimens. Each morning Friday through Sunday we would gather at the campsite to discuss potential plant collecting sites in the surrounding area. Once collecting sites were selected, we would divide into groups and head into the field. Some groups would venture to sites that required long diffi-



Group preparing to collect plant specimens up a hillside along Wellington Creek Road. Photo by Dick Smith.

cult hikes, while others would drive along a road stopping to collect a short distance from the road.

After spending the day in the field collecting plants, the groups returned to the campsite in the afternoon. There the plants were pressed to preserve them for future study. Each plant specimen was carefully laid out between sheets of newsprint and labeled. The plants within the newsprint were stacked in piles with pieces of cardboard separating each plant specimen. The stacks of plant specimens and cardboard were cinched down tightly to rapidly pull the water out of the specimens. The stacks of plant specimens were transported back to the herbarium at the end of the weekend. Once dried, the plant specimens will be identified to species. They will then be mounted on herbarium sheets and stored in herbarium cabinets. These specimens will potentially be used for centuries to answer important botanical and ecological research questions.

The collecting sites were located in the Cabinet Mountains in the Lightning Creek and Trestle Creek drainages and along the lower reaches of the Pack River. Most of the collecting sites were located within the Kaniksu National Forest of the Idaho Panhandle National Forests, but one site was located on the Idaho Fish and Game Gold Creek property along the lower reaches of the Pack River. An Idaho rare plant, black snakeroot (*Sanicula marilandica*), was collected on the Gold Creek property. Collecting sites within the National Forest include areas around Lake Darling and Moose Lake. One group travelled up Wellington Creek Forest Road all the way to the ridge stopping to collect plants in a variety of habitats along the way. Deer fern (*Struthiopteris spicant*) which is another Idaho rare plant was collected in a small wetland along the road. Another group took a seriously long hike up the East Fork of Lightning Creek. Kristin Kaser's "a day in the life of a plant collector" account of that hike follows:



Group on a 13-mile trek to collect plants up the East Fork Creek drainage. Photo by Kristin Kaser (shown in front).

Dan Turck took our group on a botanical adventure in search of a rare paintbrush (*Castilleja*) species that grows in higher elevation habitats. While we never found the paintbrush species, Dan discovered a new population of subalpine larch (*Larix lyallii*). He jumped for joy when he realized the grove of conifers more than a 1/4 mile away was indeed *L. lyallii*.

Before our group began the hike, we got some real world practice of changing the van's tire which had the misfortune of picking up a nail. We got it all changed out once we found a parking lot. We drove up to the trailhead along Lightning Creek, passing the active Bee Top forest fire to the west, and took the turnoff towards East Fork Creek. With several creek crossings in pursuit of an unused trail, the decision was made that we'd make one more try to find the turn off by heading back to the trailhead. Our group was so excited to be on the lookout for a rare plant, we had blown past the obvious trail turnoff. Once sorted out, we hiked up a surprisingly well marked trail. It cut across the hillside through big openings of huckleberry patches. I had never thought it was possible to eat too many huckleberries until then.

As our group hit five miles, a lovely trail marker declared Mile 1 but we continued our jaunt towards those rocky outcrops that may potentially have the elusive *Castilleja* species. As we passed by all the reasonable habitat and the trail became slightly steeper, everyone was generally in good spirits for an unplanned adventure and we continued to ascend the hillside. At a flatter stretch of the trail, it was decided to continue to reach the top and try to find an old lookout station. We reached the ridge not long after, all very excited to sit and relax



Foam flower (*Tirella trifoliata* var. *unifoliata*) is a common species found in the mesic forests of northern Idaho. Photo by Steve Martin.



Dan Turck excited about finding a new population of subalpine larch (*Larix lyallii*) in the Cabinet Mountains. The tree on the left is subalpine larch. Photo by Kristin Kaser.

while others poked around the collapsed wooden structure of the old lookout. All except Dan who announced he'd need to just look into Montana because we were so close. After a short time, he came back nervously, but excitedly, to announce he thought he'd found a new population of alpine larches. However, they were growing far enough away he was hoping some of us would go with him. Three of us took the bait, much to his surprise, and we headed up the mountain into Montana. None of us had planned for such a great adventure, but we were all excited to see the various alpine species. Once we gained the ridge line, we saw the distinctive growth pattern of *Larix* clinging to the cliffs, but to determine which species, Dan needed the cones. Off we went, trying desperately to not get sidetracked by the alpine itself and reach the patch of deciduous conifers.



One group of plant enthusiasts pressing the day's collection of plant specimens to preserve them for future study. Photo by Steve Martin.

After a while searching for cones, then pondering obscure differences between scales, Dan declared they were indeed *Larix lyallii*.

The extended hike had added an hour and we were anxious to head back to the main group. Dan had notified the foray organizers we would be late as we had service on the top ridge but the lower abandoned lookout lacked cell reception. The main group was planning to head back down and we were hoping to rejoin them. The descent went quickly and we reached them as they were already packed up ready to leave. The trudge back down the side cut hillside was much longer now that we'd familiarized ourselves with the flora, no longer novel, but the setting sun cast a beautiful orange glow from the nearby wildfire onto everything. Once we reached the creek, many refilled their water bottles, but I took my pack off and laid in the water. I don't often get such a lovely reward like a cool creek where I work in the sagebrush steppe on the east side of the state. It was the perfect temperature. After our break, we set out for the van. We made it back before dark and pulled into the foray campsite just as a few concerned members were heading out as a search party. They were very relieved to see us and we talked about our wonderful 13-mile adventure.

Continued on Page 25....

Botany 2023 in Boise!

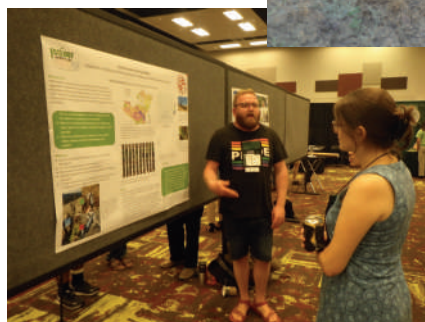
Article and Photos by Barbara Ertter, Pahove Chapter

On July 22-26, 2023, over 1,000 members of the Botanical Society of America, American Society of Plant Taxonomists, American Bryological and Lichenological Society, American Fern Society, International Association of Plant Taxonomists, and Society of Herbarium Curators converged on Boise for their annual joint meeting. Held in the recently expanded Boise Centre, this was the second time the meetings were held in Boise, the previous time being in 2014. Dubbed "Botany 2023," and subtitled "One World," the conference attracted participants not only from throughout the United States, but from many other countries around the world.



As can be expected, numerous members of the Idaho Native Plant Society gave talks, led field trips, and otherwise participated in the wide range of available activities. Don Mansfield was tapped to give the Regional Botany Special Lecture, enthraling the audience with the floristic highlights of southwestern Idaho and adjacent Oregon. Other talks and posters by local botanists, including students from BSU, covered topics ranging from goat-head control to *Lomatium* taxonomy to historical botanist T. E. Wilcox (the latter also the topic of a recent Pahove presentation: recording at <https://youtu.be/ZyEnwPc5rtQ>).

Prior to the several days of concurrent sessions, Don led a field trip to Leslie Gulch/Succor Creek, Jim Smith took a group to Snowbank Mountain south of Cascade, and Barbara Ertter and Crista O'Connor had their group ride the chairlift up to Deer Point to walk back down to Bogus Basin lodge. In addition, Barbara organized an informal outing with "Team Abronia" to see the Boise Sand-Verbena (*Abronia mellifera* var. *pahoveorum*). After the conference, Barbara introduced some paleobotanists to the newly installed exhibit at Ponderosa State Park in McCall, focused on the plant fossils discovered in the park. BIG thanks to local coordinator Jim Smith and everyone else who made Botany 2023 possible! •



Botanical Conference

Botany in Action!

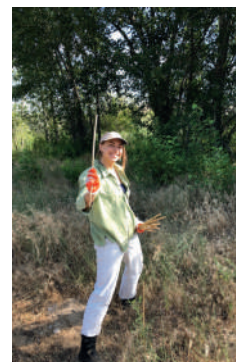
By Karie Pappani, Pahove Chapter, Photos by Sean Finn

A call to action was part of the 2023 Botany Conference in Boise. Michael Mancuso, our INPS State President, along with Jim Smith, Director of the Snake River Plains Herbarium; Sean Finn and Danae Falls, Golden Eagle Audubon Society; Helen Fisher, plot lead; and myself, plot lead and INPS Pahove Chapter President, orchestrated a successful activity on Sunday, July 23,



kicking off the Conference by getting our hands dirty. We weeded, watered, and monitored our designated plots as part of the Boise River REWild Adopt A Plot. Thirteen individuals took action by participating in the activity. It was a

great way to show people from other states about the hard work that is going on to improve riparian habitat along the Boise River corridor for pollinators, birds, and wildlife. •



Botanical Conference

Botanical Illustration Workshop

Article and Photos by Karie Pappani, Pahove Chapter

I was fortunate to have the opportunity to attend a workshop led by Linda Vorobick titled “What Makes Botanical Illustration Science.” I learned of this opportunity last minute, but I made sure to attend this two hour session on Sunday, July 23. The Botany 2023 Conference offered a grand collection of symposia, workshops, field trips, poster sessions, exhibits, and guest speakers. It was a well done conference. For me, the icing on the cake was this illustration workshop.

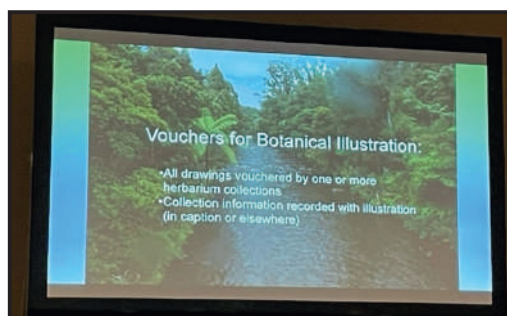
Linda has been an illustrator and a teacher for over 25 years. She shared her tips on how best to illustrate a credible piece of work.

Some of these include: using multiple voucher specimens for all



Example of Linda's work as a bookmark.

drawings, proper scale bars, as much detail as possible with diagnostic characters, and careful selection of colors reflective of actual living plants. It is important that the illustration represents the plant as best possible. To learn more more about her work, you can visit <https://www.vorobikbotanicalart.com/>. •



Photos of Linda's slideshow presentation.

The Green Gap: Challenges of Protecting Plants Under the Endangered Species Act

By Linda L. Howard, Biology and Society PhD Candidate, UCN Red List Authority, Arizona State University

As we near the end of 2023, it is a time to celebrate with family and friends and look to the future in hopes of a safe, peaceful, and prosperous new year. But this year also marks an auspicious milestone in the legal protection for non-human species: the 50th anniversary of the Endangered Species Act (ESA). On December 28th, 1973, President Nixon signed the ESA, a law that pioneered robust species-based protections in the United States and inspired legislation worldwide. Over the last fifty years, the ESA has shepherded the recovery of 22 plant species and pulled numerous others back from the brink of extinction.¹ More than 1,650 U.S. and nearly 700 international species are currently listed.²

In abstract, public popularity for the ESA remains consistently high, with surveys ranking support for the ESA between 70-90%.³ Unsurprisingly, support declines when people are faced with the impacts and inconveniences of its enforcement. Most vocal, broad opposition to the Act comes from industry and politicians. Efforts to weaken the ESA, though largely unsuccessful, have grown at an alarming pace even as the global biodiversity crisis intensifies. Although plants constitute 59% of domestic ESA species,² listed species only represent a small percentage of imperiled plants in the United States. Flaws in the law and its implementation recapitulate the broader challenges to plant conservation: lack of resources, opposition from those industries and activities that imperil plants, and the prevalence of plant perception impairment, aka "Plant Blindness." Although we should celebrate this milestone, it is also an ideal time to address some of the problems and needed changes to help the Act work better for plants.

Historically, the ESA was not the first law targeting species protection in the United States, but it was the first to specifically include the ability to protect plants. The earliest actions towards what we might, in modern parlance, call conservation sought to shield places of unique or uncommon beauty from the excesses of resource extraction. However, the federal designation of national parks and other refugia provided incidental protections to the populations and species living within their boundaries. Arguably, being sessile and seen as an aesthetic part of the landscape, plants may have benefitted more from these protections than their animal counterparts. Still, for both plants and animals, these

protections were insufficient, leading to increased efforts to protect species. The ESA is the direct descendant of the 1966 Endangered Species Preservation Act and the 1969 Endangered Species Conservation Act. Both laws sought to stem declines in wildlife and fish species imperiled by a growing human influence on the landscape. These early laws acted as drafts from which the ESA was composed, though the process was not without conflict and controversy.

The ESA was the most sweeping effort to rectify the disregard for human impacts on other species. But even from its inception, the law regarded species hierarchically. Considerable push-back against the inclusion of plants delayed the eventual passage of the ESA by several months. Spearheaded by Alaska Senator Ted Stevens, preliminary drafts of the law excluded all references to flora.⁴ Excluding plants was a deliberate choice, not because there was no recognition of botanical extinction risk, but because it was politically expedient and a lack of botanical knowledge complicated enforcement. Interest groups raised concerns that including plants would create challenges for agricultural production, while others feared it would divert resources from animal conservation.

Through its inclusion of plants, the 1973 passage of CITES, the Convention on International Trade in Endangered Species of Wild Fauna and Flora, signaled an end to the rounds of debate on the issue and forced the conversation to shift from whether to include plants, to how to incorporate them and enforce their protection. Anticipating its eventual ratification, legislators resigned themselves to including plants and crafted guidance for the CITES-listed species and domestic plants for ESA listing.⁵ Perhaps, due to being removed and added back into the drafts, plants are mentioned fewer times throughout the text, and Section 12, titled "Endangered Plants," consists of only one sentence.⁶

At its most rudimentary, the ESA considers species dichotomously; species are either listed or unlisted, but within those two branches, nuance exists. The ESA defines imperiled species in three ways. First, taxa described as Endangered include "any species which is in danger of extinction throughout all or a significant portion of its range."⁶ Listed species can also be labeled as Threatened, described as "any species which is likely to become an endangered species within the foreseeable

future throughout all or a significant portion of its range.”⁶ The third taxa category is Candidate species that await listing decisions in a limbo-like state of limited, but better than nothing, protections. The candidacy phase acts as a bottleneck for listing and has been used as a political tactic to delay listings. This tactic, coupled with an underfunded and understaffed listing agency, has reduced listings and amplified a backlog of candidates, particularly since the year 2000. Only 27.3% of successful species listings have occurred since 2001, and the average number of listings per year has declined from a pre-millennium average of 36 species to 20 species per year.⁷ As a consequence, litigation has increased to force the U.S. Fish & Wildlife Service (USFWS) to address the listing bottleneck and meet the legally required timeline for listing species.

The threshold for listing a species consists of five criteria, any one of which was intended to be sufficient cause to list:

- 1 “the present or threatened destruction, modification, or curtailment of its habitat or range”
- 2 “overutilization for commercial, recreational, scientific, or educational purposes”
- 3 “disease or predation”
- 4 “the inadequacy of existing regulatory mechanisms”
- 5 “other natural or manmade factors affecting its continued existence”⁶

Once listed, the hierarchical treatment of species becomes apparent, most notably in the prohibition of “taking” or harming protected animal species without a permit. No such protections were extended to plants until the ESA was amended in 1982, which included a provision prohibiting the harming or removing of listed plant species on federal lands. It was limited to federal lands because plants were considered the property of landowners, while animals were considered transient, common property whose fate was determined by the government. Plants were owned by whoever owned the property on which they grew. Restricting harms to plants on private property was viewed as “federal overreach,” harkening back to fundamental arguments about centralized power, but it also reflected the broader ethical premise that plants are primarily resources, left out of discussions granting intrinsic value to non-human species.

A second important distinction between plants and some animal species is the treatment of hybrids, which has been used to deny listing and to de-list several plant species. The definition of species in the text of the ESA is “any subspecies of fish and wildlife or plants, and any

distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature.”⁶ By excluding plants and invertebrates in the wording of the definition, “distinct population segment” can be interpreted to exclude plant hybrids. Although the literature doesn’t agree to what extent, most sources concur that nonanthropogenic hybridization is an important form of speciation in plants^{8,9} and one that inherently creates rare taxa subject to stochastic threats.

With the passage of the ESA, the Smithsonian Institute was tasked with creating a list of plant species thought to need federal protection. Titled “Threatened and Endangered Species of the United States,” the list from the Smithsonian proposed over 3,000 plant species for listing. From that original proposal in 1975, 23% have been listed. Of the current 971 ESA-listed plant species, 635 were on that original list, though many took decades to achieve listing.

The Idaho contingent from the Smithsonian list consisted of 60 taxa. Of those, two have been granted ESA protections as threatened species, *Mirabilis macfarlanei* (MacFarlane’s four-o’clock), listed in 1979, and *Silene spaldingii* (Spalding’s catchfly), which was finally listed in 2001, twenty-six years after its initial candidacy proposal. In the years between the publication of the Smithsonian list in 1975 and its eventual listing in 2001, Spalding’s catchfly existed in a common but unenviable position of federal conservation limbo, waiting for a final listing decision far longer than the median listing time of 12.1 years.¹⁰

Of the 60 Idaho species proposed as part of the original Smithsonian list, 20 were described by the USFWS during the 1993 bulk review as listable.¹¹ Seven were assigned Category 1, meaning sufficient evidence was available to list, but species were considered low priority for listing, aka warranted but precluded.¹¹ The remaining 13 were ranked as Category 2, meaning listing is likely warranted, but insufficient evidence was available to list at the time of the decision.¹¹ In the NatureServe rankings for imperilment, 8 of those 20 have been most recently ranked as Critically Imperiled or Imperiled. Although not an exact proxy for listing suitability, threat rankings offer a snapshot of imperilment and a means of identifying potentially overlooked species for conservation actions, including but not limited to ESA listing.

Three notable Idaho species have been removed from listing consideration during the last decade: *Castilleja christii* (Christ’s paintbrush), *Astragalus anserinus* (Goose Creek milkvetch), and

Astragalus cusickii var. *packardiae* (Packard's milkvetch). Each of the removed species was excluded for similar reasons. The USFWS described their removal as "Due to the species being in a conservation agreement and the best available information on biological vulnerability and threats is insufficient to support a conclusion that the species warrants listing as a threatened species or an endangered species."¹² All three species are subject to threats from grazing, off-road vehicles, non-native species, and fires.^{13,14,15} Both *Castilleja christii* and *Astragalus cusickii* var. *packardiae* are ranked by NatureServe as Critically Imperiled, while *Astragalus anserinus* was most recently ranked as Imperiled by NatureServe.¹³ All three species are rare and vulnerable to multiple common threats. Only time will tell if existing conservation agreements are sufficiently robust to prevent their slide towards extinction.

My criticisms of the Endangered Species Act come from a desire to improve it, particularly for plants, and to see the law be a viable and vital part of plant conservation for another 50 years. The ESA has reduced extinction risk for those plant species who are successfully listed, but far too many imperiled species are rejected or slip through the cracks. Plants are crucial parts of nearly every biome on the planet, and in the coming years, more plant species will need even greater protection. If we are to protect plants from extinction, the Endangered Species Act must be part of a suite of solutions addressing the needs of plants on a changing planet. •

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ESA Anniversary Report - Threatened Species

MacFarlane's four-o'clock (*Mirabilis macfarlanei*)



Photo by Lynn Kinter/Jennifer Miller, IDFG.

MacFarlane's four-o'clock (*Mirabilis macfarlanei*) is a perennial wildflower with large clusters of bright ma-

genta flowers. MacFarlane's four-o'clock can be found in steep river canyon grassland habitats. There are thirteen known populations of MacFarlane's four-o'clock and ten of those exist in Idaho.

MacFarlane's four-o'clock was originally listed as Endangered in the Endangered Species Act (ESA) in

Threatened, First Listed Plant in Idaho

1979. Resulting from ongoing recovery efforts and the discovery of new populations, MacFarlane's four-o'clock was downlisted to Threatened in 1996. Five-Year Status Reviews indicate that the population is stable, but despite ongoing annual survey efforts, no new populations have been discovered. The most recent Five-Year Status Re-

view was completed in 2015 and a new one was initiated in 2020. (<https://species.idaho.gov/other-species-info/-macfarlanes-four-oclock/>)

The main threat to MacFarlane's four-o'clock continues to be invasive non-native plant species like cheatgrass, yellow starthistle, dalmation toadflax, and rush skeletonweed. The exotic species compete with MacFarlane's four-o'clock for space, light, water, and nutrients, and the presence of cheatgrass can drastically increase the frequency and intensity of wildfires. While the 2015 Five-Year Status Review states that MacFarlane's four-o'clock is not in immediate threat of extinction, it also emphasizes that populations are not secure from habitat degradation threats caused by invasive nonnative species and increase of wildfires. (<https://species.idaho.gov/other-species-info/-macfarlanes-four-oclock/>) •

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ESA Anniversary Report - Threatened Species

Spalding's catchfly (*Silene spaldingii*)



Photo courtesy Latah Soil and Water Conservation District.

Spalding's catchfly (*Silene spaldingii*) is a perennial with green to white to pinkish flowers with sticky hairs on the leaves, stems, and flower bracts that trap insects. It is found in the Palouse Region of Washington, Oregon, and Idaho, and in northwestern Montana and adjacent British Columbia. It is found in grasslands, sagebrush steppe, and sometimes open forest at elevations ranging from 1,900 to 3,600 feet. Spalding's catchfly was listed as Threatened in 2001.

Threats include loss of habitat due to human development, habitat degradation, off-road vehicle use, livestock grazing, fire, and invasive non-native plants. A recovery plan for Spalding's catchfly was finalized in 2007. Management actions are in place. Read more about this species' progress on Page 14. •

Threatened, but with a Promising Success Story

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Slickspot Peppergrass (*Lepidium papilliferum*)



Photos by Lynn Kinter/Jennifer Miller, IDFG.

Slickspot peppergrass (*Lepidium pappiliferum*) grows as an annual or a biennial plant. There are many clusters of pretty white flowers on each plant. It is found in soil inclusions known as slickspots in sagebrush steppe habitats of southwest Idaho.

Slickspot peppergrass was first listed by the U.S. Fish and Wildlife Service in 2009 as a Threatened species under the Endangered Species Act of 1973, as amended (74 FR 52014) due to two primary threats: the increased frequency and intensity of wildfire and the introduction and spread of invasive non-native plants.

Threatened, New Draft Recovery Plan Open for Public Comment

The Idaho District Court vacated the decision to list the species on August 8, 2012, and remanded the final rule to the Service to recon-

sider the definition of “foreseeable future” for this species. Slickspot peppergrass was reinstated as Threatened (81 FR 55058) effective September 16, 2016. (<https://ecos.fws.gov/ServCat/DownloadFile/169600>)

Threats to slickspot peppergrass are habitat destruction; decline and fragmentation from agricultural and urban development; activities associated with, and grazing by, domestic livestock; competition from non-native vegetation; alterations of the natural fire cycle; and fire rehabilitation activities (<https://www.fws.gov/species-publication-action/endangered-and-threatened-wildlife-and-plants-listing-plant-lepidium>).

Roughly 78,000 acres of critical habitat for this species was designated in 2023. A draft recovery plan is out for comment currently. Please submit any comments by January 3, 2024 (<https://www.fws.gov/story/2023-11/slickspot-peppergrass-recovery-planning>). •

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Ute Ladies'-Tresses (*Spiranthes diluvialis*)



Photo by Lynn Kinter/Jennifer Miller, IDFG.

Ute ladies'-tresses (*Spiranthes diluvialis*) is an orchid with white or ivory colored flowers in a many flowered spike, glandular-pubescent stems, and leaves largest near the base and progressively smaller further up the stem. It grows specifically in riparian areas (moist meadows, gravel bars, high flow channels, sloughs, and river terraces.) In Idaho, it occurs in the floodplains of the Henry's

Fork and the South Fork of the Snake Rivers (Miller 2021). This species is found in several other states.

Ute ladies'-tresses was listed as Threatened in 1992. Threats to this plant are non-native plants, water management, drought, flooding, livestock grazing, roads, urbanization, and recreation activities. The U.S. Fish and Wildlife Service (USFWS) is now recommending that Ute ladies'-tresses be delisted due to recovery. These determinations came after a Species Status Assessment Report and 5 Year Review were completed in June and August of this year. This species was found to be resilient enough to withstand disruptions to the population. Also, the USFWS states that there are no significant portions of the species range that are threatened or endangered. The rulemaking process will be initiated soon to move forward with delisting this species.

Very recent findings concerning Ute ladies'-tresses in Idaho have been reported by botanists Jennifer Miller, Lynn Kinter and Rose Lehman. Jennifer Miller, Plant Research Ecologist with the Idaho Department of Fish and Game (IDFG), led assessments on Ute ladies'-tresses at the Sand Creek Wildlife Management Area, Chester Wetlands Segment, in 2023. Roughly 1,000 plants were observed. According to Jennifer, "In recent years (2014, 2018, 2021 and 2022), we've found new plants a short ways outside the previously mapped sub-pops, but this year we were seeing them much further away. We also found a new sub-pop!" The BLM also did a full assessment at Fisher Bottoms and partial counts from a couple

other areas. Jennifer, along with Lynn Kinter, botanist at IDFG, have also conducted recent surveys at Cartier Slough WMA (Wildlife Management Area) and Deer Park WMU (Wildlife Mitigation Unit). Rose Lehman, botanist with the U.S. Forest Service, has also reported a recently found large (over 500 plants!) expansion of the Ute ladies'-tresses occurrence below Palisades Dam (Leahman 2023). •

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**Listed as
Threatened,
Recommended
for Delisting**

ESA Anniversary Report - Threatened Species

Spalding's Catchfly Recovery on the Palouse—Paradise Ridge

By Brenda Erhardt, Conservation Planner, Latah Soil & Water Conservation District, and White Pine Chapter



Since 2013, the Latah Soil and Water Conservation District (Latah SWCD) has been involved in the recovery effort for Spalding's catchfly (*Silene spaldingii*), an ESA-listed plant. To date, Latah SWCD has planted 3,118 Spalding's catchfly to support U.S. Fish and Wildlife Service's (USFWS) recovery efforts within the Paradise Ridge/Gormsen Butte Key Conservation Area (Paradise KCA) in Latah County, ID. One of the Spalding's catchfly recovery plan goals is to maintain a minimum of 27 populations with at least 500 reproducing Spalding's catchfly plants per a minimum of 27 KCAs throughout Spalding's catchfly's range (USFWS 2007). The Paradise KCA is one of 3 KCAs in the Palouse Grasslands physiographic region and is a critical location for the recovery of this rare plant.

Spalding's catchfly plants were not found to occur naturally within this KCA prior to the start of transplanting efforts in 2013. However, the site was chosen as a KCA and recommended for recovery plantings through the coordinated efforts of Latah SWCD, USFWS, and the Spalding's catchfly technical team

given the limited quantity and quality of intact Palouse Prairie remnants containing suitable habitat. Most of the original Palouse grasslands have been converted to agriculture, are privately owned, and are highly fragmented. The Paradise KCA has multiple private landowners dedicated to Palouse Prairie preservation and restoration. All properties where Spalding's catchfly is planted are currently placed in conservation easements, owned by a conservation agency (Palouse Land Trust), or owned by conservation-minded landowners who have given permission to plant Spalding's catchfly on their property.

Spalding's catchfly recovery goals for the Paradise KCA include establishing 500 individual plants within the Paradise KCA and future monitoring should show an upward trending or stable trajectory of the population. Starting from zero plants in 2013, monitoring results through spring 2022 now show that we have 618 Spalding's catchfly currently growing in the KCA. Spalding's catchfly is a plant sensitive to its surroundings and is difficult to establish from plants and/or seed. Therefore, achieving the goal of over 500 plants on the KCA is a satisfying milestone and efforts will continue to ensure that this number continues to grow to allow for the Paradise KCA population to contribute to the ultimate recovery of Spalding's catchfly throughout its range. More details on Latah SWCD's Spalding's catchfly planting and monitoring efforts can be found in the Latah SWCD Spalding's catchfly planting and monitoring protocols and reports on the Resources page on the Latah SWCD website (<https://www.latahswcd.org>). •

ESA Anniversary Report - Threatened Species

Whitebark Pine (*Pinus albicaulis*)



Whitebark pine (*Pinus albicaulis*) is a tree with bundles of five needles, thin, scaly, grayish bark, and separate male and female cones on the same tree. This long-lived tree can live from 500 to over 1,000 years and grow up to 66 feet tall. It may be confused with limber pine (see

Idaho's Newest Threatened Plant under ESA

reference on how to distinguish tree species). Whitebark pine is a climax species in montane forests at high

Photo by Lynn Kinter/Jennifer Miller, IDFG.

elevations, up to 12,000 feet. It can be found in central and northern Idaho. Threats to whitebark pine are mortality caused by the non-native white pine blister rust, impacts from altered fire regimes, and climate change. Whitebark pine was a Candidate species for listing dating back to 2011. This plant was then updated to proposed Threatened in 2020 and officially listed as Threatened on December 15, 2022. It is the most recently listed species in Idaho. •

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ESA Anniversary Report - Removed Species

Christ's Paintbrush (*Castilleja christii*)



Photos by Lynn Kinter, IDFG.

Christ's paintbrush (*Castilleja christii*) is a showy, yellow to yellowish-orange flowered perennial endemic to a single population on Mt. Harrison in the Albion Mountains of Cassia County, Idaho, where it occurs in subalpine meadow and mountain sagebrush communities. Christ's paintbrush was designated as a Candidate species under the Endangered Species Act in 1980. A Candidate Conservation Agreement was put in place in 2005 and subsequent actions have greatly reduced livestock grazing, off-road

vehicle, and recreation-related threats to the species. In addition, weed control efforts have greatly reduced the abundance of the non-native rhizomatous grass smooth brome within the population. These actions contributed to Christ's paintbrush being removed from Candidate status in 2012. •

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**Removed from
Candidate List
in 2012**

ESA Anniversary Report - Removed Species

Packard's Milkvetch (*Astragalus packardiae*)



Photo by Lynn Kinter, IDFG.

Packard's milkvetch (*Astragalus packardiae*) is an erect perennial with sparse foliage, light-purplish flowers and inflated, yellow-green to sometimes red-mottled fruit pods. It is endemic to an approximately 10-square mile area in the northeastern corner of Payette County where it grows on distinctive whitish, sparsely vegetated outcrops surrounded by what was historically shrub-steppe habitat. Packard's milkvetch was designated a candidate for listing as Endangered or Threatened in 2010.

**Removed from
Candidate List
in 2014**

Threats to the species included disturbances and alterations to its habitat from off-road motorcycles, live-stock grazing, wildfire, and weed invasion. A series of conservation actions and management plans outlined in a Candidate Conservation Agreement between the US-FWS and BLM led to Packard's milkvetch being removed from Candidate status in 2014. •

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ESA Anniversary Report - Removed Species

Goose Creek milkvetch (*Astragalus anserinus*)



Photo by Danielle Clay, IDFG.

Goose Creek milkvetch (*Astragalus anserinus*) is a mat forming perennial forb with pink to purple showy

pea-like flowers and grayish leaves. It is found in an approximately 100 square-mile area of the Goose Creek drainage centered near the three-corners common border of Idaho, Utah, and Nevada. It occurs on soils formed from volcanic tuff in open sagebrush-steppe or Utah juniper communities from 5,000 to nearly 6,000

**Removed from
Candidate List
in 2015**

feet elevation. Goose Creek milkvetch was designated a Candidate species under the Endangered Species Act in

2009. Threats include an altered wildfire regime, fire-fighting and post-fire disturbances, invasive annual weeds, livestock trampling, habitat degradation, and restoration activities. Goose Creek milkvetch was removed from candidate status in 2015. •

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ESA Anniversary Report - Delisted Species

Water Howelia (*Howellia aquatilis*)



Photo courtesy USFS.

Water howellia (*Howellia aquatilis*) is a winter annual with branched, submerged, or floating stems. White to light purple trumpet shaped flowers can be seen at or above the surface of the water. It grows in freshwater wet-

lands and ponds that were once associated with glacial potholes and former river oxbows that flood in the spring, but usually dry at least partially by late summer (<https://www.fws.gov/species/water-howellia-howellia-aquatilis>).

Water howellia is endemic to the Pacific Northwest and found in California, Idaho, Montana, and Washington. Threats to this plant include invasive plants, such as reed canarygrass; climate change; modifications to hydrology, such as conversion of wetland systems; urban development; timber harvesting; and livestock use of wetlands.

(https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.136199/Howellia_aquatilis, https://www.fs.usda.gov/wildflowers/Rare_Plants/profiles/TEP/howellia_aquatilis/index.shtml).

Water howellia was proposed for listing as Threatened in 1993, determined to be Threatened in 1994, initiated as a draft recovery plan in 1996, underwent a Five

Year Review in 2007, and was removed from listing (officially delisted) in 2021. •

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Delisted Species

Pollination Insights for *Astragalus mulfordiae*

By Clara Buchholtz, PhD candidate in Ecology, Evolution, and Behavior, Boise State University

Introduction

Narrow endemic plants are especially vulnerable to extinction due in part to their limited range sizes and often narrow niches and low reproductive output (Holmes et al. 2008, Harnik et al 2012, Enquist et al. 2019). Knowledge about their reproductive biology is fundamental to both in situ and ex situ conservation efforts, but remains lacking for many species (Weller 1994). This information is especially important for plants that rely on pollinators for reproduction because their conservation needs must also encompass the needs of their pollinators. These may include surrounding nutritional and nesting resources or protection from insecticides, and often these extend beyond the boundaries of the plant populations (Nicolson & Wright 2017).



Astragalus mulfordiae growing in the Boise Foothills. Photo by Clara Buchholtz.

In April 2022 we began work to fill knowledge gaps about the reproductive ecology of *Astragalus mulfordiae*, a rare species that has been of conservation concern for many years. Our objectives were to 1) identify whether *A. mulfordiae* relies on pollinators for reproduction, 2) identify its likely pollinator species within two regions of its range: the peri-urban Boise Foothills and rural-agricultural Owyhee Front, and 3) evaluate sources of disturbance in its habitat at scales relevant to both *A. mulfordiae* populations and insect pollinators.

Astragalus mulfordiae

Astragalus mulfordiae is a perennial forb in the legume family (Fabaceae). It is endemic to the Snake

Not Listed But the Future Outlook is Grim

River Plain of southwestern Idaho and eastern Oregon where its range encompasses an approximately 100 x 100 mile area (Pyramid Botanical Consultants 2019). It grows with a deep taproot in loose sandy soils, often on dry south and west-facing slopes dominated by mixed desert shrub species (Moseley 1989). It emerges in early spring, with its flowering time usually occurring between April and late June. Reproductive output is quite variable, with large and mature plants capable of producing many hundreds of flowers and fruit. Prior to this study, little was known about its reproductive biology or relationship with pollinators.

A. mulfordiae is a BLM Type 2 special status plant, indicating that it is imperiled throughout its range and has a high likelihood of being petitioned for federal listing (Pyramid Botanical Consultants 2019). A formal monitoring program was initiated in Idaho in the late 1990s, and recent re-surveys have shown steep declines in its populations (Mancuso 2001, Pyramid Botanical Consultants 2019, Mancuso & Brabec 2019). Contributing factors include habitat loss and degradation stemming from multiple sources such as development, agriculture, and recreation (Mancuso 2001, Pyramid Botanical Consultants 2019, Mancuso & Brabec 2019).

Study Locations

Our project included six study sites, with three in the Boise Foothills and three in the Owyhee Front. The Boise Foothills sites fell within the City of Boise and were near residential areas and greenspaces popular for



Kylie Stear (City of Boise intern and BSU student) collecting pollinator exclusion experiment data. Photo by Clara Buchholtz.

outdoor recreation activities such as hiking, mountain biking, and dog-walking. The Owyhee Front sites were along the Snake River in Owyhee County and were near agricultural operations (primarily corn and alfalfa), as well as recreational activities along the river.

Methods

We initiated the pollinator exclusion experiment in April 2022, with data collection continuing through the first week of July. The experiment compared fruit and seed production on inflorescences excluded from pollinators with tulle fabric bags to open-pollinated control inflorescences. We estimated the likelihood of fruit and seed production in each treatment using generalized linear mixed models with binomial distributions and logit-link functions. In our models, we also controlled for variation that may have been due to differences in sites and plants.

To identify likely pollinators of *A. mulfordiae*, we collected insects that contacted the reproductive parts of *A. mulfordiae* flowers during a series of observation



Clara Buchholtz setting up the pollinator exclusion experiment. Photo by Helina Alvarez.



Collecting pollinators from *A. mulfordiae*. Photo by Clara Buchholtz.

periods at each site. We identified these insects using dichotomous keys, and with the generous guidance of Boise State personnel including Ian Robertson

and Emily Sun. Many of the specimens were bees from the family Megachilidae, which can be notoriously difficult to accurately identify to species. For these and other challenging species-level identifications we contracted with taxonomist Skyler Burrows.

We collected anthropogenic disturbance data for each site using existing data products (such as land cover classification maps) and GIS software. This data comprised 12 variables, falling within the categories of agriculture, development, ground cover, and fire. We

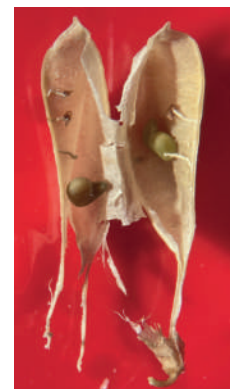
considered two different scales for our disturbance measurements: the plant scale (measured as the plant population boundary), and the foraging insect scale (a buffer around each plant population based on an estimate of likely foraging distances from Cane 2001).

Results

Our pollinator exclusion experiment showed that *A. mulfordiae* is highly reliant on pollinators for reproduction. Flowers receiving the exclusion treatment had only a 2.1% likelihood of producing fruit, as compared to a 25.4% for those in the random control and 30.4% for those in the tagged control. Our seed set analysis showed that the small number of fruits that were produced in the exclusion experiment had no difference in the likelihood of producing seeds, with around 30% of ovules developing into seeds across all treatments.

In total, we collected 155 floral visitors from *A. mulfordiae*, representing 4 taxonomic orders, and at least 9 families, 16 genera, and 33 species. The most abundant *A. mulfordiae* visitors at each site were mason bees from the genus *Osmia*, which comprised 108 of the total 155 specimens, and represented at least 22 species. The most abundant of the *Osmia* were *Osmia albolateralis* (35 specimens), *Osmia* aff. *clarescens* (24 specimens), and *Osmia nigrifrons* (14 specimens). The abundance and richness of *Osmia* species we collected at each site differed, with the Boise Front showing overall greater richness and abundance of insect visitors.

Our disturbance data showed that sites differed with regards to agricultural, development, ground cover, and fire disturbances. Overall, the Owyhee Front sites had higher exposure to agriculture-related disturbances. For example, two Owyhee sites showed notably higher risk for exposure to insecticides relative to all other sites. Disturbances related to human development, such as the coverage of impervious surfaces like pavement and proximity to roads, were predictably higher for the Boise Foothills sites. Measures for ground cover showed less variation, and metrics such as invasive annual grasses had high coverage at sites. Fire history differed between sites, with those in the Owyhee Front generally having more recent and frequent exposure to fires than those in the Boise Foothills.



Seed set in a fruit collected from *A. mulfordiae*. Photo by Clara Buchholtz.

Continued on Page 20....

Discussion

Results from the pollinator exclusion experiment suggest *A. mulfordiae* relies on pollinators for reproduction, and its fruit production is significantly reduced when pollinator visitation is diminished. However, the small number of fruits the plants produced in the exclusion treatment showed no significant reduction in seed set, suggesting that *A. mulfordiae* may be weakly self-compatible. The full details of *A. mulfordiae*'s mating system remain unknown because it is possible for plants to be self-compatible but still require a floral visitor to trip flower structures to release pollen. Such a mechanism is sometimes found within the *Astragalus* genus (Soltani et al. 2021). However, an experiment with a more extensive set of pollination treatments would be needed to determine which system applies for *A. mulfordiae*.

The results from our insect collections suggest that *Osmia* species are likely important pollinators for *A. mulfordiae*. However, *A. mulfordiae* also appears to attract a diversity of other insect visitors. This aligns with findings for other *Astragalus* species, many of which have plant-pollinator relationships with bees from the family Megachilidae, including *Osmia* (Watrous & Cane 2011, Soltani et al. 2022, Schurr et al. 2019). Differences in the species of visitors between sites indicate that local pollinator networks may differ substantially from one another, with the possibility that some are more vulnerable to disruption than others. For example, a single species (*Osmia albolateralis*) made up nearly two thirds of the visitors to *A. mulfordiae* at one of the Owyhee Front sites. Disruption to *A. mulfordiae*'s relationship with this species would likely be more detrimental to plants at this site than at sites where no single species of visitor dominated so heavily.

Our disturbance data showed that disturbances known to impact both plants and pollinators were prevalent although distributed differently across our study sites. Impacts from fire as well as agriculture (particularly pesticide use) likely pose a higher threat to Owyhee populations, while human development stressors are more prevalent in the Boise Foothills. Taken together, the evidence from the pollinator exclusion experiment, insect visitor identifications, and disturbance



Some of the insects collected from *A. mulfordiae* flowers. Photo by Clara Buchholtz.

data, suggest that considering the site-specific threats facing surrounding pollinator communities, and in particular the needs of species in the genus *Osmia*, is an important dimension to conserving and restoring *A. mulfordiae* populations. •

Acknowledgements

We thank the Idaho Native Plant Society, Bureau of Land Management, Martha Brabec, Jessa Davis, Craig Carpenter, Anne Halford, Ian Robertson, Mike Mancuso, Skyler Burrows, and Emily Sun for supporting this project.

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Salvaging *Abronia mellifera* var. *pahoveorum*

By Barbara Ertter et al., Pahove Chapter

In the early morning of Thursday, June 15, the handful of cars driving up the Bogus Basin Road were presented with a puzzle: Why were five people kneeling on the curb at one location, engrossed in some mysterious activity? What was happening was an impromptu salvage effort of otherwise doomed and/or superfluous seedlings of the Boise Sand-Verbena (*Abronia mellifera* var. *pahoveorum*). This beautiful but extremely rare plant, restricted to the foothills between New Plymouth and Lucky Peak Dam, was only recognized as a distinct variety in 2016 (see “A Big Welcome to Idaho’s Newest Rare Plant!”, *Sage Notes* 38[2]: 8–9, 2016).

Due to its recent appearance in the conservation arena, very little is currently known about the Boise sand-verbena’s requirements and reasons for rarity, other than can be deduced from general observations. It is apparently a relatively short-lived perennial, occurring as scattered populations that can fluctuate dramatically from year to year. Periodic recruitment from the seedbank is evidently critical, in combination with spo-

radic dispersal between the loose sandy sites that are the plant’s preferred habitat. Alas, these habitats have been disappearing from the Boise Front, mostly because of conversion to invasive non-native grassland or to prime real estate development.

One of the Boise Foothills Rarest Plants: Not Listed, But Should It Be?

To hammer home just how rare the Boise sand-verbena is, the sobering reality is that the bumper crop of seedlings that happened to germinate at this particular roadside site in 2023, serendipitously noticed by Barbara Ertter, outnumbered all the currently known adult plants in existence. And most were doomed if left alone, either

because of overcrowding or because they were within the “death zone” of routine highway maintenance. And yet this same bare zone resulting from highway maintenance was providing exactly the right conditions for germination, at least this spring. Fortunately, an arrangement had recently been made for Daniel Murphy to attempt propagation of the Boise Sand-verbena at the Idaho Botanical Garden, with the hope of augmenting and re-establishing populations on land managed by the Boise City Department of Parks & Recreation. Daniel’s initial efforts at seed germination had

only limited success, possibly because of a late start, so the opportunity to jump-start the program with seedlings that needed salvaging was a godsend.

A quick flurry of emails ensued among Barbara, Daniel, and Boise Parks and Recreation Ecologist Martha Brabec, to decide when the three of us could rendezvous for a salvage effort, assisted by Erin Manzutto and



Continued on Page 22....



Dylan Werlinger. And so there we were, lined up along the Bogus Basin Road on a delightfully chilly morning, doing what we could to give these struggling seedlings a

chance to carry their species into the future. Dozens of baby sand-verbena are now under Daniel's care at IBG, in the company of other rare sand-verbena that Daniel is also ministering to. This includes the related Yellowstone Sand-verbena, a globally imperiled species found only on the shores of Yellowstone Lake. We wish these seedlings the best of luck, and hope that one day they and their progeny will one day repopulate the Boise Front with their fragrant snowballs of night-blooming flowers. •



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2024 Education, Research, and Inventory Grant Program

By Steve Rust, ERIG Committee Chair

To support its mission Idaho Native Plant Society (INPS) annually grants awards through the Education, Research, and Inventory Grant (ERIG) Program. Since 2005 INPS has awarded over \$30,000 in grants of up to \$1000 that stimulate and lend support to educational, research, and conservation activities that promote an appreciation for native plants and plant communities in Idaho. Continuing in that tradition in 2024, INPS will partner with projects that contribute to the appreciation, conservation, and knowledge of Idaho's native flora and vegetation. Idaho Native Plant Society encourages you to submit a proposal for projects that may qualify. The deadline for submitting proposals is February 15, 2024.

Grant Guidelines: The ERIG program is intended to support direct project costs. Grant proposals should not include expenses for salary and personnel benefits, the purchase of personal equipment, equipment not dedicated to the project, or other expenses not essential to the project. Indirect costs such as administrative costs will not be funded. Expenditures shall be verified by receipt submittals. Here are some examples of costs the grant may cover:

- Direct costs of travel, meals, and lodging for the project.
- Supply and service expenses used for the sole purpose of the project (e.g., native plant material, interpretive signs, lab materials).
- Printing costs for public outreach material or research publications.

Application Procedure and Requirements: Proposals must contain the following information, as line items, in the application. Please be succinct:

1. Project Title.

2. Contact Information: Name, address, phone number, organization/affiliation, and email address.
3. Project Description:
 - a. Outline the project objectives, methods, and final product.
 - b. Explain how the project will benefit the appreciation, conservation, or knowledge of Idaho's native flora.
 - c. Where applicable, will there be public access to the project?
 - d. Describe how project success will be evaluated.
4. Itemized budget: Outline an overall project budget, including the amount you are requesting (up to \$1,000). Include other funding sources.
5. Timeline: Please provide a timeline for completion of all major milestones associated with the project, including presentation of the results.

Project proposals must pertain to native plants of Idaho. Please limit grant requests to a maximum of \$1,000 and be aware that less may be awarded due to INPS budget constraints and the number of applications submitted. Recipients of these awards have a timeline of two years from the date of the award to complete their projects. Successful applicants are required to submit a final report to INPS documenting project accomplishments and a summary of the project to be published in the INPS newsletter, *Sage Notes*. INPS membership is not a prerequisite to apply for, or receive, an ERIG grant.

Please submit proposals by email to Steve Rust at srust@naturescap.com (refer to "ERIG proposal" in the subject line) or by mail to: ATTN: ERIG Committee Chair, Idaho Native Plant Society, P.O. Box 9451, Boise, ID 83707. •

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The City of Hailey Thanks INPS for ERIG!

By Linda Ries, Wood River Chapter, Hailey Tree Committee, Arboretum Volunteer

The City of Hailey, the Hailey Tree Committee, and the Wood River Chapter of the INPS wish to express their appreciation for the 2022 ERIG grant to fund the creation of sixty-five plant signs that have been placed at the Hailey Native Plant Arboretum. The signs are made of long lasting anodized aluminum. Seven species of trees, eight species of shrubs, 23 species of forbs, and 10 species of grasses are newly signed. These signs have common name, scientific name, some information about the plant, and where it is native. With the addition of these new signs the Arboretum has been utilized more often as visitors take the time to

wander the site and read the signage to learn the native plant names. Community volunteers working in the Arboretum have been told many times how much everyone loves and appreciates

the new signage! In fact there are “regulars” who walk through the Arboretum just to see what is in bloom! This summer a local nature journaling club was given a tour of the Arboretum and a chance to draw and paint from living specimens. In addition to the new signage, a lovely stone bench has been placed in memory of long time INPS member, Wood River Chapter President and highly esteemed botanist Carol Blackburn. The bench is tucked under two large Douglas firs, one of which Carol donated in 1996!

There is great potential for research opportunities at this Arboretum site to demonstrate to the public more about native plants and their adaptations, and there is a local opportunity to showcase species that are tough and drought-tolerant for use in urban landscapes. Many species in the Arboretum have thrived with only drip irrigation or no irrigation at all. Examples of some of these durable species include curl leaf mountain mahogany (*Cercocarpus ledifolius*), oneseed juniper (*Juniperus monosperma*), Utah juniper (*Juniperus utahensis*), Rocky Mountain juniper (*Juniperus scopulorum*), Gambel oak (*Quercus gambelii*), sulfur buckwheat (*Eriogonum umbellatum*), Wyeth's buckwheat (*Eriogonum heracleoides*) and several species of *Penstemon*. The Arboretum is an ideal location to observe and learn more about native species of Idaho, the Great Basin, and the

Rocky Mountains. Local native landscapers and arborists go there to collect native plant seed and also visit the site with their clients to look at mature native plants. The Arboretum is the only site in Hailey which has both the Idaho State Tree western white pine (*Pinus monticola*) and the Idaho State Flower syringa (*Philadelphus lewisii*) for students and the public to observe and learn about. The Arboretum attracts many pollinators, especially native bees, and deer, elk, moose, and several species of birds have been seen. •



Wyeth's buckwheat
(*Eriogonum heracleoides*).



Penstemon venustus.



Tiger swallowtail butterfly
on syringa (*Philadelphus lewisii*).

Greater Cultural Diversity Needed in Ecological Restoration Projects

By Sidney Fellows and Christina Stucker-Gassi

The Northwest Center for Alternatives to Pesticides (NCAP) is celebrating a decade of on-farm habitat work that has helped dozens of farmers and ranchers prioritize habitat projects that benefit pollinators and other valuable insects!

We have contributed tens of thousands of dollars toward habitat projects that have lasting impacts. Not only do these plants provide vital nectar, pollen, and nesting material for numerous species, they also cycle nutrients and sequester carbon. In addition to these benefits, our work positively contributes to the rise in initiatives to plant more native plants. While we celebrate this work, we want to share with you some guiding thoughts for the next ten years.

Our organization's habitat work will continue to prioritize planting native plants. Intermountain west plant species have long been part of Indigenous communities as food, medicine, materials, and creation stories. In honor of these rich relationships, NCAP's team of Sidney Fellows (Shoshone-Bannock and Chippewa-Cree) and Christina Stucker-Gassi (European American) are taking native plant habitat efforts in new directions. Through collaboration with Sho-Ban tribal citizens and departments, the Fort Hall Native Plant Project was created to indigenize our plant conservation efforts and support Indigenous-led restoration at the Tribes' reservation in what is now Fort Hall, Idaho.

Over the past year, the Fort Hall Native Plant Project aided in restoration and enhancing activities centered around native flora on the reservation to advance tribal-led priorities of land management, exercising tribal plant knowledge, and strengthening human-plant relationships. This work has provided us the opportunity to better prioritize the human-nature relationships that tribal citizens often understand to be the backbone of ecological restoration and

conservation efforts. The Sho-Ban tribal community, during our team's work with tribal departments to implement native plant habitat, communicated their interest in incorporating tribal values into our team's conservation efforts.



These tribal priorities complement NCAP's work that encompasses wilderness protection, river and wetland conservation, and biodiversity conservation through native habitat installations. The Tribes' guidance to integrate their cultural values into our conservation efforts represents valuable innovation in conservation.

Our habitat team is contemplating how the cultural keystone species concept can guide our team's part within the conservation community to incorporate diverse social values. Ann Garibaldi and Nancy Turner introduced and defined the concept as the culturally salient species, such as plants or animals, that "shape in a major way the cultural identity of a people." Even the Endangered Species Act, which is among the best pieces of federal legislation we have to support ecological restoration activities, has continually undermined tribal sovereignty and cultural identity. We are learning that good ecological restoration restores both social and ecological systems. Restoration efforts can prioritize, and therefore help maintain, Indigenous social, ecological, political, epistemological, and moral systems through implementing efforts like the cultural keystone species concept. In this way, ecological restoration can be a path that exudes goodness and diverse expansion. Through purposeful diversification, restoration can go beyond restoring ecological systems by uplifting tribal sovereignty, honoring different cultural values, and strengthening human-nature relationships. •

Idaho Botanical Foray ...Continued from Page 5

We had a very successful foray. During the three days of botanizing effort, we collected nearly 900 plant specimens. More importantly we were able to establish a great comradery among the 23 participants. Participants came from throughout the state and around the world. We had someone join us from the coast of British Columbia and we had a graduate student from Nigeria. Here is a list of those who participated in the 2023 Idaho Botany Foray: Preston Andrews, Derek Antonelli, Pete Boas, Lorel Boas, Daniel Botello, Lisa Maria Bresett, Beth Corbin,

Jennifer Costich-Thompson, George Gehrig, Alma Hanson, Kristin Kaser, Steve Martin, Anna Miera, Phebian Odofowa, Amy Petersillie, Jim Smith, Jason Smith, Dick Smith, Sandy Smith, Alan Steele, Annie Taylor, Margurite Trost, and Dan Turck.

The Idaho Botany Foray is open to anyone who wants to join us. Novice collectors are especially welcome. If you would like to be informed about future forays, submit a request to the author (ds.ca.antonelli@gmail.com) to be added to the email notification list. •

Chapter News

CALYPSO CHAPTER

The public is invited to all chapter activities. All chapter activities are subject to change—watch chapter emails for updates. Contact Derek to be added to email list.

When: Chapter meetings are held on the first Wednesday evenings of March, April, May, and October.

Where: Meetings will be held in the Idaho Fish and Game (IDFG) Hunter Education Building, 2885 W Kathleen Ave, Coeur d'Alene.

Contact: For more information about Calypso Chapter activities, contact Derek Antonelli, ds.ca.antonelli@gmail.com, (208) 691-1070.

Upcoming Events

March 6: Calypso Chapter meeting, 7:00 pm. The presentation topic for this meeting has not been determined yet. Please submit topic suggestions.

April 3: Calypso Chapter meeting, 7:00 pm. The presentation topic for this meeting has not been determined yet. Please submit topic suggestions.

April 27: Farragut State Park Hike. Meeting point and time to be determined.

May 1: Calypso Chapter meeting, 7:00 pm. The presentation topic for this meeting has not been determined yet. Please submit topic suggestions.

May 17: Lost Lake Hike. Meeting point and time to be determined.

May 31: Rathdrum Mountain Park Hike. Meeting time to be determined.

June 14 to 17: INPS Annual Campout and Meeting, Farragut State Park. Calypso Chapter is hosting this year.

LOASA CHAPTER

When: Meetings are held third Thursday of each month at 7:00 p.m.

Where: Taylor Building, Room 247, College of Southern Idaho, Twin Falls.

Contact: Bill Bridges, bridgesbill34@yahoo.com

PAHOVE CHAPTER

When: Chapter meetings with intriguing presentations are held the second Tuesday of each month from October–April starting at 7:00 pm. Times, dates, and topics are tentative. Current information will be sent to members via email. Announcements are also posted on the Pahove Chapter page of the INPS website:

<https://idahonativeplants.org/pahove/>

Where: Chapter presentations currently offer hybrid viewing formats, both in-person at MK Nature Center in Boise and a Zoom link for at-home enjoyment.

Contact: For more information about Pahove Chapter activities visit the website: www.idahonativeplants.org or email Karie Pappani at pahove.chapter.president@gmail.com.

Past Events

September 26: The Pahove Chapter hosted a season kick-off party at Smokey Mountain Pizzeria and Grill in Boise. The event was well attended. Pizza, beverages, and great conversation were enjoyed by all. Additionally, we had a seed exchange table set up in the corner of the pizzeria patio. Many seeds were swapped including native plants (biscuitroots, bee plants, milkweeds, and more!), garden veggies, and even a few tropical species for the indoor plant lover.

October 10: Carole Prentice and Barbara Ertter gave a wonderful presentation filled with local knowledge and great research on Timothy Wilcox, an early botanist who spent time at Fort Boise.

November 14: Kerry Byrne, Cal Poly, presented "Beneath Our Feet: Harnessing the Power of the Soil Seed Bank for Restoration."

December 12: Cathy Ford spoke about the ITD Roadside Pollinator Project.

Upcoming Events

January 9: Richard Rachman, Boise State University, will speak on "Goatheads and Invasives." Susan Ziebarth will add a snippet on "Goatheads: Native to Bosnia and Croatia."

February 13: Michael Mancuso will speak on the 25 Peaks Project.

SAWABI CHAPTER

We welcome the public to our chapter's informative winter programs and warm weather plant walks.

When: All plant walks and winter programs are no longer prescheduled but will be announced via email.

Where: Winter programs are presented in Pond Student Union Building classrooms, ISU Campus, Pocatello.

Contact: For more information contact Paul Allen 208-241-5265 or pokyallen@hotmail.com

UPPER SNAKE CHAPTER (INACTIVE)

Contact: Kristin Kaser, kaser.kristin@gmail.com

WHITE PINE CHAPTER

When: Meetings are typically held the third Thursday of the month, September through April. Current information is posted on our chapter webpage:

<https://www.whitepineinps.org/WPschedule.html>

Where: Meetings are held in-person in the 1912 Center Lecompte Auditorium (2nd floor) in Moscow at 7:00 pm. Video recordings of meetings will be made available on our YouTube Channel a few days after each meeting.

Contact: For more information about White Pine Chapter activities, contact us at INPS, White Pine Chapter, PO Box 8481, Moscow, ID 83843 or whitepine.chapter@gmail.com. Visit the chapter website (<https://www.whitepineinps.org/>) for upcoming event information and visit our YouTube Channel for video recordings of past talks (<https://whitepineinps.org/WPYoutube.html>).

Past Events

November 16: Presentation by Chris Duke, Phoenix Conservancy, "Pocket Prairies: Leveraging Small Urban Spaces as Vital Habitat and Seedbanks for Native Plants."

Upcoming Events

January 18: Presentation by Pam Brunsfeld, retired curator of University of Idaho's Stillinger Herbarium, "Superbloom in the Southwestern US."

February 15: Presentation by Eva Strand and Steve Bunting, University of Idaho, "The Importance of Old Trees in Juniper Woodlands."

March 21: Presentation by Aram Aramian, "Breeding and Raising White Pine Blister Rust-Resistant Seedlings."

May 16-18: Native Plant Sale. Latah County Fairgrounds.

WOOD RIVER CHAPTER

When: Typically we have talks in the cold months and walks in the warm ones. Non-members are welcome. Please see our website or email newsletter for information on all programs.

Where: Field trip and talk locations and details will be included with the description, posted online and emailed to members and other interested parties.

Contact: For more information about Wood River Chapter activities: email: woodriverinps@gmail.com; website: <https://woodriverinps.wixsite.com/wrinps>; phone: Mary (559) 696-9953; to subscribe to the newsletter: email us.

Past Events

November 16: "Native Plants, Native Peoples." Talk by Kristin Fletcher, chapter President and knowledgeable naturalist. Kristin offered a look at ways local native plants supported indigenous peoples to not simply survive but thrive in our harsh climate. In partnership with Hailey Public Library. The talk is available via video at www.haileypubliclibrary.org >Library Programs.

December 2: Annual Fall Potluck share a meal was held at Town Center West with botany bingo played for great prizes. Election of Chapter Officers for 2024 was also held at this time.

Upcoming Events

January 23: "Superbloom 2023." Talk by Pam Brunsfeld. Pam will share her visit to the Antelope Valley Poppy Preserve, Carrizo Plain and the Mojave Desert of southern California, which experienced an exceptional "superbloom" in spring 2023. Pam is the retired University of Idaho Stillinger Herbarium Director and Systematic Botany Instructor. Since retirement she has visited the Southwest deserts every spring to view and learn the flora. She has been able to witness two super blooms. This program will be available via Zoom and, later, by recording. More information on how to get the link will be posted at <https://woodriverinps.wixsite.com/wrinps> after January 1 and also in our newsletter.

March 21: Presentation by Bob Moseley on the flora of the most floristically diverse temperate ecosystem on earth, the alpine region of Tibet. Bob says "(there are) 200+ species of *Pedicularis*, 180 rhododendron species, 100 primroses etc." In addition to lots of images of flowers and their habitats, Bob will explore the cultural uses and traditions of ethnic groups of the region in his talk. Bob is the author of *Khawa Karpo: Tibetan Traditional Knowledge and Biodiversity Conservation*. In partnership with Hailey Public Library. The talk will be available for live streaming or, later, via video, at www.haileypubliclibrary.org >Library Programs. 5:30-7:00 pm MT at Town Center West (Hailey, Croy X River Sts).

April TBA: When most of the snow is gone from Murdock Trail in the SNRA, we will host a field trip to see what nature has been up to while snow has been on the ground. Of interest will be basal rosettes of plants, plants with leathery leaves that don't lose their leaves in fall, lichens, trees, birds, animals and whatever our geeky brains find of interest. This walk is rated Easy/Moderate. The trail is good but there are some uneven places, possibly walking in snow, moderate elevation change.

May 25: Opening Day at Silver Creek Preserve. Our chapter will host an information table on plants native to this Nature Conservancy area. New this year: explore interesting plant structures up close and personal with the benefit of the Education Center's dissecting microscopes and assistance from members of our chapter.

June TBA: Plant Identification Class at Silver Creek Preserve education center.

Early to mid June TBA: Members only hike at Silver Creek Preserve. Some surprises, we promise. Bring your binoculars, because you never know what you will see. •



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

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