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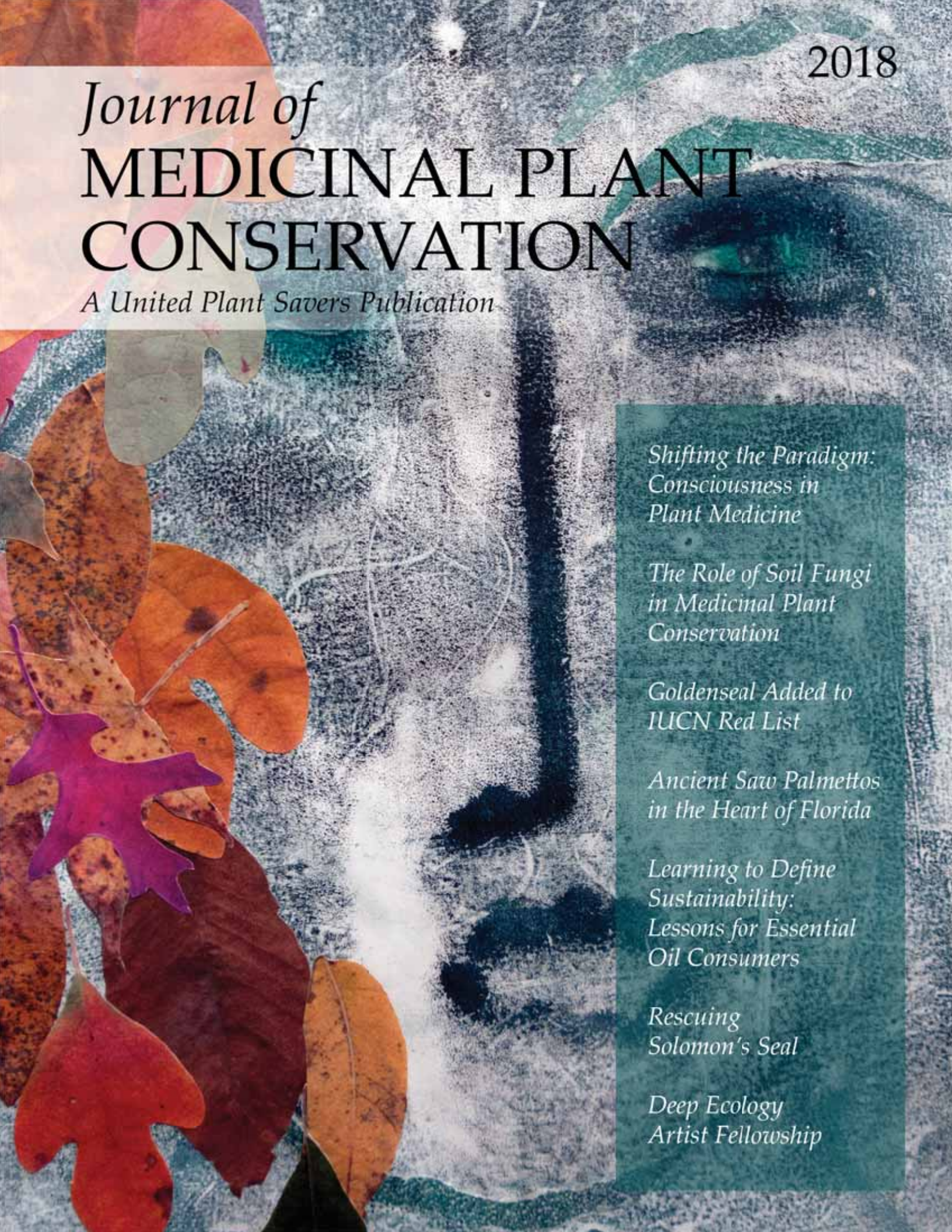

Shifting the Paradigm: Consciousness in Plant Medicine

The Role of Soil Fungi in Medicinal Plant Conservation

Goldenseal Added to IUCN Red List

Ancient Saw Palmettos in the Heart of Florida

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Rescuing Solomon's Seal

Deep Ecology Artist Fellowship

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KAT MAIER ELECTED BOARD PRESIDENT OF UNITED PLANT SAVERS

by Sara Katz

United Plant Savers is a unique organization in many ways. We are the only organization in the U.S. whose mission is to protect indigenous medicinal plants. We are a very small budgeted organization with an outsized voice. We have a board comprised of some of our country's most passionate medicinal plant conservation advocates who travel all year long to attend UpS board meetings, herbal conferences and symposia, and participate in plant population studies and plant rescues. UpS strives to respect, support, and find common ground with all individuals and groups in the medicinal plant community.

I think perhaps no one is more archetypical of these combined qualities than UpS's third and current board president, Kat (aka Kathleen) Maier. A practicing herbalist for over twenty years, Kat is founder and director of Sacred Plant Traditions in Charlottesville, Virginia. Many of you know Kat through her educational programs, clinics, and community herbalist training programs. She is a founding board member of Common Ground Healing Arts, a collective of practitioners that offers their services on a donation basis. Kathleen has served on the UpS board since 2011 and was the recipient of UpS's very first Medicinal Plant Conservation Award in 2005.

UpS has had only three board presidents in its almost 25 years of existence. Rosemary Gladstar, visionary and founder of United Plant Savers, became the first board president at the organization's inception in 1994.

During Rosemary's tenure as board president, United Plant Savers birthed a plethora of unprecedented programs and initiatives. The UpS "At-Risk" List was conceived and developed early on, along with Partners in Education, the *Journal of Medicinal Plant Conservation*, the Botanical Sanctuary Network, UpS's acquisition of the Botanical Sanctuary in Rutland, Ohio, and many more!

A few times during her busy 14 years as board president Rosemary tried to pass on this leadership role, but every time was assured by the board she was doing a fantastic job and no rest for the excellent, or something like that, so Rosemary led on. She served as President until 2008, when I relieved her of that leadership responsibility. I was completely honored to be asked to fill this role of humble servant to the plants and to this organization, which has

absolutely been the most rewarding time and experience of my life.

During my decade as President, UpS continued to grow programs and expand our reach. We held an At-"Risk" List Summit, inviting experts from around the country to take a fresh look at our "At-Risk" List; we developed plans and funding for the Center for Medicinal Plant Conservation, which is breaking ground this Spring; the Talking Forest Medicinal Trail at the Sanctuary in Ohio was inaugurated and opened to the public; UpS took over Sacred Seeds, a network of sanctuaries dedicated to preserving biodiversity and plant knowledge around the globe; and we perfected two Conservation Easements on UpS's 360 acre Sanctuary in Ohio. But my single greatest pride and accomplishment during my years as board president was to hire Susan Leopold as UpS's third Executive Director. Susan, a force for the plants, was recommended for this position by none other than Kat Maier.

Kat totally fell in love with the UpS Sanctuary in Ohio such that from the very first time she walked its forest and meadows, her heart was committed to taking care of that place forever more. It is this absolute dedication, her overflowing nurturance and love for plants and their people, along with a brilliant mind and rooted heart that assure me that, in Kat Maier, United Plant Savers has the best possible leadership to carry us forth as we enter our second quarter century of wild medicine plant stewardship. ■

WHEN THE MUSIC GOES SILENT

by Susan Leopold, PhD

As of January 2017, all rosewoods (Dalbergia), bubinga (Guibourtia), and kosso (Pterocarpus erinaceus) were added to Appendix II of the CITES list of protected species.[1]

"Every species has a song", is a quote from Kathleen Harrison, founder of Botanical Dimensions.[2] Brazilian rosewood (*Dalbergia nigra*) has a rare songful story that plant people should know because this species has played music for the masses as the main source of tonewood used in classical instruments and most notable guitars.

In July of 2017, I attended the CITES *Plants Committee* meeting in Geneva, Switzerland. The most active discussion that took place was from instrument manufacturers and orchestra groups, who were presenting concerns about how they were to navigate the new regulations elicited, that now required permits and restrictions on international travel with instruments and trade. I had special earphones so I could hear multiple languages translated from various countries, but all I could think about was how monumental it would be if every instrument owner participated in a global concert to raise awareness for the most silent of environmental crimes—illegal logging of endangered trees and the habitat loss of our global forests. Instead, the human plight was consumed in how to navigate enforcement, paperwork, and the rights of the music makers: the orchestras, musicians, and manufacturers. Who then speaks for the trees?

Consciousness in plant medicine necessitates the art of listening, as well as nurturing the diversity of sounds and scents.

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ON THE COVER:
A Forest Caretaker
by Katherine Ziff

Touch Drawing (monotype) on cotton vellum over water soluble oils, embellished with collage and soft pastels. Fall leaves scanned, printed on cotton vellum, and collaged.

Riled up about what it means to seek balance between new trends and marketplace demands vs. respectful stewardship? Cultivating consciousness in plant medicine is a theme in this year's *Journal of Medicinal Plant Conservation*. The answers aren't easy, the issues are multifaceted thus the following articles provide a range of insights from personal interaction with plants to consumerism of herbal products.

This year United Plant Savers delivered the opening talk to the AIA (Alliance of International Aromatherapists) conference at Rutgers University on the reality of unregulated trade in Hawaiian sandalwood essential oil. I believe there is important holistic insight into how traditional cultures use aromatic plants and value them as sacred. For example, aromatherapy as practiced in traditional communities in Central and South American is done with aromatic flowers/leaves often grown in home gardens, sustainable, and therapeutic in the cultural context of ceremonial baths and ritual. In the case of certain essential oils, it's a very different story. It is a resource-intensive practice, and often those who use the oils have no idea where they come from or how they are being made. Buyers beware—adulteration and illegal practices are commonplace.

Rosewood (*Aniba rosodora*) makes the news again in September of 2017 with the announcement of a settlement to which Young Living founders, Gary and Mary Young, plead guilty to the intentional illegal harvesting and falsification of documentation to import rosewood essential oil and sell it for profit of which they made an estimated $9 million. Threatened with extinction due to demand and unsustainable business practices, not only is its wood prized for musical instruments and furniture/art carving, but also for the essential oil distilled from its inner heartwood and roots.

In detailed court documents it is stated that between 2010-2014 Young Living harvested 86 tons of rosewood illegally in Peru.[3] They were also found guilty of illegal trade in spikenard (*Nardostachys jatamansia*) oil from Nepal. Through the FOIA (Freedom of Information Act) UpS acquired the court documents stating the case details, which we have on our website. How can we deplete biodiversity and at the same time claim that we are engaged in a healing practice? Essential oil use has to come with ethical consumerism, and Erika Galentin's article, "Learning to Define Sustainability: Lessons for Essential Oil Consumers", presents both mindful reflection and cautionary wisdom. New UpS board member, Kelly Ablard, explains about those essential and carrier oils that are threatened globally.

Reflecting back on 2017 it was a year of tremendous growth for United Plant Savers. We jumped into an "Earth Day Crowdrise" campaign to raise capital for building the first of its kind "Center for Medicinal Plant Conservation." Thank you to all our supporters who made our fundraiser a success. We then headed to Wheaton College for the biannual International Herb Symposium where a new track of classes focused on conservation through cultivation was launched. A few weeks later, we held the Future of Ginseng and Forest Botanicals Symposium, a three-day conference in Morgantown, West Virginia. 'We cannot have commerce without conservation' was the guiding mantra! We have included the Table of Contents of Research and the Symposium summary in this Journal, the full proceedings are on the Up's website. We held a Planting the Future event in Kickapoo, Wisconsin, taught classes at the Oregon Eclipse, and set up a booth at the Lockn Festival.

For the first time membership has surpassed 3,500. Our goal is to double our membership, then as an organization, we could sustainably support UpS's operational costs and programs. If each member who receives this Journal could tell one friend, we could achieve our goal! Most importantly we want to share our mission, and we do so by providing all of our information on our website with free access to our resources, "At-Risk" Tool information, podcasts, past and present Journals, articles, and symposium proceedings.

We have also posted on our website a fascinating study of plants in trade on the internet that are CITES listed. This report was done by Jin A. Choi, an amazing young woman from South Korea who was an intern last year for the CITES Secretariat at the headquarters in Geneva.

As plant savers, we must take the time to know the stories of these plants. They need us to be their voice before their song goes silent. ■

1. Bartel, Chad (Aug 05, 2016). Guitaronomics, The Rising Cost of Tonewood. Reverb.com.

2. Buhner, Stephen H. (2006). *Sacred Plant Medicine: The Wisdom in Native American Herbalism*. Rochester, VT. Bear & Company.

3. Department of Justice, Office of Public Affairs (Sep 18, 2017). Essential Oils Company Sentenced for Lacey Act and Endangered Species Act Violations to Pay $760,000 in Fines, Forfeiture, and Community Service, and to Implement a Comprehensive Compliance Plan. *Justice News*. Retrieved on 5/1/2018 from https://www.justice.gov/opa/pr/essential-oils-company-sentenced-lacey-act-and-endangered-species-act-violations-pay-760000

"We need the tonic of the wilderness."

– Henry David Thoreau

A YEAR IN REVIEW

UpS Board of Directors winter meeting

Team UpS at the International Herb Symposium

UpS supporters at Rutgers for the AIA conference

The sun temple at the Oregon solar eclipse festival

Teachers at the UpS event in Kickapoo, WI

UpS booth on Participation Row at Lockn

IUCN redlist training workshop in Arizona

UpS recognized for conservation easement by AOA

Rosemary and Susan at the Mid Atlantic Women's Conference in PA

Steven Yeager and Howie Brownstein at the AHG conference in OR

Mark Hanson's sandalwood nursery on the Big Island, HI

UpS receives AHPA herbal insight award for 2017

SHIFTING THE PARADIGM: CONSCIOUSNESS IN PLANT MEDICINE

by Shantree Kacera

In the last decade, especially the previous year or two, the field of herbalism has been shifting—the consciousness of both herbalists and the general public has changed as our climate and landscapes have around the whole world. The shift to looking through the eyes of our ecological selves has come more into the forefront.

In Carolinian Canada the landscape has changed dramatically since I started exploring, studying, and practicing herbalism in the 1970s. This beautiful green island tucked into the southward thrust of the Great Lakes is Canada's richest and most endangered ecosystem. It is surrounded by 20% of the fresh water in the world. This life zone is actually the northernmost edge of the deciduous forest region in eastern North America and is named after the Carolina states.

It is a unique ecosystem zone found in southern Ontario. The term "Carolinian" refers to its similarity to the forests found in North and South Carolina in the southern United States. The Carolinian zone in Canada is extremely rich in both plant and animal species. Even though this region's habitats and ecosystems include examples of sand dunes, marshes, tall-grass prairies, savannas, wetlands, streams, shorelines, and other aquatic habitats, it is the southern-type deciduous forests that characterize this unique Canadian ecosystem. Fifty-eight percent of these ecosystem types are considered rare. Each of these ecosystems has a distinctive set of species. **Of all the plants on the UpS "At-Risk" and "To-Watch" Lists more then half of these are rare, threatened, or endangered here in this fragile bioregion of the world.**

"The keystone of forest gardening is a paradigm shift in our own human consciousness. From monoculture mind to polyculture mind;

From separation to unity; From exploitation and manipulation to respect and interdependence; From intervener to ecosystem participant."

– Dave Jacke

It is the country's most diverse and most threatened ecological region. Over 500 species in the region are considered rare.

- 25% of Canada's population on 0.25% of its area
- Over 7 million people live in this ecosystem and best farmland in the country
- Forest zone only covers 550 km, or 0.1% of the total forest area of Canada
- More endangered and rare species than any other life zone in the country
- **80% of the Carolinian region was covered with vast tracts of maple, ash, elm, oak, and pine forests, mostly in old-growth condition.**
- A great diversity of wildlife of all kinds, including many species not found elsewhere in Canada
- Less than 2% of the landscape is in public ownership
- 73% of the landscape is in highly productive agriculture
- Forest cover has been reduced from 80% to less than 4% in key counties with almost no old-growth
- Forest interior has been reduced to just 2%
- Wetlands reduced from 28.3% to less than 5%
- It is estimated that some 2,200 native species of herbaceous plants grow here
- **Less than 5% of Carolinian Canada is currently protected as natural landscapes**
- There are 77 species of trees alone
- It is also the richest life zone with the most diversity in Canada.

Climate

The climate of this region is the main reason it forms a unique ecosystem. Affectionately termed the "banana belt" of Canada, this zone boasts the warmest average annual temperatures, the longest frost-free seasons, and the mildest winters in Ontario. For example, Point Pelee near Windsor averages over 170 frost- free days, while Guelph, which is just north of the Carolinian boundary, has an average of only 135 frost-free days per year.

Rare Species

The most unique feature of the Carolinian life zone is the number of rare species found here. The region boasts fully one-third of the rare, threatened, and endangered species found in all of Canada. Sixty-five percent of Ontario's rare plants are found in the region, and 40% are restricted to the Carolinian zone. Included in these are trees, such as the pawpaw, blue ash, tulip, slippery elm and the Kentucky coffee tree; and herbaceous plants, such as American ginseng (*Panax quinquefolius*), bloodroot (*Sanguinaria canadensis*), echinacea (*Echinacea* spp.), false unicorn root (*Chamaelirium luteum*), goldenseal (*Hydrastis canadensis*), lady's slipper (*Cypripedium* spp.), wild yam (*Dioscorea villosa*), both black cohosh (*Actaea racemosa*) and blue

cohosh (*Caulophyllum thalictroides*), true unicorn (*Aletris farinosa*), Virginia snakeroot (*Aristolochia serpentaria*), trillium (*Trillium* spp.), our provincial flower, and our only cactus, the Eastern prickly pear (*Opuntia humifisa*). The rare southern flying squirrel, while also known from a few sites has its main habitat along the north shore of Lake Erie.

Shifting Our Paradigm – Living the Solution

In the last decade there has been a major shift among the many herbalists, forest gardeners, and foragers to localize our medicines and integrate native foods into our daily life. We are weaving herbal medicine, wild nutrition, and forest gardening into the mentorship programs offered at The Living Centre. We approach the solution through consciousness of re-wilding and of the interconnectedness of all things and looking at wisdom of wild plants that are native to this bioregion. We are designing a one-kilometer native plant trail using re-wilding perennial polyculture practices.

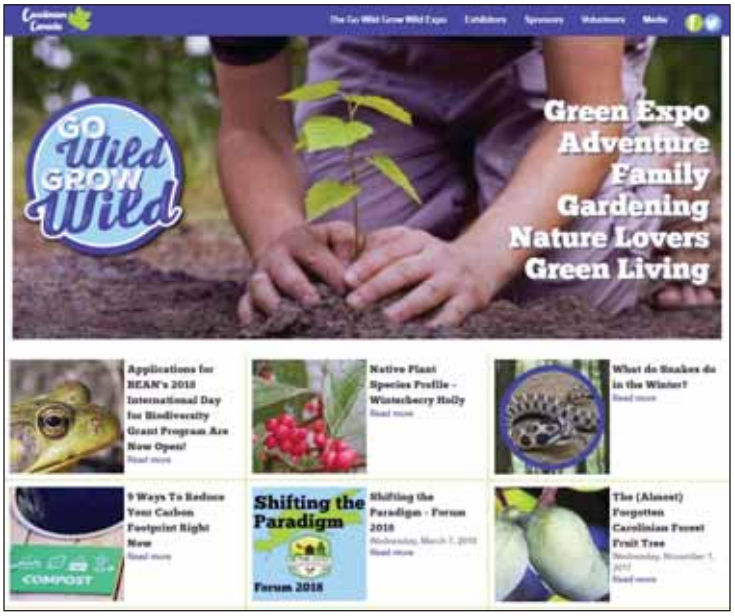
Re-Wilding – The Art of Creating Wild Perennial Polycultures

The re-wild strategy we are applying is done through a native perennial polyculture mapping process creating a dynamic, self-organizing multi-species community. This design process is done in such a way that entails the growing of a diversity of perennial plants, which imitates the diversity of natural ecosystems. It is a form of re-wilding both the landscape and practitioner. This is achieved through shifting the lens of the observer to see forward in time of the regeneration potential, a process that can occur by stepping in and being an active ecosystem participant. The intention in this process is to set ecosystems in motion to support their return back to wholeness to reach their optimal potential.

The other essential key to supporting the shift for the participants is asking each individual to commit to a regular practice of what we call "Tree Time", a time to observe and connect to an ecosystem, to learn and be inspired. In addition we ask folks to integrate native wild foods into their daily life. For we "Are Where We Eat", we encourage folks to experiment and create new wild and native delicious recipes. In gratitude a shifts happens—the internal ecological landscape to a full spectrum and expression of being a wild steward—to now act in shifting the external landscape in the art of Save – Steward – Seed for the future.

Go Wild Grow Wild – In the Zone Carolinian Canada

There is a major shift happening amongst the general public and the plant and herb lovers through a movement launched last year called *In the "Zone"*



to encourage folks to *Go Wild Grow Wild* and create native foraging sanctuaries. This is to educate, demonstrate, and inspire folks in using, conserving, and revering native plants.

Thousands of folks are creating these native habitat sanctuaries and becoming intimate with and being a voice and a wild steward of living the solution and shifting the paradigm—a return of the sacred.

The vision is to plant one million forest gardens in Carolinian Canada by 2020 with native medicines and foods to create a resilient culture. As each person acts as ecosystem participant with a clear intention, applied ecological knowledge, and wisdom, we can actually benefit the earth with our existence by creating responsible managing and stewarding healthy ecosystems, which achieve miraculous abundance and regenerate the earth as well. ■

Shantree Kacera, RH., D.N., Ph.D. is the founder and co-director of The Living Centre (1983) and Living Arts Institute, located outside of London, Ontario in the heart of Carolinian Canada. Shantree received his doctorate in Nutritional Medicine and Herbalism in the 70s. He has an integrative seasonal approach to his teaching students, mentees, and apprentices through his mentorship programs in Herbal Medicine, Wild Nutrition, and Forest Gardening. He is one of a few Canadian Herbalists awarded 'Honouring our Elders' by the Canadian Council of Herbalist Association who have spent at least 25 years offering outstanding contributions to the field of herbalism. www.thelivingcentre.com

Artist, Katherine Ziff

"AT-RISK" & "TO-WATCH" LIST

STATEMENT OF PURPOSE

For the benefit of the plant communities, wild animals, harvesters, farmers, consumers, manufacturers, retailers, and practitioners, we offer this list of wild medicinal plants which we feel are currently most sensitive to the impact of human activities. Our intent is to assure the increasing abundance of the medicinal plants which are presently in decline due to expanding popularity and shrinking habitat and range. UpS is not asking for a moratorium on the use of these herbs. Rather, we are initiating programs designed to preserve these important wild medicinal plants.

"At-Risk"

AMERICAN GINSENG
Panax quinquefolius

BLACK COHOSH
Actaea (Cimicifuga) racemosa

BLOODROOT
Sanguinaria canadensis

BLUE COHOSH
Caulophyllum thalictroides

ECHINACEA
Echinacea spp.

EYEBRIGHT, *Euphrasia* spp.

FALSE UNICORN ROOT
Chamaelirium luteum

GOLDENSEAL
Hydrastis canadensis

LADY'S SLIPPER ORCHID
Cypripedium spp.

LOMATIUM
Lomatium dissectum

OSHA
Ligusticum porteri, L. spp.

PEYOTE
Lophophora williamsii

SANDALWOOD
Santalum spp. *(Hawaii only)*

SLIPPERY ELM
Ulmus rubra

SUNDEW, *Drosera* spp.

TRILLIUM, BETH ROOT
Trillium spp.

TRUE UNICORN
Aletris farinosa

VENUS' FLY TRAP
Dionaea muscipula

VIRGINIA SNAKEROOT
Aristolochia serpentaria

WILD YAM
Dioscorea villosa, D. spp.

"To-Watch"

ARNICA
Arnica spp.

BUTTERFLY WEED
Asclepias tuberosa

CASCARA SAGRADA
Rhamnus purshiana

CHAPARRO
Castela emoryi

ELEPHANT TREE
Bursera microphylla

GENTIAN, *Gentiana* spp.

GOLDTHREAD, *Coptis* spp.

KAVA KAVA
Piper methysticum (Hawaii only)

LOBELIA, *Lobelia* spp.

MAIDENHAIR FERN
Adiantum pendatum

MAYAPPLE
Podophyllum peltatum

OREGON GRAPE
Mahonia spp.

PARTRIDGE BERRY
Mitchella repens

PINK ROOT
Spigelia marilandica

PIPSISSEWA
Chimaphila umbellata

RAMPS, *Allium tricoccum*

SPIKENARD
Aralia racemosa, A. californica

STONEROOT
Collinsonia canadensis

STREAM ORCHID
Epipactis gigantea

TURKEY CORN
Dicentra canadensis

WHITE SAGE, *Salvia apiana*

WILD INDIGO, *Baptisia tinctoria*

YERBA MANSA,
Anemopsis californica

"In-Review"

HIGHEST PRIORITY: RESCORE NOW

SLIPPERY ELM
Ulmus rubra

GOLDENSEAL
Hydrastis canadensis

FALSE UNICORN
Chamaelirium luteum

BLACK COHOSH
Actaea racemosa

TOP PRIORITY: IN THE NEXT YEAR

SPIKENARD
Aralia racemosa, A. californica

CASCARA
Frangula purshiana

BLOODROOT
Sanguinaria canadensis

VIRGINIA SNAKEROOT
Aristolochia serpentaria

TRILLIUM, *Trillium* spp.

BLUE COHOSH
Caulophyllum thalictroides

WILD YAM, *Dioscorea villosa*

MID PRIORITY: IN THE NEXT 2 YEARS

LOMATIUM
Lomatium dissectum

OSHA
Ligusticum porteri

ECHINACEA
Echinacea spp.

BUTTERFLY WEED
Asclepias tuberosa

STONEROOT
Collinsonia canadensis

YERBA MANSA
Anemopsis californica

MAYAPPLE
Podophyllum peltatum

PARTRIDGE BERRY
Mitchella repens

Requested To Score

INDIAN PIPE
Monotropa uniflora

CHAGA
Inonotus obliquus

WILD CHERRY
Prunus serotina

SOLOMON'S SEAL
Polygonatum biflorum

YAUPON
Ilex vomitoria

WILD GERANIUM
Geranium maculatum

THE ROLE OF SOIL FUNGI IN MEDICINAL PLANT CONSERVATION AND REGENERATIVE AGRICULTURE: SOIL FUNGAL INOCULANTS' IMPACTS ON CROP YIELD, NUTRITION, AND BASIL DOWNY MILDEW

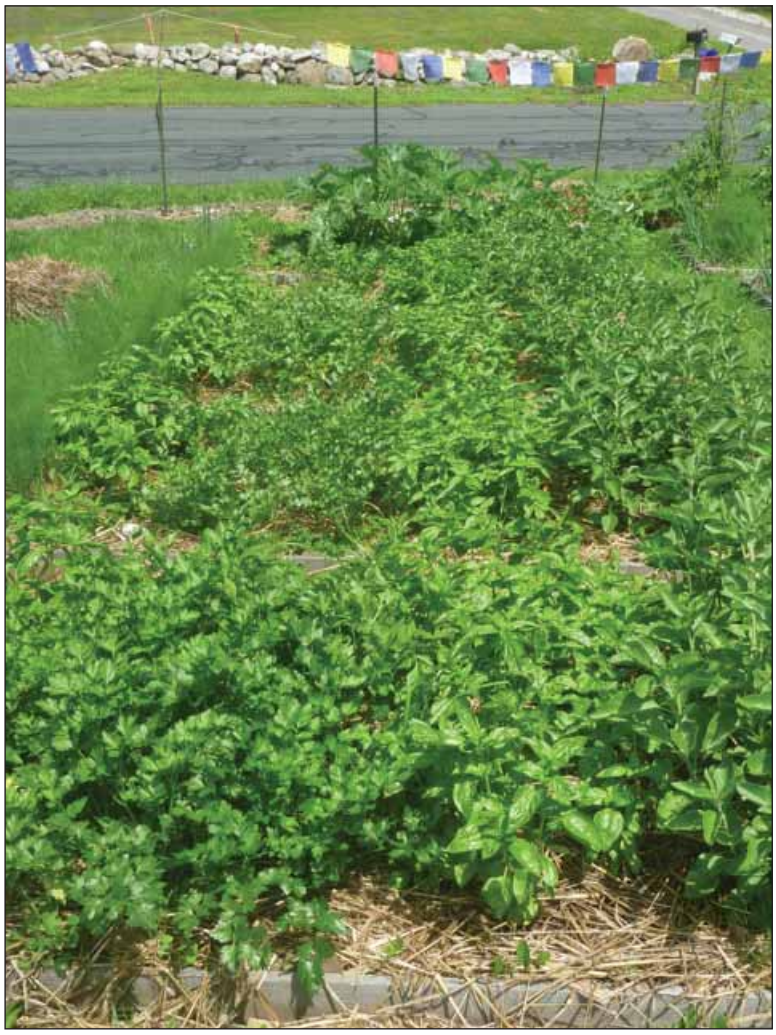
by Melody Wright

The cultivation of medicinal herbs using regenerative agriculture methods can be as vital as conservation and education in meeting United Plant Savers' goals. Herb farmers have the ability to cultivate some of the UpS "At-Risk" or "To-Watch" species, potentially reducing pressure on wild populations, as well as grow and promote alternatives to these same plants of concern. Herb farmers, particularly those who sell directly to consumers through farmers' markets or Community Supported Agriculture (CSA) models, can also play a vital role in educating consumers who may not be aware of herbalists' and UpS members' stewardship concerns.

In an ecosystem, such as a farm, just as in humans, the health of the individual depends on the health, support, and cooperation of the larger community. On farms the role of soil microorganisms is increasingly being studied and understood as vital. Peer-reviewed research has shown that a healthy population of soil microorganisms can help increase crop yields, promote disease resistance of plants, and provide tolerance to abiotic plant stressors such as drought.

Folks drawn to herbalism often look beyond the individual health benefits of plants but also believe in the role of plant medicine in the healing of the community and planet. Soil microorganisms can be part of this larger healing, as they can help produce soil stabilizing humic compounds, act as natural fertilizers for crops, provide a significant role in carbon sequestration to help combat climate change, and also provide economic stability to farmers. Finally, research has shown that the right soil microorganisms can increase the nutrient density of foods and increase the levels of the active constituents in medicinal plants, potentially leading to increased medicinal benefits.

The relationship between plant roots and one part of the world of soil microorganisms, the mycorrhizal fungi, has been called the most important symbiosis on earth, essential to ecosystem function. The challenge for gardeners and farmers is that it is still unclear how to best work with these mycorrhizal fungi. The high level of interest of growers in the benefits of working with mycorrhizal fungi led to the development of a farm-based field research project looking at crop nutrient density, disease resistance, and crop yield in five medicinal herb crops: sweet basil (*Ocimum basilicum*), ashwagandha (*Withania somnifera*), parsley (*Petroselinum crispum*), fennel (*Foeniculum vulgare*), and onion (*Allium cepa*). This field research was completed on a small medicinal and culinary herb farmlet called Pleasant Valley Botanicals in Northwest Connecticut. It was completed by the farmer, with the assistance of volunteers (special thanks to Andrea Boneset!) and statistical analysis by Dr. Maura Bozeman (a local professor of Environmental Sciences). The methodology was designed to look at the crop yield of these five crops, the nutrient density of onions, and the disease resistance of sweet basil to basil downy mildew. Basil downy mildew was chosen because it is a devastating oomycete (*Peronospora belbahrii*) that can cause 100% crop loss, and there are no effective organic or conventional controls. Basil is the most econonomically profitable annual culinary



Research beds

herb crop in the United States, and crop losses due to basil downy mildew can have a significant negative economic impact on vegetable and herb growers.

New healthy basil growth

This research used a block design method, where each of the five crops in the field received one of three treatments at time of transplantation: a control, a commercially purchased fungal inoculant, and a homegrown fungal inoculant called IMO (Indigenous Microorganism). IMO inoculant is based on a Korean Natural Farming method, designed to cultivate a native population of mycorrhizal fungi and hopefully provide a wide range of benefits to the plants through these symbiotic relationships.

As each crop was harvested throughout the growing season, the yield was recorded from plants in each of the different treatments; crops were then included in the farm's Medicinal Herb CSA shares. After data analysis, no crops in the IMO or commercial inoculant treatments had statistically significant improvements in crop yield compared to the control treatment. We also looked at the total inter-species crop yield from each bed to see if there was any possible benefit from the common mycorrhizal network. The CMN concept has shown that fungi will share nutrients between different species of plants, such as one study showing nutrient flow between a Douglas fir, a paper birch, and a western red cedar. However, there was also no statistically significant increase in inter-species crop yield.

Ultimately, this researcher concluded the environment created in the field trial did not meet the conditions necessary to support the mycorrhizal fungi and ultimately the benefits to crops as measured by yield. Specifically, regenerative agriculture presents us with three key components to have more effective sustainable agriculture systems: cover cropping, crop diversity, and low or no-till practices. This particular field design only incorporated crop diversity, as there was no prior cover cropping, and the design incorporated significant prior soil disturbance. Other research strongly suggests that maximum benefits are achieved by the inoculation of plants at the time of seeding (germination) as opposed to at the time of transplantation, as done in this study.

Because of financial and lab access limitations, this study used a refractometer to look at the brix levels of one crop, onions, as an attainable proxy for nutrient density or active constituent levels. There were no statistically significant differences in the onion brix between each treatment.

Finally, additional sweet basil plants in each treatment protocol were monitored weekly for signs of basil downy mildew based on percentage of leaf area with sporulation. There was a delay in infection in basil plants inoculated with the Indigenous Microorganisms treatment, which is a potentially promising finding worth further investigation. Even more exciting were two basil plants in the IMO treatment protocol that were infected with basil downy mildew (which typically has 100% crop loss), but then made a significant recovery with new healthy leaf growth. These finding may be an indication of systemic acquired resistance, though such a conclusion is beyond the scope of this study. This resistance is when a plant is able to develop an immune response or resistance after exposure to a pathogen, in this case because of the benefits of mycorrhizal symbiosis. Plants growing as part of a healthy ecosystem that includes mycorrhizal fungi have improved access to the diversity of metabolites and are better equipped to combat pathogens. Remarkably, plants can down-grade their immune systems to allow for beneficial symbiotic relationships, which later can protect them from other pathogens.

Setting this research project within a larger body of knowledge, the author would offer the following conclusions to gardeners and polyculture farmers: By adding fungal inoculants at the time of seeding, we improve the likelihood of seeing beneficial results. By exploring low cost, low tech methods of cultivating local indigenous microorganisms, we may find benefits

IMO (Indigenous Micro-Organism) treatment

well worth the effort. But most important is supporting growing conditions where soil microorganism can thrive, which can potentially help grow higher quality and more medicinally potent plants and offers significant environmental benefits. If used simultaneously, the three key tenets of regenerative agriculture: use of cover crops, crop diversity, and low or no-till practices potentially will create a habitat for the soil microorganisms and their associated benefits. These practices bring us back to farming methods more in keeping with natural processes than current conventional agriculture methods. ■

Melody Wright is the farmer/founder of Pleasant Valley Botanicals, a small farmlet growing vibrant medicinal and culinary herbs for the local community. Her commitment to growing medicinal herbs is based in her belief of herbs as an integral part of affordable and holistic health care and agricultural systems.

Author, Melanie Wright

The author welcomes correspondence on this article and will gladly share the data and findings, a bibliography of helpful books and relevant peer-reviewed research, or information about the SARE program for interested medicinal herb farmers.

Pleasantvalleybotanicals@gmail.com *or*
pleasantvalleybotanicals.com

This project supported in part by the Northeast Sustainable Agriculture Research and Education (SARE) program. SARE is a program of the National Institute of Food and Agriculture, U.S. Department of Agriculture.

"The spicy teas and tasty delicacies I prepare from wild ingredients are the bread and wine in which I have communion and fellowship with nature, and with the Author of that nature."

— Euell Gibbons

UNREGULATED WILD COLLECTION AND HABITAT LOSS LEAD TO VULNERABLE STATUS FOR MEDICINAL GOLDENSEAL

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Hydrastis canadensis, Goldenseal flower, Howard County, MD, Helen Lowe Metzman. USGS Bee Inventory and Monitoring Lab.

The latest update to The IUCN Red List of Threatened Species™ saw Goldenseal classified as "Vulnerable" on The IUCN Red List in a move that highlights concerns about the medicinal plant's decline.

The IUCN Red List (www.iucnredlist.org) now includes 87,967 different wildlife species, of which 25,062 (approximately 28%), are classified as threatened - assessed as Critically Endangered, Endangered or Vulnerable.

Goldenseal (*Hydrastis canadensis*) is a long-lived perennial plant native to North America (USA and Canada) where it has undergone a decline in both its distribution and the quality of its habitat.

The plant is widely used medicinally amongst rural communities and national consumers alike given its high concentration of medicinally-active alkaloids. Its applications include treating colds and other respiratory conditions as well as curing digestive disorders such as stomach pain and swelling, diarrhoea and constipation.

"Goldenseal was widespread in eastern North American forests two centuries ago, and it has long been prized for its medicinal use," says Leah Oliver, Senior Research Botanist with NatureServe who led the assessment.

"The main threats to Goldenseal are unregulated wild collection combined with historic and continuing loss of its forest habitat. However, there is a growing international market for cultivated Goldenseal, and wild-collection may be sustainable if it is carefully managed and contributes to protection of forest habitat. These activities may slow the decline of the species."

"Medicinal plants, including Goldenseal, are an important use of the earth's amazing biological diversity—not just for human health," says Danna Leaman, Co-chair of the Medicinal Plant Specialist Group of the International Union for Conservation of Nature (IUCN).

"Many subsistence incomes, as well as some substantial fortunes, continue to be made from their commercial value. Survival of the companies and markets that rely on these species depends on adoption of sustainable wild harvest methods and habitat protection. We are undertaking global Red List assessments of many

North American medicinal plants to identify the need for sustainable wild harvest before a species becomes threatened with extinction."

National and international demand for Goldenseal continues to rise. The species is designated as Threatened and is protected by national legislation in Canada, but is not protected in the United States. International trade requires a permit and is monitored by both countries under the Convention on International Trade in Endangered Species of Fauna and Flora (CITES).

"Goldenseal is an important species within the medicinal plant trade, both commercially and within local communities," said Anastasiya Timoshyna, TRAFFIC's Medicinal and Aromatic Plants Programme Leader.

"Its listing as Vulnerable to extinction should alert the industry associated with the wild harvest of Goldenseal to the urgent need for implementing sustainable wild harvesting practices—there has never been a greater need for sustainability certification systems like the FairWild Standard, which have already been instrumental in protecting other threatened plant species from over-exploitation."

The FairWild Standard was established by TRAFFIC, IUCN, and WWF, in partnership with industry and other organizations concerned about unsustainable sourcing of wild plant ingredients. It provides the necessary safeguards and frameworks to enable sustainable wild collection and ensure the long-term survival of wild plant species as well as fair pay and good working conditions for plant harvesters.

"FairWild Certification schemes can also give rural collectors and communities access to commercial markets to help them reap the rewards of sustainable wild harvesting," says Timoshyna.

"It is time that sustainable certification systems become a requirement rather than just an appendage to any form of wild plant collection. Otherwise we may see many more species declining, or disappearing completely, from the wild." ■

About FairWild

The increasing demand for wild plants—as ingredients for food, cosmetics, well-being and medicinal products—poses major ecological and social challenges. The pressure on potentially vulnerable plant species can endanger local ecosystems and the livelihoods of collectors, who often belong to the poorest social groups in the countries of origin.

As a response to these concerns, the FairWild Foundation is working with partners worldwide to improve the conservation, management and sustainable use of wild plants in trade, as well as the livelihoods of rural harvesters involved in wild collection. TRAFFIC has supported the development of the FairWild Standard, and now hosts the organization's Secretariat under a partnership agreement. www.fairwild.org

About TRAFFIC

TRAFFIC, the wildlife trade monitoring network, works to ensure that trade in wild plants and animals is not a threat to the conservation of nature. TRAFFIC works closely with its founding organizations, IUCN and WWF, making a critical contribution to achievement of their conservation goals through a unique partnership that complements and engages the considerable strengths of each of these two major global conservation organizations. www.traffic.org

About the IUCN Medicinal Plants Specialist Group

Medicinal Plants Specialist Group is a global network of specialists contributing within their own institutions and regions, as well as world-wide, to the conservation and sustainable use of medicinal plants. The MPSG was founded in 1994 to increase global awareness of conservation threats to medicinal plants, to undertake Red List assessments of medicinal plants, and to promote sustainable use and conservation action. The Group supports development and implementation of the FairWild Standard to verify sustainable harvesting and trade in wild plants. www.iucn.org/ssc-groups/plants-fungi/medicinal-plant-specialist-group

About NatureServe

NatureServe is a non-profit biodiversity conservation organization comprised of 86 Network Programs encompassing more than 800 biodiversity scientists who discover, innovate, and conserve over 70,000 species and 7,000 habitats in the Western Hemisphere. The NatureServe Network collects comprehensive information about imperiled species and entire ecosystems, transforms the data into knowledge products and visualizations, and provides meaning through expert analyses to guide decision-making, implement action, and enhance conservation outcomes. NatureServe diligently keeps its finger on the pulse of the planet, providing decision-quality knowledge to ensure the preservation of species and natural communities. Website: www.natureserve.org

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ANCIENT SAW PALMETTOS IN THE HEART OF FLORIDA

Reprinted with permission of Matt Candeias, In Defense of Plants

When we think about long lived plants, our minds tend to fixate on bristlecone pines (*Pinus longaeva*), coastal redwoods (*Sequoia sempervirens*), or that clonal patch of quaking aspen (*Populus tremuloides*) in Utah. What would you say if I told you that we can add a palm tree to that list? Indeed, recent evidence suggests that the saw palmetto (*Serenoa repens*) can reach a ripe old age measured in thousands (yes, thousands) of years.

Now, at this point some of you are probably thinking, "How can you measure the age of a palm when there are no annual growth rings?!" This is a legitimate hurdle that had to be overcome before such a claim was made. Using a lot of attention to detail and some crafty mathematics, a team of researchers was able to age saw palmettos in Florida's most ancient habitats.

This work was performed on a peculiar geological formation. Aptly named the "Mid-Florida Ridge," this 150 mile sand ridge bisects the middle of the state. Throughout much of the Pliocene and early Pleistocene, sea levels were as much as 50 meters higher than they are today. Nearly all of Florida was underwater during this time. All that stuck out above the water was a series of small islands. These islands served as refugia for flora and fauna pushed south by repeated glaciations. Once the ocean receded to its current level, these islands were left high and dry, thus forming the ridge in question. Because of its history as a refugium, the Mid-Florida Ridge is home to a staggering array of plant species, some of which are endemic to this relatively small area of Florida.

Saw palmettos

South Florida Satellite Image Map – The light sandy looking area in the middle is the Mid-Florida Ridge

Because of its relative stability through time, the Mid-Florida Ridge is a haven for long lived plant species. Thus, it was a prime location for trying to understand the longevity of the charismatic and ecologically important saw palmetto. By tagging individual palms and observing them year after year, researchers were able to get an idea of exactly how fast this species can grow. Depending on soil conditions, saw palmettos grow at a rate of somewhere between 0.88 and 2.2 cm per year. They certainly aren't winning any speed races at that rate. Regardless, you can begin to see that an estimate of yearly growth rate can shine a light on how

long these palms have been around. Measurements of tagged palmettos growing on the sand ridge show that individuals aged at a staggering 500 years are not uncommon!

This estimate gets a bit complicated when we consider another aspect of saw palmetto biology - they are clonal. For a variety of reasons, as saw palmettos grow, their sprawling stem will often branch out, creating clones of themselves. Over time, the trunk portions that connect these clones rot away, giving the impression that they are unique individuals. Genetic analyses showed that many of the palmettos in the study area were actually clones. Using some pretty sophisticated models coupled with DNA evidence, the research team was able to reconstruct the growth history of many of these clones, thus allowing them to more accurately age these clonal colonies.

Their results are staggering to say the least. Based on the rate of growth and spread, the estimated age of these clonal patches of saw palmetto range anywhere between 1227–5215 years! At this point you should be asking yourself "how accurate are these data?" The truth is that the researchers were actually being quite conservative in their estimates. For instance, there were likely many clones well outside their study area. If so, they were likely underestimating the growth time of these clonal colonies. Additionally, they were only using the growth rates of adult saw palmettos in calculating average growth rates.

Seedling saw palmettos have been shown to have a reduced growth rate compared to adults, only 0.3 cm per year. Thus, they did not take into account the time it takes for seedlings to reach maturity. The team feel that accounting for such variables could increase the age estimates for such clonal patches to well over 8,000 years! I don't think we should be looking into buying that many birthday candles just yet, however, even their reported estimates are shocking to say the least.

What we can say is that for as long as Florida has been above water, saw palmettos have played an integral role in the ecology of the region. Long before humans began developing the state, the saw palmetto was functioning as a major player, shaping these sand ridge communities into the ecosystems they are today. It is without a doubt, a species worthy of our admiration and respect. ■

IN DEFENSE OF PLANTS

It would seem that most people don't pay any attention to plants unless they are pretty or useful in some way. This is not good for the natural world. Plants are so much more than medicine or food. They are living breathing organisms that are fighting for survival just like animals. What is more, plants are the foundation upon which all other forms of life sit. They have this amazing ability to use our nearest star to break apart water and CO2 gas in order to grow and reproduce. From the smallest duckweed to the tallest redwood, the botanical world is full of amazing evolutionary and ecological stories. I am here to tell those stories. My name is Matt and I am obsessed with the botanical world. In Defense of Plants is my way of sharing that love with you. www.indefenseofplants.org

"I see a time of Seven Generations when all the colors of mankind will gather under the Sacred Tree of Life and the whole Earth will become one circle again."

– Crazy Horse,
Oglala Lakota Sioux
(circa 1840-1877)

Monotropa uniflora growing under White Pine in Bowie, Maryland, Zone 7A

LESSONS ON STEWARDSHIP: CHINQUAPINS, CHIGGERS, AND INDIAN PIPES

by Ruth Davis

Plants are often introduced into my garden by a share from a friend. Sometimes it is only a fond memory shared that sends me on a search for the plant itself. This is the case with the chinquapins. My mother spent her childhood in the foothills of the Blue Ridge Mountains and talked so often about the abundance of the delicious nuts from these scrappy relatives of chestnuts. So, as a memorial, a few years ago, I began a quest to establish them in my garden. The first transplants from a southern Virginia nursery failed, but a second planting had survived two winters and were growing!

On a beautiful early summer afternoon, I made my way to check on the very first, very eagerly awaited chinquapin nuts. Surely, their willingness to fruit meant they were content in their suburban Maryland location under a small grove of white pines, and I was very pleased. Smiling on the path out, a bit of gleaming white caught my eye. Kneeling down to examine this 4" wonder, I met for the first time an intriguing and very unusual plant—*Monotropa uniflora*, commonly called Indian pipes or ghost plant.

Soon I was back at my computer researching and learning from others about this queer and clever plant. But what I most want to share with you is what the plant taught me firsthand, and it was not a pleasant lesson.

Starting with Google Images, I was able to find the plant's identity, and then went searching for more information. Ghost pipes are unusual in appearance, in method of survival, and in relationships with humans. I found many essays, comments, photos, and even a Facebook group. After reading and digesting what others had to say, I began to feel quite uneasy that ghost pipes were about to become the newest "rock star" of the herbal world and face danger of overharvesting.

Monotropa uniflora is a mycotrophic plant, meaning that it exists by tapping into the mycorrhizal network, obtaining nutrients thought this mutualistic relationship between fungi and plant roots. It does not photosynthesize nor contain chlorophyll. It can neither be transplanted nor propagated. The simple fact of their uniqueness seemed to make people want to harvest ghost pipes with abandon, not pausing to question the need of the human, nor the survival of the plant. Mostly the "otherworldliness" attributed to this plant seemed to be the draw, even with warnings that its magic and mystique were powerful forces. Soon I had confirmation that the warnings and my fears were real.

The next morning after my first encounter, I took my husband out to see the chinquapin nuts, stopping also to wonder about the pipes. We talked a bit about my research, the unearthly quality of the plant, and why it might have popped up just there and just then. We agreed that we had never encountered anything remotely akin to this Being; we agreed that the plant should be left in place, protected and watched without harm—that is, without harm to the pipes.

Later that day we both started to itch. Ferociously. After comparing symptoms and going back to Google, it appeared that we were the victims of chiggers. Seriously? We had not even been away from our house for a few days? It became apparent that we had been only one place outdoors together where we might have encountered the chiggers—at the locations of the chinquapins and the ghost pipes.

Not in 50 plus years of exploring and enjoying all that the great outdoors has to offer had I succumbed to this plague. My husband had also spent years as a Boy Scout and enjoyed camping and hiking as I had, and he also had never seen this form of torture. During the following several weeks of nearly constant application of anything we could think of to stop the itch, we talked a lot about why the chiggers hit when they did. I am a "get down in the dirt" kind of gardener and have knelt, sat, and sometimes crawled all over this property that we tend. I feel certain that this was a call from the ghost pipes. I had already felt unease through my readings, and it seemed that the chiggers were a very deliberate warning that the pipes should be left alone. I complied.

Later in the season, we found another little stand of ghost pipes about 5 yards from the first. Again, we watched with respect and admiration, but from a distance. The information that I learned about this marvelous plant will be shared later—again with a caution toward harvesting respectfully, only if necessary, and if invited. Maybe they will call to me for use in the future. For now, however, my goal is to have spoken on their behalf, reminding others that we have a duty to act thoughtfully and prudently in our interactions with the plant world, preserving and protecting where we can. Likewise, I hope to share more thoughts in a future article on the chinquapins and the chiggers as they were also a big part of this lesson. ■

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Ruth Davis is a student of nature and a household herbalist in Bowie, Maryland. Grateful for the generous teachings of the plants and the humans who speak for them – historic and contemporary – she is eager to continue the sharing of knowledge at every opportunity. Reach her at ruthdavis@aol.com.

Artist, Katherine Ziff

SOLOMON'S SEAL

by Laurie Quesinberry

Solomons seal roots

Unlike ginseng (*Panax quinquefolius*), Solomon's seal (*Polygonatum multiflorum*) sells for very little to a local root broker. However, its tendency to grow in thick patches and being easy to dig makes it a poacher's gold mine. These plants were once found in abundance along the meandering roadsides of my area. As a former poacher, I've seen firsthand the damage that's done by overharvesting and road crews.

As plans for the expansion of Hwy 58 into a four-lane highway chug along and survey lines go up marking land that will forever be changed, you'll find me fighting the frozen ground to harvest Solomon's seal roots. Most people wouldn't look forward to searching the roadsides for brown tops that have died back for the winter, but to me it's a privilege. You see, no longer are these plants a few pennies in my pocket from the local broker. Instead, this Solomon's seal is a key to my family's future.

Looking towards a sustainable path for both my family and the plants is an ever unfolding journey. The more I learn, the more it becomes evident that farming the plants I once harvested from the wild is the only truly viable path. But I'm not a farmer; I'm a digger. Nonetheless, I anxiously await the days when it's above freezing to go out with my shovel and bucket to gather roots for planting in my less than an acre yard.

This is a whole new concept, and there is no near-by farmer that I can visit to learn from. Instead the plants are teaching me and leading the way. In the wild Solomon's seal grows alongside its close cousin, giant Solomon's seal (*Polygonatum biflorum* var. *commutatum*), and together they thrive. Medicinally interchangeable, giant Solomon's seal's unique root growth habits hold great promise as a commercial crop.

Giant Solomon's seal is fast growing and has massive roots in comparison to standard Solomon's seal. One root has the potential to grow over two feet long and weigh half a pound. Thriving in conditions where the roots are compacted and growing intertwined, a 3x5 foot patch of plants can yield twenty or more pounds of sellable root.

Another wonderful aspect of giant Solomon's seal is its propagation. Easy to grow by seed, these plants also self propagate. In the wild, I often find mother and grandmother roots that are creating baby roots off of their sides. As the older root dies back, the offspring establish themselves and carry on. Knowing that root division is part of Solomon seal's natural life cycle shows me that it's possible to use smart root division to my advantage.

With well over one hundred pounds of Solomon's seal in the line of bulldozers, I'm on a mission to rescue as much as I can and use it to create a thriving farm. All around my house, I'm creating beds and holding places for rootstock. Following the cues of nature, I'm dividing roots into different lengths for planting back with the hope that each piece will create a new plant. As the ground thaws, I'll plant these divisions in beds based on their size. With this model, we'll be able to harvest different beds each year putting back cuttings and babies to start the cycle all over again. Additionally, thousands of seeds will be produced and planted back. The potential is truly as amazing as nature herself.

As the demand for Solomon's seal rises, with no end in sight, it's foreseeable that this plant will all but be lost within my lifetime. On the other hand, the future doesn't have to be so grim. If all goes well, this spring my land will be bursting forth with plants—a sign that true change is possible not only for me, but also for other diggers in my area. This is a growing example of how thinking outside of the prescribed box and looking at nature differently can create a better future for both our families and the plants around us (unconventional to say the least). But I believe the plants are leading us down an unconventional path. They have a plan and "if we listen, they will teach us" the way. ■

Laurie Quesinberry, a generational digger and mountain woman, is steeped in the traditions of Appalachia wildcrafting. Laurie's unique perspective towards commercial wild harvesting started as a poacher and evolved into the role of plant- and land-steward. Today she's working to breathe new life into old traditions, while preserving a path for the future by promoting sustainable harvesting methods for "At-Risk" plant medicine.

A tiny osha sprout grows from roots left over from earlier harvest in a research plot on Missionary Ridge.

RESEARCHERS STUDY IMPACT OF MEDICINAL PLANT'S HARVEST IN SAN JUAN NATIONAL FOREST

By Ann Bond

National forests supply Americans with many natural resources – timber, livestock forage, minerals, energy – and increasingly, medicinal plants. Although native plants have been harvested for centuries by Native American tribes for medicinal purposes in North America, the modern herbal industry has increased the pressure on some species.

One of the medicinal plants found in the San Juan National Forest is osha (*Ligusticum porteri*), a slow-growing, perennial member of the parsley family. Osha is found in the southern Rocky Mountains and Sierra Madre between 7,000 and 11,000 feet. Large roots, typically from plants at least 10 years old, are favored as an herbal remedy.

"Osha has many traditional uses," said Regi Black Elk of the Oglala Lakota Nation in South Dakota. "It is used for upper respiratory infections. You can chew the root for a sore throat, and it aids in treating colds."

Black Elk, a senior studying American Indian Studies at Haskell Indian Nations University in Lawrence, Kansas, was high atop Missionary Ridge north of Durango last month helping collect data for a research project on the impacts of root harvest on osha populations.

"This work is hard but beneficial, especially if the Forest Service uses it to work with native tribes to save medicinal plants for future generations," said Black Elk as he climbed over downed logs searching for osha sprouts and seedlings to flag amid dense vegetation.

The collaborative effort is spearheaded by Kelly Kindscher, senior scientist and environmental studies professor at the University of Kansas. His diverse research group includes college students and representatives from United Plant Savers, a national nonprofit, which lists osha as a species at risk from over-harvest, and the American Herbal Products Association, an industry group that promotes responsible commerce of herbal products.

"The Forest Service faces the challenge of managing the harvest of medicinal plants in a sustainable manner, so they will be available for traditional and cultural purposes into the future," said Gretchen Fitzgerald, a forester who oversees permits for medicinal plant harvest on the San Juan National Forest. "Research like this will help us obtain biological information to inform our decisions."

Sixty plots were established in areas where osha grows naturally on the Rio Grande and San Juan national forests. To add diversity, locations included an open meadow and beetle-killed forest in the Cumbres Pass area, and the burned area of the Missionary Ridge Fire.

"In some plots, we harvested 100 percent of the flowering plants and/or those mature enough to flower," Kindscher said. "In others, we harvested one-third or two-thirds each year. In the control patches, we didn't harvest at all. Now, three years later, we see some flowering plants in all of the plots."

All those involved in the study say their intent is to ensure an abundance of medicinal plants on public lands. It takes osha three to five years to grow into its flowering reproductive stage. While it is resilient as a rhizome that can grow from its roots and also produce seeds, its vulnerability comes from its limited range, slow growth, and the fact that its roots are dug up during harvest. Additionally, osha has not been cultivated commercially because its germination rates are low, and it is very slow growing.

"We're not asking for a moratorium on the use of native plants. Rather, we want to preserve these important species," said Susan Leopold of United Plant Savers. "I'd love to see the creation of botanical sanctuaries to protect biodiversity for medicinal and native species and harvest areas set up to engage people with their public lands."

Leopold says that protecting osha habitat will also protect other medicinal species in the Rocky Mountains, such as baneberry, arnica, yarrow and others.

Daniel Gagnon, who owns the Santa Fe shop, Herbs, Etc., participated in the study as a representative of the American Herbal Products Association.

"We all need to work together to teach people how to harvest in a sustainable fashion," Gagnon said. "We'd like to see the allocation of certain areas to certain pickers under permit and monitor the results."

Kindscher said he expects to submit the results of his research for publication within a year.

"We feel we have enough data now to put forth a proposed rate of sustainable harvest for osha to be considered by the public land agencies, industry and others," Kindscher said.

In the meantime, the San Juan National Forest will have no program for commercial harvest of osha until the results of the research offer enough information about how best to manage harvest of this important plant.

"Free permits are required to collect small amounts of osha root for personal use," Fitzgerald said. "Participating in the permit process allows us to keep track of which areas are being harvested and to offer harvesting tips for sustainable practices." ■

Ann Bond is the public affairs specialist for the San Juan National Forest. Reach her at: abond@fs.fed.us. Reprinted with permission of The Durango Herald www.durangoherald.com. *Images courtesy of Ann Bond/ San Juan National Forest.*

Daniel Gagnon, left, owner of Herbs Etc. in Santa Fe, and Maggie Riggs, a volunteer from Lawrence, Kansas, prepare to plant flags to mark the levels of osha regeneration in study plots on Missionary Ridge.

Regi Black Elk, left, a student at Haskell Indian Nations University, and Courtney Masterson, a student at the University of Kansas, plant flags to mark immature, mature and flowering osha plants in a research plot on Missionary Ridge.

A smiling Susan Leopold of United Plant Savers helps the University of Kansas research crew monitor the rates of regeneration of osha in plots established on Missionary Ridge.

LEARNING TO DEFINE SUSTAINABILITY: LESSONS FOR ESSENTIAL OIL CONSUMERS

by Erika Galentin, MNIMH, RH (AHG)

The Elephant in the Room

Define sustainability. "Sustainability" is a not-so-new term floating around the shelves of our global economy, hot on the tongue of marketers and advertisers ready to sell us the next best thing to organic. Within the natural products industry, "sustainability" is a concept that appears in many dressed-up forms. For example, when we are purchasing essential oils or herbs, we are keenly aware of phrases such as "sustainably harvested" or "ethically wild crafted." These phrases indicate concepts that we all seem to intuitively understand when we see them on a label, as if they give us clear conscious permission so we can proceed with our purchase.

When we see these phrases, we would like to think that the path this product has taken from its origins to our shopping cart is free from atrocity, dirty business, and unkind environmental practices. But is this really the case? How, for example, can the bark of Hawaiian sandalwood (*Santalun albun*) or palo santo (*Bursera graveolens*) be "sustainably harvested" when the biological, ecological, social, and economic data that would define its sustainable harvest do not exist? Can there really be such a thing as "ethically wild crafted" or "ethically harvested" when we are purchasing a critically-threatened species? Can a product be sustainable when an entire culture has become enslaved by its sale on the international market?

Believe it or not, for the average consumer "sustainability" is a concept that is nearly impossible to define. Marketing has done a good job of teaching us that all we need to know is that "sustainable" equals "good," just as "farm fresh" or "all natural" equals "good" (although they rarely do). So, when thinking critically about the products we purchase, how much do we really know about sustainability and what it truly means?

To emphasize the weight of this question, it is important to remember that there are many businesses and manufacturers (even within the natural products industry) that have mentioned sustainability as a goal, yet often fail to transparently define how it is measured. To further this point, "sustainability," "sustainably harvested," or "ethically wild crafted" can mean entirely different things, depending on the product and the company producing it.

Distillation of Lemon Balm using an Alquitar copper still. Photo by Erika Galentin.

So if businesses and manufacturers are not upfront, clear, or consistent about how they define these phrases, how are consumers meant to interpret their meaning? The answer to that question is pure and simple. As consumers of essential oils, we must educate ourselves, not just about the company and the end product we are purchasing, but also about the plants themselves and their journey to market. We must learn to define the terms "sustainability," "sustainably harvested," or "ethically wild crafted" for ourselves, rather than simply trusting a label. This takes work and effort, and for many consumers, this is the elephant in the room. Not only is it sometimes impossible to find all the answers we seek, some of us are fatigued by the idea that our purchasing decisions may require additional energy beyond what is already represented by our dollars.

For herbalists, aromatherapists, and consumers of essential oils and medicinal plants, the journey to defining "sustainability" may be a long one, but it can also be incredibly rewarding. I liken it to going for a run, after having had a tough time motivating myself to put on my running shoes. Afterwards, I feel so good about myself, well in my body and mind, and generally accomplished. So, let's not get too overwhelmed and discouraged by the work and start our journey together with a few simple definitions.

Learning to Define Sustainability from a Consumer Perspective

Before diving into the sustainability of essential oils, it is important to clearly present some concepts that are meant to define "sustainability" within a larger context. It is from this defining framework that we can then begin to ask questions about the sustainability of essential oils directly. To begin, when we type "define sustainability" into Google or Yahoo what do we find? Give it a try and let's see. Both browsers point us to the following:

From Dictionary.com:

sustainability [suh-stey-nuh-bil-i-tee] noun

1. The ability to be sustained, supported, upheld, or confirmed
2. Environmental Science. the quality of not being harmful to the environment or depleting natural resources, and thereby supporting long-term ecological balance

The next listed search result in our browsers is the Merriam-Webster.com definition:

sustainable sus · tain · able [sə-'stā-nə-bəl] adjective

1. Able to be used without being completely used up or destroyed
2. Using methods that do not completely use up or destroy natural resources
3. Able to last or continue for a long time

Bay laurel soaking in water before distillation. Photo by Erika Galentin.

These definitions seem rather comprehensive as I read them and try to understand the concepts that they explain. Both of these definitions suggest larger issues regarding quantity of resources, impact of long-term resource use and resource availability, and the environmental impact of extracting and utilizing those resources. These definitions are reminiscent of my internal, intuitive definition of "sustainability" and perhaps represent where many of us go in our minds when we try and define "sustainable." However, more importantly, these definitions raise some interesting resource-based questions.

Using these definitions, we may ask ourselves, "If this product were continually produced in the same way, what types of resources would be needed to *sustain*, *support*, and *uphold* its production to indefinitely *confirm* its presence in the marketplace?" This is, of course, a loaded question that in and of itself begs further inquiry. For example, what is a resource? Is it plant material? Agricultural land? Fossil fuels? People? Is the marketplace a global or local one?

With these definitions, the issues of environmental degradation and depletion of natural resources are also mentioned. They give us the opportunity to ask questions such as, "If this product were continually produced in the same way indefinitely, would this resource disappear or cause other resources to disappear?" or "Can the methods being used to extract this resource ensure that the resource populations and habitats are not being decimated?" All in all, these definitions and the questions they arouse seem sound.

However, our process of defining "sustainability" is not yet complete. There is still more to add and certainly more to think about. There may be as many definitions of sustainability as there are groups or entities trying to define it. These additional definitions may have something to do with living within the limits, understanding the interconnections among economy, society, and environment, or encouraging the equitable distribution of resources and opportunities. However, different ways of defining sustainability are useful for different situations and different purposes. For this reason, we need to put our business hats on and check "sustainability" out from a business or manufacturing perspective.

The Triple Bottom Line: Planet, People, Profit

Oh geez. There it is: **profit**, the word that can make my skin crawl, as it tends to carry with it some negative connotations. However, within the capitalistic model of economics, profit is vital to business. Business is vital to economics. Economics is vital to the maintenance and stability of culture and society, and so on and so forth.

We have to remember that as consumers within this web of a capitalistic economy, profit must play a part in the decisions that businesses make about the products they source, manufacture, and sell to us. We can sit here and say that businesses are wrong or evil

for wanting to make a profit off of nature, but that is oversimplifying things. It is how those businesses go about making that profit that should concern us as consumers.

I mention all of this because there are many profitable businesses out there that have taken the time to strategically design their sustainability protocols, which out of good measure will most often be easily accessible to the consumer (and not absent or buried in their website). More often than not, these protocols are based on a framework known as "**triple bottom line accounting**," which incorporates three measures of performance: social, environmental, and financial. These three measures are also referred to as the 3P's: people, planet, profit, or the "three pillars of sustainability."

Sustainable businesses should be incorporating measures of these three different bottom lines in order to take account of the full cost involved in doing business. "Profit" refers to the standard measure of corporate profit, or the bottom line of profit and loss. "People" refers to how socially responsible a business has been throughout its operations. This refers not only to employees, but to the communities that the business is involved with. Lastly, "planet" clearly refers to a measure of how environmentally responsible a company has been.

The first drops of Lemon Balm hydrosol. Photo by Erika Galentin.

One of the major issues with businesses labeling themselves as "sustainable" using this framework is that while profit and loss are measured in dollars, it is difficult to create a measure for social and environmental impact. These later measures can be company/business specific. As consumers, we may not agree, or we may find that the standards that the business is using to measure social and environmental impact are inaccurate or incomplete. Nonetheless, getting a handle on the concept of "triple bottom line accounting" gives consumers an opportunity to learn about sustainability from a business perspective. This can assist us in our information gathering and help us see the bigger picture when we make purchasing decisions.

The Bottom Line of Essential Oils: Resource Intensive Products

Now that we have taken the time to contemplate some larger concepts within the definition of "sustainability," we are ready to get down to the nitty-gritty.

Unfortunately, it cannot be sugar coated. **Essential oils are resource-intensive products**. Period. It begs the question as to whether or not essential oils as products could ever fit into a definition of "sustainable." As consumers of essential oils, we should be willing to face this truth and see it for what it is.

"Why be so glum?" you may ask. Let's think about the sheer quantity of plant material needed to create a very small amount of essential oil. **Hundreds, and sometimes thousands, of pounds of plant material are needed to produce just 1 gallon of essential oil**. This is a huge volume when we think about the amount of agricultural land needed to grow the plants (soils, fertilizers, pesticides, water) or even when we are considering phrases like "wild crafted" or "ethically harvested" from wild populations.

We also need to consider other resources that are used in the harvest, transport, and production of essential oils. For example, if you are in the United States, and you are buying lavender essential oil, are those lavender plants being grown in the United States? It's not likely. Let's think about the quantity of fossil fuels needed for the agricultural production, distillation/production, and international transport of these products.

What about the people involved in essential oil production, from the growing or collecting of plant material, all the way to the final product? Are farmers or gatherers being given a fair price for their efforts? Is there support going back into the community? Do they have access to food, water, healthcare, and education? Is the industry negatively impacting culture? What about the company's employees? Are working conditions safe?

What about the plants themselves? Are they critically threatened, or does the process of gathering the materials for their essential oil production actually kill the plant? Are they an endemic species, or do they require very specific habitat that can easily be destroyed through intensive harvesting? Are industries cutting down forests to create space for agricultural crops, as is the case of palm oil? As you can imagine, there are many, many layers to this onion. And sometimes onions can give us tears.

What is Your Bottom Line?

So perhaps you are now thinking to yourself "This lady doesn't want us to use essential oils at all." This is actually not the case. I use essential oils frequently for both self-care and for my family and clients. There are many companies involved in the essential oil industry that take the definition of "sustainability" and run with it. They are doing good work and are transparent and fair in their business dealings.

I make my essential oil purchases keeping in mind that essential oils are resource-intensive products. I choose which oils to use, which ones to avoid, and which companies to purchase from, based upon my own knowledge, understanding, and well-developed definition of "sustainability." As a consumer, I continue to do the work needed to make the most ethical and sustainable purchases possible considering the product I am purchasing. I have created my own bottom line.

When learning how to define sustainability, it is important to remember that **our purchasing power can shape entire industries**. When we educate ourselves and make informed decisions about our purchases, we as consumers are the ones defining what "sustainability" means, rather than relying on the company or manufacturer to define it for us.

I have presented the preceding concepts and definitions with the hope that we all can discover how to ask better questions in regards to sustainability and learn how to think more critically about our essential oil purchases. It is probably safe to say that if you have read this entire post, you are a consumer of essential oils who is willing to do the work. For that, I commend you.

Resources for further reading:

Cropwatch
Is an Independent Watchdog for Natural Aromatic Products used in the aroma (fragrance/cosmetics, flavour, aromatherapy), traditional herbal medicine and phytochemical industries. Many of these natural commodities are under threat via their over-exploitation in the wild (see articles in Cropwatch Files section), or their continued use and availability faces uncertainty via the imposition of restrictive & over-precautionary legislation. You can find Cropwatch's list of threatened aromatic plants here.
http://www.cropwatch.org/

FairWild Foundation
Established in 2008, the FairWild Foundation promotes the sustainable use of wild-collected ingredients, with a fair deal for all those involved throughout the supply chain.
http://www.fairwild.org/

The Numen Blog and the Sustainable Herbs Project
The Sustainable Herbs Project is a new project by the producers of the award-winning documentary, Numen: the Nature of Plants, the first feature length film on the healing power of plants. We are creating an interactive documentary following medicinal plants through the supply chain to provide you with the information needed to feel more confident about the herbal remedies you purchase. With stories, videos, and facts, we'll bring the supply chain to life with interviews with men and women involved in all aspects of the industry.
http://www.numenfilm.com/blog/sustainable-herbs/

United Plant Savers
United Plant Savers' mission is to protect native medicinal plants of the United States and Canada and their native habitat, while ensuring an abundant renewable supply of medicinal plants for generations to come. HANE students and members can get a United Plant Savers membership at a discounted price. Log in to your student account or Herbarium membership and click on the "discount" tab for more info!
http://www.unitedplantsavers.org/

American Sustainable Business Council
The American Sustainable Business Council offers programs that educate and inform the public and policy makers about the benefits of a more sustainable economy and about policies and practices that can help the economy become more sustainable. The Council spans a growing network of business associations across the United States, which in turn represent over 200,000 businesses and 325,000 business executives, owners, investors, and others.
http://asbcouncil.org/

Lowell Center for Sustainable Production (University of Massachusetts Lowell)
The long-term goal of Lowell Center projects and affiliates is to redefine environmentalism and occupational health and safety while also demonstrating how these concepts are compatible with new systems of production and consumption that are healthy for workers, environmentally sound, economically viable, and socially accountable.
http://www.sustainableproduction.org/ ■

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Images courtesy of Erika Galentin, MNIMH, RH (AHG)

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ESSENTIAL AND CARRIER OIL-BEARING PLANTS: CONSERVATION CONSCIOUSNESS

By Kelly Ablard, PhD, MSc, RA, EOT

The planet is undergoing the "sixth extinction" whereby species are being lost at a rate that far outruns the origin of new species. According to the IUCN (2018), approximately 970 species/subspecies are extinct, and nearly 7000 land plant species are threatened (i.e. critically endangered, endangered, or vulnerable). As an ethnobotanical and conservation research scientist and a certified essential oil therapist, the implications for the future of aromatic plant medicine are of considerable concern, not only for North America, but for countries throughout Africa, Asia, and Latin America which primarily use traditional medicine to support their health (WHO, 2003).

This is because although medicinal plants are highly valued for their use within these countries, essential oils of many aromatic plants are exported for economic gain. This puts a particularly high demand on said plants, as their oils and extracts are utilized worldwide. They are used in soap, cosmetics, solvents, toothpaste, shoe polish, printing ink, gum, soft drinks, tobacco, candy, ice cream, reagents, agriculture, perfume, and as medicine (Shiva and Lehri, 2002). Further, oil-bearing plants may be unsustainably managed, overharvested, and illegally traded. This puts these plants in imminent danger of extinction, especially when high demand and unsustainable management are coupled with impacts of climate change, overgrazing, pests, disease, fire, and/or logging.

Figure 1. Evidence of illegal logging of Rosewood (*Aniba rosaeodora Ducke*), Peru. © Kelly Ablard

Although some measures are in place to address pertinent sustainability and conservation issues globally, conservation consciousness of these measures is just beginning in North America within industries that rely on essential and carrier oils. Consequently, the goal is to spread awareness as we all have a responsibility to protect and preserve the plants on which we depend and deeply value.

Conservation statuses of over 400 essential and carrier oil-bearing plants using Global Forest Resources Assessment (2005) and the IUCN (2018) reports and databases were researched in September, 2017. Consequently, there are 20 threatened species (6 critically endangered, 6 endangered, and 8 vulnerable); and 6 species regulated by Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES, 2018).

CRITICALLY ENDANGERED

The actual or projected reduction in population size has decreased by ≥80% over the last 10 years or 3 generations; there are only fewer than 250 mature adults and the numbers are declining, and there is a 50% probability of extinction within 10 years or 3 generations. Critically endangered species are palo santo (*Bursera graveolens*), spikenard (*Nardostachys jatamansi* a.k.a. *N. jatamansi*), sandalwood (*Santalum album*), guggul [a.k.a. common myrrh] (*Commiphora wightii*), silver white fir (*Abies alba*), and agarwood (*Aquilaria rostrata*) (IUCN, 2018) (Table 1).

ENDANGERED

The actual or projected reduction in population size has decreased by ≥50% over the last 10 years or 3 generations; there are fewer than 2500 mature adults and the numbers are declining, and there is a 20% probability of extinction within 20 years or 5 generations. Endangered species are juniper berry (*Juniperus communis*), rosewood (*Aniba rosaeodora*) (Figure 1), atlas cedarwood (*Cedrus atlantica*), bay laurel (*Laurus nobilis*), araucaria [a.k.a. callitropsis; faux santal] (*Neocallitropsis pancheri*), and rosewood [English] (*Dalbergia abrahamii*) (IUCN, 2018) (Table 1).

VULNERABLE

The actual or projected reduction in population size has decreased by ≥30% over the last 10 years or 3

generations; there are less than 10,000 mature adults and the numbers are declining, and there is a 10% probability of extinction within 100 years. Vulnerable species are olive (*Olea europaea*), sandalwood (*Santalum album*), sweet almond (*Prunus amygdalus*), Spanish cedar (*Cedrela odorata*), elemi (*Canarium luzonicum*), Brazilian sassafras (*Ocotea pretiosa*), Siam wood (*Fokienia hodginsii*), and agarwood (*Aquilaria malaccensis*) (IUCN, 2018) (Table 1).

CITES

There are approximately 30,000 protected by CITES. Six CITES protected essential oil-bearing plant species are guaiac wood (*Bulnesia sarmientoi*), rosewood (*Aniba rosaeodora*), agarwood (*Gyrinops* spp. and *Aquilaria* spp.), African sandalwood (*Osyris lanceolata*), Himalayan spikenard (*N. grandiflora* a.k.a. *N. jatamansi*), and Indian rosewood (*Dalbergia darienensis*) (CITES, 2018) (Table 1).

CONSERVATION CONSCIOUSNESS

There are ways to help conserve threatened aromatic medicinal plants. You can educate sellers and consumers about their plight and remain current on statuses and the global value of these plants through the IUCN, CITES, TRAFFIC, and United Plant Savers (UpS) websites. Take an active role in collective research projects by using tools like the UpS "At-Risk" assessment tool, or the IUCN Assessment tool for gathering population data. Grow and distil aromatic medicinal plants in community gardens; this is common in countries where aromatic medicinal plants extracted for essential oils face extinction. And you can also volunteer on projects aimed at replanting and saving/sharing seeds.

Finally, buy oils from aromatic medicinal plants not listed by the IUCN as Threatened or Near Threatened, but rather have a status of Least Concern (e.g. Roman chamomile (*Chamaemelum nobile*), yarrow (*Achillea millefolium*), and Virginian cedarwood (*Juniperus virginiana*) (Table 1). If possible, use oils from plants categorized as Least Concern because species that have not yet been assessed, or issued a status of data deficient could have a status of concern. If you choose to use oils extracted from threatened plants, minimize their use, ensure they are backed with a CITES permit when necessary, and request GC-MS profiles, which are critical as many said oils are adulterated and/or synthetic. Also explore alternative oils with similar chemical profiles. For example, because of their high linalool content, Ho wood (*Cinnamomum camphora*) and coriander oil (*Coriandrum sativum*) are good alternatives to rosewood (*A. rosaeodora*) oil and are not derived from threatened species.

I hope you will join me in elevating conservation consciousness as one way to help protect and preserve these beloved aromatic medicinal plants. For more information, please visit www.kellyablard.com. ■

"Earth provides enough to satisfy every man's needs, but not every man's greed."

— Mahatma Gandhi

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Table 1. Common and Latin names, Countries (where threats are present), Conservation statuses, and last assessment dates of Threatened and Near Threatened essential and carrier oil-bearing plant species; *CITES regulated species.

Common name(s)	Latin name	Countries	Conservation status	Last updated
Agarwood	*Aquilaria rostrata; Gyrinops* spp.	India; Malaysia	Critically Endangered*	1998
Guggul (Common myrrh)	*Commiphora wightii*	India; Pakistan	Critically Endangered	2014
Palo Santo	*Bursera graveolens*	Peru	Critically Endangered	2005
Sandalwood	*Santalum album*	Timor Leste	Critically Endangered	2005
Silver white fir	*Abies alba*	Belarus	Critically Endangered	2005
Spikenard	*Nardostachys jatamansi* a.k.a. *N. grandiflora*	India; Nepal; Bhutan; Myanmar; SW China	Critically Endangered*	2014
Juniper berry	*Juniperus communis*	Europe	Endangered	2005
Laurel leaf or bay laurel	*Laurus nobilis*	Albania; Slovenia	Endangered	2005
Rosewood (Bois De Rose)	*Aniba rosaeodora*	Brazil; Peru; Colombia, Ecuador; French Guiana; Guyana; Suriname; Bolivian Republic of Venezuela	Endangered A1d+2d ver 2.3*	1998
Atlas cedarwood	*Cedrus atlantica*	Algeria; Morocco	Endangered A2cd ver 3.1	2013
Araucaria (Callitropsis; Faux santal)	*Neocallitropsis pancheri*	New Caledonia	Endangered A2cd; B1ab….	2009
English Rosewood	*Dalbergia abrahamii*	Madagascar	Endangered B1+2abcd ver 2.3*	1998
Muhuhu	*Brachylaena huillensis*	African countries	Lower Risk/near threatened ver 2.3	1998
Opopanax	*Commiphora guidotti*	Ethiopia; Kenya; Somalia	Lower Risk/near threatened ver 2.3	1998
Karamaryanian thyme	*Thymus karamarianicus*	Azerbaijan	Near Threatened	2008
Frankincense	*Boswellia sacra*	Oman; Somalia; Yemen	Near threatened ver 2.3	1998
Himalayan fir needle	*Abies spectabilis*	Afghanistan, China, Nepal, Pakistan	Near Threatened ver 3.1	2010
Port Orford cedarwood (Rose of cedar)	*Chamaecyparis lawsoniana*	USA	Near Threatened ver 3.1	2011
Hemlock spruce	*Tsuga canadensis*	USA; Canada	Near Threatened ver 3.1	2011
Balsam popular	*Populus balsamifera*	Russian Federation	Rare species (no status)	2005
Olive	*Olea europaea*	Tunisia	Vulnerable	2005
Sweet almond	*Prunus amygdalus*	Pakistan	Vulnerable	2005
Agarwood	*Aquilaria malaccensis*; *Gyrinops* spp.	Iran; Indonesia; Islamic Republic; Thailand; Philippines; Cambodia; Bangladesh; Bhutan; Malaysia; Myanmar; Singapore;	Vulnerable A1cd ver2.3*	1998
Elemi	*Canarium luzonicum*	Philippines	Vulnerable A1cd ver 2.3	1998
Sassafras	*Ocotea pretiosa*	Brazil; Argentina; Paraguay	Vulnerable A1cd ver 2.3	1998
Cedrela (Spanish cedar)	*Cedrela odorata*	Central and South American; Amazonia	Vulnerable A1cd+2cd ver 2.3	1198
Siam Wood	*Fokienia hodginsii*	China; Laos; Vietnam	Vulnerable A2acd; B2ab(ii,iii,iv,v)….	2012
Sandalwood	*Santalum album*	China; India; Indonesia; Philippines	Vulnerable D2 ver 2.3	1998

RURAL AMERICA: THE NEW GLOBAL HEARTLAND FOR TRADITIONAL MEDICINAL PLANTS

by Dr. Michele Devlin

The population of rural America is changing very quickly due to the global economy, new labor needs, and an influx of refugees and immigrants to work in meatpacking, agriculture, and related fields. Nearly 200 languages are now spoken even in small states like Iowa, and some rural towns are quickly becoming home to new migrants from Africa, Southeast Asia, the Pacific, and other areas.

The use of traditional medicinal herbs for healing purposes is usually very common and well developed in many of these cultures, and migrant workers are bringing their knowledge, skills, and plants with them to their adopted homeland in the Midwest. New ethnic markets are springing up all over the heartland, owned and operated by refugee families making a thriving living from selling traditional food, clothing, medicinal plants, herbs, and other goods to their fellow newcomers and even local residents. A walk through most of these stores owned by Burmese, Congolese, Ethiopian, Marshallese, Sudanese, Guatemalan, Honduran, and many others will quickly reveal a host of traditional medicinal plants, home remedies, herbal infusions, healing foods, and other holistic healing products from their native countries. These over-the-counter items are often used enthusiastically by the immigrants, in addition to Western medicine from local American clinics. Shamans, curanderos, and other traditional healers are sometimes living in these new populations as well and maintain a wealth of historic knowledge about the use of traditional medicinal plants in their cultures. Some of these cultural groups are even starting community gardens featuring some of their beloved traditional plants.

Local American residents interested in learning more about the healing practices of these newcomers and their use of traditional medicinal plants can often reach out to neighborhood ethnic associations, key community leaders, faith institutions, and store owners to connect with these migrants and learn more about their rich medicinal plant heritage. ■

Dr. Michele Devlin is a Professor of Global Health, and Chair of the Division of Health Promotion and Education at the University of Northern Iowa. She is a specialist in the traditional health and healing practices of immigrants and refugees around the world. Dr. Devlin may be reached at michele.devlin@uni.edu *or (319) 273-5806.*

Herbs for sale in local store in the heartland

Herbs for sale in local store in the heartland

REPORT ON A DEEP ECOLOGY ARTIST FELLOWSHIP AT THE UNITED PLANT SAVERS GOLDENSEAL BOTANICAL SANCTUARY

by Katherine Ziff

"The plants are calling you. They have a rich and diverse vocabulary and speak in many tongues...the plants are calling us now, asking for help. The wild gardens are in trouble, and the precious medicines of the earth are being lost."

— Rosemary Gladstar, 2000

What inspires stewardship of Earth's medicinal plants? How to change a resource extraction mindset? One way is reform of political, legal, curricular, economic, and moral perspectives to embrace the inherent value of the richness and diversity of all life on earth (Hayden, 1994; Henderson, 1994). The deep ecology movement provides direction for such reform (Naess, 1973). And what might create within an individual the creative insight and vision to commit to a personal change in consciousness? Opportunities for deep encounters with nature that encourage a relational perspective.

Such a moment, about the vulnerability of nature and my commitment to its care, came to me in 2011. Early on a summer morning I was driving through rural Vinton County, Ohio, my car full of art materials on my way to a community library where twelve children and their families were waiting for me to offer them an art experience. Up ahead in the middle of the two-lane highway stood an owl, a big one, with an injured wing. The owl, unable to fly, looked at me. I had to make an instant decision whether to stop and try to gather up the owl and take it to a place where it could be helped. In my flash calculation of risk, I feared trying to pick up a big wild injured creature and contain it in my car. I had no idea where to find help. And it was hot; I could not leave the owl in my car while working in the library. So I drove on and flashed my headlights at an approaching car, hoping that perhaps this driver would know what to do.

That owl looks at me still. Since then the trajectory of my relationship with nature has shifted and taken over more of my art, my everyday activities, and my thoughts.

United Plant Savers offered me another such an opportunity in the form of a deep ecology artist fellowship, with the invitation to visit the UpS Goldenseal Botanical Sanctuary in Rutland, Ohio and to make art in response to its presence. In the course of this work, I have met people there, walked the trails, responded to the land and its botanical riches by making art, taught UpS interns about flower essences, enrolled in an herbal medicine class, and come to know a handful of plants. Through this immersion into botanical consciousness I have learned simple things: the joy of a meadow, the wisdom of a forest, the palpable generosity of nature, the enduring nourishment of herbal medicines, and the memories of a landscape. My tools have been a notebook, a Uni-Ball pen (medium) with waterproof ink, drawing pencils (HB, 2B, and 4B), multimedia paper, water soluble oil paint, watercolors, colored pencils, my hands, and my hiking boots.

"What is the first plant that you remember?" asked John Stock, UpS Outreach Coordinator when I arrived on August 18, a question that jolted me away from the workaday concerns that had occupied my thoughts as I drove down to the UpS Sanctuary from Athens, Ohio. A stepped-up vibration on the Sanctuary's Medicine Trail, a peaceful aliveness, offered further contrast with the work preoccupations I had left behind.

A week later I returned to walk the meadow and the high Reclaim Trail, the first views of which brought a wave of gratitude bordering on joy. Right away I met ironweed (*Vernonia gigantea*), infused with concentrated sunlight and sunny strength. Back in my home studio, and taking inspiration from minimalist artist and print maker Ellsworth Kelly (Rosenberg, 2012), I made a blind contour

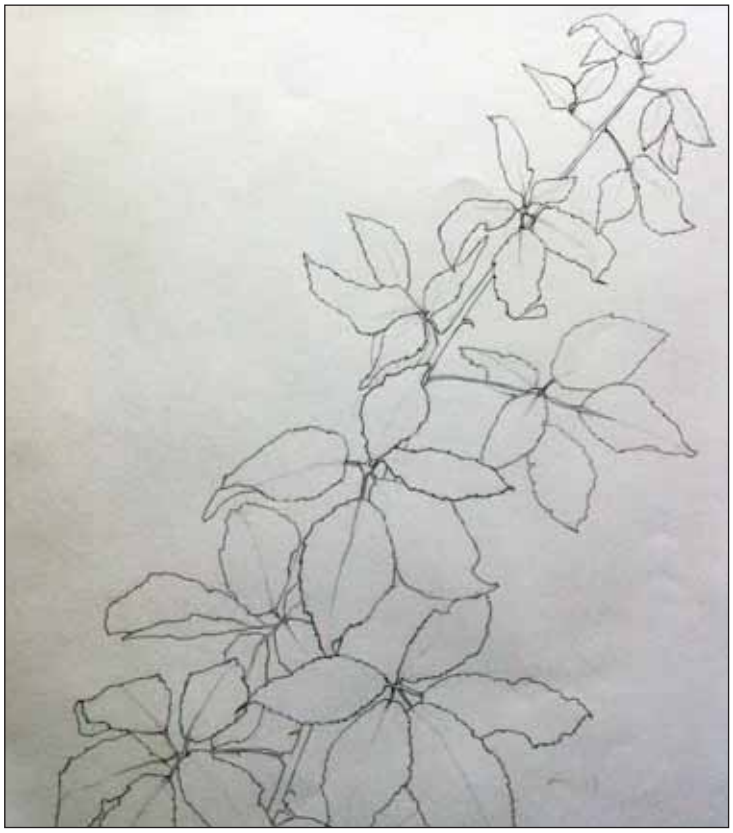
drawing of ironweed; this way of working allows you to focus on and experience the plant's details and gestures without any consideration for the outcome or appearance of the drawing. Next, I met wingstem (*Verbesina alternifolia*), also known as yellow ironweed, a plant with no known important medicinal qualities, but beautiful nonetheless and host plant for the silvery checkerspot and summer azure butterflies.

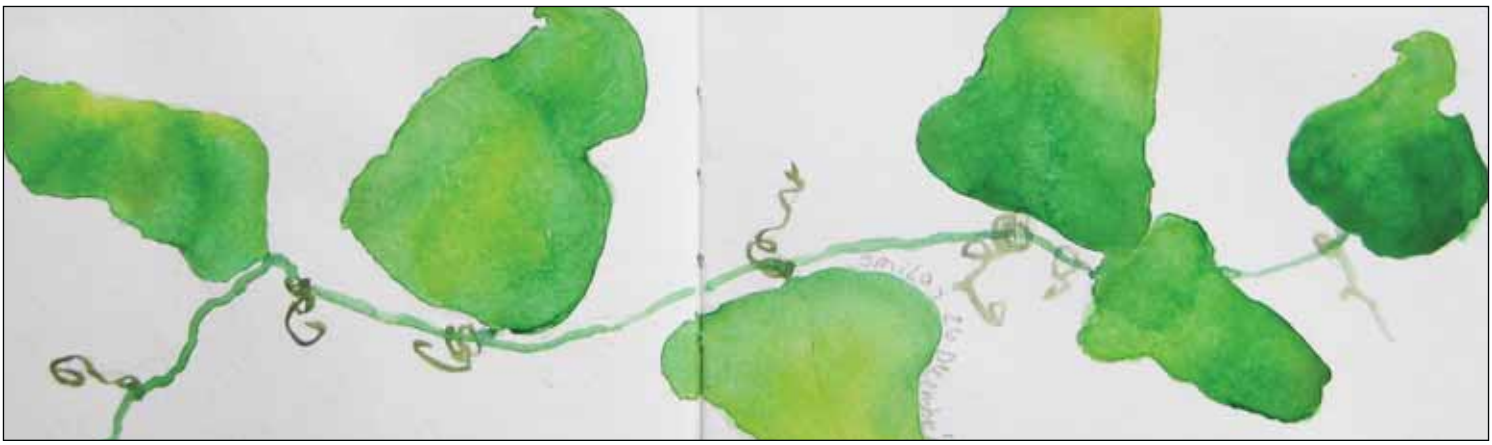
By late September, it was time to listen to the land. On a sunny afternoon on the Sanctuary's high Reclaim Trail I "announced" that I was receptive to whatever it had to share. Back in the studio I processed this listening with Touch Drawing, expecting beautiful images from nature. Instead, an old voice from the land expressed pain and despair from an earlier time about damage and destruction from coal extraction. My drawings told a story of the Earth dreaming, followed by the arrival of coal mining and the 1993 flooding of the Southern Ohio Coal Company's Meigs #31 mine when untreated, toxic acid mine drainage entered streams and creeks of the Leading Creek watershed in which the Sanctuary is located. (Leading Creek Watershed Volunteers, 2011; U. S. Fish & Wildlife Service, 2006). The final image was one of restoration and the "Green Spark" spoken of by Paul Strauss; it portrayed the source of the enormous work done by humans to restore the land of the Sanctuary and preserve the rich biodiversity of its forest.

By late October it was time to expand my experience to the Sanctuary's forest: settled, ancient in origin, beneficent, and a little cautious about newcomers (most likely my own projection rather than an accurate perception, but then again forests have reason for caution). This forest is intense with its forest floor plants, towering canopy of trees, waters, rocks, hills, small animals and big ones, too. It is majestic in places, and full of healing plants and energies and busy in a different way from the meadow. I imagine that if all the meadows of the world are in some way connected, it is by way of an airborne meadow consciousness that is busy growing, flowering, buzzing, pollinating, blooming, and full of colors—red, yellow, orange, purple, pink, blue, violet, magenta, and all the browns and grays and greens. In my imagination our forests are connected too, deep in the Earth by an ephemeral

network of forest patterns created by an original meeting of starlight and a nature force, a Green Spark converting star energy to material form. I imagine that the Sanctuary's forest pattern holds richness, diversity, and healing. It is powerful and vibrant and precious. As this one forest is cared for and protected, its connections to forests and sanctuaries and their caregivers across the planet are strengthened.

In December, two plants brought in the light of the solstice: blackberry (*Rubus allegheniensis*) and roundleaf greenbriar (*Smilax rotundifolia*). It took me a while to find Smilax rotundifolia at the Sanctuary, much less to really see its spiraling growth pattern. Once





found, it appeared in abundance. Its heart shaped leaves, thorny vine, and graceful beauty kept me company all through the late Fall.

Winter blackberry brings the warmth of the summer sun, sweetness, strength, and the joy of magenta and indigo. Its molecular structure brings to humans, in the form of antioxidants, protection from stress and other toxins of the world. Its roots and leaves are used for medicines—teas, tinctures, decoctions, extracts, and syrups. And from its fruit: pies and cobblers, preserves, wines, and cordials. Truly blackberry nourishes and heals humankind.

My artist fellowship at the UpS Botanical Sanctuary extends through the spring of 2018. I await further teaching from the land and from Nature's medicinal plants. ■

Katherine Ziff is a clinical mental health counselor, artist, and writer in Athens, Ohio. She holds a doctorate in counseling from Ohio University and is the author of Asylum on the Hill: History of a Healing Landscape, published by Ohio University Press. Learning from the Sanctuary, Ziff's online journal for the UpS Deep Ecology Fellowship, may be viewed at https://learningfromthesanctuaryblog.wordpress.com, *and her email is* katherineziff@aol.com.

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Kathleen Harrison remarks on the belief among the Mestizos of Peru in the pervasive nature of individual plant songs and their importance:

> *"Every species has a song. If you are granted the song in a vision state, or by just submitting yourself to the presence of a plant and opening up, then it's a real gift, and you are able to remember that song forever and share it when it seems appropriate. That song has power, healing power, and there are some which are handed down from one curandero or curandera to the next, and there are others which come to us as individuals. But they are part of an encyclopedia on the sonic level of the same thing that seeds represent on another level."*

— Sacred Plant Medicine: The Wisdom in Native American Herbalism by Stephen Harrod Buhner

HUMLA FUND: WILD MEDICINAL PLANT CONSERVATION IN NEPAL'S HUMLA VALLEY

by Miranda Grizio

At the northwest corner of Nepal, bordering Tibet, lies Nepal's Humla District. This remote district is known for its Tibetan villages and Buddhist way of life in a majority Hindu country. Medicinal plants are the first line of treatment for most villagers here as a part of their tradition of Tibetan medicine. Villagers in the Humla Valley collect wild medicinal plants from the forests beneath the Himalayas for their own use, as well as for export to neighboring India and China. In this way, these plants support both the health and livelihood of the Humli people. It is here that a creative project managed by Humla Fund, a nonprofit organization based in Spencertown, NY, is underway to support the conservation of wild medicinal plants.

> "Medicinal plants are like the jewels of the Earth. They are very precious and should be recognized and used as medicine."
>
> – Norbu Sangpo Lama, Humli Environmentalist

Of Nepal's seventy-five districts, Humla District is the farthest north and also one of the poorest. There is not only a shortage of modern healthcare services, but also of electricity, running water, and roads. Since the Great Himalaya Trail runs through Humla District, some tourists do pass through on their way to Tibet to trek Mount Kailash. But overall, life is quiet here and has changed little over generations.

Ongoing deforestation for timber and farmland and the impact of the country's ten-year civil war on the forests continue to threaten the habitats of Nepal's wild medicinal plants. In western Nepal, forest collection of medicinal plants is more common than cultivation, with 49.5% sourced from community forests and 18.5% from federally-managed forests (Kunwar, Mahat, Acharya, & Bussmann, 2013). Recognizing this national treasure, the Food and Agricultural Organization of the United Nations has recommended that Nepal prioritize the sustainability of its medicinal and aromatic plants, including advancing the domestication of these wild species (Food and Agriculture Organization, 1995). At last count, Nepal was home to approximately seven-hundred different medicinal plants (His Majesty's Government of Nepal/International Union for Conservation of Nature and Natural Resources, 1988).

How can a poor country like Nepal turn from resource extraction to stewardship of its medicinal plants? Humla Fund has taken a novel approach, blending international education, ecotourism, and volunteer vacations in a way that encourages the conservation of Humla's wild medicinal plants. Through an experiential travel model known as the Medical Service Trip, healthcare practitioners can travel to Humla Valley to learn about the collection and use of Humla's wild medicinal plants in traditional Tibetan medicine, while also offering their healthcare services to the villagers through mobile clinics.

The Medical Service Trip is suitable for doctors, nurses, acupuncturists, chiropractors, massage therapists, herbalists, and other healthcare practitioners. As they travel together through Humla Valley, meeting villagers and providing medical care, they also learn about traditional Tibetan healing practices, such as shaman rituals and blessings and the shaman's harvest festival.

Since medicinal plants, both their collection and application, are key to attracting

program participants, the villagers' conservation awareness is enhanced. Participants provide not only medical services, but also income to the villagers through employment as guides, translators, and cooks. An important component of Humla Fund's program is the ongoing education of villagers on the sustainable collecting of medicinal plants. Tibetan doctors and environmental activists affiliated with Humla Fund actively spread this message to the villagers. Another component is the coordination of fair trade pricing, which allows families to support themselves without over-collecting.

Humla Fund currently provides healthcare to the Humla villagers for free through mobile clinics, but the next step is to build a permanent Tibetan medical clinic. The clinic's focus will be on herbal medicine and acupuncture. These are medical practices with a long history in Humla, but perhaps as important, they do not depend on electricity and laboratory equipment (all of which are in scarce supply) the way modern medicine does.

This inspiring effort is working to spread awareness of the benefits of plant conservation. It is an integrative approach, aligned with Humli culture, to sustaining both the wild medicinal plants and the people of Humla Valley. ■

Miranda Grizio is an international development specialist focused on sustainable development initiatives that can improve the lives of the rural poor in developing countries. She provides technical assistance in the area of food science for Compatible Technology International and the Good Food Institute. Miranda lives in the Pioneer Valley of Massachusetts and can be reached at mirandag@gfi.org.

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SACRED SEEDS

To read about and connect with sacred seed gardens around the world visit www.sacredseedssanctuary.org

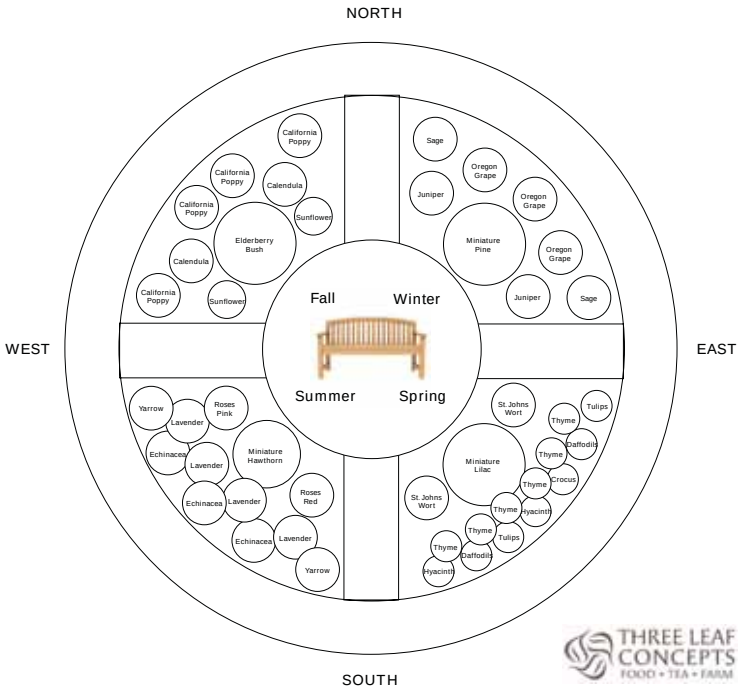
Sanctuario Semillas Sagradas, Finca Luna Nueva: Costa Rica
Missouri Botanical Garden: United States
Semillas Sagradas de Huamachuco: Peru
Crow Creek Indian Reservation: United States
Ambalabe: Madagascar
Jardin Botanico de Semillas Sagradas de Chan Chan: Peru
Sacred Seeds at the Intervale Center: The Abenaki Heritage Garden: United States
Rodale Institute: United States
Bastyr University: United States
American Botanical Council: United States
Sitting Bull College: United States
Kindle Farm School: United States
The Green Farmacy Garden: United States
Hosagunda: India
Jardin Botanico Medicinal de los Llanos: Colombia
Sacred Seeds at Reserva Natural La Pedregoza: Colombia
Institute of Ayurveda and Integrative Medicine - I-AIM: India
Native Forest Foundation: Sri Lanka
Tel Aviv University Botanical Garden: Israel
The Rattanakiri Living Library for Seeds and Culture: Cambodia
Bronx Green-Up: United States
Chaikoni Jonibo Garden: Peru
Forest School for Traditional Health Practitioners - PROMETRA Uganda: Uganda
Punta Mona Center for Sustainable Living: Costa Rica
Goldenseal Sanctuary: United States
L'Herboretum: France
IITA Forest Reserve Ethnobotanical Garden: Nigeria
Jardin Etnobotanico Pueblo Chacobo-Pacahuara: Bolivia
Southern Cross University Medicinal Plant Garden: Australia
Bakuriani Alpine Botanical Garden: Georgia
Tertulias Herb: United States
Tafi Atome Monkey Sanctuary & Cultural Village: Ghana
Maryland University of Integrative Health (MUIH) Herb Garden: United States
Florida School of Holistic Living Bodhi Garden: United States
Pha Tad Ke Botanical Garden: Laos
Forest Garden Organics (Pvt) Ltd: Sri Lanka
Holt Woods Herbs: England
Spirit of the Earth Living Center: Canada

GRANT REPORT
THREE LEAF FARM
(UPDATE SPRING 2018)

by Sara and Lenny Martinelli

In 2013 Boulder County was hit by one of the worst floods in recent history. It's been determined that it was a 500-year flood, meaning it doesn't flood like that except once in 500 years. Our little farm is tucked along the banks of the Coal Creek, a little river that flows from the Continental Divide down the Front Range of the Rocky Mountains, until it hits our little farm about 10 miles east. By the time it reaches us, the creek is normally a gently flowing, 10-foot-wide creek. Usually, it's perfect for the horses to play in or kids to hunt for tadpoles or crawfish.

But in 2013, our little creek flooded, and it covered almost our entire small 10-acre farm. The "wild" areas that we use for our herbal medicine classes were completely submerged under madly rushing water, and when the water finally receded, we were honestly unsure of what would be left. How could any plants survive the violence of that kind of natural disaster?



We turned to United Plant Savers to help us with a grant. Their generosity allowed us to help re-establish some of the native medicinal plants that we have growing in our area and to rebuild our Medicine Trail, which is one of our most important teaching tools at Three Leaf Farm.

Now that it's been almost five years since the flood, it's amazing to see the regenerative power of nature, but also the lasting changes that a natural disaster like this can bring.

Perhaps the most significant changes are the new areas of wetlands that now exist at Three Leaf Farm. Being in a flood plain, some of the areas have been holding water since the flood and don't seem likely to dry out anytime soon. We've seen a completely new kind of ecosystem, bringing with it new kinds of plants and wildlife to the area.

These wetlands are unusual in the dry climate of Colorado, making up only about 2% of the landscape of the state. It's a great opportunity for us to learn, observe, and teach about the plants. These diverse ecosystems provide many functions: they help to recharge the groundwater supply and help in nutrient cycling and sediment transport. They help to provide clean water as the wetland vegetation filters sediment that may contain heavy metals, pesticides, or fertilizers. This vegetation can also provide a buffer zone in flood areas and provide a quality wildlife habitat. Many animals at our farm depend on these wetlands, including ducks, cranes, hawks, eagles, and owls, as well as mammals like raccoons, coyotes, skunks, weasels, mice, and foxes.

The plants that are commonly found in wetlands are commonly called hydrophytes (plants that grow in water). They've adapted to their environment in a number of ways, including forming complex rooting systems, floating leaves, or long, hollow stalks that help to conduct air to the roots. We now see an amazing array of new plants, including cattails, (*Typha* spp.), rushes (*Juncus* spp.), sedges (*Carex* spp.) duckweeds (*Lemna* spp.), and watercress (*Nasturtium officinale*). Trees like willows and cottonwoods are also common, as their shallow root systems obtain a large amount of their water from the groundwater and are now thriving at the farm.

The other areas of the property have shown remarkable recovery from the damage of the floodwaters. After amending our soil in the cultivated areas, we're back into full production of the produce that we grow, including greens, beets, radishes, carrots, tomatoes, peppers, eggplant, and squashes. The medicine trail has reestablished itself through both natural means and our encouragement with the seeds purchased by the UpS grant. We have healthy populations of yarrow (*Achillea millefolium*), valerian (*Valeriana officinalis*), motherwort (*Leonurus cardiaca*), goldenrod (*Solidago canadensis*), cleavers (*Galium aparine*), catnip (*Nepeta cataria*), vervain (*Verbena* spp.), St. John's wort (*Hypericum perforatum*), and more.

The grasses have returned to our classroom meadow, and last spring we held a workshop called "Sacred Circles: Universal Symbolism of Our Relationship to Earth" in which we partnered with local naturalist, Martin Ogle for a program that explored how sacred circles have been used universally by people and seem to transcend both geography and culture. The workshop explored how these ancient motifs—and the creation of our own symbols—can help us appreciate modern-day relationships between families, communities, and Earth's living systems.

Installation of the Three Leaf Farm herb garden

Three Leaf Farm

Three Leaf Farm

Participants in the workshop helped to create a Sacred Circle Medicine Garden in the area that had been damaged by the flood. This garden is 16 feet in diameter with a walking border and an equal armed cross through the center. Each quadrant of the circle is carefully aligned to the four directions and designed to be planted with medicinal plants that correspond to that direction and season. For the first season of the garden, the workshop participants created the hardscape by digging out the circle, measuring the geometry, placing rocks, and setting different colored mulches. Initial plants and seeds were planted by the group, and we'll continue to fill in the plants this season as we host the second year of this workshop.

In the north in the winter season we planted a miniature pine (*Pinus* spp.), junipers (*Juniperus* spp.), sage (*Salvia* spp.), and Oregon grape (*Berberis* spp.). These plants are often symbolic of winter and can be useful to alleviate ailments like colds and flu or respiratory infections. In the east, we planted plants of the spring. A miniature lilac (*Syringa* spp.) is planted to bloom early with the fragrance of new beginnings. We added St. John's wort (*Hypericum perforatum*), which is traditionally harvested right at the end of spring on the first day of summer at the Summer Solstice. We added some springtime bulbs of tulips and daffodils, and tucked along the edge is a border of thyme (*Thymus officinalis*). In the south, direction of fire and the summer, we planted a miniature hawthorn (*Crataegus* spp.) and a variety of roses. English lavender (*Lavandula angustifolia*), echinacea (*Echinacea* spp.), and yarrow will all bloom and be at their most vital during the summer months. And finally, in the west, direction of the autumn, we will have an elderberry (*Sambucus nigra*) bush, sunflowers, California poppies (*Eschscholzia californica*), and calendula (*Calendula officinalis*), all plants that thrive in Colorado's warm, sunny autumn days.

We hope that over the years as this garden fills in, it will be one of the highlights of the medicine walk at Three Leaf Farm. People can walk around the exterior or move to the center to sit on a small bench and contemplate the cyclical nature of life.

Thanks to the support from United Plant Savers, our mission at Three Leaf Farm to be an educational center for medicinal plants has been able to survive the devastating damage of the floods. Not only did the grant offer us the ability to reestablish our native medicinal populations, but we now have new, unique ecosystems to explore. We are offering more workshops and classes than ever before, as well as hosting the amazing event, Botanica! A Celebration of Plants, a weekend-long event in June that explores the way that plants impact human lives through food, medicine, art, and religion. ■

For more information about Three Leaf Farm, please visit us online at www.threeleaffarm.com

PONDERING THE QUESTION

by Jesse Lovasco

On a walk today, I thought of the spring 2017 UPS journal and pondered the theme "conscious herbalism" and the question, "How can herbalism inspire stewardship instead of resource extraction of our precious "At-Risk" medicinal plants?" This is not an easy question to answer. With the amount of reckless waste and destruction of families and species of plants, it's hard to conjure hope.

I thought perhaps there may be another question that needs to be asked. What drives people to take so much once they realize a plant's value? There are two things that came to mind: recognition and financial gain. These seem to be the same reasons for extraction of many resources on this planet. The fight for water, oil, and land appear to center around financial gain and recognition or power.

So I began to think of a way stewardship could be fostered without destruction and how to approach it from a different angle. What if there were an International Plant Preservation Endowment that actually put out incentives for people who found large groups of plants or mushrooms growing in the wild and followed these instructions: mark the territory, as you would a Botanical Sanctuary and contact the United Plant Savers organization to receive a *Medicinal Plant Conservation Journal* (for education). These people could be awarded financially through the International Plant Preservation Endowment fund and receive recognition in the next issue of the journal, by stating their name, the plant or plants protected, and a description of their experience. This way the reasons that lured them in would be satisfied from a different angle. They would still get recognition, be empowered by their discovery, and receive the sum or close to the sum they may have received if they had taken it all and sold it.

There could be a board member from each participating country and within their regions they could hold an annual UpS or other plant preservation event that could create awareness and education and raise funds for the endowment.

I know, you're probably saying, that's not a conscious act in any way. But I think with the mindset of many today, we must look at the way in which they think and how they discern. How do they absorb information and what are they exposed to in everyday life? Were they taught how to care for plants or only to use them for their own gain?

I'm living in Michigan right now in a wealthy bedroom community after living in a small rural Vermont community for 20 years. It's as though I'm existing in a different culture altogether. There is a profound difference in the way both areas value nature, how they think and see life, and how much exposure and interaction they have had with the natural world.

Thus, another piece to the reward would be seeds—"At-Risk" plant seeds, so that the recipient can not only be involved in preserving what grows but have the experience of growing them in their own gardens. Through nurturing seeds, perhaps the plants themselves will work their subtle energies and create a relationship with those who follow the directives and support the growth and proliferation of plants. Perhaps this approach could be a catalyst for changing the way plants in nature are viewed and build a broader understanding of the importance of precious plants and their medicines. ■

Jesse LoVasco is an herbalist, permaculture practitioner, and artist. She received her Family Herbalist Certificate at Vermont Center for Integrative Herbalism and has been an intern for Guido Masé and Jeff and Melanie Carpenter. She taught herb classes three years for Two Rivers in Vermont and worked on a 25-acre herb farm in Montpelier, Vermont. She currently lives in Michigan where her three children have blessed her with five grandchildren.
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SUSAN'S STACK

Ethnobotany Reading List for 2018

- **Beyond the War on Invasive Species**, Tao Orion
- **Mushrooms of the Southeast**, Todd F. Elliott & Steven L. Stephenson
- **Nature's Fabric**, David Lee
- **Southern Folk Medicine**, Phyllis D. Light
- **Forest Gardening**, Robert Hart
- **Civil War Pharmacy: A History**, Michael A Flannery
- **Hopewell Ceremonial Landscapes of Ohio**, Mark J. Lynott
- **Ramp Hollow**, Steven Stoll
- **Bloodroot Cantons**, Larry L. Yates
- **Folk Medicine in Southern Appalachia**, Anthony Cavender
- **Mycorrhizal Planet**, Michael Phillips
- **The Botany of Empire in the Long Eighteenth Century**, Batsaki, Cahalan & Tchikine
- **Historical Apothecary Compendium**, Daniel A. Goldstein

MORE STORIES FROM THE UPS BOTANICAL SANCTUARY NETWORK

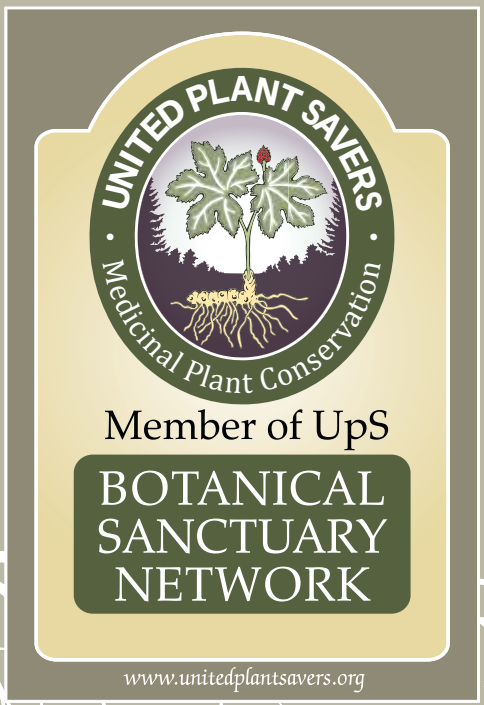
The United Plant Savers Botanical Sanctuary Network (BSN) is one of our most important ongoing projects. This is a network of over 100 landowners who have formally expressed their intentions to steward existing populations of at-risk native medicinal plants and/or reintroduce these plants to their farms and landscapes. We view these Botanical Sanctuaries as living seed banks managed by well-intentioned conservationists that are poised to spread the native germplasm across the greater landscape when conditions allow.

This concept of native plant repopulation after disturbance has been demonstrated at the original United Plant Savers Botanical Sanctuary in Rutland, Ohio. After the brief but devastating surface coal mining that took place on the sanctuary land in the early 60's, followed by years of erosion and abuse before reclamation, native plants are returning to these previously mined areas of the sanctuary. This relatively quick repopulation of the disturbed land by native plants is primarily due to an undisturbed pocket of biodiversity that remained after the mining took place. Humans, other animals, and natural systems helped to spread seeds and plant material from this remaining "plant sanctuary" across the previously disturbed area to regenerate the land. We believe that the UpS Botanical Sanctuary Network has the potential to serve this same purpose on a larger, worldwide scale.

Land that is to be considered for BSN status should at least occasionally be open to the public for educational purposes and also be a place where research on native plants, medicinal plant conservation, and cultivation is undertaken. The sanctuaries in the network range in size from small city lots to large tracts of land consisting of hundreds of acres. There has been a surge in participation in the BSN over the past few years with 29 new sanctuaries in 2017 and nearly 10 new sanctuaries so far in 2018. Please consider enrolling your land in the UpS Botanical Network. You can find more information on our website, www.unitedplantsavers.org, or by emailing office@unitedplantsavers.org.

Benefits of becoming a member of the Botanical Sanctuary Network include:

- A beautiful metal sign with the UpS logo on it to place at the entrance to your Sanctuary signifying this as a UpS Botanical Sanctuary.
- Priority Consideration for UpS Community Grants. Our Community Grants award $200-$500 dollars for community projects involving at-risk plant restoration and preservation. Sanctuary members are given first priority.
- Two weatherproof signs that designate the property as a Sanctuary being used for plant research and educational purposes.
- Botanical Sanctuary Resource Guide that includes where to order botanical signs for medicine trails, sources of grants and funding raising, useful books and information sources, etc.
- Listing on the UpS Website and social media channels.
- Opportunities to promote classes and workshops at your Sanctuary on our website and social media channels.
- Opportunities to publish your Sanctuary story on our website and in our annual *Journal of Medicinal Plant Conservation*.



7 ACRE WOOD FARM BOTANICAL SANCTUARY

Burnsville, Virginia

Sanctuary Stewards: Anne Bryan and Joe Murray

This is how a 7-acre botanical sanctuary can help heal a community's people and soil. Last year was our first year as a member in the Botanical Sanctuary Network. Receiving formal recognition from United Plant Savers and seeing our name listed with the other like-minded conservationists across North America made us feel a difference in how we related to the land.

Our first impulse in 2017 was to better understand what plants were growing on our property. Equipped with over one dozen plant identification books, we set out to identify as many plants as possible and were delighted to realize in our first year as botanical explorers, we had identified 231 plant species! We were especially pleased to learn that over 90% of the plants identified had some medicinal property recognized by Native Americans. We will continue this identification quest in 2018 and expand our search to include bryophytes, lichens, fungi, and grasses.

To improve habitat for medicinal plants, we invested time and energy to fence off areas in the forest and meadows that contained plants listed "At-Risk" on the UpS website, denying the deer browsing rights to ginseng (*Panax quinquefolius*), bloodroot (*Sanguinaria canadensis*), black cohosh (*Actaea racemosa*), echinacea (*Echinacea* spp.), and goldenseal (*Hydrastis canadensis*). These protected areas will now allow us to expand our plantings of cultivated medicinal plants and encourage the spread of wild medicinal plants.

Medicinal plant swale after the rain

Anne smelling black cohosh flowers

In keeping with permaculture design principles, we were able to turn what at first appeared to be a liability into an opportunity. Living at an elevation of 2,400 feet with a slope between 10-15% means two things: we live in a colder hardiness zone than our friends in town and, when standing outside, our feet are rarely level. We took advantage of relatively steep topography and created a series of swales to collect, move, and store rainwater. In 2017, we increased space dedicated to cultivated medicinal herbs by creating approximately 1,000 square feet of planting space in these new swales.

After entering a partnership with our local electric cooperative in which we assume responsibility for managing the electric utility right-of-way with vegetation that will not conflict with the electric wires, we continue to transform the formerly barren landscape into a vibrant habitat that supports pollinators and medicinal plants.

Last year we were both invited as guest speakers at area garden clubs and local libraries and continue to accept invitations to speak about our medicinal herbs and efforts at creating pollinator habitat. In addition to sharing resources, herbal teas, tinctures, and salves, we also share seeds from our medicinal plants with family, friends, community members, and participants at our workshops. This year we are excited to accept an invitation to be instructors and share our knowledge and experience growing medicinal herbs at the Allegheny Mountain Institute, a permaculturally-inspired educational non-profit organization training young adults in creative food growing systems and public outreach. ■

www.7acrewoodfarm.org

FORSAKEN ROOTS

Acme, Pennsylvania
Sanctuary Stewards: Sara Shoemaker and Thomas Brown

We are Sara Shoemaker and Thomas Brown of Forsaken Roots in Acme, Pennsylvania. Our farm's name, "Forsaken Roots" comes from the idea of lost or forgotten ways. It applies to us in more ways than one could ever imagine. From our home, to our property, our antique letterpress/block printing studio, to our 1952 Ford F-1 pickup truck, we are immersed in revitalizing what is already here and creating new life with it all.

So far, we have designated 35 acres of our property as a Botanical Sanctuary. Our farm is part of a 500+ acre farm that has been in Thomas's family for 212 years. Within the last 3 years we have by ourselves, begun to restore our portion of the property's fields, meadows, and forests to encourage native plant growth.

In time, we will be holding guided plant walks and workshops for underprivileged children, children of parents that are mentally ill or suffer from addictions. By offering our sanctuary to them, we hope it will allow those that need to disconnect from chaotic environments to find the peace and comfort that nature offers. We also plan to offer our sanctuary as a place for homeschooled children to visit and workshops for them to expand their studies. The workshops will range from plant identification, learning the endangered or at risk plants, to creating simple teas and recipes with edible plants and more.

We have planted over 500 tree saplings of different native varieties the past two springs. We are just beginning our attempts to restore the land back to its natural state as much as possible. Each year we aim to plant more and more. Thomas and his brother Benjamin have been planting saplings throughout the farm's acres each year for as long as they can remember in their lives.

We have planted native ramps (*Allium tricoccum*), ginseng (*Panax quinquefolius*), goldenseal (*Hydrastis canadensis*), Solomon's seal (*Polygonatum* spp.), and trilliums (*Trillium* spp.), from credited trusted sources, as well as transplanted endangered or at risk species from areas that were to be clear cut logged or cleared out for roadways, home building, etc. We plant to continue with these kinds of feats as much as possible.

Last fall, we planted 2 acres of native wildflowers in a 15 acre meadow in which native wildflowers already have established themselves. We plan to cover the entire area with native wildflower beauty for a thriving ecosystem of pollinators and wildlife.

During the summer months we harvest small amounts of flowers from the abundant field and deliver them to several local businesses in our small community, and we sometimes take special orders for small private events. We sell small bouquets in recycled jars in the family farm store and donate a percentage to our local Watershed,

Jacobs Creek Watershed. I serve on their board of directors, and our farm literally is the Headwaters of Jacobs Creek. We use the remaining portion towards purchasing more native plants and seeds and for our many restoration projects that lie ahead. We hope that by spreading these small doses of beauty with a message attached that it will become contagious and inspire others to do the same.

In the spring of this year we will be gaining the helping green thumbs of my twin Sister Jessi Shoemaker, who will be staying with us and helping us with activities and planting projects, and we have several volunteers who have committed to lending us a hand. To say we feel fortunate to have these wonderful people in our lives willing to their time and energy to help us is an understatement.

Our sister farm, Whoa Nellie Creamery has been working with NRCS in the last 2 years, making big changes to help conserve the land it occupies. We too have begun working with them to gain their assistance in taking the steps needed to create an even more biodiverse healthy native environment for pollinators and wildlife. And with the funding they will provide us, we will be able to incorporate into an Agro-forest area where we will grow an abundance of native mushrooms varieties, herbs, trees, blueberries, currents, huckleberries and more, as many of the over logged acres that have been taken over by invasive plant species and marshy areas are collapsing. We hope to replenish our property as close as possible back to its natural state.

We are also beginning beekeepers. We obtained our equipment from a local beekeeper and have befriended a neighbor who has been a respected beekeeper for many years as our mentor. We rescued a wild hive from a wall of a cottage that was about to be torn down. We will be harvesting the honey from our girls for a variety of nutritional and skincare uses. We are constantly asked when we will be selling our honey. We are starting small and will grow our hives slowly. Offering honey for sale will come with time, as we are focused more on creating strong hives and bringing back the pollinator population over making profit from them.

I (Sara) also create herbal goods that are in line with nature. I sustainably forage the medicinal and wildflowers growing in abundance for simple herbal recipes and as main ingredients to oils, salves, tinctures,

infusions, and teas. Just by gathering the abundant medicinal plants and herbs that grow on our property, I have been able to create enough Simples for fully stocked cupboards for a lifetime of cold and flu remedies, first aid and pain ointments, healing skincare, hair care, oxymel vinegars and cleaning vinegars, dried herbs for teas, and nourishing infusions.

I use absolutely no essential oils in any of my goods. I am a learning folk herbalist furthering my knowledge of the green world as a Green Witch student of the renowned herbalist, Susun Weed. Susun takes the complexity out of learning the plants and their uses and puts a focus on Simples and taking the time to get to know each plant. I believe that no matter how much I learn, I will always be a student of the plants, willing to learn all that they have to offer.

Another element of our sanctuary is our cabin home. The 2400 square foot 3 story 1790s Pennsylvania hued log cabin, (originally a German church) is the kind of house we both had explored as children in museum settings with our family or by exploring abandoned places as children with our siblings. Both of us always dreamed of living in a home like we have built for ourselves.

We began restoring the cabin in 2012, after Thomas and his brother purchased the home that was in ruins from the landowner for $100. The 3 story cabin had to be cleaned out, disassembled piece by piece, and moved 60 miles from Somerset County Pennsylvania to our property that sprawls across the Chestnut Ridge of the Laurel Highlands (a short trip from the origins of the Mother Earth News Fair!).

We live completely off grid and lived in the basement of our home with no utilities and running water for a span of for two and a half years. We, along with the help of a few family members and friends have patiently created a beautiful, simple, and comfortable home that now has running water and solar electricity.

Around the cabin, we are slowly creating a perennial biodynamic yard. We let the weeds and plants flourish and spread as they would in the wild, thus creating an ecosystem for insects, wildlife, and plants to thrive and makes less work for us having little yard maintenance. Although we do grow some annual veggies, almost everything else that we are planting are perennials in areas where they thrive best in companion style making for a diverse landscape that attracts, bees, butterflies, and native wildlife and looks naturally beautiful at the same time. The connection between nature and people has been lost with modern society. We hope by sharing our story with others that we may be the green spark that ignites the path for others to find this connection in their lives.

If anyone would wish to follow our endeavors please follow us at: @forsaken_roots_ on Instagram. We thank you all for taking the time to read our story!

Onward for the greater good,
Sara and Thomas Brown

GASPEREAU MOUNTAIN HERB FARM AND BOTANICAL SANCTUARY

Gaspereau Mountain, Nova Scotia
Sanctuary Stewards: John Cummings and Vaunda MacDonald

As I ponder the concept of sanctuary, feelings of safety and protection resonate inside. These feelings are commonplace throughout this land. Perhaps it's the location. At an altitude of 650 ft., the Gaspereau Mountain Herb Farm and Botanical Sanctuary is nestled at the top of the northernmost range of the Appalachian Mountains. Gaspereau Mountain overlooks the agriculturally fertile region of Nova Scotia's Annapolis Valley. These ancient granite barrens and uplands have been inhabited for approximately 14,000 years by the Mi'kmaq Peoples, whose influence is regaining strength. The farm is 10 minutes directly up the mountain from the Bay of Fundy, known for the highest tides in the world, whose dramatic moisture and winds shape our daily lives as well as those of the forests and fields.

Observing and stewarding this land since 2012, our relationship feels like it is just beginning. A passion for herbal medicine fueled the search for this special land, the story of how we came to be here being a beautiful example of manifestation. The last property on this dead end road, our 220 year old farmhouse is surrounded by over 3000 acres of Acadian forest, much of which has been heavily cut over by generations of farmers. All of it is now in varying stages of regeneration. Our 25-acre farm includes teaching gardens, food gardens, a large greenhouse, production fields, forest, and recently planted fruit and nut orchards.

Having interned at the UpS Goldenseal Sanctuary in Ohio in 2009, then tending the gardens of Sage Mountain in Vermont, inspired me to create the magic that is happening. My connection with United Plant Savers, their remarkable work and people began then, forever shaping my life and visions to this day. Sanctuary became a sense of purpose, not just a physical place.

Upon arrival here, Vaunda and I were greeted in these fields and woodlands by an abundance of medicinal plants, both indigenous and naturalized. Many are included on the UpS "At-Risk" and "To-Watch" Lists. Eyebright (*Euphrasia* spp.), goldthread (*Coptis trifolia*), lobelia (*Lobelia inflata*), and pipsissewa (*Chimaphila umbellata*) were here growing, but it is the pink lady's slipper (*Cypripedium acaule*), with whom I am most enamored. Last year I spotted well over five hundred of these orchids in our woods. Often in June, I can be found sitting in a dense patch of these majestic beauties, offering tobacco, my gratitude, and singing praise. My respect and reverence is profound.

Since 2012, we have identified 40 or more medicinal plants here, and by applying permaculture and biodynamic practices, we have planted close to 50 more species of herbs and trees. Of importance to UpS, they include American ginseng (*Panax quinquefolius*), bloodroot (*Sanguinaria canadensis*), black cohosh (*Actaea racemosa*), blue cohosh (*Caulophyllum thalictroides*), goldenseal (*Hydrastis canadensis*), echinacea (*Echinacea* spp.), wild yam (*Dioscorea villosa*), arnica (*Arnica* spp.), butterfly weed (*Asclepias tuberosa*), gentian (*Gentiana* spp.), mayapple (*Podophyllum peltatum*), and false unicorn root (*Chamaelerium luteum*). Despite the fact we are outside the native range of many of these mostly forest dwellers and

Autumn Ginseng Planting

John, Wile E, and the Lady of the Lake

Ladyslipper's and White Pine

that the soil here is acidic, our climate (5b) and forest mix is right for most. Tenacity, inspiration, and determination to grow these precious allies help.

Intern Accommodations

My attempt is to take the notion of sanctuary and conservation to that of the reintroduction, establishment, and proliferation of these much needed plants. Along with planting in our fields, gardens and edges, I have planted in the neighboring forests, streamsides, and abandoned pastures. Most of the "At-Risk" and "To-Watch" plants that have been reintroduced are not planted for harvest, but to enable propagation and to attract pollinators.

For the past 2 gardening seasons, the farm has hosted interns from around the globe. An amazing array of folks have helped us, often leaving with an appreciation for our indigenous medicinal plants, as well as knowledge about their healing abilities. Teaching workshops, doing plant walks, product making, live medicinal plant sales, and clinical herbal consultations have been part of the mix for the last 3 years, with this year seeing us organize a free herbal gathering entitled "Medicines of the People – A Herbal Celebration." With over 125 attendees, our first annual event was a resounding success. Mi'kmaq elders opened the day with drumming, prayers, and smudging in an attempt to share their indigenous worldview and knowledge. The sacredness of water was a key theme and a reminder to all that water is the first medicine and must be protected.

Becoming part of the Botanical Sanctuary Network was a highlight of my year and is a great honor and privilege that I am still vibrating from. I managed to return to the Goldenseal Sanctuary for a visit in October of 2017, once again being inspired by the people, plants, and place.

This upcoming season will see us increase our workshop offerings and native plant walks. As it seems to be increasingly difficult to obtain ginseng and goldenseal seed in Canada, we will also attempt to establish a patch of each of these that will produce enough seed to share.

As Dr. Low Dog once said, "Don't ever apologize for dancing with the plants". ■

Gaspereau Mountain Herb Farm & Botanical Sanctuary
GREENMANBOTANICALS.COM

Artist, Katherine Ziff

THE GINKGO TREE BOTANICAL SANCTUARY

Dogwood and Brambles Farm, Ontario Canada
Sanctuary Stewards: Penelope Beaudrow and Will Hutchison

My partner and I live on a lovely little farm called Dogwood and Brambles in central Ontario. This farm has been my personal sanctuary for over thirty years. It is part of me, and I am part of it. Will and I are at our happiest roaming the fields and bush with our dogs, Fred, Gus, and Pearl while identifying and picking a few leaves or flowers, which will become our next pot of tea. Many of these plants, the "At-Risk" and "To-Watch" have solely been identified and nurtured by me. We do not use these plants for teas or medicine. We have reintroduced many of these plants and welcomed Mother Nature back to stay.

I am so thankful that I have been able to also nurture and raise my four children in this little piece of heaven, now we have grandchildren, who will be having their own adventures on this family farm, learning to appreciate the nature that surrounds us. My dad, Frank, works along with us keeping up our gardens and being an amazing land steward. Did I mention he is 80 years old and irreplaceable? Only a small portion of our 100-acre farm is actually "*farmed*".

While most of our neighbors are clearing every fence row and bush for more workable land, we have taken over 60 acres of workable land and given it back to nature. Trees, shrubs, wildflowers, and herbs are all thriving, increasing the natural habitat for the surrounding wildlife. Common sightings are deer, rabbits, coyotes, wild turkeys, hawks, raccoons, and rare sightings of bobcats, bears, and even a cougar.

It is on this land since 2010 that herbal wisdom has been shared, taught, and felt. I share the knowledge that I have been gifted with my students on our nature walks and in workshops. I feel it is so important to share and educate about our plants.

The preservation of plants and natural habitat for wildlife and for others has been a huge part of what and who we are. It wasn't until last year after speaking to United Plant Saver volunteers at the New England Women's Herbal Conference that I realized that my personal sanctuary is already a botanical sanctuary! We are very proud to say that last year we became a Botanical Sanctuary Member of United Plant Savers, the first member in Ontario!

Our future goals here on our farm are simple—to increase the number of "At-Risk" plant colonies annually by way of donations, volunteers, and hands on education. We will offer "At- Risk" botanical walks and lectures. It is my dream that one of my children or grandchildren will carry on my work with plants, nurturing and loving our sanctuary as much as I do.

I am incredibly thankful every day for my work within the herbal community introducing people to the many uses of herbs and seeing them begin to use them daily—for themselves and their loved ones (human and pet)—it is truly my life's passion! ■

http://theginkgotree.ca/

Polypores at Sisters Sanctuary

SISTERS SANCTUARY

Guilford, Vermont
Sanctuary Steward: Martha Rabinowitz

This is land that was used by a dairy farm for pasture, corn, and hay. Over the years the forest has returned, maple with beech, hemlock, pine, and birch. I am starting to turn my attention to medicine from trees, but I am just a beginner at that.

Some acres here are still hayed, certified organic, and that is where I gather many herbs such as alfalfa (*Medicago sativa*), red clover (*Trifolium pratense*), motherwort (*Leonurus cardiaca*), milkweed (*Asclepias syriaca*), and more. So many common herbs are very medicinal, and I believe that using them is one way to preserve the more rare species. The hayfields are loved by pollinators and butterflies. My lawn is really just a close mowed field and has violets (*Viola* spp.), dandelions (*Taraxacum officinale*), plantain (*Plantago* spp.), and more. I have counted over 30 species growing.

In the forest I have seen a natural return of herbs as the canopy closes and the soil regenerates. The first near my house was blue cohosh (*Caulophyllum thalictroides*). Last year I found maidenhair fern (*Adiantum pedatum*), and in the fall I found ginseng (*Panax quinquefolius*) with seeds. I planted them right near the mother. I was so excited!

I also have a patch of goldenseal (*Hydrastis canadensis*) that I planted with roots from someone across town. My patch has grown so well, it is my pride and joy. One year there were so many seeds, I planted them in a corner of the patch, and they have sprouted. I intend to plant them out in the forest next fall in spots where I think they will thrive. Last year all my seeds disappeared, and I suspect the local blue jays. I hope some of them sprout wherever they fall! I did have to put a good fence around my little plot to keep out deer, and I am always looking at the surrounding trees and adjusting the amount of light they get.

I also have rescued bloodroot (*Sanguinaria canadensis*) that was on the edge of the road left by the road crew machinery, and just a few roots have produced babies that sprout up all over the place and are so beautiful in the spring. In the same way I have adopted some black cohosh (*Actaea racemosa*) that appeared in a neighbor's garden. He was horrified, but once he found out that I thought it was a great plant, he decided he thought so, too and has kept his patch going. I also moved leeks and trillium (*Trillium* spp.) from where they would have been destroyed. My black birches have produced chaga (*Inonotus obliquus*) as well.

Much of my "gardening" is fighting at the field-forest boundary with invasive plants. Bittersweet (*Celastrus* spp.) is brought in by the birds and grows rampant. Black swallowwort (*Cynanchum louiseae*) is taking hold, and I actually burned a fire over where it lives, since it's so hard to get rid of. I think it helped, but I have to keep after it. Spotted knapweed (*Centaurea maculosa*) is another, and Japanese barberry (*Berberis thunbergii*) far outgrows the amount I could ever use for dye or medicine and brings in ticks.

I try to appreciate every plant, but some take over too much. So a lot of my gardening is not in a little spot but in keeping the architecture of the forest and swamp available for the wild plants and animals to regenerate. I feel so blessed to do this work! ■

SACRED PLANT SANCTUARY AT SEATTLE SCHOOL OF BODY-PSYCHOTHERAPY

Seattle, Washington

Sanctuary Steward: Aylee Welch, LICSW

Sacred Plant Sanctuary at Seattle School of Body-Psychotherapy

Exquisite black cohosh blooms

Blue cohosh

Devil's club, a Pacific Northwest powerhouse

Solomon's seal

Osha

The great magical mandrake

Schizandra blooms

Maidenhair fern, an at-risk beauty

WALKER MOUNTAIN BOTANICAL SANCTUARY
(2018 UPDATE)

Deerfield, Virginia

Sanctuary Stewards: Shay and Kim Clanton and family

It is early February at Walker Mountain Botanical Sanctuary, close to the midpoint between the winter solstice and the spring equinox. This has been a cold winter, and it is comforting to think that we are headed towards spring and the emergence of the vibrant green world.

We are happy to write that, in 2016, we were able to purchase an additional 60 acres adjacent to the existing 40 acres of our land here at Walker Mountain Botanical Sanctuary in Deerfield, Virginia. The new land is mountain hardwood forest with an open field at the base of the mountain, and there is an old house that was the post office for this part of the valley long ago. The land, on the western edge, borders the George Washington National Forest, so we are connected to 1000s of acres of unbroken forest land. There is a rich north slope where mature ginseng (*Panax quinquefolius*), black cohosh (*Actaea racemosa*), blue cohosh (*Caulophyllum thalictroides*), bloodroot (*Sanguinaria canadensis*), and mayapple (*Podophyllum peltatum*) thrive. Last fall we planted more ginseng, both roots and seeds, as well as ramps (*Allium tricoccum*), trillium (*Trillium* spp.), and goldenseal (*Hydrastis canadensis*). We also carefully planted the berries of the mature ginseng already growing here in good places in the same general area as the mother plants. There is an old trail that winds up the mountain from a small spring, and here we have begun a medicine trail using old slate roof tiles for plant ID markers. We plan to continue to work on the trail throughout the spring and to add plants and seeds every year. We would love to soon be able to share with the public the woods and rich diversity of plants and the beautiful rushing mountain creek that flows from springs on Walker Mountain.

Ginseng in the fall

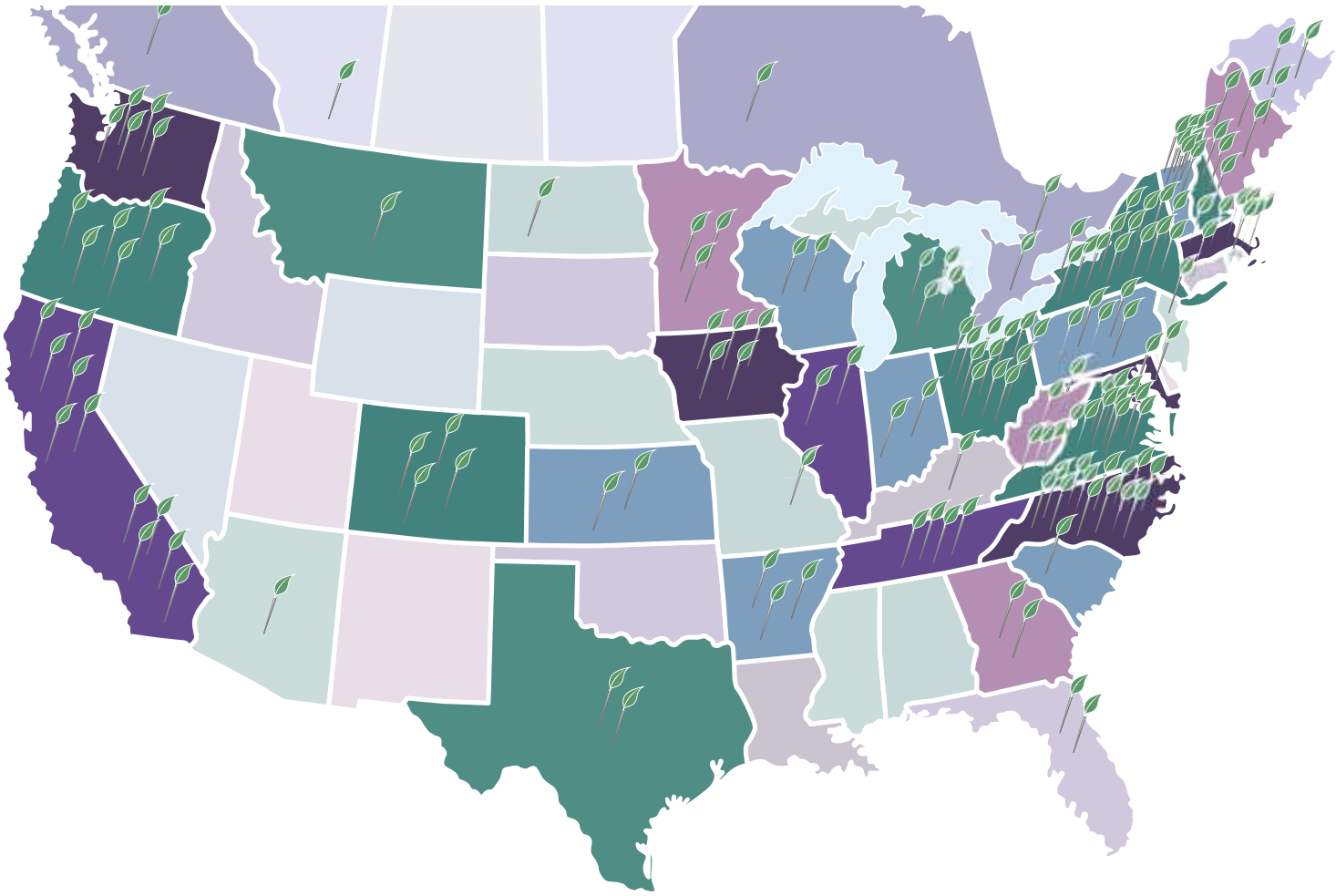
It is a dark time politically for those who love and honor the earth. The route of the proposed Atlantic Coast Pipeline runs just a few miles from our home on the opposite side of Walker Mountain. The ACP is a huge fracked gas pipeline that will run 600 miles from the fracking fields of West Virginia through Virginia to North Carolina through 1000s of acres of National Forest (where steep mountain ridges will be flattened and forests permanently cleared the width of a six-lane highway) and across 1000s of streams, rivers, and private farms and land, including the base of the western side of Walker Mountain and through beautiful Deerfield Valley. We have fought for three years with citizens groups to stop it, but it is currently in the final stages of approval. Our work with United Plant Savers and Walker Mountain Botanical Sanctuary gives us perspective and balance in a difficult time. This place is truly a sanctuary for the plants and for all beings. We are grateful to live in this beautiful forest and to be a part of the work of United Plant Savers. In each UpS Botanical Sanctuary there is hope for the green world and trust in the ancient intelligence and resilience of the natural world.

"If we surrendered to the earth's intelligence we could rise up rooted, like trees"

— Rainer Maria Rilke from his poem, "As Surely Gravity's Law"

UPS BOTANICAL SANCTUARY NETWORK: ACTIVE MEMBERS

REGISTERED SANCTUARIES THROUGHOUT THE US & CANADA



7 Acre Wood Farm
Burnsville, VA

Aaxis Health/Nature Cares Nursery and Botanical Sanctuary
Portland, OR

Acadia University Harriet Irving Botanical Gardens
Fountain Valley, CA

Appalachia Ohio Alliance
Logan, OH

Appalachia School of Holistic Herbalism/Soulflower Farm
Asheville, NC

Ataga'hi
Marengo, IL

Avena Botanicals
Rockport, ME

Bastyr University Dept. of Botanical Medicine/Bastyr Herb Garden
Kenmore, WA

Bean Tree Farm
Tucson, AZ

Bee Fields Farm
Wilton, NH

BeeGood Gardens
Columbus, OH

Bluebird Botanical Plant Sanctuary
Eureka Springs, AR

Brigid's Way
Washington Boro, PA

Broadwell Hill
Stewart, OH

Buck Mountain Botancials
Miles City, MT

CA & J Farm
Foster, VA

Catskill Creek Native Plant Nursery
Greenville, NY

Cedar Mountain Medicinals
Newport, WA

Cherokee Medicine Woods
Bloomington Springs, TN

Dandelion Herbal Center
Kneeland, CA

Desert Canyon Farm
Canon City, CO

Diana's Garden Herb Farm and Sanctuary
Sturbridge, MA

Dibble Hill Native Plant Sanctuary
Saegertown, PA

Dragonfly Medicinals
Vashon Island, WA

Earth Remedies
New Hartford, CT

Earthcrafts Botanicals
Uxbridge, MA

Eden Hyll Botanical Sanctuary
Natural Bridge NY

Equinox Farm
Rutland, OH

Farmacy Herbs Farm
Providence, RI

Fern Hill Nursery
Cottage Grove, OR

Fire Om Earth
Eureka Springs, AR

Florida School of Holistic Living
Orlando, FL

Foodmedicine Farm/ Whole System Design
Moretown, VT

Forsaken Roots
Acme, PA

Frontier Natural Products Co-op
Norway, IA

Gaia Herbs, Inc.
Brevard, NC

Gaia's Peace Garden
Iowa City, IA

UPS BOTANICAL SANCTUARY NETWORK: ACTIVE MEMBERS

Gaspereau Mountain Herb Farm and Botanical Sanctuary
Wolfville, NS

Genie's Dream
Gatlinburg, TN

God's Gardens
Robbinsville, NC

Green Comfort School of Herbal Medicine
Washington, VA

Green Farmacy Garden
Fulton, MD

Green Turtle Botanicals
Nashville, IN

Happy Homestead/Bluebird Botanical Plant Sanctuary
Eureka Springs, AR

Hawthorne Way Botanical Sanctuary
East Meredith, NY

Healing Wheel Sanctuary
Hancock, NY

Heartmore Farm
Kents Store, VA

Heartstone Herbal School
Van Etten, NY

Herb Mountain Farm
Weaverville, NC

Herbminders of Maine
Lubec, ME

Hidden Garden Ethnobotanical School
Brooklyn, NY

Herb Pharm
Williams, OR

Highwoods Heaven Botanical Sanctuary
Yacolt, WA

Humming Bird Hill Native Plant Nursery
Crozet, VA

IdleWild Native American Plant Sanctuary
Wilburton, OK

Indian Pipe Botanical Sanctuary
Linden, VA

Knowlton Farms
Sebastopol, CA

Labyrinth Gardens
Mulberry Grove, IL

Light Footsteps Herb Farm and Learning Center
Chardon, OH

Luna Farm Herbal Gardens and Botanical Sanctuary
Troy, IL

Lynnwood Herb Farm
Lykens, PA

Maryland University of Integrative Health Garden
Laurel, MD

Mill House
Arrington, VA

Mockingbird Meadows Eclectic Herbal Institute
Marysville, OH

MoonMaid Botanicals/Woodlands Medicinal Sanctuary
Cosby, TN

Morning Star Sanctuary
Westcliffe, CO

Morning Sun
New Egypt, NJ

Motherland Botanical Sanctuary
Willits, CA

Mycoevolve
Essex Junction, VT

N.C. Ginseng & Goldenseal Co./ Eagle Feather Farm
Marshall, NC

Native Earth Teaching Farm
Chilmark, MA

Nature Cares Nursery and Botanical Sanctuary
Portland, OR

Nettlejuice Herbals
Cochranville, PA

Oak Creek Botanical Sanctuary
Corvallis, OR

Owl Mountain
Clyde, NC

Pangaea Plants
Black Mountain, NC

Perry Hill Farm
Millbrook, NY

Peterman Brook Herb Farm
N6280 Riverview Road
Porterfield, WI

Pheonix Farms
Augusta, ME

Plant and Gather Forest Farm
Marshall, NC

Plattsburgh Botanical Sanctuary
Plattsburgh, NY

Restoration Herbs
Erie, PA

Sacred Mother Sanctuary
Peabody, KS

Sacred Plant Sanctuary at Seattle School of Body-Psychotherapy
Seattle, WA

Sacred Plant Traditions
Charlottesville, VA

Sacred Roots Herbal Sanctuary
Shepherdstown, WV

Sage Mountain
E. Barre, VT

Sage of the Woods
Cedar Falls, IA

Seeds and Spores Family Farm
Marquette, MI

Seven Arrows Farm Botanical Sanctuary
Seekonk, MA

Shaw Black Farms
Morning View, KY

Shindagin Hollow Woodland
Willseyville, NY

Singing Brook Farm
Worthington, MA

Sisters Sanctuary
Guilford, VT

Sisters Sanctuary
Guilford, VT

Soothing Herbals
Goshen, VA

Soulflower Farm
Asheville, NC

Sweetwater Sanctuary
Danby, VT

Terra Firma Gardens
Harrisonburg, VA

The Ginkgo Tree
Cannington, ONT

The Green Spiral
Middleburgh, NY

The Herb Crib
Blairsville, GA

The Living Centre
London, ONT

The Rare Seed Sanctuary
New Gloucester, ME

The Trillium Center
Conneaut, OH

The Wellspring Valley
Stahlstown, PA

Three Leaf Farm
Louisville, CO

Three Springs Farm
Waitsfield, VT

Two Creeks Organic Farm
Shiloh, GA

Underwood Herbs/Plattsburgh Botanical Sanctuary
Plattsburgh, NY

Vajra Herb Farm
Oskaloosa, KS

Val' Holler Farm and Homestead
Burnsville, NC

Vintage Homesteader
St James, MO

Walker Mountain Botanical Sanctuary
Deerfield, VA

Wasabi Springs
Barnardsville, NC

Weeds For Wellness
Nescopeck, PA

Wellspring Mountain/Eclectic School of Herbal Medicine
Lowgap, NC

Wildcroft Hollow
Amerst, VA

Wildflower School of Botanical Medicine
Cedar Creek, TX

Wind Song
North Garden, VA

Windsong
Honor, MI

Wise Ways Herbals/Singing Brook Farm
Worthington, MA

Wise Woman Center
Woodstock, NY

A GREAT BIG WELCOME TO OUR NEWEST SANCTUARIES!

■ = recently joined

VISIT THE SANCTUARY

As a member of UpS you can experience the power of our botanical sanctuary yourself. Along with your *Journal of Medicinal Plant Conservation*, sticker, and discounts to United Plant Savers events, UpS members have special privileges at the United Plant Savers Botanical Sanctuary.

The UpS Botanical Sanctuary is the exact location where, 23 years ago, Rosemary Gladstar, Paul Strauss, and a few others first began to talk about the idea of conserving these plants that were providing medicine and income to an ever-growing population of people.

Members are invited to hike The Medicine Trail where, if your timing is right, you will see American ginseng, black cohosh, bloodroot, blue cohosh, false unicorn root, trillium, one of the largest patches of goldenseal anywhere in the world, and more. Beyond the Medicine Trail lie The Main Hollow Trail, Oak Walk, Reclaim Trail, Heart Pond, and miles of additional paths to explore.

Come for the day or spend some extended time with us and really allow yourself to fall in pace with the plants. We have overnight lodging including The Yurt, which offers kitchen, bathroom with shower, and gas heat; Barn Rooms with two single beds, electric heat, and shared bath; the rustic Tornado Cabin nestled in the middle of the forest with two single beds; and in addition we have plenty of primitive camping sites. For more information visit www.goldensealsanctuary.org. If you would like to visit, just email office@unitedplantsavers.org or call 740-742-3455 to get on the calendar. I look forward to sharing this sanctuary with you!

airbnb hipcamp

Find the United Plant Savers Botanical Sanctuary on Airbnb and Hipcamp

It is now easier that ever to stay at the UpS Botanical Sanctuary in Rutland, OH. As of February you can now book your stay through Airbnb and Hipcamp, two online marketplace and hospitality services for people to rent short-term lodging. While overnight accommodations at the sanctuary are nothing new, these two services will attract more guests and help to expose new people to UpS and our mission.

Much of what makes the UpS Botanical Sanctuary special is the community that has formed around the plants and this hallowed piece of land. Here are a few of our neighbors, board members, and special guests during one of our annual board meeting potlucks.

...United Plant Savers'...

Medicinal Plant Conservation Certificate Program

Hard Working?

Motivated to learn about medicinal plants?

Want to experience United Plant Savers' 360-acre plant sanctuary in Ohio?

FALL 2018 SESSION:
September 4th to October 12th

~ & ~

SPRING 2019 SESSION:
April 29th to June 7th

Apply now for early acceptance!

A HANDS-ON PRACTICAL APPROACH

Interns take classes from local teachers and work on maintenance, conservation, and cultivation projects for 30-40 hours per week. The importance of interns spending time in the woods and developing relationships with the plants is emphasized. Internship program coordinator John Stock oversees the program and is the caretaker for the interns while they are here. Local teachers Paul Strauss, Chip Carroll, Lonnie Galt-Theis, and Tanner Filyaw each lead work crews and apply their own personalities and technique to teach plant identification and uses. In addition to these core teachers, interns will learn from clinical herbalist Caty Crabb, longtime herbal educator Rebecca Wood, UpS Advisory Board member Mark Cohen, artist and flower essence practitioner Katherine Ziff, and more. Interns will work daily with "at-Risk" and endangered species, perform general farm maintenance, landscape maintenance, plant identification, sustainable wild harvest techniques, medicine making, and more!

Application available online at
www.unitedplantsavers.org
office@unitedplantsavers.org
740-742-3455

Fall 2017 interns. Left to right: Bailey Grenert - AmeriCorps Service Member, Alecia Iacutone, Christine Julich, Jessica Morley, Isabella Trumpetto, Gwendolyn Rouse, Sylvia Platt, Paul Strauss.

DEEP ECOLOGY ARTIST FELLOWSHIP PROGRAM

We are seeking artists looking to spend time at the sanctuary to explore their artistic perspective in regards to the role of native medicinal plants in the ecosystem through photography, writing, and mixed media. We will accept applications throughout the year on a rolling admission basis. Applicants can apply for up to four weeks. We will provide free lodging to those who are accepted. To apply please submit a one-page description of what your interest is in applying for the fellowship and an example of your art work along with a CV.

We also ask that those who are accepted to participate in the artist fellowship to share their work in our annual *Journal of Medicinal Plant Conservation*. We hope that this fellowship will offer an opportunity for those seeking sanctuary for artistic inspiration to have the time and space to connect with the healing plants. We look forward to attracting a diverse range of individuals who will explore the meaning of sanctuary and share their artist experience with our membership and the broader plant community.

***

Deep ecology is an ecological and environmental philosophy promoting the inherent worth of living beings regardless of their instrumental utility to human needs, plus a radical restructuring of modern human societies in accordance with such ideas. Deep ecology argues that the natural world is a subtle balance of complex inter-relationships in which the existence of organisms is dependent on the existence of others within ecosystems. Human interference with or destruction of the natural world poses a threat therefore not only to humans but to all organisms constituting the natural order.

United Plant Savers Botanical Sanctuary

THE RECLAIM TRAIL

Rutland, OH

Funded in 2016 by an Ohio EPA Environmental Education Fund Grant, the Reclaim Trail guides hikers through the story of past land use and its consequences, current restoration efforts both intentional and natural, and how the power of sanctuary can heal the land and spread biodiversity.

United Plant Savers Center for Medicinal Plant Conservation
Original artwork by Philippe Grenade XIV

Begin your hike by walking up an earthen "ramp" that will take you past the Heart Pond and to the shoulder of the ridge. In 1963, there would have been large dump trucks full of coal creeping down this trail and then on to the Ohio River where they would feed power plants and fill barges.

Once at the top of the ramp you will be standing in front of the "high wall". Until relatively recent times the stone outcroppings you see would have been hidden as layers of rock strata under many thousands of years worth of topsoil. The high wall on this land was exposed during the process of coal extraction.

Continue on the Reclaim Trail as it winds along with the high wall on your right, and contoured mounds of overburden that once covered the coal seam below the trail to your left.

If it is the right season, keep an eye out for tadpoles, toads, frogs, and salamanders that take advantage of the vernal long ponds below the high wall.

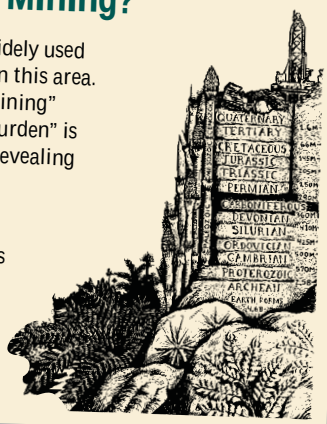
Leaving the forest canopy you will enter an open field containing native plants and trees such as goldenrod, ironweed, and hawthorn to name a few. In addition, there are several non-native plants including multi flora rose, lespedeza, and autumn olive. These non-native and potentially invasive plants were introduced as part of the reclamation process because of their ability to quickly spread, create organic matter, and fix nitrogen in the soil.

You can now return to the beginning of the trail by following Split Rock Trail to Main Hollow Trail to Medicine Trail to Prairie Walk. Take some time to enjoy Heart Pond before heading down the hill to the Prairie. Here you will have a chance to see many prairie plants that are native to this region.

What is Strip Mining?

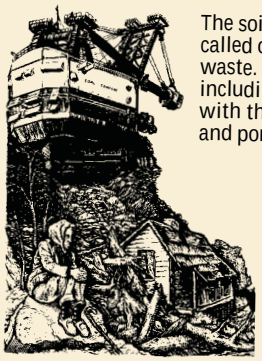
Strip mining was the most widely used way of accessing coal seams in this area. The practice is called "strip mining" because a long strip of "overburden" is first removed from the land, revealing the coal to be mined.

The coal seam in this rock represents where ancient trees decomposed. The coal found here was actually created in the Carboniferous Period, about 300 million years ago!



WELCOME TO THE SANCTUARY RECLAIM TRAIL

How Does Mining Affect Water Quality?

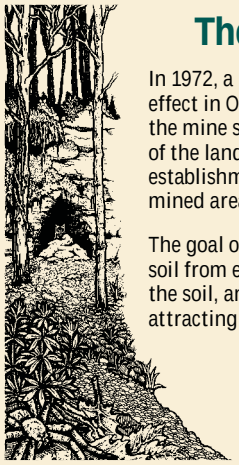


The soil and rock that covered the coal, called overburden, becomes mining waste. Heavy metals and other minerals, including sand and silt, are brought up with the coal, which washes into streams and ponds and contaminates them.

The 2005 Leading Creek Improvement Plan set goals and steps for the restoration of water quality in the Leading Creek Watershed.

The project's goal was to bring aquatic life, like frogs and fish, back to the creek.

The Reclamation Process



In 1972, a revision of the strip mine law took effect in Ohio. This law required re-grading of the mine site to mimic the pre-mining contour of the land, replacement of topsoil, and the establishment of vegetation cover over the mined area by the mine operator.

The goal of the vegetation is to protect the soil from erosion, build organic matter in the soil, and increase biodiversity by attracting insects and wildlife.

How does this Restoration Pond Help Wildlife?

Heart Pond was created by Paul Strauss to restore habitat, return beauty to the area, and to bring wildlife back after the damage caused by mining. In addition, the pond was built to create a gravity-fed water source for the greenhouse.

Ponds provide habitat for many types of wildlife, like fish and insects. Other species of animals come to the pond to get food and water.

Prairie for the Pollinators and Ecological Diversity

This field was formerly managed for cutting hay. Hay has not been harvested here since the 1990s. The field was burned and tilled the season before being planted with various prairie seeds. Seeds were gathered from Ohio to ensure maintenance of local species diversity.

These plants provide food for seed-eating birds and the flowers of these prairie plants provide nectar and attract pollinating insects, which in turn attract bug-eating birds.

PARTNERS IN EDUCATION (PIE)

United Plant Savers Partners in Education program is designed to enrich school programming and students' education through instilling awareness and ethics in regards to the conservation of our native medicinal plants. Schools and apprenticeship programs that have enrolled in the Partners in Education program have provided their students the opportunity to receive all of the benefits of membership at a discounted 'student-friendly' price. These schools and programs are also given educational resources and curricular support as well as provided the opportunity to promote classes and workshops on our website and social media channels. For more information about our Partners in Education program, please visit our website: www.unitedplantsavers.org. United Plant Savers holds a special place in our heart for our Partners in Education Schools and would like to ***thank the following participating 2016-2017 schools and programs:***

ArborVitae School of Traditional Herbalism
New York, NY
arborvitaeny.com

Appalachian Ohio School of Herbal Medicine
Rutland, OH

Bastyr University Herbal Sciences
Kenmore, WA
bastyr.edu

Blue Otter School of Herbal Medicine
Fort Jones, CA
blueotterschool.com

Botanica
New River, AZ

Chestnut School of Herbal Medicine
Weaverville, NC
chestnutherbs.com

Dandelion Herbal Center
Kneeland, CA
dandelionherb.com

Florida School of Holistic Living
Orlando, FL
holisticlivingschool.org

Florida Herbal Conference
Orlando, FL
Floridaherbalconference.org

Green Comfort School of Herbal Medicine
Washington, VA
greencomfortherbschool.com

Green Girl Herbs
Hopewell, NY
greengirlherbs.com

Green Turtle Botanicals
Nashville, IN
greenturtlebotaniclas.com

Greenwood Herbals
Limerick, ME
greenwoodherbals.com

Herbal Academy of New England
Bedford, MA
herbalacademyofne.com

Herbal Sage Tea
Pomeroy, OH
herbalsage.com

Heartstone Center for Earth Essentials
Van Etten, NY
heart-stone.com

Jean's Greens
Castleton, NY
jeansgreens.com

Magnolia School
Glouster, OH

Maryland School of Integrative Health
Laurel, MD
muih.edu

Milagro School of Herbal Medicine
Orlando, FL
milagroschoolofherbalmedicine.com

Mockingbird Meadows Eclectic Herbal Institute
Marysville, OH
mockingbirdmeadows.com

Moonwise Herbs Apprenticeships and Certification Programs
Stoughton, WI
moonwiseherbs.com

Northwest School of Botanical Studies
McKinleyville, CA
herbaleducation.net

Omnigreen
Port Clinton, OH
omnigreen.com

Owlcraft Healing Ways
Scottsville, VA
owlcrafthealingways.com

Purple Moon Herbs and Studies
Hartly, DE
purplemoonherbstudies.com

The Resiliency Institute
Naperville, IN
theresiliencyinstitute.net

Sacred Plant Traditions
Charlottesville, VA
sacredplanttraditions.com

Sage Mountain
East Barre, VT
sagemountain.com

Thyme Herbal
Amherst, MA
thymeherbal.com

Twin Star Herbal Education
New Milford, CT
twinstarherbal.com

Vermont Center for Integrated Hebalism
Montpellier, VT
vtherbcenter.org

Wintergreen Botanicals Education Center
Allenstown, NH
wintergreenbotanicals.com

Yerba Woman Herbal Apprentice Program
Willits, CA
motherlandbotanicalsanctuary.com

2017 ANNUAL MEDICINAL PLANT CONSERVATION AWARD

— *Recipient* —

LAURIE QUESINBERRY

by Kat Maier, Director Sacred Plant Traditions

Last spring I received a phone call from a woman who sounded as though she was born from the very ridges and rocks of these Appalachian Mountains. The difference from the land, said to be the oldest mountains on the planet, was that her cadence was quick and hurried, imbued with urgency. She told me she was a poacher who lived and "hunted" plants in southern Virginia, and her family had been doing so for generations. She had just learned from a friend that the plants that she was digging and selling for pennies were actually valued medicines, and many were endangered. She was incredulous that all her life she had no relationship to the species she dug, save that they were a means for her family to provide food and shelter. She had tracked down United Plant Savers, who then directed her to me as I live in Virginia. Our conversation seemed to last an eternity as I heard her stories and her immediate recognition that something had to be done to change what was happening in the fields and hollows of her home. I then called Susan Leopold, UpS ED and before we knew it, Susan and I were heading south to meet Laurie Quesinberry, this year's recipient of our Medicinal Plant Conservation Award.

Laurie Quesinberry and Emily Ruff

When we arrived in her mountains, she arranged for us to stay in a beautiful vacation cabin and had generous gifts and platters of food for our stay. Walking the mountains with Laurie and hearing her stories made me realize that all herbalists and plant stewards need to have this experience to understand the trade of our medicines. She took us to hillsides that were covered in trillium (Trillium spp.) and thinking that this growth stand was common, thought nothing of harvesting this precious medicine for literally $3.00/pound.

In the short year since the three of us walked her land, Laurie has immersed herself in the conservation, education, and sharing of what she is learning. Her immediate grasp of the benefits of social media and an ability to translate her message of stewardship and conservation into the language of vimeo, Instagram, and other modes of communicating vital issues has been nothing short of amazing. As a digger she translated for me the reality of what we are talking about when we refer to these beings as articles of commerce. I realized through her work that one pound of trillium root, which is still being bought and sold at higher quantities than we realized, represents over 400 plants. The 15-pound order that she had just filled represents thousands of plants. How there are still medicines in our mountains attests only to their resilience, yet her urgency is spot on.

It is a great honor to award this conservation award to a woman who wants to be nowhere other than in the woods, making a living in the place she knows best but is now walking with a different heart and vision. She has begun a nursery for many of our most popular native medicines and has been incredibly active with plant rescues as well as looking at forest grown planting ventures. She has shown us the value of herbalists working directly with diggers so that we can receive the medicines we know and love and be assured of high quality. We can then support this level of professionalism as we move forward in the rearranging of old hierarchies of commerce and power in our field.

Laurie has shown me how my curriculum needs to change so my students have more time in these realms of nature, harvest, forest farming, and what the business really entails for our trade, as well as the wild places. I will close my tribute by quoting Laurie from a class presentation, as she is now beginning to travel and teach at symposiums and conferences as someone who knows this world from the ground up.

For as long as anyone can remember, the plants of the mountain have been intertwined with our lives, providing for the family and giving more than we could have ever asked. Selling "Seng" for heat and food, digging cohosh to buy shoes for the kids, or searching for bloodroot to pay for school supplies, our family today still depends on these plants as much as our past generations did.

Without woods to call our own, we walk these heirloom ridges where our forefathers once tread, no longer proud to be diggers in a world that calls us poachers. Our birthright has now become dirty and a thing of

shame. Each year our numbers get fewer as the loss of wild spaces chokes out our livelihood. Soon our heritage will be all but lost, an urban legend, a fading piece of mountain history.

….I sit atop an old man rock and dream of a time when the plants are honored as well as those of us who harvest them, a returning to stewardship and partnership with the forest around us. The clan has dug and cared for our sliver of hunting lands for four generations…. Some years ago, I sat… wondering what my life would be once all that I've known is gone. Life on the mountain isn't getting easier. Lands are getting smaller and harvests get slimmer each year. Logging, cabins, and roads are encroaching on our woods…. Though diggers know almost every plant of the forest, we live in a world that's completely detached from the herbal world as a whole. We tend to think of ourselves as the dirty little secret of the industry.

Atop this old man rock, it's clear that something has to change. But how do you save the mountain and this way of life at the same time? With no book to buy or road map to follow, this is a question that I'm still trying to figure out.

I thought it was rather odd to call a plant conservation group when I was trying to figure out a better way to sell the plant. But out of desperation for some sort of direction, I finally broke down and gave UpS a call. Looking back now, I can only imagine what they thought. Yet, to my surprise, they didn't hang up on me. No one scolded me for digging plants. Instead, they listened to my heart, embraced my spirit, and filled me with encouragement.

…There's no desire inside of me to change who I am. The mountain created the digger inside of me, and a digger I'll always be. Yet…Today, I sit atop that old man rock with my vision totally changed. No longer poaching the mountain's plants, I see everything in a new way. The plants are here to be honored. They were created to give us so much. My vision now is to become a steward of these natural resources instead of a poacher. …The diggers, stewards, herbalists, users; the mountain intertwines us all in seemingly unexpected ways. There's a spirit of the old flowing throughout the mountain. The path I'm on is rocky and one of constant uncertainty. At the same time, filled with magic, this unfolding journey is right where I'm supposed to be.

To learn more about Laurie's work, you can find her website at bearsmountain.com. ■

Monotropa uniflora : an Erasure

we give Ghost Plant many terribly fragile names
and try to remember them
the deepest shade of forest floors

in dark understory we want resort
where some perennials fade away

we eventually hoist gardens
underlimb trees and shrubs for a dappled light

a parasite upon fungi
has small associations
with fungal hosts
ranging the unique ecological functions
that most mycoheterotrophic plants provide
ultimately getting energy from trees

shade won't exist
because many feel the need to harvest
for themselves

a culture objectifies
commodifies
something diminished
to a tincture made of body
through which a plant moves

never need to get the roots

Ghost Plant as medicine
when no other medicine will do
by people with enough knowledge
when no other medicine will do

it's lovely to photograph
yes, a tinctured violet color
that breaks the breath

the weird little plant
as if carved from ice
exudes bruises when picked up

traditionally used as remedy
a well-studied belief in curative properties
considerably stresses wild population

it's become popular
and stands are disappearing, being misused
it's rare in most places
and we know little of its reproduction

difficult to cultivate

"I found this medicine in my yard today"

prodded it produces an instant bruising

"what do you call it?"

"I forget"

RECAP FROM THE FUTURE OF GINSENG & FOREST BOTANICALS CONFERENCE

Summary of Conference

by Chip Carroll

Approximately 197 people, representing all stakeholder groups, attended this 3-day symposium in Morgantown, West Virginia.

During the conference, four flip charts were stationed in the exhibit area, with the following key topic headings: Conservation; Commerce; Policy/Management; and Cultivation. We asked symposium participants to take notes during sessions and post questions, ideas, concerns and thoughts on the appropriate flip chart to generate a more comprehensive view of stakeholder concerns and ideas.

The following is a summary of the points raised by symposium attendees in each of the four topic areas.

A copy of the full conference proceedings, co-edited by Alison Ormsby and Susan Leopold, can be downloaded at www.unitedplantsavers.com.

CONSERVATION

Under the Conservation heading, topics varied from environmental to scientific to policy-related issues. One theme that emerged under Conservation was concerns about habitat loss. Habitat loss was mentioned multiple times with some of the comments specific to effects of habitat loss due to surface mining and mountain top removal and climate change. Creating local seed banks and refugia for ginseng and other botanicals was another theme that came out of the comments. Concerns about genetic preservation and local seed sources were touched on in comments such as "Land Grant Universities should play a role in maintaining local seed sources and supplying growers like (they do for) other crops."

Several comments related to research needs and concerns with comments ranging from Citizen Science and Research Questions to questions and concerns about the timing of ginseng monitoring, e.g., population censusing needs to be done before June 15th to get reasonable demographic data, otherwise deer browse, etc. will skew census. Timing of monitoring efforts was a concern that was repeated along with the impacts that deer are having on ginseng populations.

Many of the comments were phrased as questions from participants such as "what is our recovery goal for ginseng; we need to know not just how to reverse the loss, but what we are aiming for" and "can a root size requirement help prevent LEGAL overharvesting / immature plant harvest?" Opinions in favor of developing a conservation plan for ginseng were mentioned with the suggestion of "modeling it on federally endangered species recovery plans." Questions surrounding issues of plant size-based harvesting or reproductive capacity were mentioned multiple times as discussions surrounding the idea of a root (thumb size or "slot" requirement as in fisheries) or leaf size based harvest criteria were mentioned and repeated. Comments in favor of a 10-year age requirement for ginseng were also noted.

Outreach, education and awareness raising were mentioned multiple times with ideas about creating "campaigns" to change public opinion and raise awareness. Comments about placing higher value and demand on cultivated botanical products (more than wild-harvested) were repeated throughout.

Themes that emerged under the conservation heading were *habitat loss/ environmental concern***s, needs for research** and identifying "gaps", **regulatory changes** (size and age-based) that would improve wild populations while protecting growers, **development of local refugia** for conservation and source for seeds/planting stock, **conservation plan for botanicals** and **evaluating methods** used to collect data on wild populations.

COMMERCE

Under the commerce heading, topics seemed to coalesce around education, marketing and regulation (i.e., digger licensing). Concerns over illegal trade and enforcement of current laws were mentioned along with interest in developing more local and domestic market opportunities for ginseng. Mention of "herbal medicine" reinforced the ideas and discussions around fungicide use and chemical inputs into traditional cultivated ginseng and concerns about residue left in roots being sold and consumed as medicine.

"Marketing and Outreach" along with "Outreach and Education for Buyers" emphasized the need for a standard education to be provided to licensed dealers around the issues of illegal trade and current trends and issues. Throughout the event, discussions about increasing or requiring more education to dealers and diggers were common. There seems to be agreement on the need for requiring education or the passing of a test to become licensed as either a dealer or digger. Many state coordinators present seemed to be considering requiring a digger license in their states; currently only Wisconsin requires licensing of diggers. Other comments related to this issue included:

- "What if harvesting permits/licenses connected to a specific area? So the diggers would become stewards of their leased/local area. If they could keep the lease for years, and sell or pass on the lease, its long-term value would encourage long-term stewardship and connection & protection"
- "Digger licensing"
- "Educational component to licensing programs… pass the test"
- "How can we get all 19 states to enact a ginseng harvester's license? CHEAP! Like a fishing license type concept"
- "Stop illegal purchasing by non-licensed individuals in commerce"

Other creative concepts that were mentioned under the commerce heading included; "With lower amounts of harvesting why not limit sales to a USA market only until supplies return?" This comment revolves around lower availability of harvestable plants and harvestable areas in the wild and suggests limiting export until populations recover. Some comments revolved around commerce in the more traditional sense such as "Designing products around regenerative supply chains/forest farming into mainstream" and "Marketing regenerative supply chains/forest farms into mainstream" both of which are interested in placing more value on forest farmed and/or cultivated plant material. This is another theme that seemed to develop and continually be discussed throughout the event – a call for more companies to begin to place more/higher value on cultivated material.

Other ideas captured continued along the lines of the need for education and information sharing such as: "We need to keep lines of information flowing… how do we do that?"; "Menominee Tribe Message: --Public Education & outreach meetings – Social Media Pages – Facebook – Brochures regularly annually"; and "Law enforcement: How does the Menominee tribe put the conservation message across? Could states use their message? And Methods?" These ideas seemed to involve the need for developing consistent educational materials across the board for the entire industry and using technology (social media) to better spread the messages.

Commerce topics related specifically to growers, and opportunities included concerns about availability of local seed, availability of local roots for local herbalists, start-up business opportunities and the need for an organized group or growers association. Comments included: "How can we build up growers and help growers start local/native ginseng seed banks"; "Finances of start-up companies"; "Local seed banks"; "Local roots for local practitioners"; and "States need ginseng growers associations or a viable National Ginseng growers network/association."

Remaining topics listed under the commerce heading were largely questions and concerns. Concerns about diversity and stakeholder inclusion were repeated several times. Comments such as, "Diversity, opportunities targeting African Americans and Native Americans" were repeated under all the headings as well as a concern over the lack of harvesters and diggers attending the meeting. Some key stakeholder groups were not well-represented at the event and finding ways to engage them will be an important part of any successful follow-up work.

A few other questions and comments included: "Is there any difference in medicinal value/price between Re and Rg genetic ginseng?"; "Are any diggers, growers & brokers considering offering ginseng leaf as a result of attending this symposium? Super sustainable product."

Themes that clearly emerged under the commerce heading include **the need for education around conservation, regulations and sustainability for all stakeholders** and interest in pursuing **digger licensing** (with "test" / education component) to combat illegal trade and get a grip on chain of custody issues. **Development of domestic market** and placing **greater value on cultivated materials** were two other topics that had a lot of interest. Overall the theme seemed to be driven by the need for more sharing and education throughout the industry and developing more opportunities that value the sustainable practices while discouraging poor practices through regulation and education.

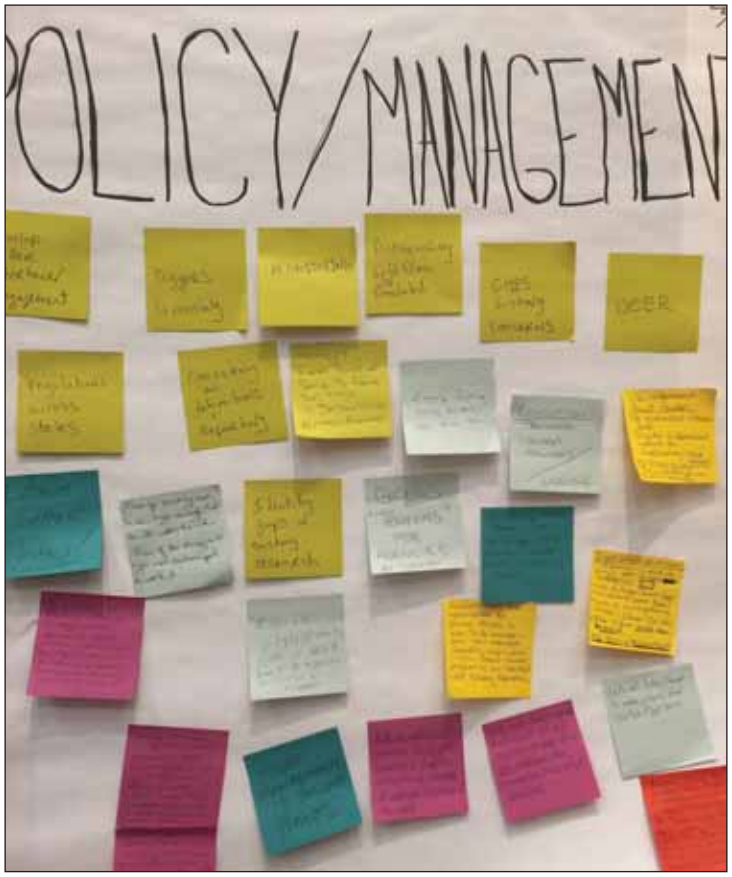
POLICY/MANAGEMENT

Under the Policy/Management heading, topics ranged from ideas around using a new or additional metric to guide the harvest of ginseng (size-based or age-based) to concerns about deer and definitions. The policy/management topics cover a wide range of issues and concerns as well as ideas about how to better manage all facets of ginseng harvest and trade. Several presenters at the event discussed the idea of managing ginseng much like we manage our fisheries, with ideas about developing a "slot" system for ginseng harvest that would allow reproductive plants to be harvested but leave juvenile and "elderly" plants to grow, reducing the "high-grading" of ginseng in the wild. Some of these ideas require more discussion and evaluation before any new policies are developed.

One comment that deserves additional thought and discussion was "please suggest possible size criteria

for harvest." Based on information presented by Jim McGraw, the idea is that it may make sense to explore other criteria besides age to base harvest on. Leaf width, stem size, root size and plant height were all possible alternatives. Administrating or enforcing another metric besides age will be difficult and requires additional thought and exploration. Another comment related to this idea was "Engage fishing policy makers, learn from them" – the idea of managing ginseng more like a fishery.

Some of the recurring themes under the policy/ management heading revolved around ginseng theft (poaching); penalties; licensing of diggers, buyers and exporters; and illegal trade. Comments such as the following all encompass concerns about the education of those participating in the ginseng harvest and trade: "Digger licensing"; "Restrict first points of sale to fresh root only to cut down on early harvest"; "Education/ Training, Buyers, Diggers. Licensing"; "Make sure that proposed tests built into any new regulations/ licensing are fair and consider the education level of all involved"; "If we move in the direction of written tests for diggers permits…how can we address literacy concerns in the region that could disenfranchise people who have historically harvested this plant?" (Video instead of written?); "Educational Classes for dealers, diggers and buyers collectively instead of sending literature in the mail"; and "Ginseng training for agencies provided by industry & growers." There seemed to be consensus around the idea of requiring educational components to any licensing programs as long as the educational components are equitable and fair to those who would be required to pass a test. Ideas about having diggers watch an educational video and take a brief test to qualify for a license were discussed as an alternative to written materials.



Another comment suggests administration with a point system that would penalize offenders: "Digger permits/ Point System… Theft / Poaching = (x) points on permit. After (x) points or # offences, loss of digger permit, loss of dealer permit, loss of hunting/fishing licenses. Also have fines greater than $1000. Add Teeth to Regulations!" Some other concerns around this idea have to do with the ability of states to administer a ginseng licensing program because many of the state licensing agencies are separate from the agency tasked with managing ginseng. It is important to state that licensing would generate some income for ginseng management. Also there seemed to be consensus on the fact that any licensing requirement should be kept fairly priced with many discussing the idea of a $10 license fee. It is worth noting that the licensing discussion appeared under all the headings – conservation, commerce, policy, and cultivation.

Comments around the theft issue and current laws were also at the forefront of the policy/ management discussion. The following comments all revolve around the problems and concerns with the theft and illegal harvest of ginseng: "Law enforcement should develop A.) relationships with dealers and B.) better enforcement methods for theft/poaching/illegal harvest. Do it like regular FWS/Wildlife type law, e.g., Ability to search, etc."; "Enforce current laws!!!"; "Fines for poaching need to be high enough that it's not worth the risk. Price of ginseng is so high that most poachers feel it is worth it"; "Growers need real repercussions for ginseng thieves in order to do business & grow this valuable commodity crop – which in turn lessens market pressure on our beautiful wild ginseng populations"; and "Educate judges prosecuting cases – send $$$ (fines) back to species protection/research." Theft and illegal harvesting were of major concern to all of the stakeholders present, suggesting that current regulations and laws addressing the issue may not be having the desired impact of reducing occurrences. In many states, the penalties for ginseng theft were much stiffer 100 years ago than they are today.

Other topics that came up under the policy management heading had to do with management of the resource, current policies, and a desire to develop consistent definitions and rules across all states. "Regulations across states", "Consistency on definitions & reporting", "Develop better interface/ engagement", "CITES listing concerns", "Distinguishing wild from wild-simulated", and "Monitoring" all capture the concerns around difficulties in managing ginseng when there are 19 states with differing agencies tasked with consistently managing this resource. Lack of standard definitions and policies across all states leads to confusion and difficulty in effectively managing ginseng harvest and trade. Inability to distinguish wild

Artwork by Flora Trumpetto

from wild-simulated roots creates the possibility of poor management decisions based on incomplete and inaccurate harvest data. Lack of regular interface and engagement between and amongst agencies and stakeholder groups can lead to confusion and distrust amongst stakeholders. Clearly there seems to be a desire for more interface amongst key groups such as what took place at this event. Bringing together stakeholders more often and regularly can provide the opportunity to "dig down" on some of these issues and come up with workable solutions for all involved. Other comments related to management included: "Beyond policy to prevent the exploitation of ginseng as a resource – what thoughts do people have here for using this resource/cultivation of it for preservation of our forests and watersheds…Keystone species"; "Deer"; "Monitoring"; "Forest management to consider plants/ understory"; and "Identify gaps in existing research" all touched on the need for more research and better research methods i.e., timing of monitoring) in order to get a more accurate picture. Comments also touched on the correlation between non-timber forest products (NTFP's), ginseng and overall forest health and management. New information about the interactions and relationships between ginseng and other species (e.g., wood thrush) and NTFP's as an indicator of overall forest health were mentioned as was the need to consider NTFP's in forest use planning and overall management decisions.

In summary of the policy/management heading, comments focused primarily on issues related to **Education** focusing on diggers, buyers and agencies, **Licensing** of diggers with a strong educational component, enforcement of existing **Laws** as well as development of more consistent rules and regulations across states. **Theft & Illegal Harvest** were front and center amongst the concerns mentioned as was **Deer Impacts** on both wild and wild-simulated ginseng populations. **Ginseng as a keystone species** encompasses the ideas around considering ginseng (and other botanicals) in our overall decision-making processes related to forest management.

CULTIVATION

Under the cultivation heading, most topics fell into three broad categories: grower verification; planting stock/ seed sources; and theft or "poaching" issues. Other topics discussed relating to cultivation were about support and education for growers, and questions related to specific growing techniques.

Support for verification programs for growers was voiced in simple statements such as "verification" and "support for growers" and "Buyers/Consumers willing to pay premium prices for cultivated crops." The ideas about grower verification programs such as the one being administered by PCO (Pennsylvania Certified Organic) were discussed at the event. The need for this type of verification has been being discussed for at least the last decade and stems in large part from concerns ginseng growers had about the future ability for them to market their crops if an export ban were ever placed on American Ginseng. Since that time West Virginia legislatively established a ginseng grower certification/verification program, and PCO established their "Forest Grown Verified" program that includes other forest grown botanicals besides ginseng. In addition to potentially protecting a grower's ability to market ginseng, these program have also placed value on raw materials that are verified and labeled under such a program.

The issue of ginseng theft was discussed repeatedly, with concerns about the lack of consistent and strong penalties for those who engage in such activity. Comments such as "Theft, stealing, poaching", "Fines for poaching need to be high enough that it's not worth the risk. Price of ginseng is so high that most poachers feel it is worth it", "Growers need real repercussions

Thank you to symposium videographer Philippe Grenade XIV and Jennifer Gerrity from our sponsor, Mt. Rose Herbs

for ginseng thieves in order to do business & grow this valuable commodity crop – which in turn lessens market pressure on our beautiful wild ginseng populations" and "Educate judges prosecuting cases – send $$$ (fines) back to species protection/research" were repeated across headings.

Concerns over the lack of availability of local seed sources for ginseng were mentioned repeatedly as well. "Planting Stock Sources", "Seed Sources" and "How do I find local seed source for ginseng in my area?" were common concerns. Because so much attention and concern has been given/raised over the last decade in regards to genetic mixing of ginseng from cultivated gardens with that in the wild, sourcing "local" seed has become a hot topic. Although demand for local seed is high, producing it is difficult because of the intensity in which ginseng must be cultivated in order to produce any meaningful amount of seed. Comments related to this issue can be found throughout all four different headings discussed.

The importance of cultivation in general was expressed through comments such as: "Cultivation is of the upmost importance not just to take the pressure off of wild populations, but also to have easier methods of studying them. See the Chinese concept of Dao Di"; "Educate to encourage growing by private citizens"; "Create opportunities for African American and Native American partnerships/communities"; and "Polyculture/ forest farming/ecological design/symbiotic species." These comments share the idea that cultivation of these forest botanicals in their native habitats can provide benefits economically, environmentally, and socially if supported and encouraged properly.

Some comments and questions were broad and showcased the questions or "gaps" in information that people are seeking. Questions related to cultivation methods included: "Are there known companion plants to support ginseng production and/or pollinators and ways to bring them into ginseng populations"; "As a "would be" cultivator in PA, where is the best place to start? Education, Resources, Agencies. Is there a universal list for the entire US specifically for ginseng?"; "Is it possible to grow ginseng in the piedmont area of Virginia? East of Lynchburg, VA?" – "Yes"; and "Does canopy litter bioaccumulation act as a limiting factor in alkaloid content?" Other concerns listed under cultivation related to terminology and definitions and a concern over the use of fungicides and herbicides on ginseng crops: "Terminology problems – Woods grown, wild-simulated, wild"; and "No more poison in ginseng."

In summary of the cultivation heading, clearly the big issues include issues around **Theft / Poaching, Planting Stock Sources** and **Grower Verification**. Comments indicate an understanding for the importance of cultivation and a recognition of the many benefits of forest cultivation of these botanicals. Comments also indicate a need for more information sharing and better communication amongst industry, regulators and growers to come up with workable solutions that can benefit everyone. Based on the questions asked, it appears that there is a need for more research and information gathering related to the cultivation of ginseng and many forest botanicals.

OVERALL SUMMARY OF INPUT

Interestingly, comments, concerns and discussions seemed to have focused most often on the need for greater education, educational resources and information sharing for all the stakeholder groups. This speaks to the need for stakeholders to come together more often and regularly to share current trends, information and research as well as to develop educational materials to be shared with the broader community. Lack of effective ways to reach folks on the ground (i.e., diggers, buyers and growers) who are often operating independently and in isolated rural communities will only exacerbate the many problems and issues surrounding the habitat loss and over-harvesting of these botanicals. Finding ways to engage all stakeholders more effectively and more often will go a long way to helping conserve these important species. Thinking creatively about new ideas and policies and working with the larger community to develop those ideas can potentially provide answers to some of the issues facing American Ginseng and other forest botanicals.

Symposium Papers

"The Sustainable Herbs Project: Sourcing and Sustainability in the Herbal Products Supply Chain"

Armbrecht, Ann. Sustainable Herbs Project Director, Montpelier, VT. a.armbrecht@gmail.com

"Can Wild Ginseng Regenerate New Plants from Replanted Rhizome?"

Beyfuss, Robert Layton. Retired Agriculture Agent and American Ginseng Specialist for Cornell University Cooperative Extension, NY and Vice President American Ginseng Pharm LLC. rlb14@cornell.edu

"Black Cohosh: Harvest Impacts, Population Response and Implications for Sustainable Management of this and Other Medicinal Forest Products"

Chamberlain, James and Christine Small. USDA Forest Service, Blacksburg, VA. jchamberlain@fs.fed.us

"Demographic response of American ginseng to three natural canopy disturbances common in mixed mesophytic forests"

Chandler, Jennifer L. Appalachian State University, Boone, NC. jchandler23@gmail.com

"Ginsenoside Profiles in American Ginseng (Panax quinquefolius L.) in Western North Carolina" (poster)

Clarke, H. David, Jonathan Horton, Jennifer Rhode Ward, Jessica Burroughs, and John Brock. University of North Carolina Asheville. jburroug@unca.edu

"Use of Natural Fungicides with Organic Ginseng Production"

Eidus, Robert. North Carolina Ginseng & Goldenseal Co., Marshall, NC. reidus@frontier.com

"Characteristics of Woodland Herbal Users in the United States – Summary from an Epidemiological Study"

Feinberg, Termeh and Kim Innes. University of Maryland. TFeinberg@som.umaryland.edu, Kinnes@hsc.wvu.edu

"Mycorrhizal Symbiosis in Forest-Grown American ginseng (Panax quinquefolius) and the Relationship Between Mycorrhizal Colonization and Root Ginsenoside Content"

Filyaw, Tanner R. and Sarah C. Davis. Environmental Studies, Ohio University, OH. tanner@ruralaction.org, tf287901@ohio.edu, daviss6@ohio.edu

"NatureServe and Native Plant Conservation in North America"

Frances, Anne, Amanda Treher, and Leah Oliver. NatureServe, Arlington, VA. anne_frances@natureserve.org

"Supply and Regulation of Wild American Ginseng"

Frey, Greg, James Chamberlain, and Jeff Prestemon. Forest Service, Southern Research Station, Forest Inventory & Analysis, Blacksburg, VA. jchamberlain@fs.fed.us

"Indications for the Importance of Growing Methods on Pharmacological profiles of Herbal Medicines"

Gonick, Meghan. University of Bridgeport Acupuncture Institute, CT. generativehealth@gmail.com

"Sanguinaria canadensis L., Bloodroot, highlighting historical and potential uses"

Gonick, Meghan. University of Bridgeport Acupuncture Institute, CT. generativehealth@gmail.com

"Spreading the Ginseng Gospel: Case Study in Ginseng Production and Promotion from Watauga County Cooperative Extension"

Hamilton, Jim. County Extension Director for North Carolina Cooperative Extension, Watauga County, Boone, NC. jim_hamilton@ncsu.edu

"Connecting Appalachian Icons: The importance of conserving plant-animal mutualisms in a changing world."

Hruska, Amy M., Michael C. Elza, and James B. McGraw. University of Hawai'i at Mānoa. hruska.amy@gmail.com

"Antidermatophytic Effect of Black Walnut hull, Juglans nigra"

King, Rosanna, Andrea Lutac, Natalie Rubio, Jenna Yutzy, and Rebecca Rashid Achterman. Bastyr University, Kenmore, WA. herbalist.rosanna.king@gmail.com

"RootReport: Measuring the Market for Forest Medicinals"

Kruger, Steve, John Munsell, James Chamberlain, Jeanine Davis, Ryan Huish, and Steve Prisley. Virginia Tech, Blacksburg, VA. skruger@vt.edu

"Producing wild leek in forest farming under northern climates"

Lapointe, L., Dion, P.-P., Denis, M.-P., Boulanger-Pelletier, J., Bussières, J. & Bernatchez, A. Department of Biology and Centre for Forest Research, Laval University, Quebec City, Canada. G1V 0A6. line.lapointe@bio.ulaval.ca

"Conservation status of North American forest botanicals: What do we know? Why does it matter?"

Leaman, Danna. Research Associate, Canadian Museum of Nature, Ottawa, Canada. Co-Chair, Medicinal Plant Specialist Group, Species Survival Commission, International Union for Conservation of Nature (IUCN); Trustee, FairWild Foundation. djl@green-world.org

"Taking the Broad View: How Are Wild Ginseng Populations Faring and When Does Conservation Policy Need to Change?"

McGraw, Jim. Eberly Professor of Biology, West Virginia University. james.mcgraw@mail.wvu.edu

"Population, Distribution, and Threats of American Ginseng (Panax quinquefolius L.) in Indiana and Illinois"

Oliver, Leah, Amanda Treher, and Anne Frances. NatureServe, Arlington, VA. leah_oliver@natureserve.org

"Partial root harvest of Panax quinquefolius L. (American ginseng): a non-destructive method for harvesting root tissues for ginsenoside analysis"

Sabo, Ian, Jonathan L. Horton*, H. David Clarke, and Jennifer Rhode Ward. Biology Department, University of North Carolina Asheville. *Corresponding author jhorton@unca.edu

"Assessing the Status of American Ginseng from Harvest and Monitoring Data"

Schmidt, JP and Jenny Cruse-Sanders. University of Georgia, GA. jps@uga.edu

"Relationships between Genetic and Phytochemical Diversity of American Ginseng from Western North Carolina"

Ward, Jennifer R.1,*, H. David Clarke1, Jonathan Horton1, John Brock2, Jessica Burroughs1, and Nicholas Freeman1 1 Biology Department, University of North Carolina Asheville. 2 Chemistry Department, University of North Carolina Asheville. * jrward@unca.edu

"American ginseng status assessment on four National Forests in the Mid-Atlantic U.S."

Young, John, David Smith, and Tim King. USGS Leetown Science Center, Kearneysville, WV. jyoung@usgs.gov

"An Introduction to Flower Essences: Sustainable Supplements from Forest, Field, and Garden"

Ziff, Katherine. Briarwood Studies, Athens, OH. katherineziff@aol.com

"Alkaloid content in forest grown goldenseal: preliminary results and current directions"

Zuiderveen, Grady H. and Eric P. Burkhart. Pennsylvania State University, State College, PA. gjz5033@psu.edu

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