

Journal of MEDICINAL PLANT CONSERVATION

2020

A United Plant Savers Publication



FARMING FOR THE BIRDS

CASTOR BEAN

LICORICE

KAPOK BUSH

UAE

FOREST BATHING

TRILLIUM GOVANIUM

GINSENG

APPALACHIA

PAKISTAN

KENYA

KAZAKHSTAN

ASPLIA AFRICANA

ZHUMERIA MAJDAE

FRANKINCENSE

NIGERIA

IRAN

ETHIOPIA

ZIZIPHUS SPINA-CHRISTI

JORDAN



WILDCRAFTING IN WARMING A WORLD

IUCN CONSERVATION CONGRESS 2020

POSTPONED

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WINDOWSILL TO THE WORLD OF MEDICINAL PLANTS

by Susan Leopold

The inspiration for the 2020 cover of this Journal came from a post made on Instagram not too long ago. A question was asked, "What is your favorite plant podcast?" and hundreds of people engaged. Most fascinating was the response on podcasts that relate to potted indoor plants. According to the *New York Times*, indoor plants have become extremely popular from podcasts, Instagram accounts, and plant stylists. What does this latest plant craze say about how plants make us feel when we connect with them, even in the simple capacity of caring for an indoor plant? This question is easily answered in the beautifully animated short film "Bloom" by Emily Johnstone, brought to my attention through the weekly blog Brain Pickings! This short film captured kindness and overcoming depression through the tending of an amaryllis that lived in a city windowsill. Forest bathing, wildcrafting, mindfulness, farming for the birds, finding sanctuary, and a language for grief are all parts of the holistic role plants play in our lives. Thus the idea for the potted plants on the windowsill came to mind as a way to illustrate and honor the global diversity of plants and how they touch our lives. The creativity of the cover is a visual collage inspired by current trends to engage and connect with our readers.

United Plant Savers is an active member of the IUCN (International Union for Conservation of Nature). Within the IUCN Species Survival Commission is the Medicinal Plant Specialist Group – a global network of people working on medicinal plant conservation. Every four years the IUCN gathers for the conservation congress. The last congress was held in Hawaii, and this year's congress was planned to be in Marseille, France in June. Unfortunately, it has been postponed until January of 2021.

The IUCN was founded in 1964. One of its six volunteer commissions, the Species Survival Commission, is a world-wide network of scientists working to document and monitor biodiversity, most notably through the IUCN Red List of Threatened Species. Nearly 9,000 people attended the last congress in Hawaii from countries around the world. They gathered to discuss conservation priorities and to adopt voluntary global resolutions that help guide nation-state policies critical to biodiversity.

When I was a student studying global ethnobotany, the IUCN Red List information was a critical resource. Sadly, hardly any work had been done to evaluate medicinal plants in North America until last year when goldenseal was listed as Vulnerable. Now there is an active program newly funded through the New Mexico BioPark Society to evaluate the UpS "At-Risk" and "To-Watch" plants! This project is detailed in the first article of this issue. The IUCN Medicinal Plant Specialist Group was invited to submit stories to this year's Journal. Each account reminds us that plant conservation is a global issue. Not only do these stories highlight endemic species, but also those medicinal plants that have traveled and found a new home where they are important to local needs, which is why I highlighted the castor plant in the Kenya story on the cover of the Journal.

In the upper right-hand corner is an image of C.S. Rafinesque (1783-1840), whose father was a merchant from Marseille. Rafinesque would eventually make his way to North America and is considered by many as the father of Eclectic Medicine. He was a polymath, helping to decipher Mayan script, wrote about evolution before Darwin, and documented the mounds of Kentucky before most were destroyed by the plow, just to name a few significant contributions. In his time he was an outcast and died penniless, that said he leaves behind a bridge to a bio-diverse landscape through his hundreds of publications.

In the far left-hand corner is a hidden "Reine de Deniers" from the Tarot de Marseille. The Queen seemed the perfect choice as a maternal card that expresses spirituality and creative energy in the earthly plane that we so need at this moment in time. The tarot has a mysterious link to the Eclectic School of Medicine, most notably by the Lloyd brothers, who were known to belong to the Theosophical Society. John Uri Lloyd would go on to write the novel *Etidorpha*,



and he would ask his friend Augustus Knapp to illustrate the infamous occult classic. Curtis Lloyd, a mycologist would commission Knapp to illustrate 42 studies of fungi. Knapp would later move from Cincinnati to California and go on to meet Manly Hall, and thus the classic Knapp/Hall tarot cards were created. The tarot of the Americas continues in the tradition of the tarot of Europe, steeped in the mysteries of sacred geometry, astronomy, alchemy, herbalism, and divination.

Another hidden gem in the cover is a stamp from Zaire (now the Democratic Republic of Congo), *Engleromyces goetzei*, a fungus that grows on bamboo and is mentioned in the article from Kenya as a very important medicine. The mysteries of plant medicine rooted in cultural and diverse landscapes are often just hiding in plain sight—we only need to recognize their value, and thus they appear.

The theme of Marseille for this year's cover seems very symbolic to the folklore surrounding the classic thieves oil. The story is told that in 1413, as the bubonic plague decimated France, a group of unemployed spice merchants was arrested for robbing the dead and dying. When caught the judge offered leniency if they shared their secrets for not contracting the plague. Thus the classic thieves oil: clove, lemon, eucalyptus, rosemary, and cinnamon, and certainly many other classic combinations and remedies that have ties to the spice trade. Marseille has a rich herbal history, for example, the beak-like masks that plague doctors wore, stuffed with absorbent material soaked in the thieves blend to protect them from getting sick.



There is so much to be learned in these pages, and many different ideas, perspectives, and opinions are presented. It's ok to disagree or feel differently about a particular topic. What is important, as consumers of herbal medicine, is to take the time to know the stories of plants, so that we can be united, advocating for biodiversity. Medicinal plants are teachers! The lesson is simple—plants are not only medicine for our physical, mental, and spiritual health, they heal the planet and if we diminish biodiversity, then we have destroyed the capacity for the earth to heal itself. This is why we are called to herbs. They heal us, and in return, we reciprocate by protecting biodiversity, human health is planetary health. Even in the smallest action of caring for a houseplant and growing a windowsill garden, we are activating reciprocity. In these challenging times, we are grateful to our members for your support and we are so thankful to the plants. ■

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ON THE COVER:

This year's cover was illustrated by artist, Philippe Willis [Our Numinous Nature]. Also making an appearance within the cover art is a small reproduction of "Owl and Passionflower", an original oil on canvas by Sophie Grandval.

CONSERVATION OF NORTH AMERICAN MEDICINAL PLANTS BEGINS WITH COMPREHENSIVE STATUS ASSESSMENT

- Danna J Leaman, Co-Chair and Medicinal Plant Red List Authority, Medicinal Plant Specialist Group, Species Survival Commission, IUCN – International Union for Conservation of Nature (djl@green-world.org)
- Clayton Meredith, IUCN Red List Officer for Plants, New Mexico BioPark Society
- Anne Frances, Lead Botanist and North American Plant Red List Authority, NatureServe

Approximately 2,000 species of medicinal and aromatic plants are native to North America. The conservation status of these species is currently being assessed and updated by the IUCN Medicinal Plant Specialist Group and NatureServe, in partnership with New Mexico BioPark Society/ Albuquerque BioPark. Conservation status assessments will identify key threats to these species and their habitats, and support priorities for action to prevent resource decline and species extinction.

Introduction

Native species of medicinal and aromatic plants comprise ten percent of the North American flora, and 0.05 percent of the known flora of the world. However, the North American native flora may provide nearly half of the medicinal and aromatic plants in global trade. Conservation, and sustainable use of this resource is therefore of great importance for the domestic and international supply of this resource.

The flora native to North America – considered in the *Flora of North America* to include the continental United States, Canada, the French islands Saint Pierre and Miquelon, and Greenland – comprises 20,000 species of vascular plants and bryophytes (*Flora of North America*, 2019), approximately 5% of the world's known 400,000 plant species (World Flora Online, 2019). At least 2,000 of these species have reported historical or current medicinal uses. This estimate is derived primarily from two data sources: the Native American Ethnobotany database (Native American Ethnobotany, 2019) and the Medicinal and Aromatic Plants of the World (MAPROW) database (Schippmann, 2019).

Conservation Status of North American Medicinal and Aromatic Plants

The proportion of the world's medicinal flora for which the IUCN Red List status is known is small, just seven percent of the nearly 30,000 taxa included in the MAPROW database. In partnership with NatureServe and the New Mexico BioPark Society, where a North American “hub” for Red List assessment, assessment training, and conservation planning has recently been

established, North American members of MSPG and other regional experts have begun to identify North American medicinal plant species with a high priority for new or updated Red List assessments and subsequent conservation planning and action. The IUCN Red List has search functions that will enable evaluation of the degree to which medicinal plants in North America are threatened with extinction compared with other regions of the world, which types of threat are most significant for medicinal plants, need for additional research and conservation action, and types of conservation action that will be most effective. This initiative also supports updating NatureServe ranks for North American medicinal plants.

The conservation status of a majority of plant species native to North America has been evaluated at the continental, national, and state or provincial level by NatureServe, a non-government organization established in 1994 (NatureServe, 2019). In North America, NatureServe compiles and analyzes species distribution and other population data from a network of partners, including state-supported natural heritage programmes throughout the United States, and provincially supported natural heritage conservation bodies throughout Canada. The conservation status of a species is expressed by NatureServe as a rank, or a range of rank values, that indicate the severity of the threat of extinction to the wild population, ranging from “presumed extinct” to “secure” (Table 1).

The IUCN Red List is organized and published by the International Union for Conservation of Nature (IUCN) with assessments contributed by a large network of expert specialist groups, Red List authorities, and Red List partners (IUCN, 2019a). It is considered to be the global standard for conservation status assessments; for example, the IUCN Red List is the official indicator of progress on Target 15.8 – Life on Land – of the global Sustainable Development Goals (IUCN 2019b). Red List assessors assign a category of extinction risk using a rule-based system of criteria and thresholds that accommodate both data-poor and data-rich species. Assessment categories and criteria are applied on a global scale (IUCN, 2012a), with adjustments for national- and regional-scale applications (IUCN, 2012b).

Both systems enable assessors to objectively apply rules for conservation status assessments, but also allow assessors to adjust the calculated rank or threat category.

The North American Medicinal and Aromatic Plant Assessment Project

In early 2018, IUCN Species Survival Commission (SSC) began a partnership with Albuquerque BioPark (Albuquerque, New Mexico) and funded through the New Mexico BioPark Society to develop staff capacity for conservation status (IUCN Red List) assessment and conservation planning. Clayton Meredith is working with the IUCN SSC Medicinal Plant Specialist Group on North

Table 1 Comparison of NatureServe Global Ranks and IUCN Red List Threat Categories*

	IUCN Red List Category	NatureServe Global (G) Rank	Definitions
EXTINCT	Extinct (EX) ^a	Presumed Extinct (GX) ^b	a No reasonable doubt last individual has died [after] exhaustive surveys. b Not located despite intensive searches; virtually no likelihood of rediscovery.
	Extinct in the Wild (EW) ^c	Presumed Extinct in the Wild (GXC) ^d	c Species known to survive only in cultivation or captivity, or as naturalized population(s) well outside past range. d Presumed extinct in the wild across entire native range, but extant in cultivation, in captivity, as naturalized population(s) outside historical native range, or as a reintroduced population not yet established.
THREATENED	Critically Endangered (CR) (Possibly Extinct) ^e	Possibly Extinct (GH) ^f Possibly Extinct in the Wild (GHC) ^g	e Likely already Extinct, but confirmation is required. f Known only from historical occurrences but still some hope of rediscovery. g Possibly extinct in the wild across entire native range, but extant in cultivation, in captivity, as naturalized population(s) outside historical native range, or as a reintroduced population not yet established.
	Critically Endangered (CR) ^h Endangered (EN) ⁱ	Critically Imperiled (G1) ^j	h Best available evidence indicates that species faces extremely high risk of extinction in the wild. i Best available evidence indicates that species faces very high risk of extinction in the wild. j At very high risk of extinction due to extreme rarity, very steep declines, or other factors.
	Vulnerable (VU) ^k	Imperiled (G2) ^l	k Best available evidence indicates that species faces high risk of extinction in the wild. l At high risk of extinction or elimination due to a very restricted range, very few populations, steep declines, or other factors.
NOT THREATENED	Near Threatened (NT) ^m	Vulnerable (G3) ⁿ	m Does not meet criteria but is close to qualifying, or likely to qualify, for a threatened category in the near future. n At moderate risk of extinction or elimination due to restricted range, relatively few populations, recent and widespread declines, or other factors.
	Least Concern (LC) ^o	Apparently Secure (G4) ^p Secure (G5) ^q	o Does not meet criteria for threatened (e.g., widespread and abundant taxa). p Uncommon but not rare; some cause for long-term concern due to declines or other factors. q Common: widespread and abundant.
UNKNOWN	Data Deficient (DD) ^r	Unrankable (GU) ^s	r Inadequate information to make direct or indirect assessment of a species' extinction risk based on its distribution and/or population status. s Currently unrankable due to lack of data or substantially conflicting information about status or trends.
	Not Evaluated (NE) ^t	Unranked (GNR) ^u	t Not yet evaluated against the criteria. u Global rank not yet assessed.
	(No IUCN Red List equivalent)	Not Applicable (GNA) ^v	v Conservation status rank not applicable because species is not a suitable target for conservation activities.

* Adapted from Westwood et al. (2017) and Frances et al. (2019), compiled by Oliver and Leaman (2018)

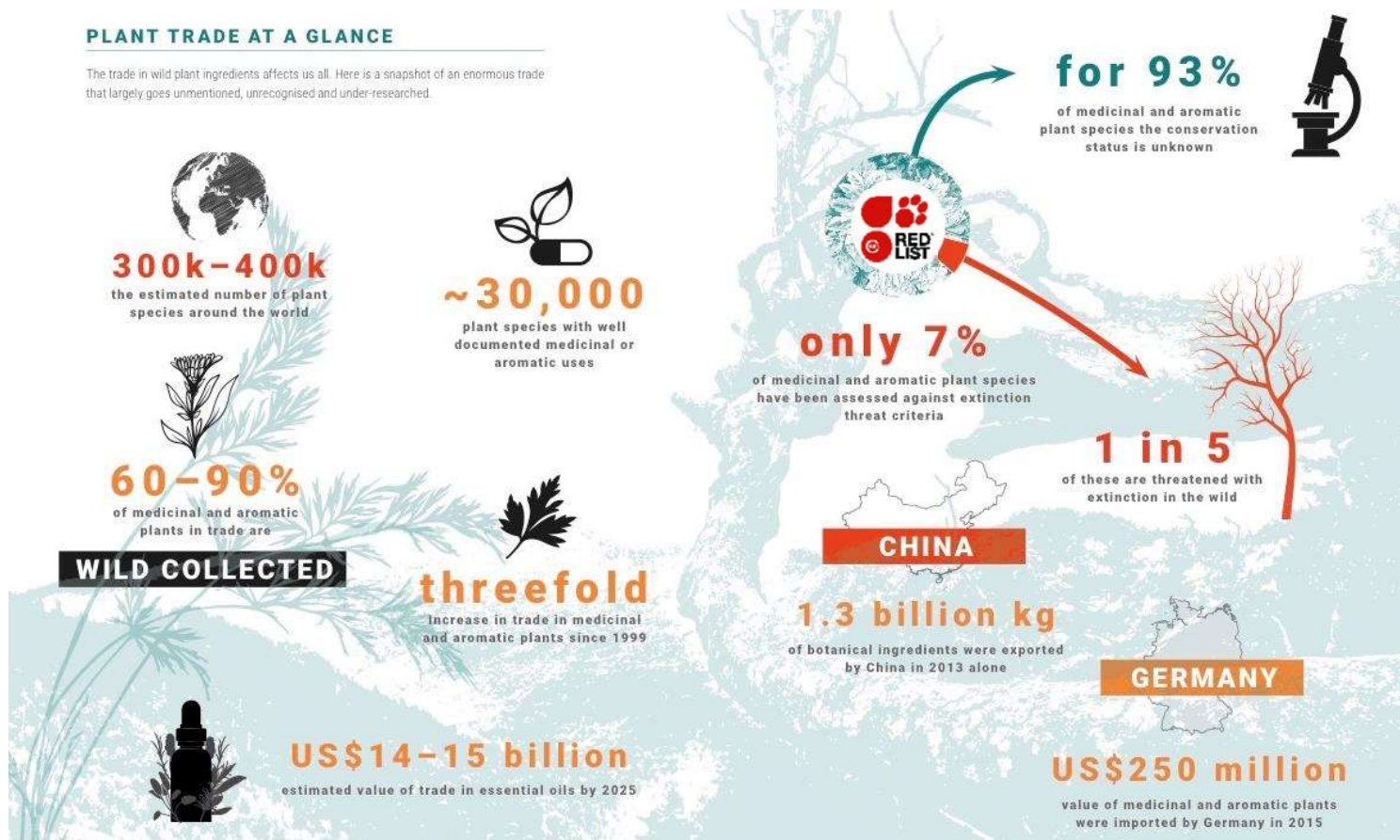


Communicate

Medicinal Plant Conservation, Trade, and Sustainable Use

PLANT TRADE AT A GLANCE

The trade in wild plant ingredients affects us all. Here is a snapshot of an enormous trade that largely goes unmentioned, unrecognized and under-researched.



Jenkins, M., A. Timoshyna and M. Cornthwaite. 2018. **Wild at Home: Exploring the Global Harvest, Trade and Use of Wild Plant Ingredients**

American medicinal plant Red List assessments.

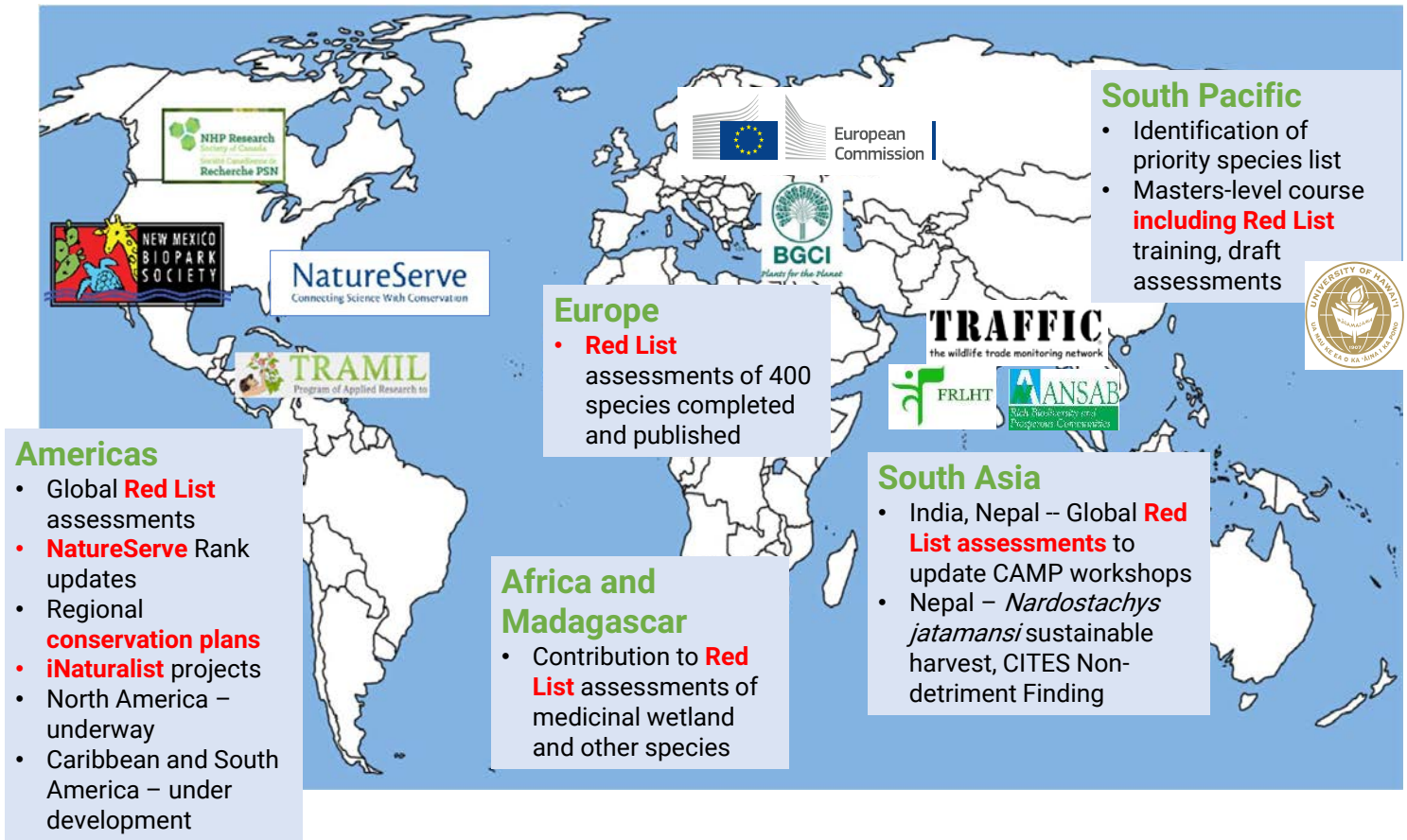
This project is part of the broader IUCN Plants for People initiative (IUCN 2019c). In 2019 and early 2020, with additional support from numerous experts, we completed draft Red List assessments for more than 60 species of North American medicinal plants, including 42 species in the genus *Trillium*, 15 species in the genus *Ligusticum*, and 17 species found only in the American southwestern "Borderlands" within and surrounding New Mexico. Included in these assessments are numerous species identified by MPSG as high priorities for global assessment of extinction risk. Our high priority list currently focuses on medicinal and aromatic plant species included in the Convention on International Trade in Endangered Species of Fauna and Flora (CITES 2019), species included in the World Health Organization's series of monographs on medicinal plants of global importance (WHO 1999, 2002, 2007, 2009), and species included in the United Plant Savers' "At Risk" and "To Watch" lists (United Plant Savers 2019).

What happens next?

We aim to produce or revise conservation status assessments for all North American species of medicinal and aromatic plants (ca 2,000) by 2022, with a broadening base of institutional, expert, and funding support for assessments and conservation planning/action.

Our plans for 2020 and onward include:

1. **Publication of a comprehensive list of the approximately 2000 North medicinal plant species native to North America**
This list is derived by comparing species included in the *Flora of North America* with the MAPROW (Medicinal and Aromatic Plants of the World) database that is managed by Uwe Schippmann, former Chair of MPSG. MAPROW incorporates key North American sources such as the Native American Ethnobotany database compiled by Dan Moerman and the American Herbal Products Association's *Herbs of Commerce* (McGuffin et



Learn more: <https://www.iucn.org/theme/species/our-work/iucn-red-list-threatened-species/plants-people>

al. 2000), as well as many global and regional pharmacopoeias and other sources. This comprehensive North American list will be available on-line as an open-access resource, to engage MSPG members and the wider interested expert community and public in identifying additional priorities, resources, and expertise for IUCN Red List assessment of extinction risk, as well as in identifying errors and gaps.

2. Expert review of draft assessments

We will be reaching out to members of MSPG and beyond for assistance in reviewing draft assessments. A few North American MSPG members have undergone training in application of the IUCN Red List criteria; others have expertise in particular taxa or regional floras. We encourage you to let us know if you are willing to review draft assessments and/or undertake training to become an IUCN Red List assessor. An online training package is available to anyone interested, and training workshops may be available through ABQ BioPark in 2020.

3. Conservation Assessment workshops

We plan to continue a series of workshops to review draft Red List assessments in several regions of North America with significant medicinal plant diversity. The first workshop, held in July 2019, focused on medicinal plant species that occur in the Southwestern United States including and bordering New Mexico. The second workshop, hosted by Mount Cuba Centre in Delaware, USA, focused on all Trillium species native to North America. Additional workshops will likely focus on species that occur in Southern Appalachia, Great Lakes, and Pacific Northwest regions.

We employ methods developed by the IUCN Conservation Planning Specialist Group to ensure that outcomes of these workshops include recommended conservation action, as well as an understanding of extinction risk for North American medicinal plant species.

4. Fundraising and new partnerships

We are working with New Mexico BioPark Society, NatureServe, and IUCN SSC to access additional sources of funding for this initiative.

Plants for People – Medicinal Plants – in other regions

We're exploring additional Plants for People initiatives focusing on medicinal plants native to Latin America and the South Pacific, based on interest and enthusiasm of MPSG members and potential partnerships. We know that other regions are exceptionally important for medicinal plant conservation and encourage you to let us know about opportunities for developing Plants for People – Medicinal Plants – partnerships in your region.

Acknowledgement

Some of the content of this article is extracted from Leaman (in press). ■

Keepers of Medicine

*Across mountains and plains
with buffalo, prairie dog, snake,
I must search for keepers of medicine,
ask to use what they unearthed from blessed soil*

*Their labor with mud crusted hands,
cannot be measured.*

*We have reaped the value of what they revealed,
in yellow dock, dandelion and yarrow,
the great medicines that heal.*

*Risking death, as they spoke to rain and thunder,
sang praises to sun, flared in rash, burned
and coughed up blood, in order to understand.
They gathered knowledge*

*from each landscape and leaf,
knowing when to use a flower, when to use a root,
which ones were asking to be chosen,
chopped, boiled, swallowed in a brew.*

*Years of trials, the great task of listening,
through hunger, drought and birthing children,
they grew trust in the roots of autumn,
spring blossoms, birds that move seeds through air.*

— Jesse LoVasco

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MPSG's Strategic Planning Targets and Activities


To facilitate our group's contributions to the SSC programme, The Medicinal Plant Specialist Group (MPSG) defined several targets and activities based on broad IUCN Species Survival Commission priorities and aligned with IUCN's Programme and Species Strategic Plan 2017-2020 (https://www.iucn.org/sites/dev/files/content/documents/ssc-iucn-components-a4-digital_0.pdf). These targets and activities are being reviewed in 2020 with MPSG members and partners, and updated to align with the new IUCN Programme 2021-2024.

Target for Quadrennium	Expected Results for the Quadrennium	Results for 2018
<p>Complete IUCN Red List assessment of 1500 priority species of medicinal and aromatic plants</p>	<p>Global and/or regional Red List assessments of 70 CITES-listed species of medicinal plants, 150 WHO monographed species, and additional identified as priorities for the IUCN Plants for People Initiative: current focus regions -- South Pacific, North America, DD-designated European species; integration of traditional knowledge and citizen science into Red List Assessments</p>	<p>In partnership with the Albuquerque BioPark, we identified a preliminary list of 300 priority species of North American medicinal plants for assessment, and have subsequently identified a comprehensive list of ca 3200 North American medicinal plant species for assessment / reassessment within an ongoing North American regional Plants for People (medicinal plants) initiative should funding and Red List support continue. The initial 300 priorities include 16 WHO monographed species, 10 CITES Appendix II-listed species, 43 species included as herbs in trade by the American Herbal Products Association, and 100 medicinal plant species and close relatives considered conservation priorities by the United Plant Savers. Approximate 120 draft assessments were completed in 2018. One assessor (Albuquerque BioPark staff) was trained in Red List assessment. One regional workshop to review draft assessments (SW US) is planned in 2019; three additional regional workshops (US, Canada) are planned for 2020 if funding can be secured.</p> <p>Some ad hoc progress on medicinal plant assessments via other regional projects, e.g. 20 medicinal plant species included in freshwater plant assessments for the Lake Malawi/Nyasa/Niassa catchment. None of these is included, however, in the 1500 species identified as MPSG global priorities for Red List assessment.</p>
<p>Increase the visibility and recognition of the contribution of medicinal and aromatic plant conservation and sustainable use to livelihoods, health, food security, and biodiversity</p>	<p>IUCN Congress 2017 event(s); Meetings of the IUCN MPSG members; presentations at conferences and other events.</p>	<p>Conferences and presentations:</p> <ul style="list-style-type: none"> - CITES and certification of medicinal and aromatic plants, Presentation at a CITES Plants Committee side-event, July 2018 (Anastasiya Timoshyna) - Sustainability, livelihoods and health: implementing best practices for wild harvesting and trade in plants, Presentation at the meeting of the working group on Traditional Chinese Medicine, July 2018 (Anastasiya Timoshyna) - Wild plants trade: Opportunities of Sustainable and Legal Trade, Presentation at the IUCN Sustainable Use and Livelihoods in Central Asia workshop, September 2018 (Anastasiya Timoshyna) - Succeeding with CITES: Sustainable and equitable Jatamansi trade from Nepal, Presentations at the project launch, September 2018 (Anastasiya Timoshyna) - Keynote address on conservation and sustainable use of Latin American medicinal plants, XII Latin American Botanical Congress, Quito, Ecuador, Oct. 2018 (Danna Leaman) - Sustainable and equitable trade in wild medicinal and aromatic plants: Case studies from China, Nepal, Viet Nam and India, CITES and Livelihoods International Workshop, November 2018 (Anastasiya Timoshyna)

<p>Increase the visibility and recognition of the contribution of medicinal and aromatic plant conservation and sustainable use to livelihoods, health, food security, and biodiversity</p>	<p>Publication of Conservation Outlook for medicinal and aromatic plants; relaunch of Medicinal Plant Conservation newsletter on-line</p>	<p>The Wild at Home report was finalized and launched for the social media FairWild week 2018; providing an update on the IUCN Red List assessment of known medicinal plants (only ~7% were found assessed; of those 20% threatened): Jenkins M., Timoshyna A.,</p> <p>Cornthwaite M. (2018), Wild at Home: Exploring the global harvest, trade and use of wild plant ingredients; https://www.traffic.org/site/assets/files/7339/wild-at-home.pdf and launched by IUCN here: https://www.iucn.org/news/species/201806/wild-home-threats-and-opportunities-trade-wild-plants</p> <p>Oliver, L.E. and Leaman, D.J. (2018). Protecting Goldenseal: how status assessments inform conservation. <i>Herbalgram</i> 119: 40-55. Peer-reviewed in-depth analysis of global and regional conservation status assessment of an important CITES App. II - listed species and implications for trade and livelihoods.</p> <p>Partnership identified and being followed-up on with the United Plant Savers, IUCN Member (Head of the organization is MSPG member), to launch the special edition of the Journal of Medicinal Plant Conservation (flagship publication of UPS) as a partnership product between MSPG and UPS. This is now planned for 2020, prior to the IUCN WCC 2020.</p>
<p>Increase the visibility and recognition of the contribution of medicinal and aromatic plant conservation and sustainable use to livelihoods, health, food security, and biodiversity</p>	<p>MPSG website; continuing support for e-list</p>	<p>Website: co-chair personal investment in creating a new platform to develop website independent of IUCN's limitations in self-website management, no funding or other support yet available.</p>
<p>Increase the visibility and recognition of the contribution of medicinal and aromatic plant conservation and sustainable use to livelihoods, health, food security, and biodiversity</p>	<p>Linkages to other specialist groups (in particular plant SGs - trees, orchids, CWR - and SULi) and advancing the MSPG work via this channel</p>	<p>Linkages with other SGs: collaboration/communication established with Orchid, Carnivorous Plant, Global Trees, Palm, Cacti and Succulent SGs on Red List assessment / reassessment of priority species of North American Medicinal Plants.</p> <p>Engagement with the IUCN Sustainable Use and Livelihoods Specialist Group, in particular around the Central Asia sustainable use workshop.</p>
<p>Develop and implement Plants for People initiatives for medicinal plants in at least 3 regions</p>	<p>Creative strategies for building regional capacity for Plants for People initiatives, e.g. graduate-level course/research projects; development and implementation of citizen science population distribution, size and trend data for priority species (e.g. iNaturalist); Conservation planning (in situ, ex situ, sustainable use) for: 9 threatened European medicinal plant species; at least one So Pac Island species (<i>Santalum paniculatum</i>), at least one North American species (<i>Hydrastis canadensis</i>)</p>	<p>Some progress in 2018 on identifying a core regional partnership in Latin America for a regional Plants for People initiative.</p> <p>Core partnership for North American initiative developed and implemented with Albuquerque BioPark, NatureServe US. Other North American partner organizations under discussion</p> <p>Initial discussion with Canadian Wildlife Federation to launch an iNaturalist citizen-science project to collect current population distribution, size, and trend data for priority species of North American medicinal plants.</p>

<p>Contribute to the implementation of the FairWild Standard and certification scheme for sustainable use of wild plants for at least 50 species, 50 companies and 20 countries</p>	<p>Risk analyses completed on demand for all FairWild Standard species; review and benchmarking of risk analysis matrix; expansion of risk analysis and management planning to fungi, lichens. Provide technical advice on the implementation of the Standard. Contribute to the revision of the FairWild Standard and implementation guidance.</p>	<p>Risk analysis factors for sustainable wild harvest of fungi drafted in consultation with members of IUCN SSC fungi SGs and other experts. Presentation of brief talk, poster at RBG Kew State of the World's Fungi symposium, September 2018.</p> <p>Project Succeeding with CITES: Sustainable and equitable Jatamansi trade from Nepal, led by TRAFFIC in collaboration with IUCN MPSG, funded by the UK government's Darwin Initiative, was launched in 2018. The project focuses on the sustainable use and trade approaches for the Threatened <i>Nardostachys grandiflora</i>.</p>
<p>Promote the recognition of the sustainable use, trade and conservation of medicinal and aromatic plants in policy and action at the global, regional and national levels (action via CBD, CITES, WHO, ITPGR, WHO and other policy fora)</p>	<p>Application of CITES NDF guidance for perennial plants;</p> <p>Review of the applicability of the FairWild Standard and certification scheme for CITES-listed medicinal plants;</p> <p>MPSG engagement in CITES processes'</p> <p>Publication of the revised WHO/IUCN/WWF/TRAFFIC Guidance on Conservation of medicinal plants;</p> <p>Recognition of the role of MAPs and FairWild in supporting the delivery of the Target 12 (and Objective 3) of the Global Strategy for Plant Conservation</p>	<p>Application of CITES NDF guidance for perennial plants; CITES 9-step perennials NDF guidance, developed by TRAFFIC and German government (BfN), and applicable to CITES Appendix II listed medicinal and aromatic plants, is now available in English, Spanish, Chinese, Georgian, Korean, French, Italian and soon to be Portuguese. The last four translations were carried out by countries themselves, showing how valuable they consider the guidance to be. Use of the 9-steps guidance has now been written into Georgia's legislation for managing trade</p> <p>Review of the applicability of the FairWild Standard and certification scheme for CITES-listed medicinal plants: Project led by TRAFFIC, with support from BfN, in 2018, included the desktop literature review, CITES-listed Medicinal and aromatic plants trade analysis, and the presentation of the initial findings to the CITES Plants Committee in July 2018 (through an information document https://cites.org/sites/default/files/eng/com/PC/24/Inf/E-PC24-Inf-12.pdf and a side-event). Further stakeholder consultation followed, feeding into the Stakeholder workshop in January 2019 (https://www.traffic.org/news/making-cites-work-for-wild-medicinal-and-aromatic-plants/), attended by governments, businesses, IUCN Global Species Programme, and other stakeholders.</p> <p>MPSG engagement in CITES processes: There is an opportunity for specific engagement at, and as a follow-up to CITES Conference of Parties upcoming in August 2019 (postponed from May 2019), with CITES Secretariat submitted document on the work on medicinal plants. There was no progress on the publication of the revised WHO/IUCN/WWF/TRAFFIC Guidance on Conservation of medicinal plants; the Wild at Home publication provided a relevant update on the known threats (assessed against the IUCN Red List) to medicinal plants, opening the opportunity to engage with range of key collaborators.</p> <p>Recognition of the role of MAPs and FairWild in supporting the delivery of the Target 12 (and Objective 3) of the Global Strategy for Plant Conservation: Information is being provided to GPPC in ad hoc manner, and MPSG members' contributions will further coordinated in the run-up to the 2020 CBD CoP in China. Meanwhile, MSPG Co-Chair is invited to speak at the Global Plant Conservation Congress in October 2019, Chengdu, China.</p>

Target for Quadrennium	Expected Results for the Quadrennium	Results for 2018
<p>Complete IUCN Red List assessment of 1500 priority species of medicinal and aromatic plants</p>	<p>Global and/or regional Red List assessments of 70 CITES-listed species of medicinal plants, 150 WHO monographed species, and additional identified as priorities for the IUCN Plants for People Initiative: current focus regions -- South Pacific, North America, DD-designated European species; integration of traditional knowledge and citizen science into Red List Assessments</p>	<p>In partnership with the Albuquerque BioPark, we identified a preliminary list of 300 priority species of North American medicinal plants for assessment, and have subsequently identified a comprehensive list of ca 3200 North American medicinal plant species for assessment / reassessment within an ongoing North American regional Plants for People (medicinal plants) initiative should funding and Red List support continue. The initial 300 priorities include 16 WHO monographed species, 10 CITES Appendix II-listed species, 43 species included as herbs in trade by the American Herbal Products Association, and 100 medicinal plant species and close relatives considered conservation priorities by the United Plant Savers. Approximate 120 draft assessments were completed in 2018. One assessor (Albuquerque BioPark staff) was trained in Red List assessment. One regional workshop to review draft assessments (SW US) is planned in 2019; three additional regional workshops (US, Canada) are planned for 2020 if funding can be secured.</p> <p>Some ad hoc progress on medicinal plant assessments via other regional projects, e.g. 20 medicinal plant species included in freshwater plant assessments for the Lake Malawi/Nyasa/Niassa catchment. None of these is included, however, in the 1500 species identified as MPSG global priorities for Red List assessment.</p>
<p>Increase the visibility and recognition of the contribution of medicinal and aromatic plant conservation and sustainable use to livelihoods, health, food security, and biodiversity</p>	<p>IUCN Congress 2017 event(s); Meetings of the IUCN MPSG members; presentations at conferences and other events.</p>	<p>Conferences and presentations:</p> <ul style="list-style-type: none"> - CITES and certification of medicinal and aromatic plants, Presentation at a CITES Plants Committee side-event, July 2018 (Anastasiya Timoshyna) - Sustainability, livelihoods and health: implementing best practices for wild harvesting and trade in plants, Presentation at the meeting of the working group on Traditional Chinese Medicine, July 2018 (Anastasiya Timoshyna) - Wild plants trade: Opportunities of Sustainable and Legal Trade, Presentation at the IUCN Sustainable Use and Livelihoods in Central Asia workshop, September 2018 (Anastasiya Timoshyna) - Succeeding with CITES: Sustainable and equitable Jatamansi trade from Nepal, Presentations at the project launch, September 2018 (Anastasiya Timoshyna) - Keynote address on conservation and sustainable use of Latin American medicinal plants, XII Latin American Botanical Congress, Quito, Ecuador, Oct. 2018 (Danna Leaman) - Sustainable and equitable trade in wild medicinal and



SUSAN'S STACK

- *Cattail Moonshine & Milkwood Medicine*, Hartung
- *The Wind Is My Mother*, Bear Heart
- *What the Robin Knows*, Young
- *What A Plant Knows*, Chamovitz
- *The Science of the Sacred*, Redvers
- *Good Seeds*, Weso
- *The Absent Hand*, Lessard
- *Pacific Northwest Medicinal Plants*, Kloos
- *Edible and Medicinal Plants of the Great Lakes Region*, Naegele
- *How We Became Human*, Harjo
- *Emily Dickinson's Gardening Life*, McDowell
- *Underland*, Macfarlane
- *The Book of Caterpillars*, James
- *People and Places*, Mead
- *The Living Forest*, Llewellyn/Maloof
- *Hearts of Our People*, Yohi/Greeves

MEDICINAL PLANT SPECIALIST GROUP NETWORK

PROJECT UPDATES FROM AROUND THE WORLD



BLOOMING HABITAT

Regeneration of *Trillium govanianum*

By Dr. Ikram Ur Rahman

Sustainable Land Management Program-II

UNDP Pakistan

Conservation and sustainability approach of the Plants Specialists Group in Swat Pakistan under the domain of Mountains and Markets project (2014-2017) not only created and promoted entrepreneurship development among local indigenous communities but endeavored to resume vulnerable plant species in their respective habitats through awareness campaigns among stakeholders. *Trillium govanianum* (locally known as Matar Jari, Tin Patri or Dood Baccha) was introduced as a high market value species in 2012 by the USAID-Entrepreneurs Project. During this time the population status of the species was found satisfactory in the conservancies' areas. Due to its high economic potential and known value to the local people, the dependent communities harshly exploited the species for its root collection and marketing with a worth of PKR: 3000-4000/kg of dried roots. The unsustainable collection practice professed the species population as critically endangered and led to gradual disappearance of the species from the habitat with its status near extinction in the year 2015.

Interviews with the local inhabitants revealed that they have destructively exploited the species without understanding safe and technical collection means and methods. During the initial assessment the project field

team observed the plant species near extinction in the habitats of its previous existence. During a transect walk of 5 km in the forest in May 2017, only three plants were recorded. Joint efforts of the project team and community biodiversity enterprises enabled the forest dwellers in Miandam, Bishigram, Mankial, Kalam, Utror, and Dir Kohistan valleys to impose a ban on further exploitation of the species and promote its regeneration. The regeneration status of the species since 2015 is now visible in forest areas of Miandam in nearby demonstration sites. Community Biodiversity Enterprise Miandam tops the scoring in the competition of this species survival. The success of species survival also led to protection of bush forming shrubs as habitat needed for the wild bird species and provided a feasible nesting environment for precious birds egging and hatching, e.g. Pheasants. This is further indication of wildlife co-existence and survival. After awareness and capacity building, the NTFP directorate of forest department is now a custodian to function for nursery propagation and transplantation of the species in the respective habitats as part of the sustainability aspect of the program. The recovery work began in 2015 after the inception of Mountains and Markets project, and Miandam valley habitat of the species was closed to public use for its collection. Restoration of the species was materialized through seed dispersal, rhizomes placement, and protection. The NTFP directorate and CBEs developed a successful method to germinate seeds and to accelerate their development into seed-producing adults for transplanting. Seeds were collected in early to mid-July. The seeds were air dried and kept for storage and propagation by the communities and directorate of NTFP as a joint venture. The species count in an area of 2 ha in compartment No: 20 of Miandam valley in 2017 rose from 73 plants to 3830 in 2018, and the same situation now prevails in other sites of Miandam forest areas. This successful recovery effort over the past three years is highly encouraging for species survival, as awareness of the local people and population status proceed to meet the recovery goals of the species. ■



Dr. Ikram Ur Rahman is currently provincial program coordinator for Sustainable Land Management Program-II, a joint venture of Ministry of Climate Change, Provincial Government of KP Province and GEF/UNDP.



Frankincense (*Boswellia sacra*) trees survive the extremes of the Omani climate.

A FRANKINCENSE TREE CONSERVATION PROJECT IN OMAN: COLLABORATION BETWEEN AN INTERNATIONAL COMPANY AND A NATIONAL ENVIRONMENTAL ORGANISATION

by Susan Curtis

Background

Frankincense plays an integral part in the Omani heritage and culture and has been a main source of income for Dhofari communities for centuries. The primary range of the *Boswellia sacra* tree, a species considered to produce a fine quality resin, is in Oman. The Qarā' Mountains in Dhofar, the southern province of the sultanate of Oman, experience rain and mist from an annual monsoon that keeps the seaward (southern) side of the mountains, as well as the coastal plain, fertile, providing ideal conditions for *Boswellia sacra* to thrive.

The Threat

Several threats affect this species range such as habitat

destruction, insect infestation, overgrazing particularly by camels, and over-tapping for trade. Along with many other species of frankincense, *Boswellia sacra* is listed as "Near Threatened" on the Red List. In a previous project the Environment Society of Oman (ESO) studied the sustainable harvesting of frankincense trees in four experimental research locations in West Dhofar from 2014 to 2017. An optimum frequency of tapping was determined to produce good yield without adversely harming the tree. An outreach program and a poster were delivered, including two workshops attended by around 150 people in 2016.

Campaign Aim And Activities

The current campaign is a partnership between the ESO and the UK-based natural health and beauty company, Neal's Yard Remedies. It aims to spread awareness about the conservation of frankincense trees and to have a planting program donating seedlings to local communities. It covers the following activities:

- Spread awareness about sustainable cultivation and care of frankincense trees in the local communities of Dhofar by organizing school presentations; one-to-one meetings with farmers, land owners, and tribe leaders; and awareness presentations in public areas.
- Distribute frankincense seedlings (around 1,000

per annum) to local communities as a message of conservation and environmental stewardship. This is accompanied by a leaflet describing best practice of caring for donated trees and supporting long-term viability.

Progress To Date

Neal's Yard Remedies has been working with local experts on a nursery to cultivate *Boswellia sacra* seedlings since 2017.

In October 2019 Neal's Yard Remedies partnered with the Environment Society of Oman to launch the Frankincense community outreach and tree planting campaign in the Sultanate. Aimed at safeguarding the future of the *Boswellia sacra* trees, this campaign kicked off in Sadah and Mirbat, where 500 seedlings were distributed to participating local farmers and harvesters, students, and community members. In December 2019 a further 500 seedlings were distributed in Thumrait, and there will be a follow up assessment in May 2020.



The outreach program gave *Boswellia sacra* seedlings to school children, students, farmers and local landowners.

Global Frankincense Alliance

This is a very timely project that supports some of the main aims of the recently founded Global Frankincense Alliance that Neal's Yard Remedies has signed up to and which supports the protection and conservation of *Boswellia* and *Commiphora* species through promoting propagation, sustainable harvesting, and use of the trees and their products. ■



Susan Curtis is the Director of Natural Health for Neal's Yard Remedies with a particular interest in medicinal and aromatic plant use and conservation. She is a member of the IUCN MPSG and FairWild Advisory Panel.

Sustainable Herbs Program

AMERICAN BOTANICAL COUNCIL

THE SUSTAINABLE HERBS PROGRAM

by Ann Armbrecht, PhD SHP Director

"We can't be well until the planet is well"
— Kenny Ausubel

I began following herbs through the supply chain because I believed that telling the stories of the people and places behind the finished products mattered. Herbs are sourced from around the world, often changing hands many times on their way from forests and meadows to shelf. While knowing where and how any products are sourced is important, it is essential for botanical products where the quality of the finished product is inextricably tied to the attention and care on each step of the journey.

Sourced responsibly, botanical companies claim that growing, harvesting, and processing medicinal plants can be a way of supporting biological and cultural diversity. I wanted to understand whether in fact that was true, to highlight examples of programs that were successful, and to advocate for greater attention to the importance of producing herbal products in ways that support cultural, ecological, and economic sustainability.

The *Sustainable Herbs Program* (SHP) is a joint program with the American Botanical Council following medicinal plants and botanical ingredients from their point of origin through the supply chain to the consumer. We believe that the quality of the raw materials and finished products are only as good as the health and vitality of the ecosystems and livelihoods of everyone involved.

Through videos and photo essays, interviews with experts, as well as plant profiles, the SHP website documents best practices in the botanical industry. Videos and essays explore key issues: biodiversity and wild harvesting, the impacts of climate change, the importance of relationships, regenerative agriculture, forest botanicals from Appalachia and more. To date, short videos go behind the scenes to document where and how botanicals are sourced in Eastern Europe, India, and the US.

We aim to inspire change in the botanical industry and awareness of herb consumers to help drive change. We are also interested in exploring much broader questions about our role as citizens of the world: How can we live more lightly on the earth? How can we treat each other, the earth, and ourselves with more care and respect? How can we create worlds that are healthier — physically, socially, emotionally and spiritually? These broad issues are revealed by asking the simple question, "do you know where your herbs come from?"

If you would like to learn more, please visit our website at: <http://sustainableherbsproject.com/>

MEDICINAL AROMATIC PLANTS OF THE ARID REGION: CALL FOR INTENSIVE CARE

by Suzan Shahin

In the desert regions, where natural conditions are severe and resources are so limited, each water drop is precious and should be used in the best possible way. Global phenomena such as climate change and global warming are additional stressful conditions, adding to the sharply growing global population leading to more complications and to further challenging consequences.

Sustainability is a definition merged in every single life aspect, and in arid regions this concept is questionable. Regional and international efforts at all levels are focusing on adoption of the best practices and strategies that ensure the continuity and sustainability of the natural resources, while mitigating and adapting the global concerns, like climate change.

Medicinal aromatic plants of the desert were always Bedouins' rescuers in past times. Where hospitals did not exist, the traditional herbal practices using the medicinal aromatic plants were always the magical solutions to the acute and chronic health symptoms.

However, today with the urbanization activities and the land-use changing patterns the number of many desert medicinal aromatic plants has been declining, and many species have become threatened and endangered. Additionally, as people today become more dependent on modern medications, the vision related to the medicinal aromatic plants has been dramatically changed, and the values of their applications are mostly underestimated.

There is an obvious gap between the old herbal practices and the modern therapeutic ones. The mindset of the young generations should be changed and their vision of medicinal aromatic plants should be upgraded. The same is necessary to conserve the earth's resources and to have a healthy sustainable future.

Awareness and education related to the expensive values of the medicinal aromatic plants are necessary as the same are the main resources of therapeutic phytochemicals, as well as, main resources of today's industries (pharmaceuticals, fragrance, flavor, preservatives, etc.).

Awareness and education concerning the value of medicinal aromatic plants are necessary as they are the main resources of therapeutic phytochemicals used in modern industries as pharmaceuticals, fragrances, flavors, preservatives, etc. ■

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Dr. Suzan Shahin is an assistant professor and head of research and development in the Emirates Canadian University College. Dr. Suzan is a pioneer in the aromatic medicinal plants of the UAE. She is an active researcher and has various participations in regional and international conference proceedings and publications in prestigious journals. Dr. Shahin is a social influencer promoting healthy lifestyles and environmental concepts.



Desert Cotton or Snow Bush (*Aerva javanica*)



Zhumeria majdae

ZHUMERIA MAJDAE, AN ENDEMIC ENDANGERED AROMATIC PLANT FROM SOUTH IRAN

by Ziba Jamzad

Zhumeria majdae is a small aromatic shrub with grey foliage from the mint family. It is an endemic plant distributed in a small area in a subtropical climate in the mountainous area in south Iran. Botanically, it was collected for the first time in 1966 and subsequently described in 1967 as a new genus by Rechinger and Per Wendelbo and named in honor of its collector, Majda Zhumer (Rechinger & Wendelbo, 1967). Actually, the plant was known to local people before being botanically described. It was wildcrafted severely and exported to neighboring Persian Gulf countries as well as used as a traditional medicinal plant by local people. There are 12 known locations for the plant on mountain slopes where small populations exist. The conservation status of the plant was evaluated based on IUCN categories and criteria (a running national project on conservation status of Iranian Plants). The status of *Zhumeria majdae* was defined as "Endangered."

Efforts of scientists and conservationists to highlight the importance of this species and the threat it is facing caused an act by government authorities to implement plans for the species' protection. At present the wildcrafting for commerce and export is prohibited by law, but still indigenous people collect it for personal use, and it can be found in local medicinal plants markets in small quantities.

The pleasantly lemon-scented dried leaves of this plant have been used for many years as herbal tea, as a

curative for stomach-ache, as an antiseptic and analgesic agent, and for the treatment of painful menstruation. It is also used to treat colds, headache, wounds, and to relieve body heat. Its antioxidant activity was also proven scientifically. The essential oil of the plant contains two main constituents, including linalool and camphor, the chemicals responsible for its aroma (Rustaiyan et al. 1992).

In a site study for defining the conservation status of *Zhumeria majdae*, it was noticed that natural reproduction of the plant does not happen in its habitats. Only a few seedlings or young plants could be identified in its distribution area. We observed that the individual plant of *Z. majdae* has a relatively high fruit set (ca. 70%) and a moderate seed set (51%). However, there were only a few young plants and seedlings in the area (Ajani & Jamzad, in Print). Surprisingly, the seeds collected from the plants germinate easily, making it possible to farm them for medicinal and aromatic purposes.

It seems that the extreme habitat conditions are the main factors affecting population size by inhibiting seedling establishment. Drought and grazing are the risk factors for unsuccessful regeneration in natural habitats.

Zhumeria majdae is called "Mohr-e-Khosh" by local people, meaning good plant. ■

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GENETIC RESOURCES CONSERVED BY NATIONAL CENTER FOR GENETIC RESOURCES AND BIOTECHNOLOGY (NACGRAB) NIGERIA AND THE MEDICINAL AND VETERINARY USES OF THESE GENETIC RESOURCES

by Timothy Oluwafemi Ajiboye

The National Center for Genetic Resources and Biotechnology (NACGRAB) is the focal point for genetic resources conservation, and the head of the National Centre is the secretary and the registrar of the national committee on variety registration and release.

Nigeria has a wide diversity of habitat, from arid areas to swamps through many types of forests. There are widely varied and diverse gene pools associated with various ecologies and habitats in Nigeria where over 4,600 plant species have been identified. Many of these plant species have food, medicinal, and veterinary uses (NACGRAB 2004).

Apart from the Genetic resources (food crops) that have orthodox seeds which were conserved in NACGRAB seed gene bank, NACGRAB has 12 hectares of land on which diverse plant species that have food, timber, and medicinal and ethnoveterinary medicinal uses. Within this 12 hectares of land, NACGRAB has medicinal gardens carved out for the purpose of ethno-medicinal and ethnoveterinary medicinal uses. Among the plants conserved in NACGRAB field with ethnoveterinary uses are *Azadirachta indica*, *Khaya senegalensis*, *Vernonia amygdalina*, *Pilostigma thonningii*, *Psidium guajava*, *Zingiber officinale*, *Carica papaya*, *Kigelia africana*, *Citrus aurantifolia*, *Aspilia africana*, and *Ricinus communis*. The scope of herbal actions and diseases which plants conserved in NACGRAB field can be used for include cicitrisant, haemostatic, antiseptic, stimulant, tonic, drawing, dermal eruptions, inflammation, ulcers, control of parasites, bones, limbs, deformity, rickets, paralysis, epilepsy, convulsions, spasm, blood disorders, anemia, pain killers, arthritis, eye treatments, ear treatments, naso-pharyngeal, oral, pulmonary, cholera, liver, gallbladder, spleen, kidneys, anus, menstrual cycle, conception, lactation stimulants, abortifacients, parturition stimulants, venereal diseases, malaria, etc. (Burkill 1985),

There is an event called "Fascination of Plants Day" (FoPD) which comes up every two years. It is a time when various biodiversity conservation

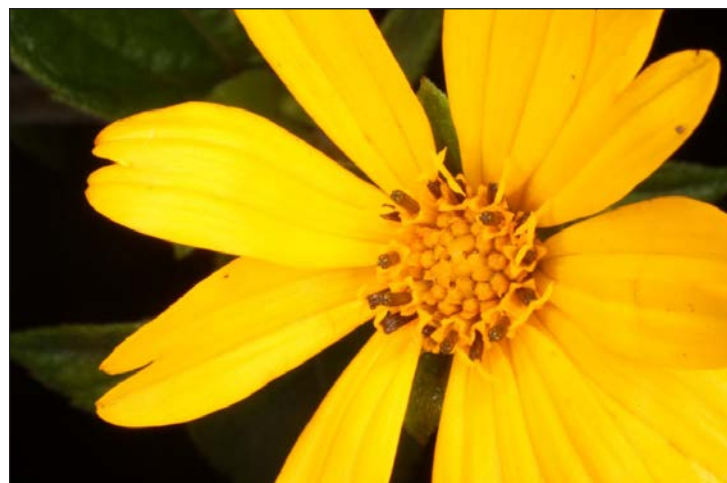


<https://plantday18may.org/>

organizations exhibit plants. NACGRAB came first in plant exhibition in the 2019 event that took place at the Federal University of Agriculture, Abeokuta, Nigeria. Fascination of Plants day is a global occasion consisting of over 1000 events held every two year across the globe. This program is coordinated by EPSO (European Plant Science Organization). ■

Dr. Timothy Oluwafemi Ajiboye earned his Bachelor of Agriculture, Master of Agriculture, and Doctor of Philosophy (Ph.D.) from the University of Ilorin in Nigeria. He has worked at the International Crops Research Institute for Semi-Arid Tropics as a Research Associate. He is currently an Assistant Director and Head of Field Genebank at the National Center for Genetic Resources and Biotechnology where he has written a thirty year Genetic Resources conservation plan. Dr. Ajiboye led the team of NACGRAB Scientists that got first position in the plants exhibition in 2019.

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A close up of *Aspilia africana*. Photo credit: Peter B. Phillipson.

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Harvesting of wild licorice (*Glycyrrhiza glabra*) in Georgia
Photos: J.A. Brinckmann, 2015



Harvesting of wild licorice (*Glycyrrhiza uralensis*) in Kazakhstan
Photo: J.A. Brinckmann, 2013

THE LONG ROAD TO SUSTAINABLE LICORICE

by Josef A. Brinckmann

Licorice, the roots, rhizomes, and stolons of *Glycyrrhiza glabra*, *G. uralensis*, and more rarely *G. inflata*,¹ is among the most widely used medicinal plants globally, in terms of annual quantities harvested and exported but also in terms of the number of formulations that contain it, especially in the traditional Chinese,² Japanese Kampo,³ Indian Ayurvedic, and Unani systems of medicine,⁴ but also in traditional European herbal medicinal formulations.⁵ Similarly, at Traditional Medicinals (Sebastopol, CA), licorice root has played an important role in many of our herbal medicinal tea formulations since our foundation in 1974.

While we have been working towards sustainable licorice production for decades, for geopolitical reasons we were not able to actualize the implementation of international sustainability standards (with independent auditing and certification) until the early 21st century. That is mainly due to the fact that the majority of licorice root in global trade is harvested from wild populations situated in extremely remote areas within republics of the former Soviet Union (e.g. especially Uzbekistan and Azerbaijan, but also Armenia, Georgia, Tajikistan, Turkmenistan, Kazakhstan, and Kyrgyzstan); frontier areas of the People's Republic of China (e.g. Inner Mongolia Autonomous Region, Ningxia Hui Autonomous Region, and Xinjiang Uyghur Autonomous Region); and other major licorice-producing countries where diplomatic relations and trade have been difficult or disrupted over the years, especially Afghanistan, Pakistan, Iran, Iraq, and Syria. There is, however some wild collection of licorice in parts of Europe (e.g. Italy, Spain, and Turkey). And, licorice is being cultivated to some extent, particularly in China (about 20% of China's annual licorice usage of about 300 million kg is now cultivated), but also in Italy, Egypt, Tajikistan, Turkey, Uzbekistan, South Africa, and Australia. So far, unfortunately, the content of much of

the cultivated root is not matching that of wild quality and thus is usually diverted to non-medicinal, food, or confectionary uses.⁶⁻⁸

In 2000, the U.S. Department of Agriculture (USDA) organic regulations were passed, inclusive of a wild-crop harvesting practice standard.⁹ At that point we encouraged all of our producers of wild collected plants to implement the new organic standards towards certification. While this was accomplished for most of our wild herbs by about 2005, wild licorice took a bit longer to sort out. At that time, much of our licorice was coming from Uzbekistan, and it was determined that the operation was not ready or willing to go for organic certification.

Furthermore, because the organic standards were limited in scope—with no criteria or indicators for determining economic and social sustainability—we looked to add on other emerging voluntary sustainability standards to compensate for the inadequacy of the organic standards. In the early 2000s both the German government-supported development of the International Standard for Sustainable Wild Collection of Medicinal and Aromatic Plants (ISSC-MAP)¹⁰⁻¹² and the Swiss government-supported FairWild Standards¹³ project were being drafted through multi-stakeholder processes and were being test implemented for feasibility with different herbs around the world in different types of ecosystems. Traditional Medicinals actively supported both of these early initiatives, as they more comprehensively addressed economic, environmental, and social sustainability in the medicinal plants value chain.

During 2005-2006, the FairWild Standard was being test-implemented with tribal groups in Afghanistan provinces of Badakshan, Baghlan, Bamyán, and Herat as part of a program funded by the Dutch development organization Oxfam-Novib with trade support of the Organic Herb Trading Company (Somerset, UK).¹⁴ We evaluated this material and found the quality to be exceptional, but it was, and remains, too dangerous for our personnel

and independent inspectors to carry out audits without bodyguards at the Afghani wild licorice collection areas. Unfortunately, this project dropped out of the FairWild production and trading system.

Concurrently in 2005, our primary licorice processor-supplier, Martin Bauer GmbH & Co. KG (Germany and Russia), identified a wild licorice operation in eastern Kazakhstan near the border with the Xinjiang Uyghur Autonomous Region that was interested and willing to test the new sustainability standards for feasibility. Traditional Medicinals and Martin Bauer commenced a multi-year collaboration to support the simultaneous implementation of three standards at this site: (1) USDA Organic wild-crop harvesting practice standard; (2) FairWild Standard¹³; and the (3) ISSC-MAP.¹⁰⁻¹² Annual audits began in 2006 by the Swiss inspection and certification body Institute for Market Ecology. The operation achieved organic wild certification in 2007 and FairWild certification in 2008. In 2008, the ISSC-MAP and FairWild initiatives merged, which led to version 2 of the FairWild Standard in 2010, which incorporated the ISSC-MAP.¹⁵

After proving feasibility and achieving organic and fair certification with the Kazakh operation, we began to encourage another of our good organic wild licorice producers to implement the FairWild Standard. That operation is situated in the remote northern areas (Gilgit-Baltistan) of Pakistan, i.e. the Hunza Valley area near the borders with Afghanistan and the Xinjiang Uyghur Autonomous Region. The operation did eventually receive FairWild implementation trainings through a Dutch-government funded project. But similar to the aforementioned project in Afghanistan, it remains unsafe to visit the Pakistani wild collection sites due to Taliban activities in the area and occasional U.S. drone attacks.

In 2007, implementation of the FairWild Standard also began in the Autonomous Republic of Karakalpakstan (within Uzbekistan) with German government financial support and trade support from a Swiss trading company, W. Kündig & CIE AG (Zurich, Switzerland). While we were interested in the potential of FairWild licorice from this region, this project unfortunately did not succeed, mainly for bureaucratic reasons.

Still aiming towards a viable second source of organic and fair licorice, in 2010 I began to hold discussions about sustainable wild collection of Georgian licorice

root with representatives of the Georgian National Investment Agency (under the Ministry of Economy and Sustainable Development) and with colleagues who were consultants at that time for a German government-funded project in Georgia known as "*Sustainable management of the biodiversity in protected areas and forests, South Caucasus.*" These discussions played some role in government agencies contacting local companies to determine feasibility of scaling up commercialization of wild licorice root for export. Although there was existing small scale wild collection for domestic consumption, the first large scale commercial harvests of wild licorice in Georgia (for export market) took place

in 2011. One of the companies was a beneficiary of USAID funding for their new licorice operation situated in southeastern Georgia near the borders with Azerbaijan, Chechnya, and Dagestan. Their first exports of certified organic wild licorice took place in 2013. It took another two years before the operation would achieve FairWild certification, with the trade support of Martin Bauer Germany and the purchase commitment of Traditional Medicinals.

In 2016, we also revisited Uzbekistan (for a third time). An operation there had achieved organic wild certification, and one of our other processor-suppliers of licorice made a site visit in order to make a preliminary determination of whether implementation of the FairWild Standard was feasible.

Finally, Traditional Medicinals has been using a lesser amount of wild licorice root from a harvesting site in the Inner Mongolia Autonomous Region of the P.R. China since the late 1990s. They achieved organic

wild certification in the mid 2000s; however, the FairWild Standard first became "legal" for audits and certification in the P.R. China in 2017—but that's another story!¹⁶

In our decades-long journey towards sustainable licorice, we've explored collaborations with wild collection operations situated in remote parts of Afghanistan, Pakistan, Inner Mongolia, Kazakhstan, Uzbekistan, and Georgia in partnerships with governmental agencies, nature conservation non-governmental organizations, and the companies that process and supply licorice in the forms and qualities we specify for use in our products. Through implementation of credible international standards for sustainable wild harvesting, coupled with annual audits carried out by independent third party inspection and certification organizations, traceability, transparency, quality assurance, sustainable harvesting methods, resource management, biodiversity



Licorice (*Glycyrrhiza glabra*)

conservation, and equitable trade have all become standard operating procedure.

Historical events that enabled the eventual ability to demonstrate ecosystem management with sustainable harvesting of wild populations of licorice included the establishment of diplomatic and trade relations with China in the 1980s, the collapse of the Soviet Union leading to the creation of the Commonwealth of Independent States (CIS) in the 1990s, and the subsequent development of credible international standards for sustainable wild collection of medicinal plants in the 2000s. ■

Josef Brinckmann is a Research Fellow at Traditional Medicinals (Sebastopol, CA) and serves as Vice Chair of the Board of Trustees of the FairWild Foundation, a Switzerland-based non-profit standards setting organization for the sustainable wild collection of medicinal and aromatic plants. Josef is also a member of the Medicinal Plant Specialist Group of the International Union for Conservation of Nature (IUCN) Species Survival Commission, an Advisory Group Member of the Sustainable Herbs Program of the American Botanical Council, and a member of the Botanical Raw Materials Sustainability Committee of the American Herbal Products Association.

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A STORY OF MEDICINAL PLANTS FROM THE OGIEK OF KENYA

By Fidensio Kinyamu Ndegwa



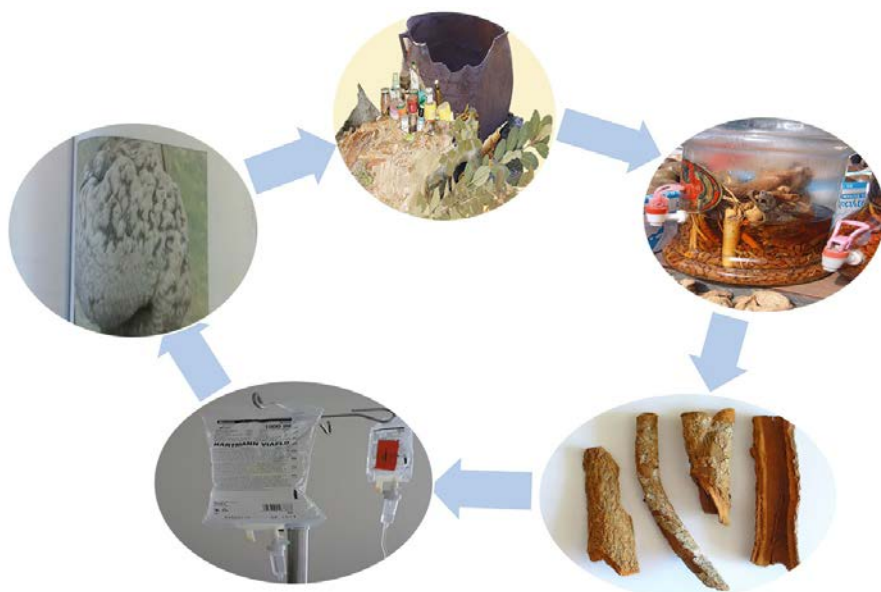
An Ogiek hunter in the traditional attire of a tree hyrax skin

In the Rift valley of Kenya, near Nakuru town is Mau forest. Mau forest is an important water tower, a source of numerous important rivers, including the Southern Ewaso Ng'iro, Sondu, Mara, and and Njoro. The Mara River is particularly important because the story of the wildebeest migration in Maasai Mara National Park is known the world over. The Sundu River empties into Lake Victoria where a hydro-electric power project is currently being constructed. On the eastern side of this forest lies the East Mau Forest, home to the famous Ogiek community for close to a quarter century.

They are referred to as "Dorobo Il Torobo" by the Maasai community. This term is derogatory because by the Maasai standards any community that has no livestock but survives on wild game is poor. Their proper name is the Ogiek, which means "caretakers of both plants and

animals." Genealogically, they are either an independent lineage or an assemblage of many communities who decided to adopt a life of hunters and gatherers. Their traditional diet consists of wild game meat and honey. They are also expert bee-keepers. In fact, the tree hyrax is their delicacy. The Ogiek are a community of forest dwellers who have survived without modern medications for disease treatment because they have little access to primary health care. Research was carried out on this community to determine their ethno medicine in order to document this vital information in view of the rapid deforestation that is taking place in many Kenyan forests, including East Mau.

The justification and objective of this work are that the medicinal plants are very important, yet they are disappearing before they are documented. A survey of medicinal plants was carried out, and questionnaires were used to interview 427 adults in the East Mau Forest. Plant specimens were collected and identified at the East African Herbarium in Nairobi. The number and type of medicinal plant species and the harvesting methods were investigated in 100 quadrats; the data



The diagram above shows progressive development of medicine, with *Engleromyces goetzei* P. Hennings, the most important medicine of the Ogiek



Charcoal burning in East Mau Forest

were analysed statistically; and 119 species of medicinal plants were documented. Ninety-eight percent of the respondents indicated that they use medicinal plants, with *Engleromyces goetzei* P. Hennings as the most important source of medicine.

This fungus grows on bamboo in undisturbed ecosystems. Its population is reducing due to the open canopy that is being created by the on-going destruction of the forest. Some of these plants are used in conventional medicine such as castor bean (*Ricinus communis*).

Most of these plants were still abundant, and their harvesting was non-destructive, as is evident from the photographs below.

The most important ailments treated by medicinal plants were stomach problems, malaria, and colds. Roots, leaves, and stem bark were the plant parts most commonly used.

The main implications of this study are that much can be learned from this community on how to utilise traditional knowledge for conservation of nature. In conclusion, it is worth investigating whether the success of the Ogiek in the use and conservation of medicinal plants may be duplicated elsewhere in the management of ecosystems. ■



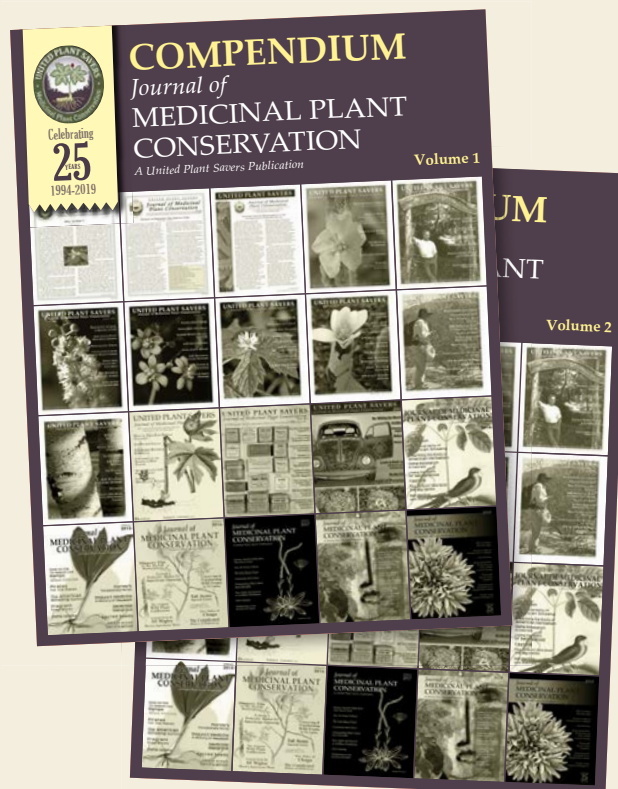
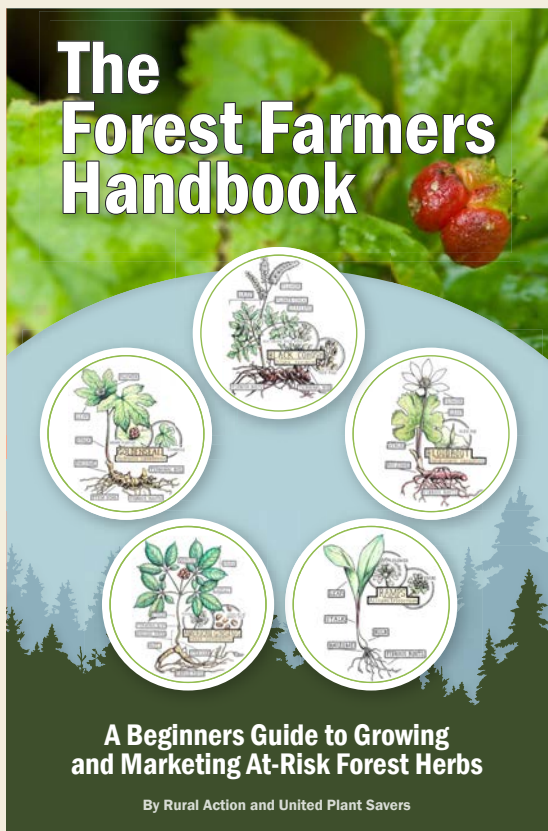
Ricinus communis L., one of the plants with application in conventional medicine



Partial debarking of *Warburgia ugandensis* Sprague, showing wound healing

Fidensio Kinyamu Ndegwa is an ethnobotanist, PhD student in Pharmacognosy, Member: Society for Economic Botany (SEB), Member: SSC (MPSG)-IUCN, and Member: CEM (SUME)-IUCN. Email: fndegwa2006@yahoo.com

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MEDICINAL PLANTS USED IN TRADITIONAL HERBAL MEDICINE IN THE FIFIA VILLAGE/SOUTHERN JORDAN

by Abdullah Aloschoush

Abstract

This study was conducted to identify the uses of plant species in traditional medicine in the Fifia village and to collect this information and save it from loss. Some of this information is not scientifically documented but is personally tested by some local communities. The questionnaire was taken with key informants like traditional healers between the aged of 25 to 60 years. From field surveys conducted among the population, 17 plants species commonly used as traditional home remedies in the Jordan valley were recorded.

Introduction

Ethnobotany is the science of documentation and conservation of original knowledge, which has been used by ethnic people since ancient history (Manandhar, 1989, Rijal, 2011). Today, millions of people around the world consume plant based medicines as part of traditional medicine for a range of medical disorders. The use of traditional medicine in developing countries contributes directly to the socio-economic status and well-being of the rural communities (Tabuti et al., 2003a; Chiranjibi et al., 2006). Conservation of plants and other natural resources has been an integral part of the cultural ethos of indigenous communities. Different religions having their own traditions, beliefs, and rituals are associated with conserving the biodiversity and forests products (Karthikeyan and Tangavelou, 2011).

Jordan is a small country, but it has a great diversity of wild plants due to the varied geography and climate. It has been estimated that there are a total of 2000 plant species, belonging to 700 genera (Afifi FU, Abu-Irmaileh B, 2002). The land itself is unique in its natural diversity due to its geographical location at the meeting point of three continents (Asia, Africa, and Europe). Its special climate is influenced by the Mediterranean as a moderating factor and the desert as a drying factor (Lev

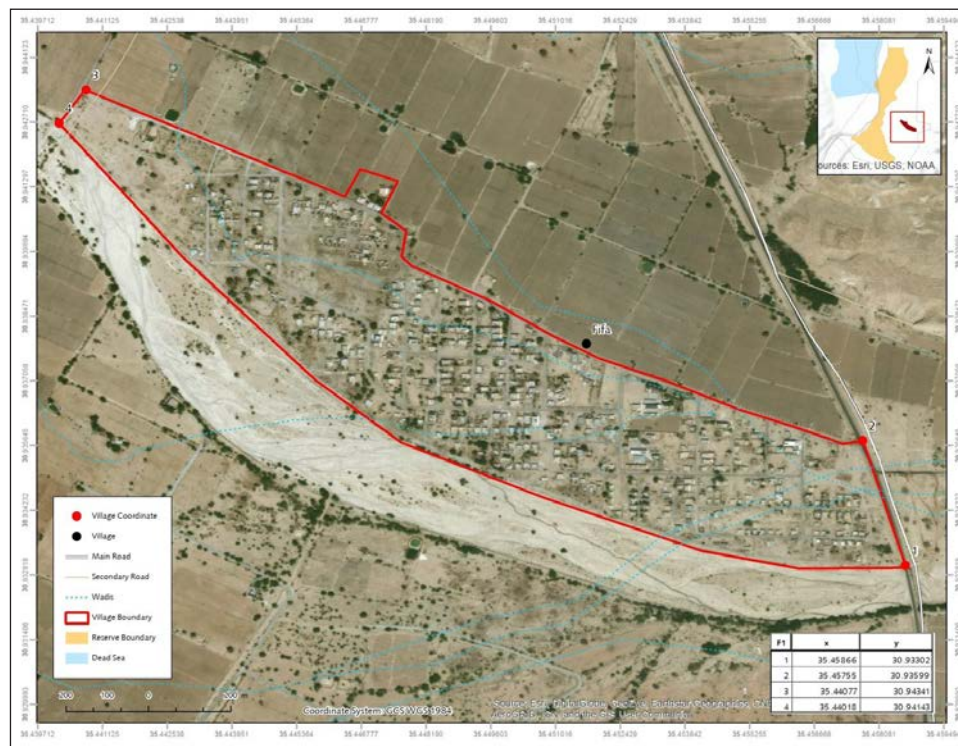


Figure (1) Fifia village map

E, Amar Z, 2002). The flora of Jordan is rich regarding its number of plant species. There are 2,978 species belonging to 120 families and 719 genera recorded in Jordan (Al-Eisawi, 1982). The total number of medicinal plants recorded includes 363 species of vascular plants, belonging to 263 genera and 86 families. The taxa recorded are wild plants that occur in Jordan, except for a few species that are cultivated and well

known to the people in the country (S.A. Oran, 1998). The aim of this study is to collect as much information as possible about medicinal plants in the Jordan Valley and save this knowledge from loss.

Materials and Methods

Study site

Fifia village is located at the southwestern part of Jordan, about 33.5 km south to southeast of the Dead Sea and 157 km north of Aqaba city [East 731366.653, North 3427479,77].

Coordinates. It is situated in the Jordan Rift Valley between the southern part of the Dead Sea and the northern extent of Wadi Araba (Figure 1). Fifia village is located within the Sudanian (Tropical) Bio-Geographical Zone, which is characterized by high temperatures with warm winters and hot summers, combined with low annual rainfall of about 50-100 mm /year.

Methods

The survey was done between September 2019 and October 2019. Using open interviews, questionnaires were adopted for documentation of botanical knowledge in the Jordan Valley where the local communities have vast knowledge about their live fencing practices and the species used. The interviews were carried out from local people to document local name and botanical uses. About 100 informants have been interviewed on a random basis.



Jordan valley looking towards Israel from the Jordanian side

Table 1. Plants species recorded in the Jordan Valley

No.	Latin Name	Arabic Name	Family	Plant Part Uses	Medicinal Use (Diseases)
1	<i>Calotropis procera</i>	ريش علال	Asclepiadaceae	Latex	Toothache
2	<i>Ziziphus spina-christi</i>	ردسل	Rhamnaceae	Leaves and Fruit	Diabetes
3	<i>Thymus bovei</i>	رت عزال	Labiatae (Lamiaceae)	Leaves	Leaching
4	<i>Artemisia sieberi</i>	حيشال	Compositae (Asteraceae)	Leaves	Colic
5	<i>Salvia fruticosa</i>	ثي حريملا	Labiatae (Lamiaceae)	Leaves	Colic
6	<i>Matricaria aurea</i>	جنوب ابايل	Compositae (Asteraceae)	Fruit	Leaching and coughing
7	<i>Pergularia tomentosa</i>	ققل غلا	Asclepiadaceae	Leaves	Treatment of skin infections and ulcers
8	<i>Allium sativum</i>	موثلا	Amaryllidaceae	Bulb	Get rid of bacterial infection
9	<i>Zingiber officinale</i>	لي بجنزل	Zingiberaceae	Tubers	Leaching and coughing
10	<i>Allium cepa</i>	لصربلا	Amaryllidaceae	Bulb	
11	<i>Teucrium capitatum</i>	قدع جلا	Labiatae (Lamiaceae)	Leaves	Colic
12	<i>Achillea santolina</i>	موصي قلا	Compositae (Asteraceae)	Leaves	
13	<i>Moringa oleifera</i>	اجن يروملا	Moringaceae	Leaves	Colitis
14	<i>Aloe vera</i>	اري فولال	Asphodelaceae	Leaves	Skin tightening and hair lengthening
15	<i>Asphodelus fistulosus</i>	نال صري غلا	Liliaceae	Bulb	Alopecia of the head
16	<i>Indigofera tinctoria</i>	قل نزل	Fabaceae	Leaves	Skin tightening and skin whitening
17	<i>Foeniculum vulgare</i>	ردوشلا	Umbelliferae (Apiaceae)	Bulb	Anemia and indigestion

Result and Discussion

In this survey, 17 plant species belonging to 14 families have been established to treat different diseases in the Jordan Valley (Table 1). The plant parts mostly reported in this regard were leaves (10 plant species, 59%), latex (1 plant species, 6%), bulbs (4 plant species, 23%), tubers (1 plant species, 6%), and flowers (1 plant species, 6%). (fig.2)

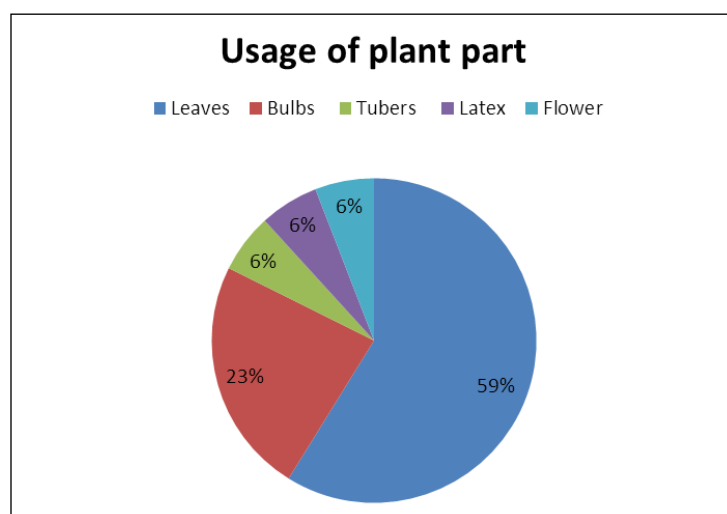


Figure (2): Usage of plant part

The purpose of this study was to highlight the plant species used in folk medicine in the Jordan Valley region in order to preserve this knowledge from loss and contamination for future generations. During the study, 20 plant species with medical uses were registered through 100 questionnaires from the population in the region. This shows a slight decline in the use of this type of medicine, especially in the younger category. As access to treatment became easy in rural areas, the use of folk medicine in the region declined.

Conclusion

The present study indicates that there are about 17 plant species used for medicinal purposes

in the Fifa village the percentage of traditional medical use decreased especially among the youth category. The purpose of this study is to save this knowledge, which has come to be used almost exclusively by the elderly, from being lost.

Acknowledgment

The survey Team would like to express our thanks for the continuous support of all our colleagues for their help in contributing to the development of this study. We are grateful to Mr. Nashat Hamidan, director of the Conservation Monitoring Center, for his unlimited support and help.

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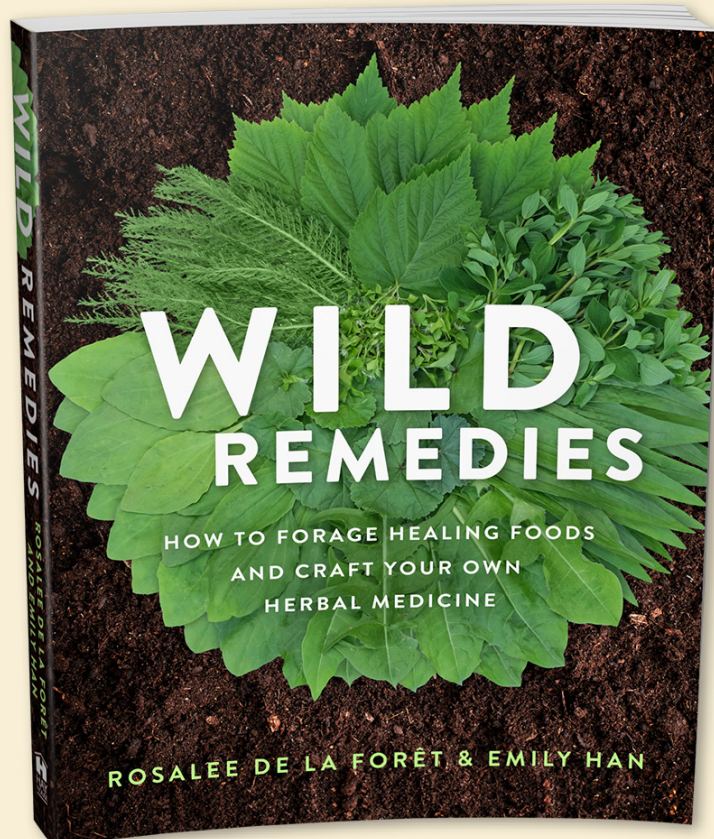
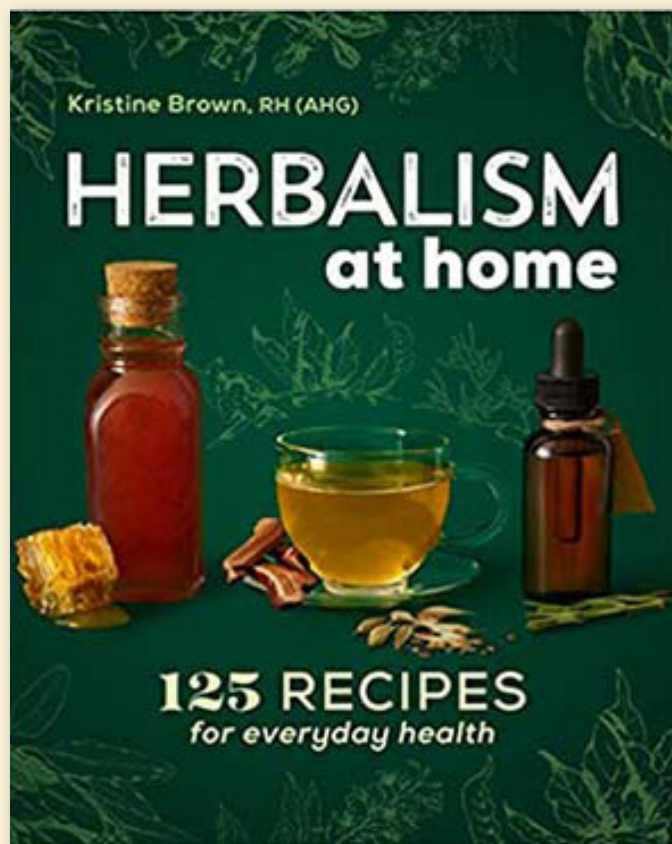
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DEATH OF THE DELTA

The Threat of Climate Change, Drought, and Hydropower Dams on the Mekong River's Traditional Medicinal Plants and Healers

by Dr. Michele Devlin

The Mekong is the world's 12th largest river and the longest in Southeast Asia. Its headwaters begin in China, and it then meanders for 2,700 miles through Tibet, Myanmar, Thailand, Laos, Cambodia, and Vietnam. More than 75% of the river is concentrated in its lower region that traverses Thailand, Laos, Cambodia, and Vietnam before it empties into the South China Sea. The Mekong Delta has historically been viewed as the "rice bowl" of Southeast Asia. Its muddy, slow-moving waters have traditionally been rich in nutrients, and local residents are among the world's leading producers of rice. The dry and rainy monsoon seasons along the Mekong provide one of the most biologically diverse environments on earth for fish, birds, mammals, and other creatures that thrive in the lush tropical environment and serve as important food sources for communities along the river.

For thousands of years, people along the Mekong have also relied on traditional medicinal plants for their wellbeing. Even today, shamans and other traditional healers remain common in many Delta communities and are often a primary source of medical care. Indeed, the heart of the Mekong runs through Southeast Asia, which sits at the crossroads of Traditional Chinese Medicine to the East and Ayurvedic Medicine to the west in India, along with local indigenous healing practices. Herbal healing, tinctures, infusions, cupping, coining, Qigong, and other sources of care are commonly practiced in the region, which is rich in numerous symbiotic spiritual practices taken from Hinduism, Buddhism, Christianity, Islam, and Animism.

Today, however, the Mekong River Delta is under serious threat of environmental degradation, as are the traditional healers and medicinal plants that have called the area home for centuries. Global climate change has resulted in a greater frequency of unpredictable weather patterns, along with droughts and hotter temperatures. Dredging for Mekong river sand that is increasingly used for urban construction projects has often resulted in erosion of vulnerable river bank soils and plants, as has logging and mono-cropping. Upriver, geopolitical conflicts between the countries that rely on the

Mekong have often strained multinational attempts for sustainable efforts to manage the Delta. In recent years, for instance, the volume of water in the lower Mekong Delta has significantly dropped due to the increase in dams being built upriver by China for hydropower. Illegal trading in precious animals and plants, as well as habitat loss, also threaten the Mekong region.

As these trends continue, the Delta is seeing an increase in new human migration patterns and negative impacts on indigenous medicinal plants. For instance, unprecedented stress is being put on the environment due to rapid urbanization in Southeast Asia and growth in its population. At the same time, lower-income rice farmers in villages are increasingly out-migrating from Cambodia, for instance, to countries such as Vietnam or Thailand, looking for more reliable sources of income that are not subject to these forces. As these new threats are happening, the stunning biodiversity



Cambodian woman on traditional small sampan, moving through the Mekong Delta wetlands



Vietnamese mother guiding her watercraft through the Tra Su Bird and Nature Sanctuary near Chau Doc

of the Mekong is being eliminated, including among its plants. The World Wildlife Fund (www.worldwildlife.org/places/greater-mekong) estimates that more than 20,000 species of unique plants live in the Delta Region. Almost half of Vietnam alone is covered in jungles and forests, with the IUCN Red List (<https://www.iucnredlist.org/>) citing almost 100 species of flora and fauna there are critically endangered. Without urgent, coordinated efforts to improve the sustainability of the region and reverse its degradation, indigenous medicinal Mekong Delta plants will continue to disappear, as will the local village shamans and herbal healers that rely on them. ■

Dr. Michele Devlin is from the University of Northern Iowa.

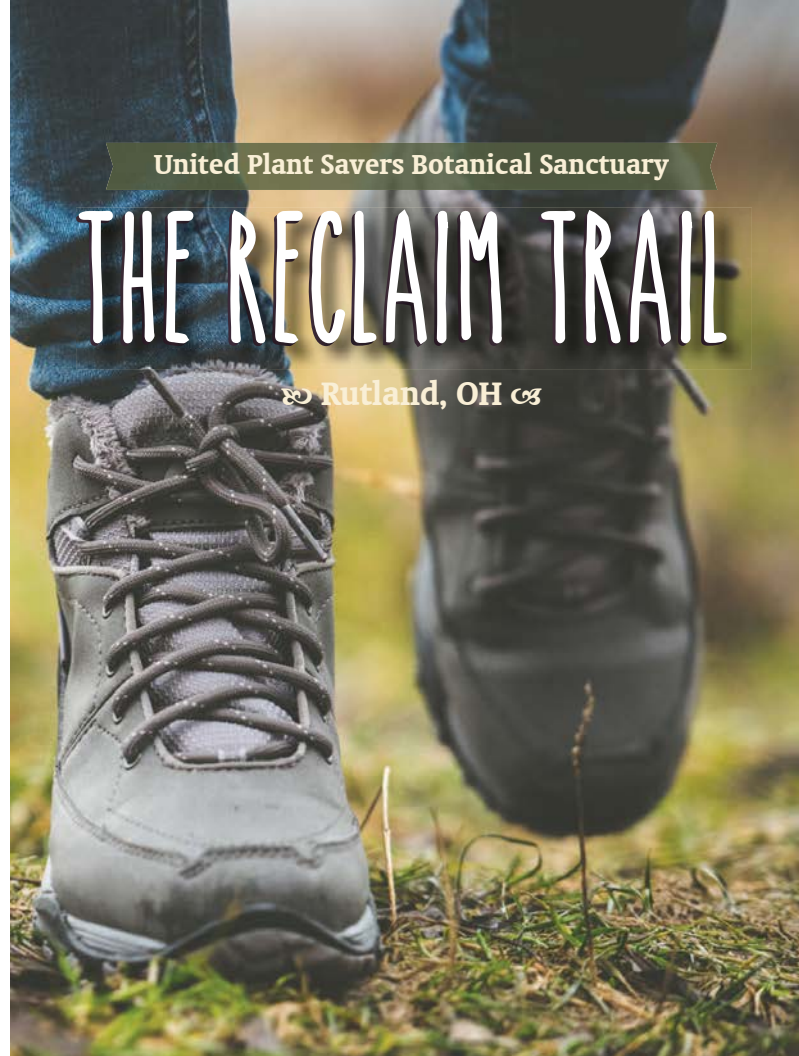


A rich delta ecosystem at risk of unparalleled historic change

United Plant Savers Botanical Sanctuary

THE RECLAIM TRAIL

in 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

GINSENG AND THE FATE OF THE COMMONS: A LESSON FROM HISTORY

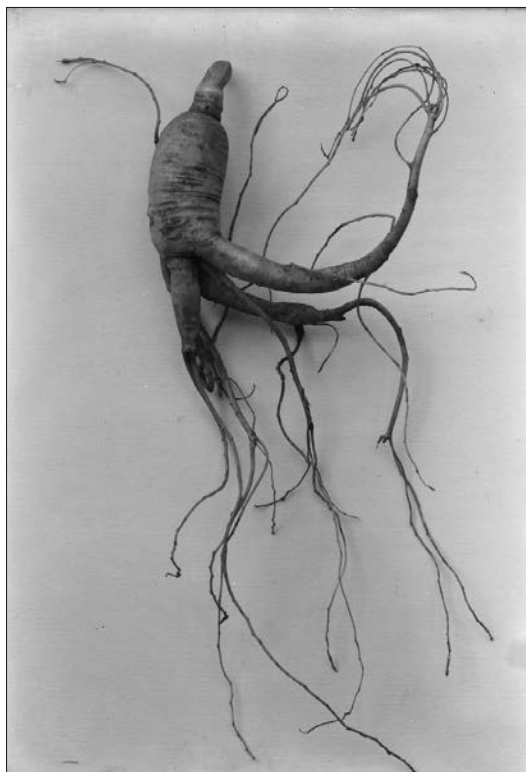
by Luke Manget, PhD

By the turn of the twentieth century, the imminent extinction of ginseng (*Panax quinquefolius*) was one of the common topics of conversation around the country stores. Ginseng had been a lucrative commodity in the United States since the 1730s when European and colonial traders realized the value of a common woodland herb in the China market. These trading firms contracted with smaller dealers, often country store owners, who would, in turn, purchase them from diggers. Throughout the nineteenth century, diggers used the root to buy knives, plow points, sugar, and land and to pay taxes and school fees. They could reasonably assume that the plant belonged to whomever dug it up, regardless of land ownership (Manget, 2017). But by the 1890s, those days were numbered. It was “as scarce as hen’s teeth,” one observer noted (Anonymous, 1901). Export totals reflected the growing scarcity. After averaging nearly 400,000 pounds per year from 1865 to 1889, exports fell to just 216,000 per year in the 1890s. Simultaneously, prices paid by exporters skyrocketed, jumping from \$1.30/lb in 1880 to \$2.00/lb in 1887 to \$4.00/lb in 1899 (Carlson, 1986, p. 239). Writers began to refer to the ginseng trade in the past tense, and mountaineers reflected nostalgically on the days when

ginseng was plentiful. “It was a sad day for the people when the ‘sang’ grew scarce,” wrote James Lane Allen in 1892 (p. 250). “A few years ago one of the counties [in Kentucky] was nearly depopulated in consequence of a great exodus into Arkansas, whence had come news that ‘sang’ was plentiful.” As wild ginseng seemed on the verge of disappearing, gardeners and horticulturists rushed to fill Chinese demand with cultivated root.

I have been interested in ginseng since I was a boy, having heard my grandmother tell stories about how her family hunted “sang” in eastern Kentucky, but it was not until graduate school that I delved into researching it. For my dissertation, an environmental history of the medicinal plant trade in southern Appalachia, I traveled across the eastern United States, scouring business records, country store ledgers, and manuscripts in more than a dozen archives, trying to piece together the long history of Americans’ relationship to ginseng and other roots and herbs. Among the many questions I sought to answer was why wild ginseng populations declined so precipitously by the turn of the 20th century. In outlining some of my general findings, this essay offers a parable for us to consider as we think about the human/ginseng relationship moving forward.

It has been easy to blame the diggers for ginseng’s disappearance. Contemporary observers certainly did. Beginning in the 1890s, writers, conservationists, and agriculturists who lived outside of the region accused sang diggers of being “the principal agents in the



Ginseng Root – Credit: University of Kentucky, Agricultural Experiment Station Negatives, 1898. American colonists began exporting large amounts of American Ginseng (*Panax Quinquifolia*) roots to China in the early eighteenth century. The Chinese, who had been consuming the related Asian ginseng for thousands of years as a health tonic, found the American species to be an adequate substitute, providing generations of backcountry settlers with a ready market.



Boy Sang Digger – Credit: Claude Matlack Collection, University of Louisville. Women and children played an important role in generating surplus income for their families during the post-Civil War depression. This boy, from Clay County, Kentucky, displays a giant ginseng root. <http://digital.library.louisville.edu/cdm/singleitem/collection/matlack/id/246/rec/12>



Root Gatherers – Credit: From Pi Beta Phi to Arrowmont, University of Tennessee Libraries. Tom Camel Campbell and his wife Sophie in 1919 with digging tools and “pokes,” or sacks used to carry forest products. Although the post-Civil-War ginseng boom ended by the turn of the twentieth century, ginseng digging has remained an important part of mountain culture.

extermination of the native supply” of the root (Kains, 1903, p. 13). One anonymous writer (1899) attacked them for “maiming the goose that laid the golden egg through ignorance.” We would recognize these critiques of sang diggers’ ecology today as a classic “tragedy of the commons.” As Garrett Hardin posited in 1968, common resources are destined for tragedy, or collapse, because commons users have no incentive to conserve the resources. They could reap the benefits of the commons without incurring the costs and would, therefore, overgraze or overharvest. Hardin’s commons was a pasture “open to all” on which herdsmen ranged their stock, but any reader of middle-class magazines and newspapers in the late-19th-century U.S. would have recognized the same scenario playing out in the forests of Appalachia. But had ginseng really fallen victim to the tragedy of the commons?

One of the problems with the tragedy thesis is that it posits an ahistorical and overly deterministic interpretation of the human/nature relationship, as if all humans can be reduced to economic beings who always exploit nature for their own individual advancement. My research suggests that the decline of ginseng populations in the late nineteenth century was the consequence of something more complex. First and foremost, one primary culprit, perhaps the most significant, is deforestation. Ginseng requires at least 65 percent shade (Persons, 1994, p. 51), and from 1880 to 1920 virtually all of southern Appalachia was deforested using clearcutting methods to fuel the nation’s insatiable demand for firewood and timber (Lewis, 1998, p. 3). This certainly had devastating impacts on ginseng habitat. This does not exonerate the diggers. Exploitation and overharvesting certainly took place, but it was not always the overriding habits of sang diggers. It happened at various times and places for historical reasons. Wendell Berry (1986, pp. 3-10) reminds us that we are not all driven by the exploiter mentality. There is a powerful but historically weak countercurrent that carries the values of nurture and stewardship. We might use this insight to reexamine the ginseng tragedy.

When the trade first developed into an economic force

in southern Appalachia in the 1780s and 1790s, there appeared to be no effort to conserve the plant. “Dig out and move on” seemed to be the mantra of these frontiersmen like Daniel Boone. Sources suggest that a good digger could harvest more than 40 pounds a day, an astonishing sum that would never again be matched (Manget, 2017, p. 79). Store records that have survived from the period indicate that settlers traded green (undried) ginseng throughout the growing season beginning in May. Because the root is the valuable part of the plant, and because the plant begins to produce seeds in September, harvests like these would have led to the destruction of entire patches of ginseng.



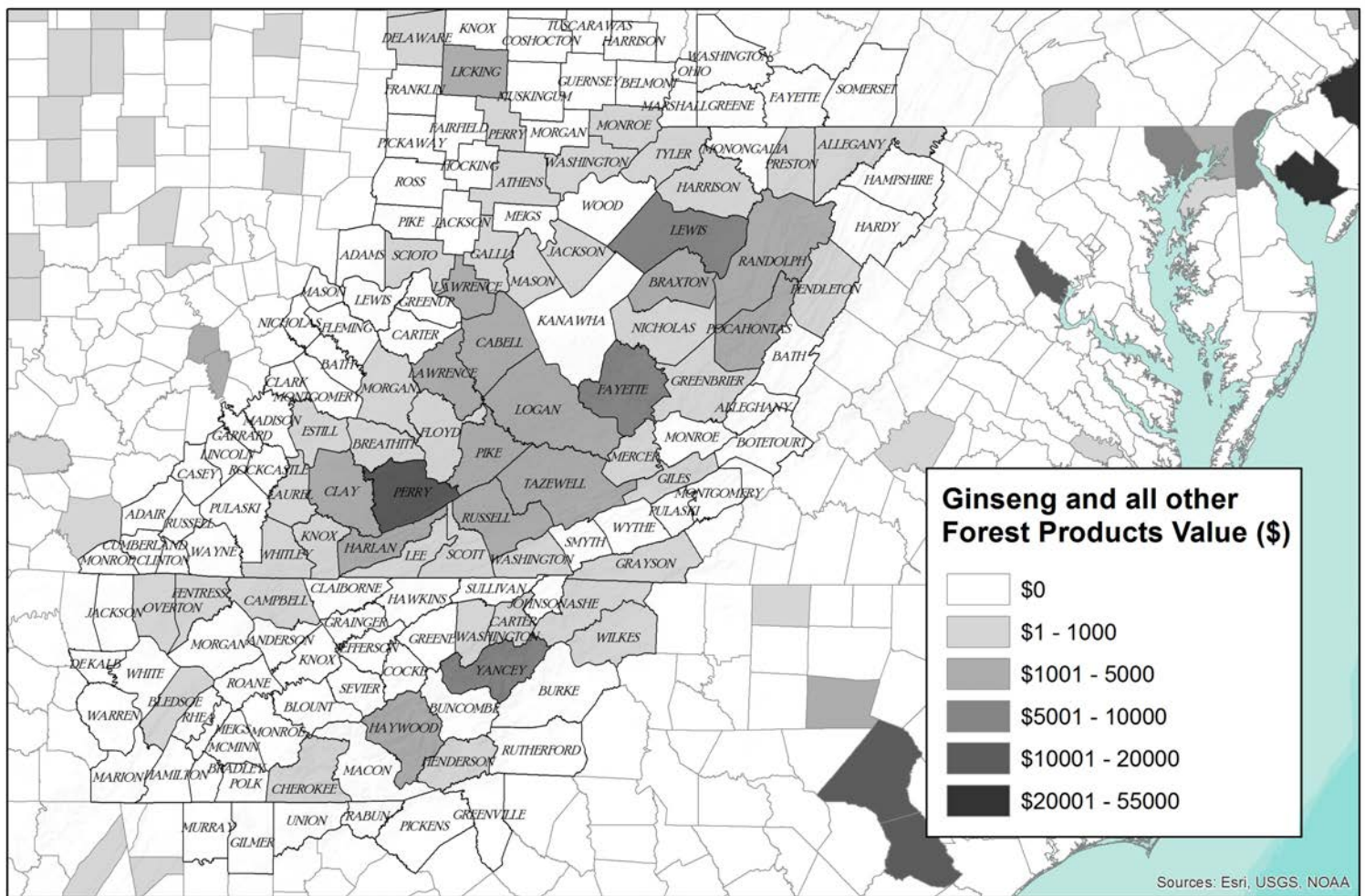
Boy with a Four-Pronged Ginseng Plant – Credit: Luke Manget.
A four-pronged ginseng plant in Western North Carolina.

By the 1840s, however, some harvesters’ mentality seems to have evolved from the initial smash-and-grab frontier phase. As ginseng disappeared from easy-to-reach places and settlers began to grapple with the prospects of long-term land tenure, some voices emerged to champion the cause of ginseng conservation, urging people to avoid digging plants until they bore seeds and to actively replant those seeds. Some communities even began to observe an unofficial ginseng season decades before states began legislating for that purpose. The comprehensive store records (1840-1860) of Randolph County, (West) Virginia merchant Ely Butcher, for example, indicate that ginseng was never traded at his store before September 1. This would have given local plants the chance to

reproduce, and residents could find enough root to effectively supplement their farm production (Manget, 2017, pp. 83-88).

The Civil War and its aftermath disrupted these efforts at conservation, leading to louder cries for state-mandated conservation efforts. The economic depression, dislocation, and social upheaval that followed the war brought greater pressure on the ginseng commons. More wild ginseng was exported to China from 1865 to 1900 than before or since, but the people who dug this ginseng were different from those who dug it in the 1840s. First, these diggers often traveled to the mountains from outside the region. Second, they had

U.S. Ginseng Production in Appalachia, 1840



Map created by Luke Manget

Credit: U.S. Census Bureau, 1840 Census: Compendium of the Enumeration of the Inhabitants and Statistics of the United States. Minnesota Population Center. National Historical Geographic Information System: Version 11.0. Minneapolis: University of Minnesota, 2016.

Map, Ginseng Production, 1840 – Credit: Luke Manget. Using information obtained as part of the 1840, this map shows the amount of ginseng harvested in that year from central and southern Appalachia. Although not a perfect measurement, it nevertheless is the only county-level statistics collected about the ginseng harvest from the nineteenth century.

few other means to earn a living. These diggers were not farmers. They had little concern for the long-term health of ginseng populations and did not observe any season. Store records show that ginseng was traded almost year-round, and green sang was brought in as early as May and June. Whatever conservation ethic may have existed among some forward-thinking diggers of the antebellum era dissolved into a milieu of mistrust and competition. And ginseng’s disappearance accelerated (Manget, 2017, pp. 243-251).

North Carolina (1867) and Georgia (1868) were the first states to mandate a ginseng season that began September 1, and a wave of other state laws followed, each one attempting to manage ginseng and its harvesters in its own way. At times it was a struggle. Some were championed by landowners and timber speculators, who did not want diggers on their property, and these attempts were publicly and privately resisted by the diggers. Other laws were promoted by diggers themselves, who were alarmed by the plant’s disappearance. Whatever the motivation, these laws

had a similar effect. This widespread renegotiation of common rights made ginseng effectively a private commodity, accessible only by landowners and those to whom landowners gave their permission. The questions of who could hunt ginseng, where, and when were increasingly determined by state and federal governments (Manget, 2017, pp. 243-251).

If my reading of the sources is accurate, it means that local communities struggled to manage their own ginseng populations well before the state compelled them to. The wasteful frontiersman has long been an important trope in the history of conservation, but we must not forget those who refused to move on to greener pastures and put down roots in a particular place. Sometimes they maintained wasteful ways, but sometimes they adapted to scarcity. Indeed, the struggle for ginseng conservation took place at the grassroots level within rural communities. Their ultimate failure to prevent the widespread population decline had more to do with deforestation and the effects of the post-Civil War depression—in other words, specific historical

circumstances—than it did with any putative universal exploitative tendencies. ■

Luke Manget is an Assistant Professor of History at Dalton State College in Dalton, Georgia. He earned his PhD in history at the University of Georgia in 2017. An expert on Southern Appalachian environmental history, his dissertation, “Root Diggers and Herb Gatherers: The Rise and Decline of the Botanical Drug Trade in Southern Appalachia,” is currently in the process of publication. tmanget@daltonstate.edu

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Ginseng in the forest – Credit: Daniel Manget. American Ginseng (*Panax quinquefolius*) in the Pisgah National Forest

COLUMBINES SCHOOL OF BOTANICAL STUDIES

Wildcrafting Checklist

- Who are the indigenous people of this place? What is their contemporary situation?
- Do you have the permission or the permits for collecting at the site?
- Do you have a positive identification?
- Are there better stands nearby? Are you at the proper elevation?
- Is the stand away from roads and trails?
- Is the stand healthy?
- Is there any chemical contamination?
- Is there any natural contamination?
- Are you in a fragile environment?
- Are there rare, threatened, endangered, or sensitive plants growing nearby at any time of the year?
- Is wildlife foraging the stand?
- Is the stand growing, shrinking, or staying the same size?
- Is the plant an annual or a perennial?
- Is tending necessary and what kind?
- How much to pick? Is the stand big enough?
- Time of day? Time of year?
- What effect will your harvest have on the stand?
- Do you have the proper emotional state?
- Move around during harvesting.
- Look around after harvesting. Any holes or cleanup needed?
- Are you picking herbs in the proper order for a long trip?
- Are you cleaning herbs in the field? Do you have the proper equipment for in-field processing?

WILDCRAFTING IS STEWARDSHIP

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IT'S ALL ABOUT TECHNIQUE: IN VITRO METHODS FOR STORING MEDICINAL PLANT GERMPLASM

By Rustin A. Rohani, MA, BSc

Despite the arrival of pharmaceutical drugs, humans have historically used plants to treat illnesses (Ganie et al., 2015). Even today, there are about 30 essential drugs directly sourced from plants (Veeresham, 2012). There are almost 18,000 documented medicinal plants in the world with many of them threatened from climate change and land usage (Willis & Bachman, 2016). The World Health Organization (WHO) reports that the majority of the world's human population still relies on medicinal plants and that health-policy makers continue to recognize how important medicinal plants are (WHO, 2002). For example, secondary metabolites in some medicinal plant extracts can act as antioxidants to treat female reproductive disorders such as infertility, amenorrhea, dysmenorrhea, gonorrhoea, hemorrhages, menstruation unrest, and inflammation of the ovaries (Mbemba et al., 2017). Also, researchers at Golestan University of Medical Sciences, Pasteur Institute, Payame Noor University and University of Karachi have identified anticoagulant compounds in some herbal species of plants that can be used to prevent blood clotting and stroke (Aalikhani Pour et al., 2016). With studies such as these showing the importance of medicinal plants for medicinal uses, it's vital to effectively preserve them, because the effectiveness of the natural elements found in many herbal plants are dependent on how these plants are collected and stored (WHO, 2002).

Collecting and storing seeds has been a common and effective *ex situ* method of preserving plant genetic resources, but there are reasons why this may not be the best method. Some plants do not produce enough seeds due to low fecundity, so banking *in vitro* tissues becomes vital (Pence, 2011). In addition, seed banking can increase susceptibility to diseases, and seeds may lose the capacity to germinate after a period of time (Jha, 2015). In contrast, the advantages of using *in vitro* methods to store plant germplasm (plant genetic material) involve tissue culture collections being disease-free and controlled in a protected *ex situ* environment (Mycock, Blakeway, & Watt, 2004).

According to Thorpe (2007), plant germplasm storage has been discussed and applied through developed *in vitro* techniques since the mid-20th century. Developed techniques have mainly involved plant growth retardants on plant growth media, low temperatures, and cryopreservation through liquid nitrogen storage (Thorpe, 2007). These *in vitro* techniques have shown to be a viable option in storing plant genetic resources, including medicinal plants.

PLANT GROWTH RETARDANTS ON PLANT GROWTH MEDIA

When it comes to storing plant germplasm, cultivating plant tissue through *in vitro* processes is required. Two main components of cultivating plant tissue are using plant growth medias and plant growth retardants (PGRs). Using PGRs, such as auxins and gibberellins, allows for natural plant hormones to be blocked when cultivating plant tissue on plant growth medias (Thorpe, 2007). Gibberellic acid is the specific hormone PGRs are used to block, because this hormone provokes plant cell growth (Thorpe, 2007).

The benefits of using PGRs to inhibit plant growth include more storage space (regulated plant stretch) and aiding in the suppression of abnormal growth (plant disease) such as overgrowths, leaf epinasty, and superfluous branching (Getter, 2013). A major plant growth media used with PGRs is Murashige and Skoog media (MS), which is made up of major salts, minor salts, vitamins, and natural ingredients (Trigiano & Gray, 2010). The primary disadvantage to using plant growth media, such as MS, is that routine sterilization is necessary to prevent any pH differences, contamination and/or degradation of the media (Saad & Elshahed, 2012).

However, a sixteen week slow-growth mid-term conservation study done by Chauhan et al. (2016) showed a 100% survival rate for the microshoots of an endangered herbal plant species (*Chlorophytum borivillianum*) when MS via PGRs was used. *Chlorophytum borivillianum* is an important herb because of its treatment uses on diabetes and joint-related diseases (Chauhan et al., 2016). Similarly, researchers from Al-Balqa Applied University stored microshoots from another herbal plant, *Stevia rebaudiana*, for thirty-two weeks with a 93% survival rate using the same media with different PGRs (Shatnawi et al., 2011).

Although it is clear that there are risks to the effectiveness of plant growth media if periodic sterilization is not appropriately executed, still, high survival rates of these cultivated medicinal plants by MS via PGRs proves that the rewards outweigh the risks. To minimize risks, researchers may practice effective laboratory management strategies, such as sterilization protocols through autoclaving laboratory equipment.

According to Sigma-Aldrich (n.d.), plant growth medias should normally be autoclaved at 121 degrees Celsius for proper sterilization. It is also important to take into account that greater volumes of media require a longer time to sterilize in an autoclave (Sigma-Aldrich, n.d.).

NON-FREEZING TEMPERATURE STORAGE

Part of storing plant tissue culture involves placing medias under low temperatures. Usually, temperatures between 1 to 9 degrees Celsius are considered non-freezing in regards to storage of plant material (Thorpe, 2007). The advantages to conserving plant germplasm in cold storage is the simplicity, financial practicality, and

long-term survival ability of plant germplasm (Jha, 2015). Cold storage of medicinal plant germplasm is quite advantageous due to its practical and safe approach. Nevertheless, the genetic characteristics of medicinal plant species stored under this method should be further evaluated to ensure consistent survival rates across tested samples.

A study done by Gianni and Sottile (2015), measured the effects of cold storage and slow-growth of two species of plum, *Prunus domestica* L. and *Prunus cerasifera*, which have medicinal properties. The results of this study proved cold storage to be effective for these Sicilian plum species in regards to survival. Under cold conditions, genotypes from these species exhibited nominal growth and had survived between 6 to 12 months. However, the survival rates of both these species in cold storage was inferred to be dependent on their genetic predisposition (Gianni & Sottile, 2015).

Another advantage to non-freezing temperature storage is that plant tissue and cells are not at risk of being injured from cryopreservation, such as plant dehydration due to freezing (Jha, 2015). Scientists have compared both cold storage and cryopreservation methods with medicinal plants by comparing these methods on three species of medicinal plants, which include *Eruca sativa* Mill., *Astragalus membranaceus* and *Gentiana macrophylla* Pall. During a five month cold storage period, 80% to 100% of tissue samples from all three species survived (Sheng-Hui et al., 2008). Cryopreservation in regards to these species presented a lower survival rate during this five month period, and plant tissue samples from *G. macrophylla* expired from freezing temperatures (Sheng-Hui et al., 2008).

CRYOPRESERVATION

Cryopreservation is similar to cold storage technique of plants in that it involves the development of sterile tissue cultures (Jha, 2015). In addition, the plant's genetic material is treated with cryoprotectants and then stored under temperatures of -196 degrees Celsius (Jha, 2015).

Shatnawi et al. (2011) states that cryopreservation is an advantageous technique for storing medicinal plant germplasm, because very low temperatures cause a restraint of biochemical processes. In consideration of this fact, scientists should still take calculated risks when cryopreserving herbal plant genetic resources in order to store a sufficient amount of collected samples.

The application of cryoprotectants on microshoots, plantlets, embryos, and cell culture, allows for storage through (liquid nitrogen) cryo freezing. According to Tao and Li (1986), cryoprotectants are compounds categorized by molecular weight that inhibit freezing injury to plant tissue. The higher the molecular weight the cryoprotectant has, the more likely these compounds will cause damage to the plant's cells. However, concentrations of high molecular weight polymers are necessary, like dimethyl sulfoxide (DMSO), in order to

penetrate the plant's cells and be effective. They suggest that a combination of cryoprotectants with differing molecular weights may lessen the degree of damage to the plant's cells (Tao & Li, 1986). Yet, experimenting with cryoprotectants may be an insufficient method when endangered medicinal plants are involved.

Inventor Meryman (1997) argued that the use of penetrating cryoprotectants and controlled freezing are not efficient techniques for cell recovery. This is due to the risks involved with the use of cryoprotectants on cells, such as the risks of ice growth during rewarming of plant tissue and the impracticality of consistent cooling and rewarming procedures of large sample sizes (Meryman, 1997). It's also important to consider the costs of time and financial resources of experimentation.

IN-VITRO, COST, AND FUTURE

In review, *in vitro* techniques are viable alternatives to storing medicinal plant genetic resources. As far as PGRs on plant growth medias, sterilization is an important aspect that can affect the technique in cultivating plant germplasm. The slow growth storage of plant germplasm is shown to be practical financially and procedurally. Lastly, freezing plant germplasm under cryopreservation involves risks, such as plant tissue or cell damage. Yet, survival rates under this *in vitro* method have been proven to be high.

From these techniques, institutions should also factor economic cost. Expenses to consider for *in vitro* storage of medicinal plants include aseptic equipment, laminar flow cabinets, and labor (Pence, 2011). Specifically, for cryopreservation of plant genetic resources, materials such as a liquid nitrogen storage tank is also necessary (Pence, 2011). Furthermore, scientists at the National Laboratory for Genetic Resources Preservation state that the viability of cryopreserved collections may be statistically dependent on the number of plant genetic resources stored and the confidence levels of the researchers (Volk et al., 2017).

Biobanking plant genetic resources can be further studied and supported through *in vitro* methods not directly involved in storage. For example, the polymerase chain reaction (PCR), allows for *in vitro* amplification of medicinal plant DNA. In fact, reviews of this technique have shown that molecular markers can provide information regarding the genetic diversity and genetic makeup of herbal plants at a molecular level (Sarwat et al., 2012).

In addition, technology has allowed scientists to characterize and assist in conserving plant genetic material through molecular computing (Thorpe, 2007). In particular, *in silico* methods, such as cheminformatics, have allowed researchers to identify chemical compounds in medicinal plants by using computational techniques. Cheminformatics has helped researchers deduce herbal plants by chemical compounds that are most effective for treatment of diseases (Aalikhani Pour et al., 2016).

CONCLUSION

It is important to consider that there are endangered medicinal plant species in many parts of the world, and storing their germplasms should be prioritized as a result. The International Union for Conservation of Nature, an international organization associated with conserving natural resources, lists some medicinal plants that are threatened due to overexploitation and are known to treat diabetes, digestive disorders, and certain cancers (IUCN, 2016). These plants include *Cistanche deserticola*, *Dioscorea deltoidea*, *Nardostachys grandiflora*, *Picrorhiza kurroo*, *Pterocarpus santalinus*, *Rauvolfia serpentina*, and *Taxus wallichiana* (IUCN, 2016). By using a combination of both *in vitro* and *in silico* methods, researchers can invest more time into storing medicinal plant germplasm that can be most beneficial to treating various illnesses for humankind. ■

Rustin Rohani completed this project as a part of his graduate work with Project Dragonfly at Miami University in Oxford, Ohio.

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BOREAL NIGHT

BEGINNINGS & THE IRRELEVANCE OF SIZE

Leslie M. Alexander

when I had a window sill of culinary herbs
I called it a botanical sanctuary

when I stewarded 7.5 acres of medicinals,
I called that space a botanical sanctuary

now, I am looking into a glass jar
it is my botanical sanctuary today

connecting seeds with shoots
and shoots with roots

and intention

linking one botanical sanctuary with another
sill-sized or other

each a sanctuary
where size matters least
and intention matters most.



WHY DON'T WE STOP AND SMELL THE ROSES?

by John Theodore Martello

Have you ever heard the expression, “Stop and smell the roses?” Do you know that sensation when the fragrance hits your nostrils and suddenly everything else in the world fades away? Now approaching my middle age, I can say I have stopped, and how sweet the roses smell. At this time last year, I began writing answers to questions on an application to enter into a guide training program with the Association for Nature and Forest Therapy (ANFT).

“What are your personal and professional goals? Tell a story about a tree that you have known that has been significant to you in some way. What practices or strategies do you use for self-development and to maintain mental, emotional, and spiritual wellness?” These questions I carried for a few months as I clarified my vision.

The goal was to become a certified guide in an emerging practice known as *forest bathing*. The people of Japan call it *Shinrin yoku*—to bathe in the atmosphere of the forest. As defined by the ANFT, “Forest Therapy is a pathway to personal health and well-being, as well as one towards pro-environmental and pro-social change at a societal level. In urbanized and digitized environments, Forest Therapy is very simply a method for re-introducing people to the forest and other natural environments. As people become estranged from nature, Forest Therapy becomes an increasingly important way to just get people outside, so that their bodies can access essential stimuli like sunlight, fresh air, and organic compounds released by plants, such as terpenes and phytoncides.”

So what does a forest bathing session look like? I like to call it a “mini retreat.” First you sign up, a guide greets you at the chosen location, and then the group embarks on a gentle walk, usually no longer than one quarter mile in length. Over the course of two to three hours, a guide offers “invitations” which are simple, open-ended prompts to connect with nature through one of the senses. After laying out some ground rules for the sharing circle, a guide creates the container in which participants can feel at ease to share what they are noticing. Participants are reminded that silence is also a valid form of sharing. There are always communal snacks and a tea ceremony at the end.

Invitations offered by guides are non-prescriptive, meaning there are no desired outcomes. This distinguishes the archetype of the guide from the archetype of the healer. A common guide mantra is “the forest is the therapist, the guide opens the doors.” Human relationship to the earth has evolved over time. In an increasingly modernized world the disconnect grows. In the early 1980s, Japan established and formalized this practice as a response to a national health crisis. Much resulting scientific research has

shown that humans are nature. Aside from the overwhelming body of anecdotal evidence that nature is good for humans, ANFT is more confident than ever when we say that “spending time with trees and bathing in the atmosphere of a natural place like a forest has shown numerous health benefits, such as reduced blood pressure, increased immunity, and stress reduction.”

The day I was accepted into the training program was the day I re-encountered a place that I walked by every day to and from my home. Behind me the sun was setting across an open expanse. Naked oak scaffolds high above were turning a fiery red. I noticed a large tree lying horizontally on the ground. Standing on the earth where the tree would have stood when it was upright, I peered into its hollow trunk. I imagined being drawn through some kind of time portal. This is the place I would come to call “sit spot.” Slowly over time, I began to notice the many offerings of this place. Patterns of winds, growth waves of vines, pleasantries of the passing seasons, this little patch of woods became a place to set aside my worldly worries and to just be. It became a place of growth and development, a place where I entered into tender relationship with myself and with all the beings around me. Before long, I would set out on an eight-day training in the mountains of western Maryland.

At training, I met so many amazing people. I had perhaps the best opportunity to come to know them during our sharing circles. Several times throughout the forest bathing walks, the group reconvened to hold space for each one to share. This helped to further develop my own capacity for noticing. It is said that circle supports cultural repair by teaching people how to listen to each other. This process supports the medicine journey by creating space for each participant to narrate their experience and for it to be witnessed by the group. As its participants are encouraged to speak and listen from their hearts, the center of the circle is the seat of the group’s wisdom where members value all stories equally.

Being guided was a new experience for me. Induced by the guide’s prompts, I was now paying attention to my senses and coming into the present moment. I had been guided through meditation before, but usually this took place indoors. There was a rigid form to it as if being read an excerpt from a meditation book. This instead was an embodiment exercise guided by principles of form and formlessness. An improvised invitation to experience breathing within and without the body came just as a light breeze filtered through the whispering trees. From that point onwards, I moved through a dream-like state. I listened to my heart, and the body followed where it wanted to go.

After the initial in-person training, the practicum continued back at home for six months. I paired up with a mentor, participated in peer conference calls, and was given assignments with names like “draw your web of interbeing,” “go on a medicine walk,” and “share your harvest project.” The pedagogy under which the entire program was designed allowed me to be my authentic self.

Guides work in partnership with the place where they guide walks. There is a deep respect for the land, as reciprocity is a recurring theme throughout any walk. Guides recognize the story of indigenous peoples who tend and have tended the land. The tea ceremony is a wonderful way to bring any forest bathing session to completion. The plant chosen for tea comes from the land and is greeted, asked permission, and carefully prepared by the guide. Each participant, the guide, and the land receive the gift of tea. Participants are given a final opportunity to share.

I now place more value in breaking from the botanizing on my forest walks. Today, I often come out of my head and drop into my body. I’ve learned that I don’t have to achieve something, I just have to be. I’ll take off my shoes, feel the earth rising up to support me with each step, embrace the warmth of the sun on my face, and stop to smell the roses. ■

John Theodore Martello was a UpS Goldenseal Sanctuary Intern in 2011. He is a Certified Guide for the Association for Nature and Forest Therapy.

Elders and Oaks

*the magnificence of oak
grows with age
bark thickens purple brown
dead layer crevices
insect roadways
shield to winds and water*

*taproots travel seven times the crown
reaching deep below
a community of trees
locking hands beneath our feet.
elders with or without our knowing
hold us this way underground silent
feeding the trunk of our existence
as we grow and feed them our leaves.*

— Jesse LoVasco



SACRED THREADS

by Paul Corbit Brown

Imagine visiting a museum of art. Now imagine the curator invites you to peer through a microscope to examine the intricacies of an ancient tapestry. You quickly discover that the scene depicted in this artifact is actually composed of thousands upon thousands of threads. As you examine it more closely, you see that even a single color is made of thousands of threads, all imbuing a unique purpose within the context of the larger image. In awe, you realize that each thread adds color, shape, lines, texture, and contrast; and you admire their individual yet crucial roles, one inextricably woven into the next, to create the complete picture.

Now imagine you are viewing the tapestry in its entirety from across the room. The image of the tapestry becomes more complete. It is less de-

finied by the individual threads and more about the synergy of the whole. This is a metaphor for nature. Each species, from the simplest bacteria to the most complex organisms, is a sacred thread in the tapestry we call Life on Earth.

When folks come to the heart of West Virginia to visit Kayford Mountain, I ask them to recognize the incredible biodiversity that exists here and to think of it like that tapestry. Even the top soil, the sustenance for most of these forms of life, is alive with the microscopic threads. Nature thrives on balance and harmony. Each living organism serves a sacred purpose much larger than itself. As humans we have come to believe that we are separate and apart from nature. We have forgotten that we are no more or no less sacred than the other threads in this

fabric of life. We live mindlessly, tugging and pulling at the other threads with no regard for how that affects the unity of the tapestry.

There are few places where the effects of this careless behavior are more visible than in Mountaintop Removal (MTR) coal mining. The thought of taking the top off of something seems simple and innocent enough—we take the top off of a can of beans for dinner, we take the top off a soft drink, we take our tops off at the beach, but taking the top off of a mountain is like taking the head off of a human being. It is a fatal and irreversible act. It is certain death for the mountain and the life that once called that mountain “home.”

Mountains are more than just large piles of stones with trees growing on top. Mountains are living entities. They are the birthplaces of rivers and the nurseries of countless species of life that are part of nature’s desire to be whole. Every week the explosives detonated in the mountains of West Virginia equal the force of the hydrogen bomb dropped on Hiroshima. In the process our air, water, and soil are being polluted. Once you take the top off of a mountain, it has to go somewhere. The “overburden” is pushed into the surrounding valleys, clogging and poi-

soning more than 2,000 miles of Appalachian headwaters with heavy metals and other industrial waste. For more than 30 years, humans have unleashed this destruction on the second most bio-diverse ecosystem on the planet—this is a dismantling that cannot be rewoven. Peer reviewed studies show that the damages to West Virginia’s waters as a result of MTR are “pervasive and irreversible.” Further studies show that people living in the communities around MTR are dramatically more likely to suffer from heart, stomach, liver, and lung disease as well as an array of cancers and birth defects. In fact, the life span of people living in these communities is shorter (by 18 years) than people in any other demographic in the United States.

Keeper of the Mountains Foundation works globally to educate and inspire people to end this practice. Larry Gibson, the founder of our organization, was able to save a small part of Kayford Mountain in West Virginia. These fifty acres now sit as a green island surrounded by an ocean

of thousands of acres of utter desolation wrought by the hubris of human greed and consumption. Each year, hundreds of students visit Kayford Mountain to witness the violent destruction of our once verdant home. In tears, they sit on the edge looking down on what remains of this mountain. An ecosystem that was previously composed of thousands of distinct species of life per acre is now a wasteland sparsely populated by broken rocks, poisoned water, and less than a dozen non-native plants.

When students ask, “What can I possibly do,” we remind them that coal is not mined for sport. Coal is mined for profit. Our wanton consumption fuels the demand for coal and its by-products. The most important step we can take is to dramatically reduce our consumption of electricity, plastics, and any single-use/disposable items.

As our dear friend, John Stock, says, “We should work diligently to practice conservation rather than reclamation.” Our Earth is a finite resource. We would do well to see our collective behavior as less a matter of destroying the planet and more a matter that our overconsumption is destroying the life support system for our species. I believe the Earth will go on. The real question is will we be with her, or will we be another thread that has been plucked from the sacred tapestry of life on this planet? Each species, each organ-

ism is its own sacred thread. A single thread is weak, but many fibers make the rope. Together, we are stronger. ■

Paul Corbit Brown is the President and Chair of the Keeper of the Mountains Foundation.

Keeper of the Mountains Foundation is a 501c3 nonprofit. If you are interested in learning more about our work, please visit our website at www.keeperofthemountains.org.

“We are the Keepers of the Mountains. Love them or Leave them. Just don’t destroy them.” Larry Gibson 1946-2012



Thousands of residents in communities situated near mountaintop removal sites have had their water sources polluted by the mining process. Maria Lambert shows two jars of the water from her kitchen faucet. As a result, she was forced to carry countless jugs of water from elsewhere in order for her family to have safe water for drinking, cooking and bathing.



WILDCRAFTING IN A WARMING WORLD: TOWARDS REGENERATIVE PRACTICES FOR LIFE IN THE ANTHROPOCENE

by Scott Kloos

It's a clear, somewhat chilly September morning in the high desert mountains of southeastern Oregon. I am here with a small group of people facilitating a plant teacher immersion trip. The day previous we came to this same place to commune with Aspen (*Populus tremuloides*); today we will ceremonially connect with Yellow Pond-lily (*Nuphar polysepala*) and potentially harvest rhizomes from which we will make medicine to share with our friends, families, and communities.

A light breeze blows through my hair. Behind me the same wind animates the leaves of the quaking aspen grove which hugs the side of the muddy lakebed upon whose ill-defined edge I stand. Surrounded by the sound of the golden-yellow, trembling leaves I relax into a deeper state of presence. Anchored by Aspen's persistent and expansive clonal root system I allow myself to open more widely to the life-force and ecological information which pulses through every being within this ecosystem.ⁱ With enhanced awareness I scan with eyes, ears, nose, heart, and whole being: vibrant blue sky, smell of sagebrush, small winds funneling across the lake-scape rustling through desiccated plant-life, large heart-shaped pond-lily leaves browned and plastered to the mud with no seedpods in sight, feelings of solastalgia.ⁱⁱ

Recognition sets in as I acknowledge the absence of any standing water. In each of the last four years I've noticed a progressive receding of the lake's water level, but this year there's not even a hint of the small puddles that remained at this time last year. In years past the water in this snow- and spring-fed basin would persist through the region's typical hot, dry summer with only the edges of the lake drying up. The yellow pond-lily's leaves would remain green. Although it is possible that the drying up of the lake may have resulted solely from periodic drought conditions that have historically impacted Oregon and other western states, we now know with certainty that conditions such as these will be increasingly common and that we have been, are,

and will most definitely continue witnessing with greater force and frequency catastrophic weather and climatic events. We are living in times of great change, which some have dubbed the Anthropocene, a new epoch of Earth's history marked by industrial civilization's devastating impact upon our planet's air, water, land, and life systems.

After concluding the ceremony our group walks down to the lake through a gap in the aspens that encircles our ceremonial space. The sun shines brightly overhead as we walk. Our silence broken only to marvel at and appreciate the presence of the many tiny brown and green frogs who hop aside to make way for our passage across the dried and cracking lake-bottom mud. A turkey vulture glides effortlessly through the sky buoyed by currents of warm afternoon air. We circle around a grouping of yellow pond-lilies that have attracted our



Nuphar Lake in southeastern Oregon, 2017

attention a third of the way in from the lake's southern edge. Not having shared with the members of the group my earlier realization about the lake's acute dryness, I invite each of us to find our alignment with the land, to tune into the deeper ecological intelligence of this place, and to observe with all of our senses—thinking and feeling our way towards an assessment of the state of this ecosystem.

After a period of silence, I invite each participant to direct their attention to Yellow Pond-lily and ask whether it is okay for us to harvest today. When holding space for a group to collectively ask permission, I honor each person's current state and their personal relationship to the plants and to the land. It is quite possible for some to get a "no" while others may hear a "yes." I usually find this process somewhat challenging. In this case it was even more so because for me, based on my longer term relationship with this place and the beings who call it home, it is very clear to me that we won't be harvesting today. We are in the midst of something beyond this time and place, and deeply consequential situations call for collective noes.

I wait silently as the attention of each participant returns from the reverent inquiry to which each has dedicated themselves and ask what information or feelings have arisen. One by one each shares that they do not feel that this is the proper time or place for a harvest. I express my feelings from earlier in the day and tell them about what I have witnessed over the last several years.

We sing to the plants. Some of us wander off to make offerings, to have a private moment to be present with our own feelings about the state of the world and the state of this place, and to perhaps enter into empathetic engagement with the surrounding life. While we won't be able to partake in the always fun and rewarding experience of a yellow pond-lily harvest together, we will all be bringing medicine home to share.

Wildcrafters as Integral Parts of the Ecosystem

Not harvesting can be as profound an experience as harvesting. Saying “no” need not feel or be constrictive. It can be as liberating as saying “yes,” and so long as our responses to the world are based on experiences of deep connection and communion with the community of life, we can move with more certainty and integrity as integral components of the Earth. But for processes such as this to be truly grounded and aligned we must also engage in critical reflection and work to heal and

transform the personal and cultural traumas we all carry. That said recognizing and accepting the ways climate change is already affecting the life-sustaining balance of the ecosystems in which wild plant communities thrive, we must as wildcrafters ask ourselves some serious questions about the ways we engage with the world. How are rising temperatures, extended periods of drought, erratic

seasonal transitions, and other factors of the Earth's changing climate impacting wild plant communities and the ecosystems in which they/we live? How will we adapt our harvesting practices to reflect this new reality? As we bear witness to the increasingly evident human-caused planetary crises spurred on by techno-industrial civilization, is it enough to simply alter the way we assess and plan for the long-term health and vitality of ecosystems from which we harvest wild plants, or might we simultaneously practice wildcrafting as a way of transforming the fundamental ways we conceive of and interact with wild nature and the community of all life? And how might adopting regenerative harvesting practices help us perceive the world in ways that will allow us to more deeply connect and intimately engage with local and bioregional ecological intelligence?

Answering questions such as these not only requires assessments of physical ecological processes but demands that we restore cultural frameworks that allow

us to access the inherent ecological knowledge that has guided and continues to guide traditional cultures all across the globe. By consciously developing relationships with the living world we can be present to the Earth community in more mutually enlivening ways that increase our understanding of already existing processes of ecosystem regeneration. We may even come to rethink, as we follow these lines of inquiry, the notion of working *with* plants and ecological communities—which is certainly more appropriate than taking *from* them—and consider that our actions if they are to be truly regenerative require us to work as integral parts of the ecosystems within which we live, work, die, and receive sustenance.

Physical Ecological Processes of our Warming World

Even without factoring the effects of climate breakdown our task is challenging. As I've written elsewhere, “We should look at the effects of our harvesting with a long-term vision, but with humans' current state of disconnect from the land and the loss of traditional knowledge, we don't have much to go on in terms of longer harvesting cycles.”^{iv} Declining populations of insect pollinators, increased browsing by deer and elk due to human eradication of keystone predators, and the rampant use of toxic insecticides and herbicides among others are all worthy of investigation as we

assess the many human-caused factors impacting wild plant populations, but in this article we will focus on the most apparent and critical ones relating to the continued thriving of plant communities in the Pacific Northwest bioregion and the state of Oregon where I live: drought and abnormal seasonal fluctuations. 2015 was a year of unprecedented heat and lack of precipitation, and according to the Fourth National Climate Assessment, its “extreme weather events...coupled with the impacts of a multiyear drought, provide an enlightening glimpse into what may be more commonplace under a warmer future climate.” The National Weather Service's bureau in Portland recently released a bulletin stating that in 2018 “above-average temperatures and near to below-average water year precipitation result[ing] in a below-average winter snowpack” has led to drought conditions throughout Oregon. Higher than normal late spring and early summer temperatures which quickened soil dehydration and greatly reduced streamflow exacerbated these conditions, and the persistence of



Nuphar Lake in southeastern Oregon, 2018

hot weather through the early fall made it even worse.^v Climate scientists write that “there is *high confidence* that climate change and extreme events [in the Pacific Northwest] have already endangered the well-being of a wide range of wildlife, fish, and plants.”^{vi} With much of the central and southern parts of Oregon, about 25 percent, already in a state of extreme drought, conditions will only get worse as the state is set to, at the very least, experience continuing drought through 2019.^{vii} Having witnessed these conditions in the field I do not harvest from communities of “plants like sharp-tooth angelica or western peony [who] choose to conserve energy by not ripening their seeds” during years of drought-stress. For “others like yerba santa [who] produce bountiful seed crops” under drought conditions, I harvest only after the seeds have ripened and can be dispersed.^{viii} I recommend that others do the same and over time investigate the ways that different plant species respond to drought and act accordingly.

We also ought to pay careful attention to the ways that abnormal seasonal fluctuations affect the growth rate and reproductive capacity of plants. The reactions of each species will differ based on complex relationships among many environmental factors and within specific geographical contexts: some will begin vegetative growth earlier and some later. Early growth is more susceptible to frost damage, and delayed initiation of budburst may diminish rates

of spring growth by preventing access to adequate moisture and temperatures favorable for growth. We also ought to examine the effects of plants flowering earlier or later than normal during the growing season. Early exposure to frost may injure or destroy early-blooming flowers; late-blooming flowers may not have adequate time to ripen fruit; and plants with distinct male and female flowers might flower at different times.^{ix}

Integral Ecologies for an Interconnected View of the World

With the uncertainty about how quickly rates of warming will progress and the unpredictability of climate chaos inhibiting our ability to plan long-range, how may we best approach these crises? We might consider, as many now are, questioning the philosophical foundations of Western culture. Even as we alter our practices according to standard ethical and ecological principles perhaps we ought to look at our practices from the more inclusive

lens of integral ecology^x and use our responses to these crises as opportunities to transform the way we inter-act with and engage the world. Modernist ways of being stand in stark contrast with indigenous modes of relationship with the land such as those practiced by the First Nations peoples of the Pacific Northwest. Like many other indigenous, animistically oriented peoples around the world, the Kwakwaka'wakw people, also known as the Kwakiutl, of what is now called Vancouver Island have practiced and continue to practice sophisticated forms of intentional food and plant medicine cultivation techniques whose primary ethic is reflected in the Kwak'wala word q'waq'wala7owkw, which when translated into English means “keeping it living.”^{xi} This way of being is more than a harvesting technique. It is a way of life that, like other traditional animistic cultural orientations, recognizes and respects the mutual interdependence which makes the maintenance and flourishing of life possible. For animistic cultures, plants, animals, and different human groups as well as rivers, mountains, and other ecosystemic components are



Yellow pond lily (*Nuphar lutea*)

kin. We in the West have much to learn from this way of thinking and being. But while we may be inspired by the Kwakwaka'wakw concept of “keeping it living,” each cultural milieu calls for different modes of relation that must apply specifically to and be aligned with each place and the beings who live there.^{xii}

Rather than just taking from this plant or stand of plants and making medicine to use for

this or that illness, bodily imbalance, or disease process, what if we view our interactions in a more integrated manner? We might choose to view the unfolding climatological crises as messages or feedback loops of the greater Earth system that our health is intimately entwined with the health of our ecosystems and the other beings with whom we cohabit. While there may be an impulse to set aside the wild to protect it, we mustn't retreat into false forms of separation in attempts to conserve nature. We must learn to be present to the natural world without imposing our will upon it. Instead it seems that we are being called to actively and intimately engage with the entire community of life on Earth.

Expanding our field of awareness beyond the mind and empathetically engaging with energies, intelligences, and ideas that exist as part of the greater field of life we might ask questions like: What are the implications of my actions within the context of my greater ecological

self? How can I/we become beneficial presences within and as the community of life? How can I/we be better inhabitants of the Earth? Even as we respect rational modes of inquiry and acknowledge the contributions of modern, materialist science, we need not discount spiritual inquiry or other approaches to being present to conceptual worlds other than the modern human ones to which we are habituated. Along with love, bodily feeling and other forms of energetic perception ought to be considered tools of equal value in the exploration of knowledge and the gathering of data. Instead of looking at nature as a conceptual space separate from humans, as do the majority of people in the dominant techno-industrial societies, as the provider of resources to be extracted for human benefit, we can view wild plants, and all beings, through an animistic lens and respect their inherent right to thrive as we recognize that our own survival as a species is inextricably bound and dependent on the vast web of interconnections that comprise life here on Earth.

As a civilization we have backed ourselves (and the rest of the Earth community) into a corner. We now have no choice but to act with integrity. There is no longer an “away” to which we can run in search of virgin lands and untouched plant communities. The way we in the industrial growth societies have treated and continue to treat the Earth’s ecosystems has disrupted the processes upon which all life on this planet depends, but with the danger we face comes increased opportunity. I invite you to engage wildcrafting as more than just a practice of ethical harvesting. Open yourself to ecological intelligence as you deepen your understanding that everything we do must be aligned with the greater fate of our planetary existence. Our lives, the lives of the plants, and the lives of every other being literally depend on it. ■



Yellow pond lily (*Nuphar lutea*)

desolation.” Albrecht, an Australian environmental philosopher, coined this neologism which is derived from the words “solace” and the Greek word “*algia* mean[ing] pain, suffering or sickness.”

ⁱⁱⁱ Erle Ellis, “Anthropocene,” *The Encyclopedia of Earth*, accessed January 3, 2019, <http://editors.eol.org/eoearth/wiki/Anthropocene>. “The Anthropocene defines Earth’s most recent geologic time period (Anthropocene) as being human-influenced, or anthropogenic, based on overwhelming global evidence that atmospheric, geologic, hydrologic, biospheric and other earth system processes are now altered by humans. The word combines the root “anthropo”, meaning “human” with the root “-cene”, the standard suffix for “epoch” in geologic time. The Anthropocene is distinguished as a new period either after or within the Holocene, the current epoch, which began approximately 10,000 years ago (about 8000 BC) with the end of the last glacial period.”

^{iv} Scott Kloos, *Pacific Northwest Medicinal Plants: Identify, Harvest, and Use 120 Wild Herbs for Health and Wellness* (Portland, OR: Timber Press, 2017), 43.

^v “Update on Drought Conditions and Impacts as of February 6th, 2019,” National Weather Service Portland, OR, accessed February 8th, 2019. <https://www.weather.gov/media/pqr/WaterSupplyOutlook.pdf>.

^{vi} C. May, C. Luce, et al., “Northwest,” in *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II*, eds. D.R. Reidmiller, et al. (Washington, DC: U.S. Global Change Research Program, 2018), 1073, <https://nca2018.globalchange.gov/chapter/northwest>.

^{vii} National Weather Service Portland, OR, “Update on Drought Conditions and Impacts as of February 6th, 2019.”

^{viii} Kloos, *Pacific Northwest Medicinal Plants*, 40.

^{ix} Constance A. Harrington, Kevin R. Ford, and J. Bradley St. Clair, “Phenology of Pacific Northwest Tree Species,” *Tree Planters’ Notes*. vol. 59, no. 2 (2016): 80–84.

^x Sam Mickey, Sean Kelly, and Adam Robbert, eds., *The Variety of Integral Ecologies: Nature, Culture, and Knowledge in the Planetary Era* (Albany : State University of New York Press, 2017 Kindle), 1–2. “Ecology is typically defined as the study of relationships between organisms and their environments. Although this definition

is correct, it does not tell the whole story. More specifically, it does not account for what can be described as integral ecologies—a variety of emerging approaches to ecology that cross disciplinary boundaries in efforts to deeply understand and creatively respond to the complex matters, meanings, and mysteries of relationships that constitute the whole of the Earth community.” And “learning about integral ecologies is important not solely because it is required for a comprehensive understanding of ecological fields of study. It is also important because of the commitment of integral ecologies to respond to the critical urgency and gravity of current ecological, or more generally, planetary, problems. Humans and the entire Earth community are facing an unprecedented situation that involves many interconnected crises affecting the natural environment, social institutions, and human consciousness, crises such as freshwater scarcity, the mass extinction of species, global climate change, ocean acidification, economic instability, poverty, sexism, racism, alienation, despair, and fragmented knowledge.”

^{xi} Douglas E. Deur and Nancy Turner, eds., *Keeping it Living: Traditions of Plant Use and Cultivation on the Northwest Coast of North America*. (Seattle: University of Washington Press, 2011), 31–32.

^{xii} Of course within this study it is necessary to also recognize, honor, and include the voices of Indigenous Peoples, some of whom may be inspiring our remembrance of interconnected ways of being and thinking.

ENDNOTES

ⁱ Embodying the energetic posture of Aspen as with all other of our plant kin reveals and accentuates hidden aspects of our own potential for energetic orientation as humans so that when, for example, we connect with the archetypal and ancient root mass of Aspen we become conscious of our own capacity to feel Aspen’s temporal and ecological depths. This experience then connects us to the source of all life, allows us to access the deep underground waters of our emotions, and grounds the sometimes overstimulating experience of sensitive interconnectivity.

ⁱⁱ Glenn Albrecht, “‘Solastalgia’: a new concept in health and identity,” *PAN: Philosophy Activism Nature*. no. 3 (2005): 48. Solastalgia “is the pain experienced when there is recognition that the place where one resides and that one loves is under immediate assault (physical



Wild Remedies Ideals

- **Awareness:** Form a deep connection to the natural world around you by practicing presence, wonder, and gratitude.
- **Interdependence:** Recognize interdependence among all beings.
- **Reciprocity:** Grow your reciprocal relationships with plants.
- **Caretaking:** Develop practices for self-care and care of the earth.
- **Seasonal Living:** Engage your senses and live in harmony with the seasons.
- **Empowerment:** Gain confidence to make your own nourishing foods and herbal remedies.
- **Community:** Cultivate community, listen to and learn from others, and work together to build a healthier world.

"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



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 Pharmacy Garden: United States

Hosagunda: India

Jardin Botanico Medicinal de los Llanos: Colombia

Sacred Seeds at Reserva Natural La Pedregosa: 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

Hidden Garden Ethnobotanical Sanctuary, Costa Rica

Ocean Forest Ethnobotanical Garden, Costa Rica

SACRED SEEDS AT FINCA LUNA NUEVA LODGE

by Tom Newmark



Ethnobotanists Rafael Ocampo and Luis Poveda in the Sacred Seeds Sanctuary

I'm convinced the place is a magnet, attracting us to it. What other explanation can there be?

Consider this: about ten years ago, Olivia Ames Hoblitzelle, a respected therapist, teacher, and author, visited Finca Luna Nueva. My wife Terry and I met her at breakfast one morning and we asked her why she decided to visit our ecolodge. That's a question we delight in asking our guests, as our lodge, while beautiful, is not exactly the Four Seasons: we don't have TV sets, we're in the mountainous rainforest, we're removed from the hurly-burly of tourist centers, and we're dedicated to rainforest conservation, birding, and regenerative agriculture. Olivia explained that her grandfather was a botanist who studied orchids, and unlike most botanists had the resources to travel every summer down to Costa Rica and other neotropical sites to deepen his knowledge of his beloved orchids. Hmm... A botanist specializing in orchids with enough money to take his family traveling every summer. "Where," I asked Olivia, "was your grandfather teaching?" "In Cambridge, Mass.," she answered, and the mystery was becoming clearer. "What was your maiden name?" "Ames."

So here she was, a descendent of the great Harvard botanist Oakes Ames, sitting with me about twenty-five meters from the Sacred Seeds Sanctuary in a remote location on the Caribbean slope of Costa Rica, out in the rainforest. And Oakes Ames, you may recall, taught Dr. Richard Evans Schultes, who in turn taught Dr. Michael Balick, who in 2006 began working with the ethnobotanist Rafael ("Rafa") Ocampo to create the Sacred Seeds Sanctuary at our farm. And so I told her "turn around, Olivia, and behold this sanctuary, an expression of your grandfather's legacy."

Many of the above names are certainly familiar to you, but this article may be your first introduction to Rafa. He is deeply respected in the Latin American ethnobotanical community, and it's no surprise that when Dr. James A. ("Jim") Duke came to Costa Rica about thirty years ago to work on what would become the Tico Ethnobotanical Dictionary, he turned to Rafa as his guide into indigenous knowledge and region.

In many ways, the *Tico Ethnobotanical Dictionary* is an expression of the combined scholarship of Rafa and Jim, and it was thus a great delight to welcome Jim to Finca Luna Nueva where he reunited with Rafa and collaborated with him, Mike Balick, Steven Farrell, Ruth Goldstein, and others in creating Semillas Sagradas, our Sacred Seeds Sanctuary.

Some years later, Mike and Rafa created an introduction to the mission and design of the Sacred Seeds Sanctuary in their book *Plants of Semillas Sagradas*, which is available as a free download at www.fincalunanuevalodge.com.



Rafael Ocampo In the medicinal herb gardens at Finca Luna Nueva

Rafa's "seminal" role in creating Sacred Seeds is a story worth retelling. For many decades he had explored Central America collecting specimens of plants deemed sacred or medicinal by indigenous communities. About fifteen years ago he came to Steven Farrell, the founder of Finca Luna Nueva, with an idea. Could we, Rafa asked, create a living sanctuary for his plant collection? Not a frozen seed bank but a living laboratory where he could plant these specimens in appropriate conditions (sun, shade, swamp, understory, with sister species, etc.) and we could learn how to keep these plants alive during this period of climate chaos. Such a place would also be, in Rafa's mind, a place where indigenous communities might come to share their knowledge, where people throughout Costa Rica could come for seeds or to take cuttings, and where students from around the world could learn about ethnobotany. We at Finca Luna Nueva leapt at this opportunity.

There was an old ginger field that had been resting for a few years, and Rafa walked that field to take an inventory of the medicinal herbs that had sprung up from the seed



Jim Duke in Sacred Seeds, where he often carried his *Tico Ethnobotanical Dictionary*



Jim Duke in the Sacred Seeds Sanctuary with (from left) Ruth Goldstein, Rafael Ocampo, Robert Newman, and Michael Balick



Rafa Ocampo and Steven Farrell “biologizing” in Sacred Seeds



Dr. Jenn Dazey of Bastyr University teaching herbal medicine in the Sacred Seeds classroom



Jim and Mike in Semillas Sagradas

bank during that period of fallow. He found about sixty medicinal plants growing there, not because any humans had planted them but because their seeds were there (perhaps disseminated by wildlife) and just needed a little undisturbed time to reassert themselves in that rich organic soil. That old ginger field became the Sacred Seeds Sanctuary, and we are proud to declare that all of Rafa’s founding hopes have been realized. Teachers, guides, and students visit our sanctuary almost daily to explore neotropical ethnobotany, and working with Rafa we now have more than three hundred species of plants of medicinal and spiritual significance. It is, according to Michael Balick, one of the premier medicinal herb gardens in the world, and we are committed to supporting this living laboratory. We are also proud to be working with Dr. Susan Leopold and United Plant Savers on the worldwide Sacred Seeds Program.

The Sacred Seeds Sanctuary is a continuing tribute to the legacies of Oakes Ames, Richard Evans Schultes, and Jim Duke and to the ongoing work of our beloved friends Mike Balick and Rafa Ocampo. It is what our land asked us to do when those sixty medicinal plants emerged on their own in our old ginger field and reminded us of what once was and what deserved to live on. And Sacred Seeds also answers the challenge voiced by the great biologist E. O. Wilson, when he explained that we are in the midst of cataclysmic biodiversity collapse. It is, he said, our spiritual obligation to shepherd as many species as possible through the bottleneck of extinction.

Please come visit this “bottleneck garden,” this place on Earth where we come together to care for these Sacred Seeds while there is, hopefully, still time. ■

Tom Newmark is a founder of Semillas Sagradas (Sacred Seeds) and a co-owner of Finca Luna Nueva in Costa Rica.



Bastyr students Lauren Flanagan, Elayne Eden (Herbal Sciences '19) and Connor Kirchoff plant native foods such as thimbleberry (*Rubus parviflorus*), evergreen huckleberry (*Vaccinium ovatum*) and red huckleberry (*Vaccinium parvifolium*) in a Sacred Seeds forest restoration site.



Elise Krohn and Mariana Harvey of Tend, Gather & Grow lead Bastyr staff and volunteer teachers in a two-day curriculum training on the Sacred Seeds Trail.

THE SACRED SEEDS ETHNOBOTANICAL TRAIL AT BASTYR UNIVERSITY: LESSONS LEARNED IN DECOLONIZING AN ESTABLISHED NATIVE PLANT GARDEN

Kenmore, Washington

Sanctuary Steward: Katie Vincent

At Bastyr University we teach integrative medicine—where the best of western medicine and natural healing modalities come together to create an approach to health and wellness that is more holistic and representative of the complex, collaborative ecosystems we are a part of. The gardens at Bastyr are an integral part of the curriculum, acting as living classrooms for students to meet their medicine and grow lifelong relationships while growing their sense of belonging to the Earth.

Bastyr's Sacred Seeds Ethnobotanical Trail, installed in 2011, is one of the first few Sacred Seeds Sanctuaries beyond Costa Rica—and the only on the West Coast. Tom Newmark, co-founder of the network, approached Bastyr directly in 2010 and asked the school to become a Sacred Seeds site representing the plants of the Pacific Northwest. The ¾-mile-long Trail preserves and educates about over 100 native plants from three Salish Sea bioregions: camas prairie, lowland forest, and wetlands/bog.

For its first six years, the team focused primarily on installation and restoration—though the capacity of the garden staff proportionally to the Trail's size meant that tending the land took priority, and cultivating relationship with indigenous and other local communities around native plant medicines took a backseat. With the installation of a teaching greenhouse in 2017, the Botanical Medicine department realized this was a problem and reprioritized growing educational opportunities and community connections around the Trail, resulting in a shift in our oversight strategy around the Sacred Seeds project.

One of the primary opportunities emerging from this reframe has been the chance to set precedence for how, as a historically settler-led institution, we might be able to step back and respectfully collaborate with local Tribal Nations in the realms of preserving biodiversity and cultural plant knowledge from a place of authenticity. That is, as an institution teaching aspects of plant medicine traditions from around the globe, we wanted to step back and create space for a whole new approach to stewarding the Trail that more deeply centers the voices and perspectives of Coast Salish indigenous folks. As a University offering courses that focus on medicine from the lands our Kenmore campus sits upon (i.e. ethnobotany and wildcrafting), we are grateful for the opportunity to more deeply and publicly collaborate with Tribal Nations in realms of indigenous land stewardship practices, medicine traditions, plant propagation, and environmental activism as means of growing trust and connection with the First People of this land and of demonstrating humility to our students.

As nonindigenous gardeners, it is an ever-humbling process to grow these connections and re-envision the original Sacred Seeds Trail project with a newer lens as we widen and deepen the quality of community involvement and educational possibilities around the Trail. It is our hope that sharing about our process inspires other Sacred Seeds gardens and UpS Sanctuaries to consider the same.

Our Process:

In 2017, Bastyr's Botanical Medicine department drafted a strategy to build community and educational opportunities around the Sacred Seeds Ethnobotanical Trail using a six-fold method:

1. Create an **Advisory Committee** of regional Tribal members to consult on educational materials, signage, and more.
2. Create more culturally representative **plant signage** and accessible educational information.
3. Purchase and train our staff on a **K-12 curriculum to adapt for field trips** that is rooted in indigenous sovereignty.
4. **Minimize barriers for K-12 Tribal and Title I schools** to access field trips at our Trail.
5. Hire an **Educational Intern** to coordinate, design, and organize K-12 field trips.
6. Increase ecological health and educational benefit of the Trail with **planting new Pacific Northwest native plant species and continuing restoration practices.**

Over the course of the last year—thanks to generous grant funding—the garden team has made significant progress in each of these categories.

In February 2019, the garden team recruited three Committee members from local Tribal Nations to be a part of the Trail's Advisory Committee—all compensated for their time on the project (\$25/hr). So far, the Committee has advised on and supported all aspects of the project, including plant selection, signage, restoration

methods, cultural knowledge, and more.

Under the Advisory Committee's guidance, the Trail is focusing on effective signage instead of other educational materials such as digital flyers, plant profiles, or monographs. As it is our priority to support Coast Salish folks in preserving and regenerating the Lushootseed/Twulshootseed language, we have been taking their lead on how to design respectful signage that

is most effective and fitting to their knowledge-sharing traditions. At the moment, this looks like exploring partnership with local indigenous non-profit Na'ah Illahee Fund to collaborate on interactive signage that makes it possible for visitors to listen to the names of the plants being spoken in Lushootseed/Twulshootseed and to hear selected plant stories shared by elders.

In crafting our educational opportunities for K-12 visitors, we opted to purchase the 'Tend, Gather & Grow' curriculum from Olympia-based non-profit GRuB to use as foundational material for our youth Sacred Seeds field trips. The included lessons and monographs were designed by a mixed team of indigenous and non-indigenous plant educators with the intent to revitalize wild edible and medicinal plant knowledge for Native and regional communities. With the help of a dedicated Sacred Seeds intern, we are actively adapting the curriculum to cater to individual school groups and to the seasonality of plants on the Trail. In an effort to address access barriers, we have grant funds to cover transportation and other

field trip costs of Tribal and Title I schools to come to our Sacred Seeds Trail. So far, we have reached over 250 K-12 students in 2019.

Lastly, it wouldn't be a Sacred Seeds Trail without extensive time spent restoring and tending our ecosystem! Since August 2018, we have planted over 300 native plants along the Trail through eight community work parties and with the weekday support of work study students and volunteers. Work activities generally include tasks such as removing invasive species,



Bastyr student Lauren Flanagan (Herbal Sciences '19) and Assistant Gardener MistyDawn Forester carefully remove invasive grasses from native Camas plantings in the Sacred Seeds meadow bioregion, clearing space for restoration plantings.



Students from Chief Kitsap Academy (Suquamish) share highlights from their Sacred Seeds forest lessons while wrapping up a field trip in Bastyr's Teaching Greenhouse.

identifying diseases of forest plants, and implementing new strategic plantings. All of our restoration practices center on the Cultural Ecosystems principles featured in the 'Tend' curriculum, all of which return to healthy, conscious human stewardship of the land that also honors the medicinal value of invasive/introduced plants.

Lessons Learned and Looking Forward

As we are only about three years into the decision to shift our priorities around the Sacred Seeds Trail, there has been plenty of room for missteps and growth on Bastyr's part. We are hopeful that sharing some of these lessons will help other historically settler-led gardens and sanctuaries learn from our mistakes as they lean into deeper relationship with the indigenous peoples of their own land.

From our Advisory Committee, we are continually learning that relationship and trust-building takes time, mutuality, and commitment. It isn't for us to assume that any Tribal community will agree to partner or collaborate unless we are willing to genuinely step up, listen, and support them. Over and over we get the feedback to slow down and learn more about the history of the land the Sacred Seeds Trail is on, as well as the stories of its First People. We are also learning that it is helpful to consider accessibility and ability needs when crafting Advisory Committee meetings, as many elders don't have easy access to technology like video chats, and vision/hearing can be a challenge for email access as well.

In terms of signage, we are learning that it is more important to our local indigenous community that the Lushootseed/Twulshootseed names for plants be shared with the general public in audible form rather than simply written on signage, as the language is in oral tradition (comprising the sounds of the land) and cannot be conveyed meaningfully through the International Linguistic Alphabet. As such, we are in active discussions with Na'ah Illahee Fund's Native Girls Code program to partner around designing an app that speaks Lushootseed/Twulshootseed plant names and stories aloud to visitors as they walk the Trail scanning QR codes on signs with a smartphone. If you are interested in supporting or learning more about this exciting

collaboration, please contact Bastyr's Garden Supervisor at gardens@bastyr.edu.

Educational opportunities on Sacred Seeds have expanded immensely for us over the last two years, from zero to an average of one field trip every 1-2 months. While feedback suggests these visits have been positive for visitors so far, we are learning the patience it takes to cultivate relationships with K-12 classrooms—especially Tribal and Title I schools—and are continually humbled by the amount of correspondence it takes to establish meaningful connection. In terms of technical support, we have discovered that while Bastyr students are enthusiastic about the Sacred Seeds project and facilitating nature connection for youth on campus, their full school schedules makes it challenging to rely

on students as volunteer teachers. To this end, we are examining ways to build a wider and more resilient crew of field trip teachers by reaching out to the larger community.

To make all this education possible, it has been absolutely essential in terms of staff capacity to have a Sacred Seeds Educational Intern focused on K-12 outreach, field trip scheduling, and curriculum design. We are hopeful to increase our grant funding for the internship in the coming grant cycle so that our intern can have greater capacity to reach out more widely for K-12 classrooms and volunteer teachers—resulting in more Sacred Seeds field trips throughout 2020 and beyond.

Lastly, in the realm of restoration practices, we are growing our methods for tracking daily activities along the Trail digitally so progress can be more effectively measured over time. We are also leaning

into partnerships with the Greater Seattle community to offer more regular community and occasional large-scale work parties—allowing opportunities for more people to grow and deepen relationship with the land and the project. Along the vein of reciprocity, we are tracking ways to collaborate with other universities and indigenous organizations for research around best practices for ecological health and land stewardship practices in this time of great climate instability—ideally focused on the Cultural Ecosystems principles we teach in our field trip curriculum.

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Bastyr student Rachel Collins assists with planting coastal mugwort (*Artemisia suksdorfii*), Puget Sound gumweed (*Grindelia integrifolia*) and showy fleabane (*Erigeron speciosus*) in the Sacred Seeds meadow bioregion.

One of the primary philosophies of the 'Tend, Gather & Grow' curriculum is the unquestionable importance in these challenging times that all people feel at home in the ecosystem around them. From indigenous to settler-descendent folks, the 'Tend' team believes that coming home to place is coming home to ourselves and is a direct cure for the root cause of our world's problems, including disconnection from our belonging to the land. Of course, there are many complexities inherent in this conversation regarding the violence and trauma of the Native American experience and other impacts of systemic oppression, but they believe all people need to have a connection of some kind to the Earth to begin to care and create a different relationship going forward. A core tenet in Naturopathic Medicine is treating the root cause of the disease rather than simply the symptom. If we are going to address symptoms of climate change and the loss of biodiversity and cultural knowledge affecting our medicinal plants, we need to look at this deeper root cause of disremembering our belonging to the earth. And what a gift it is to be a part of an international network of Sacred Seeds gardens doing just that, one visitor at a time. ■

Bastyr Sacred Seeds Ethnobotanical Trail Donors:

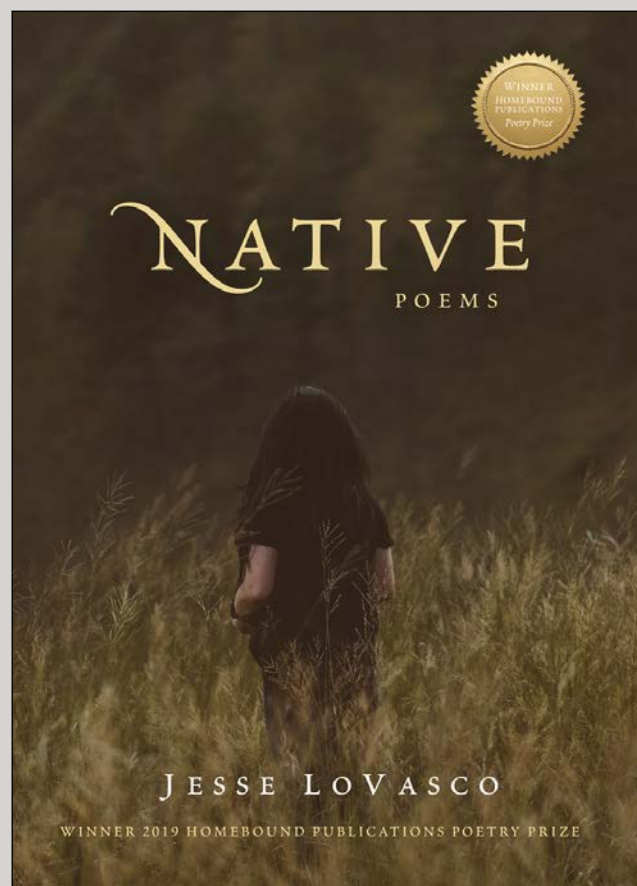
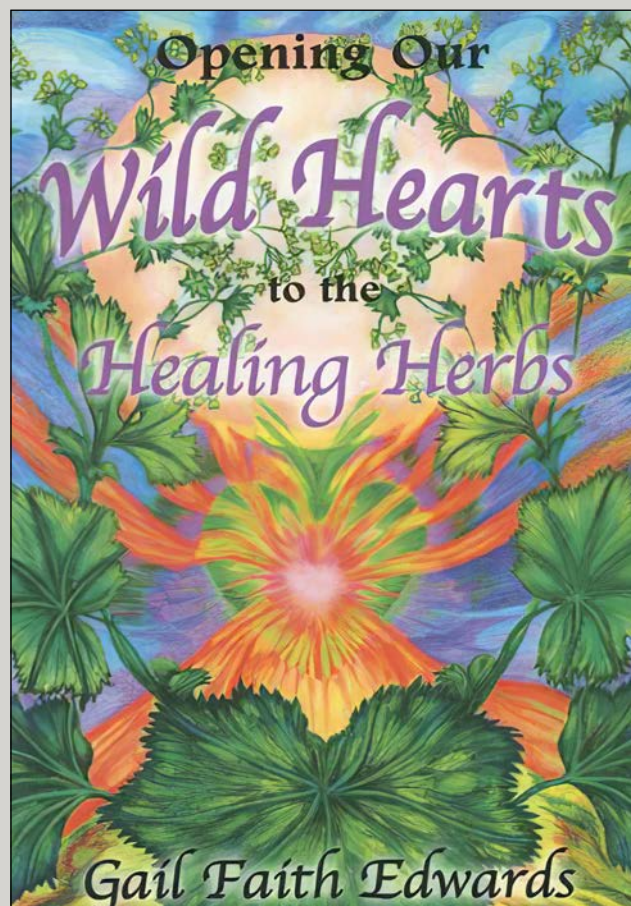
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- Agnes Cash
- The Starflower Foundation
- Washington Native Plant Society's Central Puget Sound chapter

Katie Vincent is the Botanical Garden Supervisor at Bastyr University.



Salal grows (*Gaultheria shallon*) abundantly in the Sacred Seeds forest—a delicious and energizing snack when dried into fruit leather!

More Books by Members:





TAKE A JOURNEY THROUGH THE SENSES OF YOUR ELEMENTS AT OCEAN FOREST'S ETHNO-BOTANICAL AND PERMACULTURE GARDENS ON THE OSA PENINSULA IN COSTA RICA

by Jonathon Miller Weisberger

Now reaching into 20 years, the extensive gardens at Ocean Forest Ecolodge harbor hundreds of species of native and rare ethnobotanical treasures from Central and South America as well as the Asian Tropics. These include fruit trees that guests enjoy seasonally, aromatic herbs, medicinal and sacramental plants, detox bitters, emollients, and adaptogens, many of which are served in teas at lunch and dinner or supplied upon request. Our permaculture gardens produce a seasonal abundance of foods—tubers and edible greens, fruits of all types, flavors, and consistencies, natural sweeteners, vegetables, and spices.

Take a Journey Through the Senses of your Elements

Our bodies are innately savvy! That we can perceive and experience the sweet, the spicy, the salty, the sour, and the bitter flavors in foods and plants is amazing! Few realize that these flavors actually correspond to the body's organ systems. Each flavor correlates to one of our five principal organ pairs. Sweet relates to the stomach and the spleen, spicy to the lungs and large intestines, salty to the kidneys and urinary bladder,

sour to the liver and gallbladder, and bitter to the heart and small intestines as well the triple warmer and the pericardium. This wisdom has been passed down along the guidelines of the Five Elements theory, an aspect of traditional Chinese medicine.

An amazing aspect of getting to know plants is that they bring out in us so many aspects of who we are ourselves. Our bodies are vast tools and can perceive very different sensations brought upon by the plants. We not only learn about the fascinating reality of plants but how our bodies are seamlessly parts of the natural world, or how else could we have the sensual perceptions to experience them? Plants expand the awareness of who we are—they allow us an opportunity to get to know deeper aspects of ourselves! We can look at this as discovery, but it is also elevating the common body of knowledge, as Mother Nature deeply aspires for her children to return. Our devotion to upholding and teaching the living science of ethnobotany is a passion we carry deep in our hearts.

As a way into the garden, let us use our senses to learn some plants. Let us follow the five basic elemental groups, in their creative cycle of expression, starting with the Earth element whose color is yellow and flavor sweet. Earth creates the Metal element whose color is white and flavor spicy. Metal in turn creates Water whose color is bluish. Blackish grey, like the color of the water of the North Sea—its flavor is salty. Then Water creates wood, whose color is green and whose flavor is sour. The Wood element in turn creates the Fire element, whose color is red. The flavor representing this element is bitter, and the cycle continues. It is the constructive cycle of the five elements, an integral part of holistic Traditional Chinese Medicine. Alongside these color and flavor categories,



Banisteriopsis caapi



Bitterwood (*Quassia amara*)



Pasu Tree (*Gustavia longifolia*)

let me introduce you to some of our most notable leafy friends swaying in the jungle breeze in our garden.

In the Earth element, most prominent is elegant sugar cane, striped in pinks, greens, and purples—*Saccharum officinarum*, the grass of grasses, held sacred among many indigenous tribes from Polynesia to the Amazon. In my book, *Rainforest Medicine – Preserving Indigenous Science and Biological Diversity in the Upper Amazon*, I share a Kichwa creation story outlining the origin of seven plants, all of which can be met here in our garden.

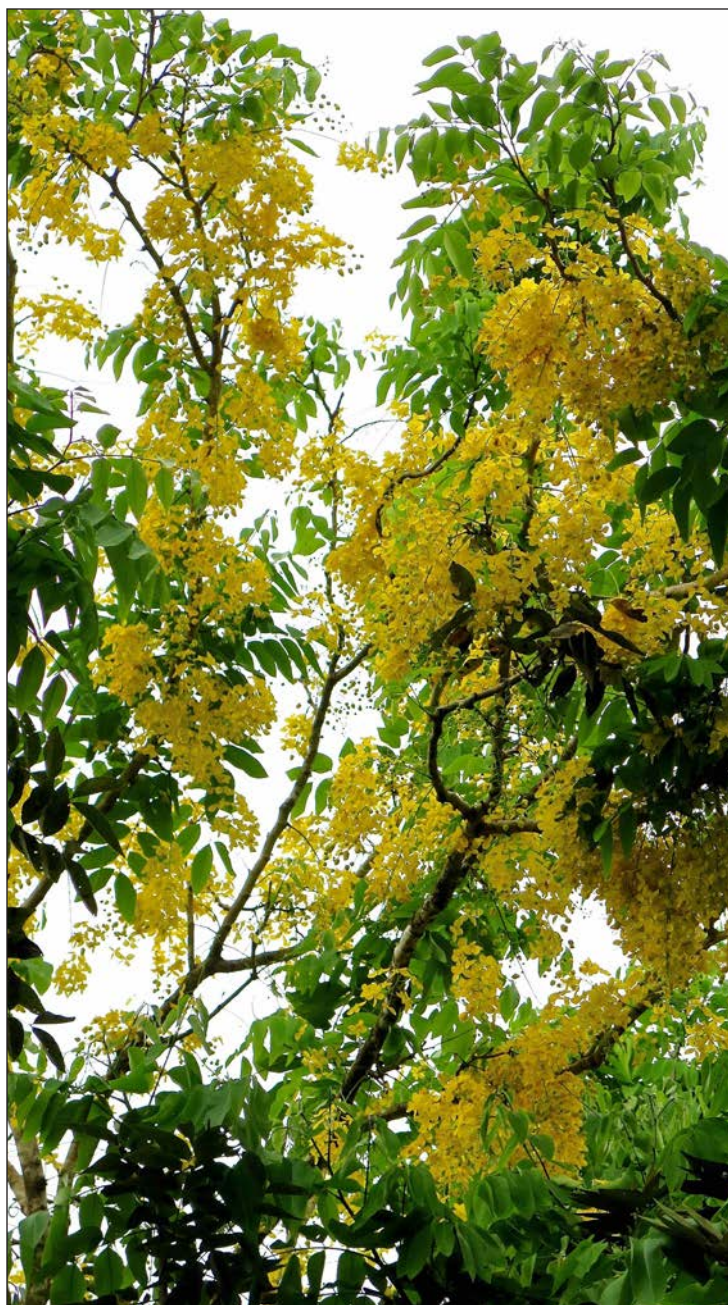
In times of old, Atacapie, the Seven-headed boa-of-disintegration-and-chaos slayed Shiu Amarun, the Glistening-silver-fertility-mother-boa-of-the-Earth. From her decomposing heart grew seven plants to aid humanity in maintaining Heaven on Earth. These include Dunduma, a sedge in the genus *Cyperus* used for ridding anemia; Uchu, this being *Capsicum*, a red-hot chili pepper; Palanda, the date banana, *Musa x acuminata* variety Lady Finger; Ayahuasca, *Banisteriopsis caapi*, the sacramental entheogen; Chalipanga, this being *Diplopterys cabrerana*, the “kindling leaf” that brings “light” to the entheogen; an extra spicy ginger called Pajujinjibri, a small rhizome ancestral type of *Zingiber officinale*; and Iru, our beloved Sugar Cane. From its stems, sweet juice pours when macerated and is believed the world over to bring Heaven to Earth. Amazing to think that from this cane not just sugar, but also ethanol is produced—now that is a potent plant indeed! And there are many varieties, too, like Caña mula, a dark purple cane excellent for animal feed and for making molasses.

Other sweet Earthen goodness mamas that exist in the garden are, of course, varieties of Mangos, *Mangifera indica* of the Anacardiaceae family, this being the family of Cashews as well as the Poisonous Ivy that I actually call Pretty-oak; that’s a whole other story. Among my most favorite is the classic Mango-criollo, this being the native or wild mango. Its round fruit is not the best for eating given the hairy fibers, and it doesn’t look all that fancy given the black splotches on its peel, but when made into juice, my, my—the richness of its flavor surpasses that of any other mango. Another variety, with a citrus tangy tinge, is the rare Mango-papa, the smallest of all mangos, that in juice is just as good. These mango varieties are highly medicinal as well. The young red leaf shoots are simmered in milk for lung ailments, in particular chest cough, and the bark heals sprains and bruises. Also, when speaking of mangos, with highest honor I am obliged to mention the all-time-classic Mango-zapata, which has a larger oblong fruit that when ripe actually stays green, thus going unseen by ravishing monkeys! Inside she is richly golden in color and variety, has somewhat of a tangy relish, and is mango at its purest and most fabulously finest! I might add a new addition to the garden, the Dika mango, *Irvingia gabonensis*, from Africa and a source of a highly nutritious and oily nut, the ogbono nut. And there’s Yuplon, *Sponias dulcis*, another sweet yellow fruit. And let us not pass Earth element without mentioning our cherished and adored Cacao, *Theobroma cacao*, food of the gods, of which we have many varieties and

wild relatives growing such as Cupusassú, *Theobroma grandiflorum*, and Pataxte, *Theobroma bicolor*, all classified as pertaining to the Malvaceae family. When looking at plants with yellow flowers, a most prominent species is *Cassia fistula* of the Fabaceae, the bean family. At the beginning of the dry season these trees are covered in golden yellow flowers, which is why they are also known as golden shower. The bark is a powerful purge used only by skilled herbalist.

Let us follow the constructive cycle of the five-element theory. Sweet and the color yellow that is the Earth element makes the Metal element, whose color is white and flavor spicy. Here, of course, first and foremost are the numerous varieties of chili peppers, pertaining to the genus *Capsicum* of the mysterious Nightshade family, the Solanaceae. We have many types growing. A particularly impressive variety is the one called Panameño, which has a curled rounded green to orange to red fruit. It is spicy—just enough and loaded with an aromatic, richly complex flavor. Few people associate garlic with the tropics, but indeed, we have here our own version. It is the Garlic Vine, *Mansoa alliacea*, a most peculiar vine pertaining to Bignoniaceae that is the family of the infamous Pau d'arco, known locally as Roble Savana, *Tabebuia rosea*, with highly medicinal bark used as an adaptogen. The garlic vines' lushly abundant purple flowers reveal themselves only every three years, emitting a pungently-sweet and velvety-deep aroma. The balm drifts thickly through the air and reaches all regions of the campus. The bark of this vine is rasped in water to emit a juice with a flavor pretty much spot on like garlic! And the leaves are used for steaming fish, filling the meal with its rich garlic flavor. This vine also has many medicinal uses. Similar to garlic, it is antibacterial and antiviral. In the Amazon, the deep forest Waorani call her Wigagen and believe when it is grown around the house, it wards off snakes and jaguars. When menacing creatures come near, it makes their teeth tingle unpleasantly, which annoys them, and they retreat. More commonly known as Ajo Sacha, the vine is used for dieting, to learn to heal, and its spirit is believed to be that of two brilliantly green parakeets. Another plant characteristic of the color white is Yuca, *Manihot esculenta* of the Euphorbiaceae. Her starchy white roots are a staple of the people and are what *aun* is made from, the Secoya flatbread and farina, a type of yuca granola, consumed throughout the Amazon.

The Metal element creates the Water Element, associated to the color black, and the flavor is salty. Possibly what most represents the salty flavor even though it's not really that salty, despite growing in salty ocean side sand, is the all-time Coconut palm, *Cocos nucifera*, a true Arecaceae, and of these we have many types. The Filipitas is a smaller green coconut with the best drinking water, and there is a golden Filipita variety as well. Our native beach Criollos grow very tall, and the oily, meaty kernel is used for extracting coconut oil. Fifty-five Criollo-coconuts peeled at the time of mid tide dropping, and grated and soaked the next day, also at the time of mid tide dropping, makes one gallon of oil. We keep this regularly on hand! Another interesting variety is the Chocuano. This large and robust Coconut



Golden Shower (*Cassia fistula*)



Toucan

palm has immense round nuts. They are used in folk medicine made into syrup to treat bronchitis and as an extract for ridding all types of parasites. The husk of all Coconut varieties is drunk in tea to aid the prostrate and prevent inflammation. The Coconut indeed is a sacred plant. Polynesian folk myth relates a time of drought and famine when, Creator sank into the earth, and from his crown grew the Coconut palm to quench the thirst and hunger of his people—thus the song line, “Palm tree in Jah sun, giving life to everyone.” Another plant that might align to this category is the curious Noni, *Morinda citrifolia* of the ubiquitous Rubiaceae. This fruit is actually white when ripe, but when prepared, by crushing the ripe fruits in a mesh bag and hanging in the sun, a jet-black ink drips out that is drunk, classic of the water element. Noni is revered as a holy medicine and valued as a general tonic. Also from its bark is produced a brownish purple dye.

The Water element creates the Wood element, whose flavor is sour and color is green. In this group we must not overlook the Membrillo, *Averrhoa bilimbi*, a Sour-grass and Star-fruit relative, member of the Oxalidaceae family. The pickle shaped spring-green colored fruits of this treelet are so sour that they are actually used by locals to bleach clothing! And does it keep those shirts white! We always add a few fruits into chili sauce, and they are also employed in the treatment of rheumatism, skin irritations, inflammation, and to control obesity. Another sour plant is Caña agria, “sour cane.” We have two types—a cane in the genus *Costus*, pertaining to the Zingiberaceae, the ginger family and a lanky, cane-like vine that also goes by this same common name. This Caña agria, known in English as Pink fringe and in the Nahuatl language as Xocoyoli, is a Melastome, *Arthrostemma ciliatum*. Sour in flavor, it is used effectively to treat lower back pains, kidney disorders, and as a diuretic.

As the Wood element creates the Fire element, whose flavor is bitter and color red, I am obliged to ask you the following. Have you ever nibbled on a leaf of Gavilana? This bushy herb, *Neuroleana trilobata*, a relative of the Sunflower or Asteraceae family has an extremely bitter juice that is used as a liver tonic, an antiparasitic, a decongestant, and is anti-catarrhal. Most people when they taste this have never experienced something so bitter. Bitters tonify the liver and the heart and promote circulation and decongestion. Now, if Gavilana ain't bitter enough, well then, let's nibble on some Hombre Grande, *Quassia amara*, Bitterwood. It is a native understory woody tree, member of the Simaroubaceae family that is

well known for its outstanding healing virtues. Employed in the treatment of diabetes, malaria, and ulcers, it is anti-leukemic and treats scalp issues and more. Hombre Grande is so bitter that it's hard to fathom a flavor this bitter can actually exist! Two more important bitter plants in this family, both being wild local species, are *Simaruba amara* known locally as Aceituno and *Simaba cedron*, called here Cedrón. Aceituno's bitter bark is used to rid parasites and for dysentery, diarrhea, and to lower malarial fevers. Its bark, interestingly enough, is the preferred breeding ground for the unusual lantern-bug. The large intensely bitter seeds of the Cedrón are used to reduce fever and as a cure for snake bite. Great care needs to be employed when using this remedy since an excessive dose can be fatal.

Of course, when mentioning plants with the color red, there a few that must not be left unmentioned. Along the beach we have the Tropical almond tree, *Terminalia catappa* of the Combretaceae family. This tree is a favorite food of the Scarlet Macaw, a flashy red bird with long red tail feathers. In March, the peak of the dry season, the tree's leaves turn bright red, and then they fall. This signature of the tree has allowed indigenous peoples to determine its use in lowering high blood pressure. The Doctrine of Signatures is a phenomenon that has been around since the old days and was a method of investigation and discovery understood by Dioscorides, Galen, and Paracelsus.

Then for plants with red we have the almighty Achioté, *Bixa orellana* of the Bixaceae family. Achioté, known as Annato, is a remarkably useful woody treelet, known as

Fire Wood, and there are many varieties. Achioté has a bright red furry fruit, but the criollo variety, a variety we are particularly fond of, has a green hairless fruit. Both are capsule-like with abundant small seeds covered in a bright red, oily paste. The tree is highly medicinal and useful. The peeled bark is boiled and drunk to alleviate hemorrhage. A leaf tea is used to stop vomiting. An eyewash from the tea of the young leaves is highly effective for red eye and reducing inflammation. The oil from the seeds heals stomach ulcers and gastritis, the red pigment is used as a ceremonial body paint, and from the dried wood and branches, the Waorani make their fire boards, hence Fire Wood.

I want to leave you with one last tree, of the so many here present, ones we love so very much. They are in their third year of ripening here. A tree symbolic of the rainforest, these are the Pasu trees, *Gustavia longifolia* a Brazil nut relative, in the Lecythidaceae family. Pasu

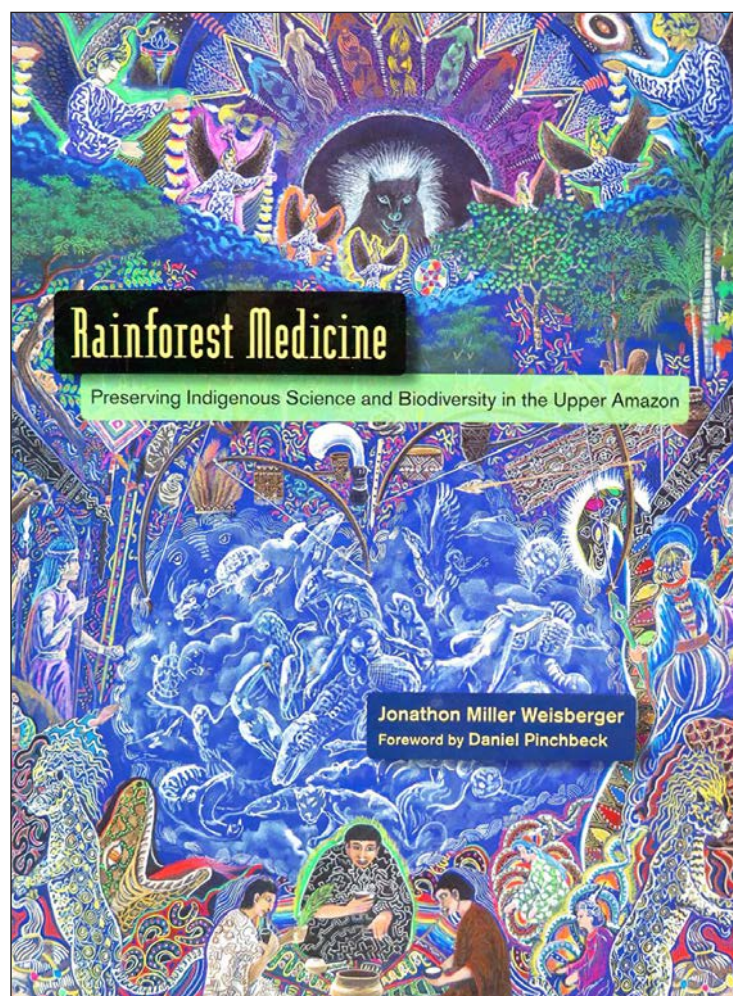


Plantain (*Musa* spp.)

can be described somewhat like the cross between an orange, avocado, and a pumpkin. Native to the Amazon, oily and delicious, it is considered a sacred tree among the deep forest Waorani, who refer to her as Nönginka. Her white, tinged in pink flowers are amazingly large, up to 8 inches in diameter! Voluptuous, velvety rich is their aroma, and they are fragile and literally drop apart in your hands. This tree represents the fragile and precious gift that is the rainforest and biological diversity, and that with care we must love and protect her.

At Ocean Forest Ecolodge, given the size of the property, space is limited. For this reason we have been expanding the garden up the hill a ways, where we have been planting an even larger Permaculture garden. A project called Cocoterra Rainforest Permaculture, we are restoring eight hectares of abandoned pasture land and aiming to create a Permaculture school that can serve as a model to the local villagers and international participants and volunteers—and as a place to connect with nature. To learn more please visit www.rainforestpermaculture.org. You can join us by signing up to our mailing list. Stay posted on upcoming Permaculture workshops and Ethnobotanical immersions. I look forward to meeting you here in the garden and invite you to join us as a guest or volunteer. For more info, also visit <http://www.oceanforest.org/volunteering/> ■

Jonathon Miller Weisberger is an Ethnobotanist and the Steward of Ocean Forest Ecolodge in Costa Rica.



DEEP ECOLOGY ARTIST FELLOWSHIP PROGRAM

This program is available for 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.

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.

2019 - 2020 Deep Ecology Fellows

2019

Julia Van Wagenen, Ohio
Photography / Cyanotypes
juliavanwagenen.com

Colleen Leonardi, Ohio
Writing / Photography
www.colleenleonardi.com

Sara Bir, Ohio
Food Librarian / Chef / Writing
Author, *The Fruit Forager's Companion* and *Tasting Ohio*
www.sausagetarian.com

2020

LeAnn Averall, New York
Photography / Videography / Printmaking

Shay Clanton, Virginia
Watercolor / Oil / Drawing / Design
www.shayherringclanton.net

Sarah Mills, Ohio
Botanical Illustration / Photography
www.sarahsnatureeye.com

Juan Zamora, Spain
Multi-Media Art / Composer / Musician
www.juanzamora.com

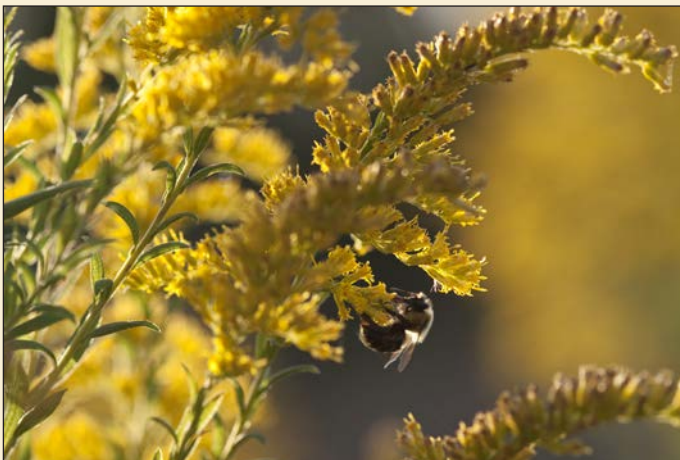
Photos by Julia Van Wagenen
2019 Deep Ecology Art Fellow



Monarch & Aster



Ramps Seeds



Honey Bee & Goldenrod



Blue False Indigo (*Baptisia australis*)

A LANGUAGE FOR GRIEF
Encounters with life and death as a
Deep Ecology artist-in-residence at
United Plant Savers

by Colleen Leonardi

It's a green day in early June with blue sky above and 379 acres of botanical sanctuary below. These Appalachian foothills at the United Plant Savers (UpS) Sanctuary in Rutland, Ohio rise and drop with enough horizons to watch storm and sun coexist. The fortitude that brings me here is some brand of the divine commingling with animal desire, driving me to commune with a pulse stronger than my own—the land a body to be with. My intellect wants to understand the language of plants to speak something other than sorrow. My heart wants to find my father. He slipped out of his body when his heart failed one May morning three weeks ago, and now I wander through my life fatherless. In the spring of my first year on earth my father would take me outside. On the forested hill that was our home, he would settle me in the Vermont clover and let me nibble on the weeds. Any instincts I have for the wild come from him.

UpS is a sanctuary for the wild. As a Deep Ecology artist-in-residence, I've come here to ask the land permission to work with me. Hard to believe that what is most essential and vital about the planet

needs a sanctuary. Yet to walk the land here is to feel what makes nature more than a place. It possesses a beingness, and I have come here to be. Grief breaks you open to the terror of loss and the beauty of love. I have come to crawl on my hands and knees in the clover, swim naked in the Heart Pond, whisper and cry to the moon at night, and listen to the plants speak their language. I want to become creature to feel past my grief and find friends who will not judge me for how deep my emotions run. Surely here in the forest where living and dying are perpetual what is verdant will offer some poetry to uplift my loss.

*Surely, the wild at UpS can cool this madness, I think, as I walk the meadow. I can name this plant, blue false indigo (*Baptisia australis*), I think, as a bumblebee circles the flowers, entering and exiting the violet canals up and down the stalk. I cannot name this one, daisy fleabane (*Erigeron annuus*), a small, plentiful, and hairy flower with light pink petals radiating from a sunny center. Here is *multiflora rose* (*Rosa multiflora*), I marvel, as sunlight washes over the white body of one rose, the sight holding me still, long enough to then notice the redbud (*Cercis canadensis*), which blossomed magenta on my first visit, before my father's death. Now its apple green leaves are spongy with life, the magenta gone.*



Multiflora Rose (*Rosa multiflora*)

I weep into the meadow. Will this land receive my tears? Will they help more flowers to grow? I see the shape of a heart in each leaf of the redbud. Hiking deeper along



Redbud (*Cercis canadensis*)

the ridgeline to the wildflower hill, I look out over the meadow. Dusk settles around us. A big bush of wild olive (*Elaeagnus angustifolia*) rises up along the path. I turn past it to head to the Heart Pond, and a warning shoots through its leaves. As prehistoric as the bush is big, I slowly back away from the animal cry and take the same path down the ridge to the yurt. A wild sound I cannot identify, a small terror now lodged alongside my grief, yet curious, as perhaps there is a creature on the land with me that is more frightening than the pain I bear within. Perhaps on this milky, stormy night we will meet at midnight, and it will be the bigger shadow to my grief. Perhaps I will let it eat me.

A mist envelops me. Up the bend in the hill that leads to the yurt, the black night thickens. I say a little prayer for light.

Looking up at the ceiling of the yurt from my bed below is dizzying, a basket-like weave in the way the beams join together at the central axis of a skylight. The circular structure makes me feel like I'm inside a drum, but when the wind blows at night with all the windows open and rain falling, the drum is at sea.

It's morning. Today, I'll walk the Medicine Trail. The power has returned after a sudden outage last night, and so did a wolf spider (*Lycosa*), her eyes glinting above me as she hides in the elbow of a beam. I let her be for a while, flashing my high-beam headlamp her way.

"Sovereignty," my dad would say in his all-knowing way. "Do you know what that means?"

I would say, "No," and roll my eyes.

"Every being is sovereign. And my sovereignty depends on your sovereignty. You take away my sovereignty by trying to control me, and you're taking away yours."



Black Haw (*Viburnum prunifolium*)

I would agree, a teenager not yet understanding what I was agreeing to.

Yet now, with both the wolf spider and my father above, I am beginning to understand. If I destroy her, then I breach the contract that makes us both us, and perhaps some nimble, spinning, fertile aspect in me, too. If I take her, then I trespass against not just her but the law of sovereignty, a natural law like gravity designed to preserve the wholeness of each and every being, element, and place on the planet. If I kill her, I create a tear in the fabric of this forest, a wound in what, for now, is my home. If I invite her to leave, I maintain the law of sovereignty. So I do, if nothing less than as an offering to my father that I am trying to understand. As big as my hand, she hops like a toad when nudged out of the yurt.

The Medicine Trail is a 5-mile wooded hike through protected hardwood, Southeast Ohio forest, the lip of Appalachia. It's home to goldenseal (*Hydrastis canadensis*), American ginseng (*Panax quinquefolius*), black cohosh (*Actaea racemosa*), blue cohosh (*Caulophyllum thalictroides*), and over 500 native plants of the region. Before European settlers claimed the land, what the Western world now calls the Native American Hopewell culture lived here. From 100 BCE to 500 CE, these First Nations people created a home in union with the forest. Today trees fallen stay, plants propagate on their clock, and insects and animals habituate and rest as instinct dictates. The forest is the wild way a forest should be and one of the few botanical sanctuaries of its kind in the U.S.

Walking the narrow path, web after web breaks over my face, a sign the trail hasn't seen anything the height of humans in a while. UpS narrates some of the plant life for you, so I stop at a small tree to read a laminated information sheet tucked in a wire basket.

The name: black haw (*Viburnum prunifolium*). It is a twiggy, unassuming tree with finely toothed leaves. The base twists up into three branches that diverge towards the taller trees in the canopy. In herbal medicine, plants carry signatures, meaning the way the plant looks, how

it is designed, is an indication of its medicine. Yarrow flower (*Achillea millefolium*), for instance, a multi-faceted floret with tiny buds woven close together, mimics the medicine it provides of knitting wounds back together. Named after the Homeric hero, Achilles, who healed soldiers with it, yarrow is purported to both cleanse and close wounds and stop hemorrhages. Native Americans used yarrow for spider bites. "Historians estimate that 46 different tribes used yarrow for as many as 28 disorders," writes Porter Shimer in *Healing Secrets of the Native Americans*. A language to plant medicine, then, in how it is designed to reveal all it knows.

Standing before the black haw, I wonder what of its signature speaks to me. I learn that the tree bark was used to prevent miscarriages in early folk and European medicine. "A cousin of cramp bark (*Viburnum opulus*), but possesses more depth," writes herbalist Matthew Wood in *The Earthwise Herbal*. Then the passage parts into how the bark was used by slave owners in America for female slaves who attempted abortions with cotton root bark (*Gossypium herbaceum*) while under ownership. Black haw is said to soothe uterine cramping. Slave masters had a vested interest in procreating, refusing to let mothers take their unborn slaves from them, often violating and raping them to produce more offspring.

An 1886 report in the *British Medical Journal* by John Henry Wilson states, "On some of the plantations in America, it is the popular belief a woman cannot abort



Wildflower Hill



Vetch (*Vicia* spp.)

if she be under the influence of black haw, although she may be taking medicine with a criminal intent."

Chills run through me the way ants run up and down the black haw. The history of slavery mixed with the medicine of this plant is overwhelming. A breeze kicks through the forest. The black haw's leaves flutter. My imagination opens. I feel the indescribable wailing of women, strong and vital, giving birth to babies they know will become slaves, women tortured by their wombs as workstation. I hear the cold hack of axe meeting bark as slave owners take medicine from a tree. Medicine doled out and given not as an option but as a prescription.

My own memories of suffering through an abortion bleed through me still. My father was the only one I told about it, a refusal on my part to invite women family members into the crisis so as not to face the motherly state I was forsaking. Now instead of carrying a child I carry grief. "Black haw is an opening medicine," writes herbalist Erika Galentin, "indicated for those who tend to face the world with clenched fists." The signature of its slim, leafy stature offers lightness to open the blood vessels, releasing its patient from resistance.

And it is true. I am a fist of grief, shaking the universe down from its mountaintop for taking my father from me too soon. Our love wasn't perfect. His Sicilian melancholy, dramatic lectures, and addiction to motorcycles and the lifestyle they engendered drove me crazy some days. Still, 64 and gone, and now I stand a woman alone.

My black haw medicine, however, is not for my body, not now. *Can a tree be a victim, too, I think, like I was? Can extraction be forgiven? Can signature be spiritual?* Black haw tells me to story her, to story us.

I walk the wildflower hill again, the one where the prehistoric sound lives. It is dusk. Tiny pom-poms of red clover (*Trifolium pratense*) bounce in the remains of a breeze. Vetch (*Vicia* spp.) leans, full of bumblebees. Butterfly weed (*Asclepias tuberosa*) ablaze in the dying light attracts butterflies and moths. The space in my



Butterfly weed (*Asclepias tuberosa*)

broken heart makes me buoyant, enchanted by the Medicine Trail, the black haw. And then I see her, a fawn (*Odocoileus virginianus*) curled into a circle of stones, camouflaged against the mossy rocks and so still my animal instinct senses death. Yet her ears are pricked and the longer I look at her the more she moves, her belly breath a scant billow among the tall grass. Witnessing what is wild turns one invisible, as if your body must become tree to gain passage to the realm where sleeping fawns lie. Yet a friend once told me deer know when they are being watched. Stand and stare at one, and you will see. Still, I want to know the fawn's mother is near, so I stare and stare and the fawn stares back at me with never a blink. Then I hear the doe, not the gentle crush of hoof meeting mud but that prehistoric, wild olive cry, a warning to stay away from her child. And so I leave.

Birdsong marks the morning. Another wolf spider has come into the yurt. This one is smaller and faster, I suspect a child of the mother spider I encountered yesterday. I spend my morning chasing it back into the woods, all my time with the forest floor beginning to wear on my psyche. I crave light, open spaces, sunshine, so I take myself to the Heart Pond. Despite my walking stick, my body still trembles like a tear dropping, upright only by virtue of its fall from the great eye of some bird or ancestor weeping above me. Perhaps I am my father's tears.

The Heart Pond bears traces of some form of algae on the surface, so I forego swimming and sit on the wooden raft tied to the shoreline. Before leaving, I massaged rose and jojoba oil over my heart, a ritual for what is broken to slowly bring back some original sweetness. Its fragrance fills the air around me. Fish pop in the pond. A single dragonfly darts out past the marshy edge close to me, then back into the trees. He continues like this, back and forth, as if he is trying to tell me some secret, and I refuse to listen. Then a butterfly dances into view and lands on my hand. When I walked up to the Heart Pond several were flitting around the milkweed (*Asclepias syriaca*). *Surely this little friend is just passing through, I think, but it continues to stay with me.*



Butterfly and Heart Pond

What begins as a few tickles becomes hundreds of kisses. The butterfly taps, licks, and senses my right hand with its antenna over and over again in minuscule steps so that its butterfly breath somehow blesses every skin cell. Its touch is gentle, vital, and the more it kisses me the more the kisses become electric. A single caress soon elicits a rain of vibration up my right hand, past my shoulder, and straight to my heart. Palm, fingers, wrist, knuckle, this butterfly has fallen in love with my hand, or perhaps the rose oil, but no matter because a smile the size of the Heart Pond moves into me, and then tears fall, into my hands, my walking stick, the splintery wood on which I sit. The butterfly does not leave me. He stays. No doe to keep me away, the pond quiet with no wind to move its current, he and I stay for nearly an hour in an embrace I can only name as kinship.

I cry and call his name, *Poppy*. *Poppy*, I miss you. And then my childish heart, the one who knows the taste of Vermont clover, who feels her father as the fawn feels the doe, knows without a doubt the butterfly is Poppy. The creature is a spiritual signature for the story my father knows I have yet to write, the sovereignty I have yet to embody, the languages I have yet to learn, the mother I have yet to become.

There are plants we cannot name, only learn to love.

"Sovereignty," he would say. "I cannot teach it to you, my dear daughter. You must go out and claim it for yourself."

Glossary of Grief Medicine (in order of appearance)

Blue False Indigo: the violet one that reminds me of my father's favorite color, purple.

Bumblebee: the yellow and black one who lives in the flowers and puts the honey in my heart.

Daisy Fleabane: the littlest ones who show me how to be joyful.

Wild Rose: the white-bodied ones, offering sweetness for my song.

Redbud: the first-flashes-of-color-in-spring tree, who marks the forest with tiny flames the color of fuchsia to bring back the blood in our veins.

Wild Olive: where the doe hides, where raindrops bead on leaves, where I get lost.

Wolf Spider: the nimble, glinting, fertile one who both terrifies me and teaches me how to spin and hide.

Black Haw: the medicine tree, who lives in myth by both water and land and tells me to story her.

Red Clover: the fullest blossoms in spring who feed the bees and tickle my toes when I walk the meadow.

Vetch: the common ones the shade of the inside of a shell who fill the meadow with bee and butterfly food.

Butterfly Weed: the bright-eyed ones who warm to an orange mid-day and turn what is vital in them into food for the bees and butterflies, too.

Fawn: the baby who leaps quicker than the wind when found yet knows how to play dead.

Doe: the mother who knows how to nest and hunt, who eats the forest to feed the fawn.

Milkweed: the ones who turn from green to pink orbs in one season and then stiffen into seed pods the size of little boats for the fluff that becomes more milkweed.

Butterfly: the flying one, the one who teaches me how to fly. ■

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North American Pawpaw Flower & Fruit by Katherine Ziff

FLOWER ESSENCES: INSPIRING PLANT CONSERVATION

By Katherine Ziff

Between every two pines is a doorway to a new world
– John Muir

Where I grow plant spirits may safely play
– *Asimina triloba*

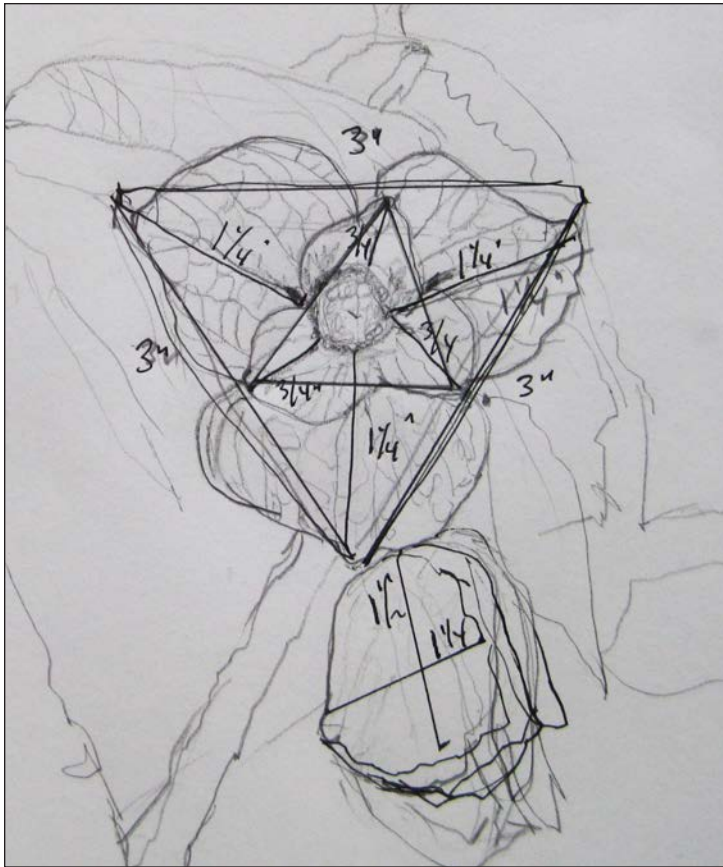
What inspires care for Earth's medicinal plants? How can we encourage a relational connection with nature that might lead to plant conservation? The plants themselves offer this to us in the form of flower essences. I learned this first from *Asimina triloba*, North American pawpaw.

Twelve years ago we had recently moved from the bustle of town to a quiet spot at the edge of some woods that extend out from Wayne National Forest in the hills of Appalachian Ohio. Early in our first September there I was heading to work and, glancing over at the ground between my studio and a stand of trees, was momentarily dumbfounded. My first thought was "It has rained stones in the night." Looking closer, I saw the "stones" were fruits and realized I now had a pawpaw patch to tend. This stand of pawpaws has been a research laboratory, a teacher, and a gateway to learning from other flowers.

Seeking to know these gangly trees that were growing with such enthusiasm via sprouts and runners from

an old "mother" tree (Moore, 2015), I sat with and observed and eventually made a flower essence from pawpaw's early spring flowers, which start out pale chartreuse and end up a deep magenta. Next, I set out to learn the properties of the North American pawpaw flower essence, which is listed in just one of the various flower essence compendia and repertories available and is described there as "...a catalyst for assimilating all nutrients into the system" (Gurudas, 1983). One day I announced to the pawpaws trees themselves that I was ready to learn more about their flower essence. Eventually and with the help of William Bloom's (1986) translation of folklore about fairies and nature spirits into contemporary terms, I learned that *Asimina triloba* flower essence supports digestion of ideas into balanced creative manifestation free from the effects of impatience, anger, and hostility. In this way pawpaw flower essence lays a foundation for a relational connection with nature, for actions free from these ill effects are more likely to be congruent with the well-being of nature and supportive of the lives of plants.¹

¹ A further perception from Pawpaw: "Where I grow, plant spirits may safely play". Years later, at the United Plant Savers 25th anniversary celebration, I heard Rosemary Gladstar tell the story of The Magic Pawpaw Moment in the founding of the UpS Botanical Sanctuary in Rutland, Ohio and then read about it in *The Big Herbs* (Strauss, 2014).



North American Pawpaw Flower Geometry by Katherine Ziff

Other flower essences from Eastern U.S. forests support a relational approach to plants. Wild ginger (*Asarum canadense*) reminds us of our connection with the forest (Woodland Essence, 2019). White fawn lily (*Erythronium albidum*) carries the deep feminine creativity and balanced grace of nature as it exists in Southeast Ohio (Ziff, 2019).

In a bioregion far from Ohio—the Sierra Nevada mountain peaks—grow flowers the essences from which align us with nature. Researched and documented by Patricia Kaminski and Richard Katz (2008), these are the “Green” flower essences of their Range of Light collection. Green bells of Ireland (*Molluccella laevis*) flower essence brings awareness of and ability to work with the elemental world of Nature. Green rein orchid (*Plantanthera sparsiflora*) supports the ability to feel the life force of the earth and heart consciousness as a pathway to ecological consciousness, and green gentian (*Nicotiana alata*) brings human heart alignment with the breathing pulse of the earth and the ability to care for all life here on our planet. Green gentian (*Frasera speciosa*) supports courageous soul alignment with the living being of earth, and green rose (*Rosa chinensis viridiflora*) offers compassion as a doorway of connection to all living beings.

Flower essences offer a powerful array of support for a balanced relationship with nature. It has been suggested to me, half in jest, that they could be sprayed through Earth’s atmosphere or added to our public water supply!

But, ethical considerations aside, flower essences are not like fluoride or crop dusting. They do their work best at the individual level, developing relational connections with nature one person at a time. ■

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Katherine Ziff is a flower essence practitioner and maker in Athens, Ohio. She is the author of Asylum on the Hill: History of a Healing Landscape published by Ohio University Press. Katherine was a United Plant Services Deep Ecology Artist Fellow in 2017 and continues to teach about flower essences in the UpS Medicinal Plant Conservation Certificate Program.

FIRE

Joy Harjo

<i>a woman can't survive</i>	<i>look at me</i>
<i>by her own breathe</i>	<i>i am not a separate woman</i>
<i>alone</i>	<i>i am a continuance</i>
<i>she must know</i>	<i>of blue sky</i>
<i>the voices of mountains</i>	<i>i am the throat</i>
<i>she must recognize</i>	<i>of the sandia mountains</i>
<i>the foreverness of blue sky</i>	<i>a night wind woman</i>
<i>she must flow</i>	<i>who burns</i>
<i>with the elusive bodies</i>	<i>with every breath</i>
<i>of night wind women</i>	<i>she takes</i>
<i>who will take her into</i>	
<i>her own self</i>	



Teaching about “At-Risk” Plants

DOGWOOD AND BRAMBLES

Ontario, Canada

Sanctuary Steward: Penelope Beaudrow

Deep within my soul I have a love of plants and nature so deep that they are a part of me, not knowing where one begins and the other stops. I have a constant yearning to be out of doors, see the land awaken after a long cold winter, feel the warm winds upon my face, and hear the geese flying overhead and walking with my dogs through fields and forest. But my favorite is the beautiful smell



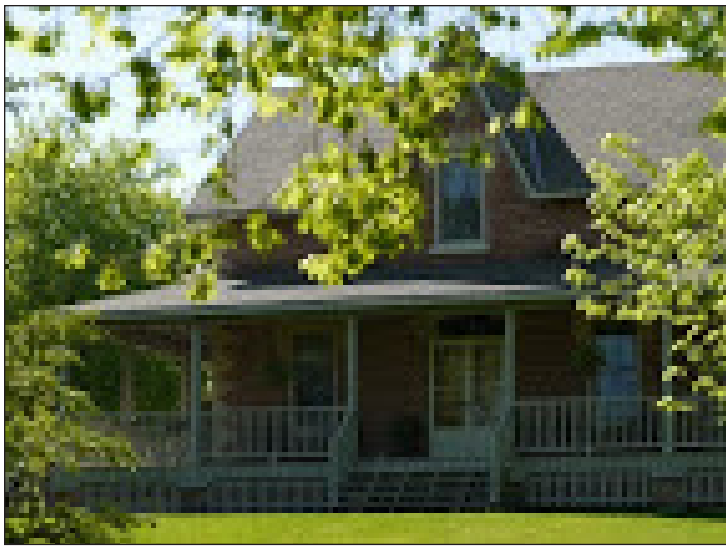
Iris (*Iris* spp.)

of spring—the scent of rain and mud, leafy greens and herbs, and blossoms, the sweet, musky floral scents of wildflowers on the breeze.

With spring upon us everything is full of promise. It's the perfect time for us to consider giving back to nature. The amazing plants of the fields and forest give us so much—intoxicating fragrances, life giving oxygen, herbal medicines, materials, and amazingly, inspiration for the arts, many a painter's muse. But alas, we keep taking. We take from mother earth's precious water resources and natural habitats to make room for factory farming and ever-expanding cities. And we can't forget our own shame—the overharvesting from the wild for our herbal medicines. As herbalists or anyone who uses herbs, it is our responsibility to ensure the replenishment of a diverse plant species. Remember that the plant kingdom is not sustainable if we only take and do not give back.

So how are we giving back?

We have been tilling, digging, dividing, and planting on our lovely little farm for over thirty years, including any native plant species that are not already thriving on the land. Only a small portion of our 100 acres is actually “farmed.” 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. In the last several years we have really been focusing on planting “At-Risk” medicinal plants. Some of the plants we have re-introduced into the wild are echinacea (*Echinacea* spp.), ramps (*Allium tricoccum*), trilliums (*Trillium* spp.), black cohosh (*Actaea racemosa*), blue cohosh (*Caulophyllum thalictroides*), arnica (*Arnica* spp.), goldenseal (*Hydrastis canadensis*), and bloodroot (*Sanguinaria canadensis*). Our most honored “At-Risk” plant in the sanctuary came all on its own. One day I was leading an herb walk discussing the “At-Risk” plants, and I happened to ask the photographer, who was out with us, what had been her favorite plant, and she said, “The yellow one.” I said,



Farmhouse at Dogwood and Brambles

“What yellow one?” She quickly scrolled back through her camera and showed me a glorious photo of a lady’s slipper orchid (*Cypripedium parviflorum*). I was stunned as we never planted this orchid. I had no idea when we first started planting that our efforts would turn into our own botanical sanctuary. We are thrilled to say that since 2015 we have been a Botanical Sanctuary Member of United Plant Savers. Our mission is to protect native medicinal plants and their native habitat while ensuring an abundant renewable supply of medicinal plants for generations to come. Our future goals are simple—to increase the number of “At-Risk” plant colonies annually. It is my dream that years from now someone will carry on my work with the plants, nurturing and loving our botanical sanctuary as much as I do. Until then, I will continue to pour my heart’s love into this land, giving the only way I know how.

Now what can you do?

- Scatter “At-Risk” or “To-Watch” medicinal plants while hiking and walking
- Donate to United Plant Savers
- Become a member of United Plant Savers
- Save plants that are being destroyed due to development by transplanting them
- Do not purchase wildcrafted “At-Risk” or “To-Watch” herbs
- Do not forage these herbs

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, not only for themselves and their loved ones (human and pet), but more importantly now is to spread the message to give back. It is truly my life’s passion. ■

Penelope Beaudrow
Dogwood and Brambles Farm
Ontario, Canada
<http://theginkgotree.ca/>

FARMING IS FOR THE BIRDS

Pangaea Plants, Lake Lure, NC

Sanctuary Steward: Gabriel Noard

When I wake up, it’s still dark out. If the sun is up before I am, I think I am already late. The day has started without me. No matter though, there’s work to be done and songs to be sung. Not that I am good at that or go about merrily singing. But as my intelligence knows, Song and Voice are much more important than what most revere them to be normally. Song is everywhere, and most agree that music is transformative. My perception of everything is often a little different than some though. So Song is not just entertainment, but to make an incantation. To me, this is to make a prayer, or wish, or to vocalize a deep powerful feeling one has in their heart, mind, body, and soul—a wish to spread it and live it in every moment and action. So this is what I live, and I head out as soon as I can to the farm to take part in the song that happens when I go there.



Oat Seed (*Avena sativa*)

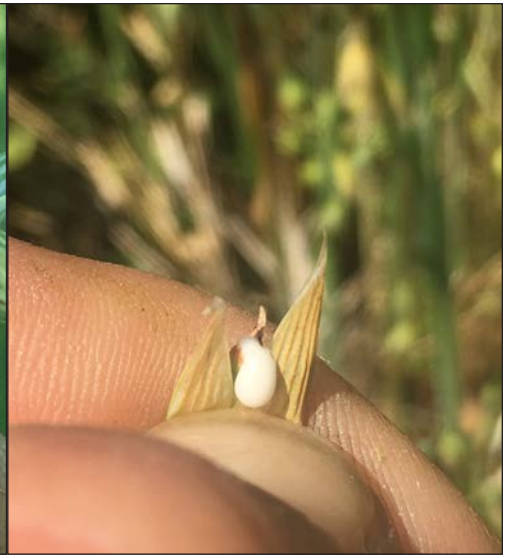
It’s as peaceful as a therapeutic massage or meditation setting. I’m sure somewhere it is indeed actually being played to people who are less fortunate and seeking solace. Imagine if you will for a moment what it sounds like as the sun rises across the fields. One can imagine birds, of course, but listen, and one can hear the rustling of leaves, and in the sea of grains growing one can hear the soft surf of the ocean. And if you are really inquisitive, you can part the sea and crouch down into a world of standing grain, and it looks like seagrass with the calm blue water above. From above it looks like a fine standing



Tall oats (*Avena sativa*)



Oats flowering tops



Milky oat seed

field of wheat or oats, rye or barley. Down below there's actually a few inches of bare earth everywhere in between the plants—no not bare really—it is teeming with life. In summer it is quite a few degrees cooler there. In the cool weather of autumn and spring one can feel the warmer earth. This is a whole different microcosm. There are hundreds of things to notice, and I wish I could look closer and closer at each thing. There are ants and spiders hurrying places and moths still sleeping, as well as worker bees who may have been too pollen laden and tired to make it home last night or might even have perished on their flight from old age. There are exoskeletons of various pods and weeds that try as they might are diminishing without enough sunlight. Immediately obvious are 5 or 6 different types of fungi, all of them fascinating and exquisitely beautiful and surreal. Each is so small but plentiful enough to be seen at least partially with the naked eye, and oh how I wish I could look closer and closer. Down there, the world is different. Down there the air is clean and replete with airborne soil particles that are full of life, filling the lungs and inducing the brain to release serotonin. Down there one can hear an insect take a bite.

From the sound of that bite I know what kind of mouth parts the bug must have and being familiar with the environment, I am certain I know what kind of bug it is. My thoughts are transformed. I realize the world that I am peeking into by sitting down inside a sea of grain. The ground is actually clearly visible and dark brown and teeming with life. There is a microcosm of action going on that any kid would immediately take to playing in. If one could only see it. But I know I am one of the few who will ever be here in this tiny world. My being is wholly consumed for the time I am there. The insect chewing brings me back a little, and I start being somewhat analytical. Do I have a bug problem with this crop? I come up slowly out of the bottom of the sea searching for any other signs. It is subdued, but it's so loud in there. Every bend of the grass makes a noise. My movements and clothing are so noisy. When I come up, it seems by the height of the sun that I have been in there for an hour and ten minutes, though it has been far less. Still, now the

day has really begun. Ok, let's get started. I say to myself, "Oh, that bug chewing I heard, is it an issue?" And before I finish standing, the songs of birds answer me that no, the farm is a healthy environment, and the bug is bird food. The plant it is eating may be weak, and its destruction will feed yet smaller bugs, and really, I'll never miss that one leaf. I'd miss the birds a lot more. The birds have a special relationship to the plants and the farmer, or steward of the land. It's obvious the birds are the real farmers here.

Who else calls in attention from far away ceaselessly every day? Who else can keep the millions of insects here in line and in balance, all the while merrily singing a gay little tune? They keep a watchful eye over the whole farm. From the ground nesting birds to the hawks and crows in the treetops, they have it on lockdown.

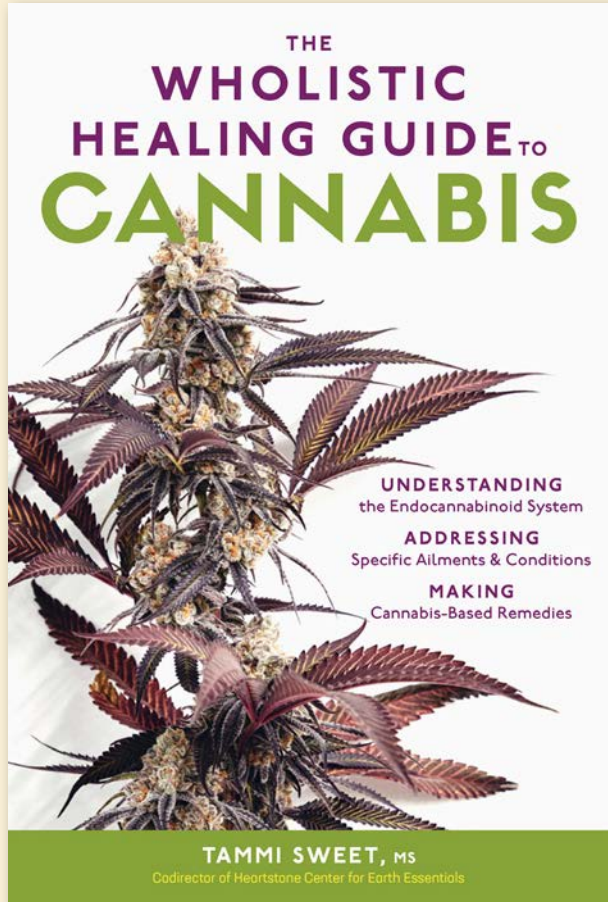
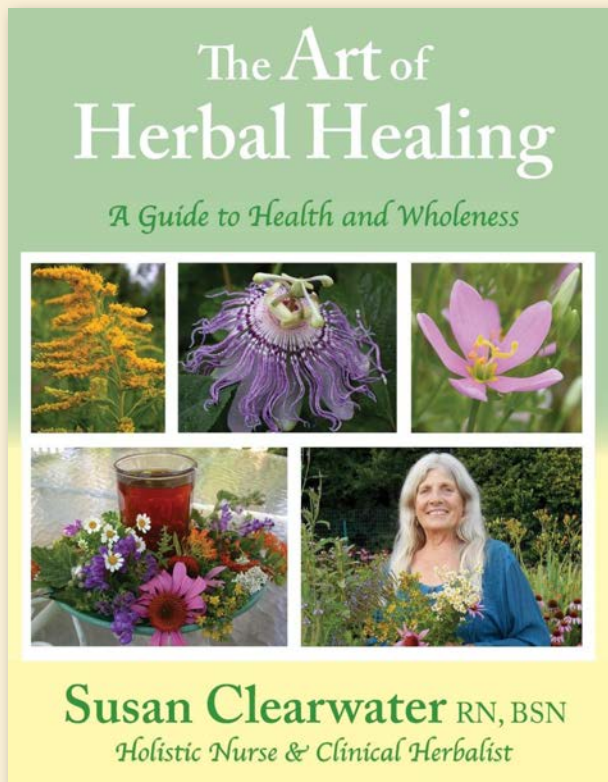
I can hear their wings flap, and as they glide I can hear the wind passing their feathers. It is a sound like no other, a sound that brings reverence and peace that inspire awe and inspiration and knowledge. It makes one smarter to hear it. Ideas come to me, and I now can continue with my plans for the day having been informed by the birds what course would be best. The birds have their own way of farming and their own way of influencing life. I am not the only one listening.

The farm song continues. Aware now of how loud I am, the sound of my footsteps informs me how the tith of the soil is and how strong the grass is today. I am reminded to walk lightly by my time crouched in the oats. I know it is full of life underfoot, and I walk more intently, more guided and fluid.

From its conception the farm was born to be a diverse sustainable medicinal herb farm. And by making such a choice, it took on a life of its own. With little additional effort the farm became certified organic, certified biodynamic, and an official United Plant Savers Botanical Sanctuary. ■

Gabriel Noard is the founder of Pangaea Plants, LLC in Lake Lure, N.C. He adds, "Let the birds do the work. I'll be found contemplating in the field—somewhere."

Newly Published Books by Members:



EDEN HYLL SANCTUARY

Natural Bridge, New York

Sanctuary Steward: Diane Seufert Tait

My sanctuary is in a forest that covers thousands of acres, crossing roads and streams, and comprises state forest, private holdings, and towns. I am twenty miles from the green line of the Adirondack Park, the largest national park in the USA.

Over the last three centuries, a complex “woods culture” has developed based on mutually agreed practices. Life can be tough in the north country. Many hunt for food, and harvesting trees is often a necessary addition to income. Near my sanctuary the economy depends on Fort Drum, a large army base. I have experienced a huge learning curve, absorbing lessons from the locals and becoming uneasily tolerant of the military presence. I respect these tough, resilient north country people—so self-reliant and friendly. Being a resident anomaly, I will never harvest my trees. I allow my shoreline to remain lush with trees and plants. I don’t hunt or trap, and I don’t own a firearm. I try to let nature dictate her needs and preferences. She knows everything about this particular ecosystem so much better than I.

Eden Hyll shares a ten-acre pond with nine other cabins. A couple of years ago, aquatic plants started to become a problem, primarily water shield (*Brasenia schreberi*), but also large-leaf pondweed (*Potamogeton amplifolius*), slender-leaved pondweed (*Potamogeton pusillus*), yellow pond lily or spatterdock (*Nuphar luteum*), bladderwort (*Utricularia* spp.), three-way sedge (*Dulichium arundinaceum*), and bur-reed (*Sparganium* spp.). Thankfully there are no invasives.

All of us on the pond shared the cost of hiring Steven LaMere of Adirondack Ecologists to do a full pond study. We learned that our pond water is clean for swimming and fishing, but the shoreline health needs improvement. Half of the cabin owners have removed the foliage from their shores, bringing in sand or planting grass, which they mow. One resident has installed



White Pine Pond at Eden Hyll



Swamp Milkweed (*Asclepias incarnata*)

a drain system that empties rain runoff directly into the pond. These practices add to the fertility of the water, fostering plant growth. Every small change has a profound effect.

Along my shore, two downed white pines have interfered with water flow, forming several tiny islands. These have become welcome habitat for Joe-Pye-weed (*Eupatorium maculatum*) and other shoreline plants. Another downed tree has become a favorite sunning log for painted turtles. Those who like to fish tell me this tree provides good fish habitat. These fishermen stock the pond with largemouth bass and minnows. The bass are a predator fish and have dramatically reduced our frog population. I do periodical frog counts by canoe.

A dammed creek formed our pond in the 1950s. We maintain water levels with culverts in our causeway and removable boards at the dam. In the past several years, rainfall has been seesawing from more to less than normal amounts. Periods of very low water have been one cause of the weed problem, as sun penetrates to the pond floor, aiding germination. A yearly beaver family living by the dam is also a problem. They plug up our outflow, add fertilizer to the pond by defecating, and down trees along the shoreline.

Each fall we employ a beaver trapper. About four years ago I spent hours wrapping over 100 feet of chicken wire around my shoreline trees, primarily maples and yellow birch. Every year I check the wire and let it out when needed. Luckily, large waterfowl taking up permanent residence have not been an issue.

Pond health is essential for the birds, resident minks, and shoreline plants, such as blue flag (*Iris versicolor*) and swamp milkweed (*Asclepias incarnata*). The recommendation of the study was to embark on an annual program of hand-harvesting the water shield in the areas where they were interfering with canoeing and swimming. Thankfully, the study put to rest the idea of chemical intervention. We are harvesting new water shield growth two to three times a season. I have found that one good harvest and a later "clean-up" is effective.

I have become adept at canoe harvesting. All pieces of the plant must be disposed of on shore. In two years we have seen good progress in plant reduction. More work needs to be done on the shoreline, although not much has been done as yet. To control the introduction of invasives, we are to inspect and wash all crafts that have been in other waters.

Communication with other pond residents is ongoing. I had to convince the resident who runs the brush hog along the edges of our shared road to go easy along my property, sparing some cedars and elderberry bushes. I was encouraging the growth of a three-foot cedar in my turn-off clearing until someone backed a large machine over it. I have talked to those with weed hogs, backhoes, and logging trucks and have a sign firmly planted in the middle of the clearing. Now St. John's wort (*Hypericum perforatum*), yarrow (*Achillea millefolium*), and wild strawberries (*Fragaria* spp.) are flourishing.



Dwarf Ginseng (*Panax trifolius*)

New plants continue to show up in my 4.82 acres, some of the miniature variety: eyebright (*Euphrasia americana*), Canadian St. John's wort (*Hypericum canadense*), and my favorite find, dwarf ginseng (*Panax trifolius*)! My sanctuary has become a popular wildlife café with the deer enjoying newly arrived staghorn sumac (*Rhus typhina*), as well as elderberry and blackberry bushes.

Every summer brings change and more lessons to be learned as I strive to be a sensitive and aware steward of my sanctuary. Several pond residents have become interested in the work I am doing. One of them wants to be my "student" next summer. She's getting better at identification every year. You are welcome to contact me for more information about property for sale in this area or to arrange a visit to my sanctuary. ■

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Jen Frey walking through the meadow of Heart Springs Sanctuary

HEART SPRINGS SANCTUARY

Lancaster County, Pennsylvania

Sanctuary Steward: Jen Frey

In 2014, heartbroken, I sold my beloved farm. This was the place that helped my life-long affair with Plants bloom into something deeper and pushed me down my Soul's path. I loved the farm—it was where my babies grew and explored. It was where I discovered many dreams as well as illusions. As I mourned the “loss” of my farm, I kept hearing, “There is a better place.” I didn't know how this would be possible. Still, I hoped that I would find a place where I could work with the Nature Beings to create a Sanctuary.

Almost three years and many dreams and prayers later, I first stepped foot on the Land which I call Heart Springs Sanctuary. As soon as I did, I knew this was the place where I could co-create a Sanctuary to help humans connect more deeply with Nature. I quickly realized that the message I received was right—there was a better place for me. The Land was calling my youngest son and me Home.

Heart Springs Sanctuary is 4.5 acres located in a tiny town in Lancaster County, Pennsylvania. There are three ponds and a small creek. Even though this is a much smaller property than our farm, the biodiversity here is amazing due to the variety of ecosystems, including full sun, part shade, full shade/wooded, wetland, and aquatic.

From the beginning, I viewed this place as a Sanctuary, a place where all Beings have a right to thrive and live together, a place that demonstrates how to work co-creatively with Nature Spirits. When I heard Kathleen Maier talk about the importance of living Seed repositories during a Teleseminar about the United Plant Savers' Goldenseal Sanctuary, I applied to join the Botanical Sanctuary Network. In my application, I stated that I wanted to be part of this network “to give more awareness to UpS and the need to be in good relationship with the Plants.” I was hoping that the signs “would cause some people to pause and wonder about a botanical sanctuary and maybe even research UpS.”

While there are more organic farms in Lancaster County than the rest of Pennsylvania combined, they are not my neighbors. I am surrounded by large farms, which mostly raise GMO corn. They are heavily sprayed and receive extensive amounts of fertilizer (mostly manure) because the soils are hard-packed and depleted. One of the issues we face at Heart Springs Sanctuary is that the water runs off of the fields as if they are parking lots and is directed towards the Sanctuary; along with the water comes the chemicals and fertilizers, which quickly go into the stream and eventually, flow into the Chesapeake Bay.

My neighbors are good people whose families have been working these farms for generations. They are suspicious of foreigners (which I am, even though I have lived my life in Lancaster County) and environmentalists, having been told that we want to destroy their



Eastern Tiger Swallowtail butterflies on Joe Pye Weed (*Eutrochium purpureum*)

livelihoods. However, they would be the first to help if I ever needed it. The first time I met my neighbors, who own the farm across the street, I told them that I work with Plants for healing. The wife was surprised to hear that the weeds she was fighting were edible. I wanted the signs for the Sanctuary to be a gentle reminder that there is a different way as well as to catch the attention of those driving by.

Sure enough, the first day I posted the signs, a neighbor I had not met before came over to introduce himself and to talk to me about them. We happened to be creating the Labyrinth that day, so on top of learning about the Sanctuary, he was introduced to Labyrinths. One of our signs was stolen, probably by a teenager, which also means that they were noticed. (Honestly, I'm surprised that only one was stolen.) Sometimes I chuckle to myself when I imagine a teenager with a sign in their room that states, "This land is being managed for wildlife and medicinal herbs. No hunting, gathering, or trespassing."

As a Botanical Sanctuary, we of course grow and plant at-risk and native Plants, as well as those Plants which



Milkweed (*Asclepias tuberosa*) field near the ponds

the Beings of the Sanctuary request. Lately, I have been focusing on flowers to raise the vibration of the Land and to provide food for the Bees, Birds, and other Pollinators. I don't feel that it is enough to simply plant Plants or honor them without honoring the other Beings as well, all of them, which means that every year when the Japanese beetles arrive, I spend time with them to create a deal. This year they wanted a red flower. When I found the Dahlia they showed me, they stopped decimating the Roses. We returned from a trip to discover that Deer had rubbed some of the baby Plants we just planted in our latest project, along with bushes and trees all over the yard, many of which we planted in the last couple years. Deer live by the two biggest ponds, though very rarely cross the creek to where the gardens and plantings are. We could have put fences up or encouraged hunting here; however, that doesn't feel like it is in alignment with Nature. Instead, I spent time with the Deer asking what they wanted and asking them to leave the baby Plants alone. We made an offering to them and came to an agreement. Since then, they have not rubbed any other Trees. It takes time and attention to communicate with



Clearing the Japanese Hops from future rain garden

and honor the Beings of the Sanctuary, though I have found in the long run this is a much more efficient and effective way, working with Nature rather than against.

I have the same philosophy towards so called invasive Plants. I figure that they are here for a reason. I had this belief greatly tested this year by Japanese Hops (*Humulus japonicus*). Japanese Hops first appeared last year. However, this year, they were taking over large areas of the Sanctuary, completely covering Bushes and Trees. When I finally was able to spend time with Japanese Hops, I discovered that they were trying to get my attention, which they did quite well, because I was avoiding working on a project which the Nature Spirits had requested. This project was to create a sort of rain garden where the water flowing in from the farm collects. This area was also the dump for the previous owners. Besides helping to slow down the water and capture the run-off, this garden is meant to shift the



The Labyrinth at Heart Springs Sanctuary

vibration of the water before flowing into the creek. It seemed like too big of a project, and I kept delaying. Thanks to Japanese Hops, I was encouraged to start. We started by clearing the Japanese Hops from this area, creating gigantic mountains. What I discovered was that the Hops were helping us because they smothered all of the other Plants that were growing there except for the Giant Ragweed (*Ambrosia trifida*). This made the project easier and more manageable. Plus I had lots of fun with Japanese Hops. We did complete the first stage of the project in the area where the Deer started rubbing. We will expand the planting area in the spring and will probably add Mushrooms to the "rain garden". Then there are other steps to do to help slow the run-off.

One of the messages that I received this year is that I'm really great at creating for other Beings: Plants, Animals, Insects, and Faeries; but I'm not so great at creating for humans. Since the classes I teach here are for humans, to help them connect more deeply with Nature and to learn how to work with the Plant and Nature Spirits for healing, it seems important that I create spaces for humans as well. This is another area where we will be focusing next year and beyond. My plan is to create some whimsical areas to make it easy to interact with Nature. So that those who are visiting the Sanctuary but not studying with me can still have their Soul stirred by Nature and hopefully remember how important this Sacred relationship is.

When I applied to be part of the Botanical Sanctuary Network, I expected to be working with the Land in this manner, and I expected to catch the attention of my neighbors; however, I was surprised by the conversations that this prompted with my son and his friends. My sons grew up close to Nature and were always taught to respect and revere Nature. However, my youngest is now a teenager. He wants to do things that I do not like, and he (of course) thinks that I'm restrictive and ridiculous. He and his friends want to drive their trucks around the Land, shoot targets, and set off fireworks. So we have discussions about this and how it is not in alignment with being a Sanctuary and how these actions affect the other Beings who live here. They can understand that a Sanctuary is a special place where the Land and Beings are respected and honored. Even if they laugh and complain about it when I am not around, they are learning a very different way of living with Nature, and they are honoring this (mostly).

These are all small efforts; however, we never know how far their effects will ripple out. I am grateful to live in a place of Beauty where I continuously learn what it means to be in co-creative partnership with Nature. I am grateful to United Plant Savers, their Botanical Sanctuary Network, and to all of you who are making small and large efforts to create healing and change for the Plants and other Beings with whom we share this wondrous Planet. May our efforts ripple out far and wide as we create the world of our dreams. ■

VERSE FOR OUR TIME

*We must eradicate from the soul
All fear and terror of what comes towards man
out of the future.*

*We must acquire serenity
In all feelings and sensations about the future.*

*We must look forward with absolute equanimity
To everything that may come.*

*And we must think only that whatever comes
Is given to us by a world-directive full of wisdom.*

*It is part of what we must learn in this age,
namely, to live out of pure trust,
Without any security in existence.*

*Trust in the ever present help
Of the spiritual world.
Truly, nothing else will do
If our courage is not to fail us.*

*And let us seek the awakening
from within ourselves
Every morning and every evening.*

— By Rudolf Steiner

ON THE BIG MOUNTAIN WITH PAWPAW BILL

By Joe Pigmon with Kate Farley



Appalachian woodlands

Those of us who love Appalachian woodland medicinal herbs often hear stories about the men and women who have harvested these plants from the wild for generations. Sometimes these stories blame traditional herb harvesters for the declining abundance of our beloved plants. We hear about diggers who take plants indiscriminately without a care for future

generations. Some people think of the many negative assumptions about poor Appalachians and assume that diggers are just lawless poachers trying to feed a drug habit and couldn't possibly share our deep love for forest ecology.

However, the real story is much more complicated than that. It is true that many diggers harvest irresponsibly. On the other hand, many ginseng diggers are doing their best to be good stewards of the forest, just as their Pawpaw or Grandma or Daddy or Aunt taught them. They use a diverse array of strategies to ensure that their grandchildren's grandchildren will get to enjoy the thrill of spotting those telltale red ginseng berries in the woods. At the same time, they are watching the destruction of their beloved forests by mountaintop removal mining, clear-cutting, and even recreational development.

The following story was shared with Kate Farley by Joe Pigmon, a ginseng digger from the coalfields of eastern Kentucky. Joe and Kate have worked together to edit this story for content and clarity.

Pawpaw Bill is a great man, an amazing person and a true friend. He's also one of the most "ginsenging" fellers I ever seen—he's 60-some years old and still going out and digging pounds of monster ginseng that most harvesters could never find. I wanted to learn from this man, and I'm honored that he became my mentor.

I knew Bill for years before I got the chance to go dig some ginseng with him. On one beautiful fall day a

few years ago, he took me up the big mountain to find those old-growth mountain monsters. It was one of the greatest rides I've ever had in my life because I was finally going to dig ginseng with Bill. As we went up the old winding mountain road, Bill and I talked about different areas to harvest from. I spotted some nice deep hollers that I thought looked like a good area for nice seng. I asked Bill, and he said, "Yeah, there's a little ginseng I left in there. Should be about time to go check and see if a few are ready to dig. But we have a place we are sure to find some nice seng, Joe; it's always there." There ain't a mountain or a holler around Bill ain't been in. He always left plenty of seng for the future generations to harvest. The road turned from pavement to gravel, washed-out and rough from recent rain. When we finally made it to the top, I looked down at the trees and felt honored to be a part of all that awesomeness.

But the mountains here in eastern Kentucky—or what's left of them—aren't what they used to be. From where I was standing, all the mountains far as you could see have had the tops scalped off, as my grandma used to say. Today, there is no mountaintop for several counties surrounding my birthplace in Appalachia. Mountaintop removal is the worst thing ever. Bill told me of the days when the mountains were whole. He told me about the vast forests where he could dig at least two pounds of huge ginseng every day he went up on the mountain, and a person could dig goldenseal for days if he wanted to. I can imagine the heartbreak he went through when he witnessed the mountains being destroyed.

We ended up at an old road cut across the top of the ridge, and Bill told me we're here. It was just an old logging road and it didn't look like much of anything was growing there. But Bill knew those woods, and he knew that the remaining patches of wooded areas still had plenty of ginseng for harvesting, with lots of goldenseal to boot if I wanted to dig a little for market or to transplant into my own patch. Bill always said that if I was a smart man, I'd transplant more goldenseal than ginseng, because with proper propagation a man can get a nice return in only five years without having to keep digging it from the wild.

Bill knew there was a big old patch of seng right near that road, and it always grew big ginseng. He kept on talking about that one patch where a man was sure to dig a nice sack of old ginseng. "It will help you get by through the winter—if you don't want to dig any, you will know where it's at. Maybe one day you will need it, Joe," he told me. "I can't remember exactly where it's at, but it's here. If we keep at it, we are sure to get you a good amount to put up and dry."

As I hiked down the steep mountain slope, I saw the sunlight breaking through the treetops in scattered

beams of light slowly evaporating the morning dew, making the thick flora I'm surrounded by look like it is smoking slightly. Deeper I go down the holler towards some old mining breaks above a highwall from an old auger mine from years past. I walked around those woods for two hours, and I found ginseng here and there. There was some nice big seng with all kinds of younger ginseng all around, but no monster patch. This really wasn't the deep forest—this was just a strip of woods between what was left of the ridge and deep holler below with a side cut where coal had been augured out from underneath. There might have been woods for a quarter mile in one direction and half a mile in the other—and somewhere in there was that patch of ginseng. Not a very big area at all to harvest from. I didn't think that I'd find that monster seng that Bill kept talking about. Someone had surely beat me to it! I thought it didn't matter if I did, as it was just special being out there in the woods with Bill.



Ginseng berries (*Panax quinquefolius*)

As I was coming back up a big steep stretch, it was so steep that I was wearing my strength down quick. The little stretch of awesomeness was just perfect, with thick patches of goldenseal, black cohosh, and many other medicinal plants that could be sustainably harvested for many generations to come. A good steward could make it so that the possible future harvest could be a bumper crop! I ran into briar thickets and monster patches of multiflora rose, and I had to push my way through with my trusty mattock.

Finally, close to the road I see a big thick patch of something that kind of looks like a bunch of Jack-in-the-pulpit, or Indian turnip as we call it. As I got a little closer, I could see that the leaves were ginseng leaves. They were just so bunched up they had grown every which way. The biggest plant stood maybe thirty-two inches tall, probably taller—I didn't keep

the tops at this time for tea, which is common practice nowadays in our community. The center leaves of the ginseng plant were actually bigger than the size of my hand, and I wear extra-large gloves. That one plant dwarfed the others, and they weren't anything to be laughed at. They all were monsters, many twenty-four inches tall with lots of fat red berries full of seeds, and I counted forty other three-prong and smaller four-prong plants growing just right there. It was just a shocking experience to see ginseng growing naturally this thick! I have harvested many pounds of seng over the years, and none were growing in such a way as this.

I started excavating. I noticed the soil had lots of sandstone mixed with limestone, which provides nutrients, and the tree canopy was a little thinner than elsewhere in the forest. Those must have been major factors in the growth rate and size of this ginseng.

I started by separating out the smaller roots and putting them to the side so that I could transplant them back, being very, very careful not to damage any of the roots. I thought I'd work my way up to that big monster piece of ginseng, saving the best for last! I noticed each one of those smaller roots was 10 years old or more, even though there's no real size to them. I only found a few roots that were up to my standards of harvesting—they were 15 years old-plus, and they had a little more weight to them, standard size enough for me to have a high-quality piece of ginseng for sale or personal consumption. But that one mother plant had to be a big one. It had to be a monster piece of ginseng. It was so big the stalk was the size of my pinky. It is very uncommon to find a plant with mass such as this growing naturally.

I started slowly uncovering the root of that big old fat-stalked piece of seng. It had a growth node the size of the tip of my pinky, with a coil as thick as my thumb. It would put another big old top on it the next year and produce a lot of seed. If I had a safe place to transplant it to, it would still be growing to this day, making more mountain monsters. But I wondered why all the other ginseng plants growing around here weren't this big. They're ten or fifteen years old, old enough to have some size to them and growing in the same soil as the big one.

I started digging deeper down, following the big old coil on this big piece of ginseng. I was shocked as I started seeing the actual root itself as I removed the dirt from around it. I counted only ten to fifteen years of growth. This root had grown very fast, gaining lots of size quickly. Even though the root weighed more than an ounce, it wasn't as valuable as a smaller root that had grown slowly. The root itself looked like a piece of cultivated ginseng. It was slick, with very few stress wrinkles or rings you get on wild ginseng. The soil that it was growing in was kind of rocky and loose, and I suspect that bigger root just sucked up all the nutrients and kept the other plants nearby from growing to that size. This big plant did have a nice fat berry pod full of seeds. All those seeds were dropping right below. Nothing had been scattering the berries in the area. That big monster is what produced all those other plants. If only a steward had come through there and removed those berries at the proper time and spread them around that hillside, there probably would have been thousands of pieces of monster ginseng. Bill tried to keep the mountains full of ginseng as best he could. Everyone else wasn't like Bill. I myself plant several pounds of ginseng seed every year just to ensure the future generations' harvest to be better than I could ever imagine. I know where that spot is, and I left all those smaller plants.

At the end of the day, we made our way back home from

the most amazing harvest I ever had the privilege to be a part of. I had a little over a pound of seng. That's not common for a couple hours in the mountains. I truly am blessed to have Bill's guidance! I planted four ounces of woods grown ginseng seed there as well. I haven't been back there in about four years. In a couple more years, I want to go back there and see what it looks like if someone hasn't come through there and wiped it out by taking everything. I'm assured by Bill it will be there. "Joe, I have watched this spot for many a year; it's always been there because no one thinks seng will grow there." This gives me some comfort knowing our efforts aren't wasted.

They say that the Cherokee tradition was to take every third plant, no matter if every plant was a monster. That would have been a really good rule of thumb back in their time, when you probably could still dig ten pounds a day by taking only every third plant. Nowadays, people think they won't make any money if they dig

every third plant. This isn't the way of a select few I know, such as myself, who practice proper stewardship. Sometimes I find patches of ginseng that I just won't dig. Stewardship and sustainable harvesting are what we need to focus on passing on! This is my goal that I hope to pass on to future generations.

Every year for the past decade I have planted at least a pound of ginseng seeds I purchase or am gifted. One day after I'm long passed away, I hope that someone will walk in the mountains where I have planted all the seeds to harvest more seng in a way that hasn't been done since the old days. I hope to leave a true patch of ginseng where a person could harvest every third plant in the Cherokee way. I hope someday ginseng will once again be so abundant that it will be possible to harvest ten pounds a day as they did. Even if I'm not there to be a part of the harvest it does not

matter, because I know I have done my best to right the wrongs made before my time by past harvesters. I'm glad I had Bill as a mentor to teach me to be a good steward of the land. If we harvest as the Cherokee did, it can sustain us indefinitely. ■

Joe Pigmon is a ginseng digger from Neon, Kentucky. He has worked in many jobs in the area, but his true love is being out in the woods, finding herbs and mushrooms. His goal is to help educate the younger generation about proper stewardship of the Appalachian forest.

Kate Farley is a former United Plant Savers intern and a current doctoral candidate in sociocultural anthropology at Washington University in St. Louis. Her dissertation focuses on the culture of medicinal herb harvesting in central and southern Appalachia.



American ginseng (*Panax quinquefolius*)

GREEN COMFORT BOTANICAL SANCTUARY

Sperryville, Virginia

Sanctuary Steward: Teresa Boardwine

The Green Comfort Botanical Sanctuary has been growing for 15 years on an acre near the Shenandoah National Park, in Sperryville, Virginia. The land that surrounds us is naturalized and undeveloped, providing opportunity for plant walks through adjoining properties in woods, to a sandy river basin, out to pavement and sunny fields, too. While sponsoring a week of botany field work, we identified more plants to add to our list, along with the family of each plant, totaling 200 plants.

We will continue to steward the plants on and around the Green Comfort School of Herbal Medicine through a new Apprenticeship offered for the first time in 2020. The Botanical Sanctuary Apprenticeship will focus on the study of the medicinal and utilitarian values of each plant, its botanical identity, and its habitat and companion plants. We will add to our native plant beds, weeding any radical roots that might choke out the natives in our sanctuary. The goal is to increase the goldenseal (*Hydrastis canadensis*) patches and plant more black cohosh (*Actaea racemosa*) so we can continue to harvest a small amount each year as we protect the environment and growth cycle.

I am happy to share our database list with anyone who wants to have a look. Also, as a school, there are other opportunities to join us for a class or open house; check out our website:

www.greencomfortherbschool.com ■



Yurt classroom and apothecary



Agrimony (*Agrimonia eupatoria*) in bloom



Purple dead nettle (*Lamium purpureum*)



Mullein (*Verbascum Thapsus*)



Fiddlehead Fern (*Matteuccia struthiopteris*)



Teaching students around the yurt



Inside the apothecary

PLATTSBURGH BOTANICAL SANCTUARY

Plattsburgh, NY | Sanctuary Steward: Jane Desotelle



A few of the many Plattsburgh State University students who come to learn more about plants. They are taking some extras I had back to the university garden.



Local Cornell Cooperative Extension agents exploring the sanctuary with bags of black walnuts (*Juglans nigra*). The Cornell Master Gardeners from area counties also visit here to view plants not found in garden centers and to learn how these plants can be useful for more than just a pretty garden.



A father and son hanging up signs at the gate on Earth Day. We open every Earth Day so people can see "What's Up!" in the early spring of our north country like the strange purple of the blue cohosh (*Caulophyllum thalictroides*) shoots.



Local public television shot a short 4-5 minute video here (see Mountain Lake public tv "Enchanted Garden" on YouTube). They came back to use part of the sanctuary as a backdrop for a promo shoot for one of their other programs. Just goes to show you one never knows what benefits a garden may have to the community.

WALKER MOUNTAIN BOTANICAL SANCTUARY

Deerfield, Virginia

Sanctuary Stewards: Shay and Kim Clanton and family

Walker Mountain Botanical Sanctuary lies in a hollow between two mountains—Walker Mountain and Sideling Hill. Clayton Mill Creek, a rushing rocky mountain stream, flows the length of the hollow. At the base of the north slope on Sideling Hill there is a small, nearly hidden spring. The mossy hollow above this spring is where the ginseng (*Panax quinquefolius*) grows. Some of the plants are old and are survivors of deer browsing, land disturbances, and a long tradition of ginseng hunting in these mountains.

On this cold December day on the winter solstice the plants sleep in the dark earth. It is hopeful to imagine all of the green life stirring again, as the days grow longer and the warmth of spring brings all to life. Sadly, many of the ginseng plants that have grown on this land for years, the old ginseng spirits that graced this mountain, will no longer appear in the spring. Last July many of the old as well as very young roots were stolen. Some of the plants grew close to the United Plant Savers Botanical Sanctuary sign and under no trespassing signs, so the thief was blatantly stealing from our land. Not only were the plants stolen, but they were taken out of season in a time when they would have no chance of reproducing since the seeds ripen much later in the summer.

There is a long tradition of “seng” hunting in these mountains, and ginseng provided extra money to diggers

for Christmas and for food in the winter months. Guy Hamilton was a respected local ginseng dealer in Deerfield for a long time. The old diggers, some of whom lived in our house long ago, respected the plant. They dug it in the fall and replanted the berries or part of the root so that the ginseng would continue to flourish and multiply generation after generation. There are still responsible diggers, who care and abide by protective laws (see US Fish and Wildlife Service International Affairs American Ginseng at fws.gov/international/plants/American-ginseng.html), but a Virginia dealer I talked to and other ginseng growers say there is more and more poaching,



American ginseng (*Panax quinquefolius*)

fueled in part by social media and by TV shows such as “Appalachian Outlaws.” They also say that there is a new breed of ginseng digger that includes people who have no knowledge of or respect for the plants, for private property, or for the law. Drug addiction is often a driving force for the quick money. In Virginia this year a pound of dry quality roots sold for \$700 or more.

The theft of the ginseng and the violation of the sanctuary is a deeply felt loss. Each plant had its own distinctive

personality and genetics that were an expression of this particular place. One was especially tall with long slender leaves. It had been growing here for a long time. Over the years we have tended the ginseng and planted the ripe seeds near the mother plants. Hopefully some of the offspring will survive. We are pretty certain we know who the poacher is. We have now put up cameras, and we will be especially vigilant next year. There is another species living here, *Crotalus horridus*, the timber rattlesnake, an ancient Appalachian protective spirit of ginseng. Together we will draw a circle of protection around the plants. ■

“The care of the earth is our most ancient and most worthy and after all most pleasing responsibility. To cherish what remains of it and to foster its renewal is our only hope.”

—Wendell Berry

WATERSHED FOREST FARM

Madison County, North Carolina

Sanctuary Stewards: Michelle Dixon

and Peter Waskiewicz

Our Botanical Sanctuary story began Thanksgiving 2016 when we stood with the Lakota Sioux Tribe at Standing Rock and became avowed water protectors for life! On the long road back to North Carolina we hatched our first action plan and long-time dream: find a sunny mountain parcel with surface water and a spring to protect, and then start planting a permaculture paradise. When we looked at a tiny cabin at the bottom of a Madison County holler, our conversation with the owner touched on Peter's permaculture work, and she lit up. She soon expressed how she had waited years for a couple like us to come along. A few minutes later she offered to finance the vast acreage above the cabin to rejoin the original homestead, and Watershed Forest Farm was born.

Peter has been following UpS from the beginning and helped establish an early UpS Botanical Sanctuary in 2001. Being a BSN member brings many benefits, but mostly our customers love it! We regularly host "Forest Farm Tour and Tea" events. We proudly hang our BSN sign at the point where we begin the tours and plug UpS every time.

Grandfathered within the Cherokee National Forest, the watershed has 5 cleared south facing acres surrounded by a classic Appalachian hardwood cove. Forming a south facing bowl that rises 1,250' from the bottom to the peak at Mitchell's Knob, the topography creates a self-contained watershed with various slopes, solar orientations, and microclimates, making it an ideal botanical sanctuary.

According to the stories told by our elder neighbor Cam, the Cherokee summered here until it was settled by the Capps family in 1888. We are currently restoring their original, hand hewn American chestnut log cabin for a classroom. Cam says, "They called it Butter Holler, because the grass and water was so sweet, the cows gave butter. They didn't have a truck, a tractor or even a wagon, just a mule and a sled." The extreme isolation was tough, but they managed to provide by "trading ginseng and bloodroot for hardware to the peddler who travelled the mountains by wagon." Like most of Appalachia, the holler has a history of clear-cutting, once in 1920 and again in 1999.

As we spent more time in the forest, our first mission statement was formed: "To wholly restore a degraded, Southern Appalachian hardwood cove into a wild-scaped, perpetually abundant, multi-generational food and medicine forest."

To achieve our goals of merging agriculture with preservation, regenerative forestry, and paying the bills, in 2018 we launched the first Community Supported Forest Agriculture (CSFA) program. Alongside traditional vegetables,



Peter & Michelle

eggs, and honey, our CSFA includes wild harvested herbs, mushrooms, value-added products, wild-crafting, fire-wood, forest to table dinners, workshops, hiking, camping, and free-range nature bathing.

After 3 years of thoughtful observation and design work this is our vision/mission statement:

Watershed Forest Farm is a Permaculture Homestead, Botanical Sanctuary, and Regenerative Forestry Preserve in North Carolina's Blue Ridge Mountains. Guided by a commitment to water protection and permaculture ethics, Peter and Michelle are stewarding this magnificent cove forest towards a legacy of ever increasing vitality and abundance. Through demonstration, practical research, and education programs, the farm works to provide a model for active preservation that inspires sustainable forestry in Southern Appalachia and temperate climates around the world. ■

Peter Waskiewicz is a Permaculture Designer and organic seedsman. Michelle Dixon is an early childhood educator and forest "farmer." In 2016 they merged for their life's greatest work, Watershed Forest Farm. Become a Patron: <https://www.patreon.com/join/watershedforestfarm> - <https://www.airbnb.com/experiences/897049>

"The tree which moves some to tears of joy is in the eyes of others only a green thing that stands in the way. Some see nature all ridicule and deformity... and some scarce see nature at all. But to the eyes of the man of imagination, nature is imagination itself."

— William Blake

UpS BOTANICAL SANCTUARY NETWORK MEMBERS

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

Akal Ranch
Pleasant Hill, OR

Atka's Garden: Sacred Warrior & Wolf Conservation Ctr. Sanctuary
South Salem, NY

Appalachia Ohio Alliance
Logan, OH

Appalachia School of Holistic Herbalism/Soulflower Farm
Asheville, NC

Ataga'hi
Marengo, IL

Avena Botanicals
Rockport, ME

Bartrams Garden
Philadelphia, PA

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

Bean Tree Farm
Tucson, AZ

Bear Haven Medicinal & Native Plant Sanctuary
Yorktown, VA

Bee Fields Farm
Wilton, NH

BeeGood Gardens
Columbus, OH

Bluebird Botanical Plant Sanctuary/Happy Homestead
Eureka Springs, AR

Brigid's Way
Washington Boro, PA

Brinton Oasis, Peoples Pantry
Cochranville, PA

Broadwell Hill
Stewart, OH

Buck Creek Sanctuary
Louisville, KY

CA & J Farm
Foster, VA

Catskill Creek Native Plant Nursery
Greenville, NY

Cedar Mountain Medicinals
Newport, WA

Cherokee Medicine Woods
Bloomington Springs, TN

Cold Spring Herbals
Attleboro, MA

Curious Roots
Louisville, NE

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

Down to Earth Massage + Wellness
Knoxville, TN

Dragonfly Medicinals
Vashon Island, WA

Earth Remedies
New Hartford, CT

Earthcrafts Botanicals
Uxbridge, MA

Eaton's Creek Farm
Joelton, TN

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

Forest Green Farm
Louisa, VA

Forsaken Roots
Acme, PA

Frontier Natural Products Co-op
Norway, IA

Gaia Herbs, Inc.
Brevard, NC

Gaia's Peace Garden
Iowa City, IA

Gaspereau Mountain Herb Farm and Botanical Sanctuary
Wolfville, NS

Genie's Dream
Gatlinburg, TN

God's Gardens
Robbinsville, NC

Golden Ratio Magazine/Indian Mountain Botanicals
Moncton, New Brunswick

Green Comfort School of Herbal Medicine
Washington, VA

Green Farmacy Garden
Fulton, MD

Green Mountain Druid School/Dreamland
Keswick, VA

Green Turtle Botanicals
Nashville, TN

Happy Homestead/Bluebird Botanical Plant Sanctuary
Eureka Springs, AR

Hawthorne Way Botanical Sanctuary
East Meredith, NY

Head and Heart
Boone, NC

Healing Wheel Sanctuary
Hancock, NY

Heartmore Farm
Kents Store, VA

Heartstone Herbal School
Van Etten, NY

Heartthrob Farm
Brewster, NY

Herb Mountain Farm
Weaverville, NC

Herb Pharm
Williams, OR

Herbalist Association of Nova Scotia
Truro, Nova Scotia

Herbminders of Maine
Lubec, ME

Hickory Heal Gardens
Maben, MS

Hidden Garden Ethnobotanical School
Brooklyn, NY

High Garden School of Wholistic Herbalism and Traditional Craft
Joelton, TN

Highwoods Heaven Botanical Sanctuary
Yacolt, WA

Historic Loveland Castle
Kings Mills, OH

Humming Bird Hill Native Plant Nursery
Crozet, VA

IdleWild Native American Plant Sanctuary
Wilburton, OK

Indian Pipe Botanical Sanctuary
Linden, VA

Kannagara Woods
Medina, OH

Knowlton Farms
Sebastopol, CA

Labyrinth Gardens
Mulberry Grove, IL

Light Footsteps Herb Farm and Learning Center
Chardon, OH

Listening Tree Cooperative
Chepachet, RI

Luna Farm Herbal Gardens and Botanical Sanctuary
Troy, IL

Lynnwood Herb Farm
Lykens, PA

Mab & Stoke Farm
East Hampton, NY

Maryland University of Integrative Health Garden
Laurel, MD

Mequon Nature Preserve, Inc.
Mequon, WI

Midsummer Farm
Warwick, NY

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

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
Dover Plains, NY

Peterman Brook Herb Farm
N6280 Riverview Road
Porterfield, WI

Pheonix Farms
Augusta, ME

Philo School of Herbal Energetics
Boonville, CA

Plattsburgh Botanical Sanctuary/Underwood Herbs
Plattsburgh, NY

Red Road Herbs
Stanton, NE

Resilient Roots
Berea, KY

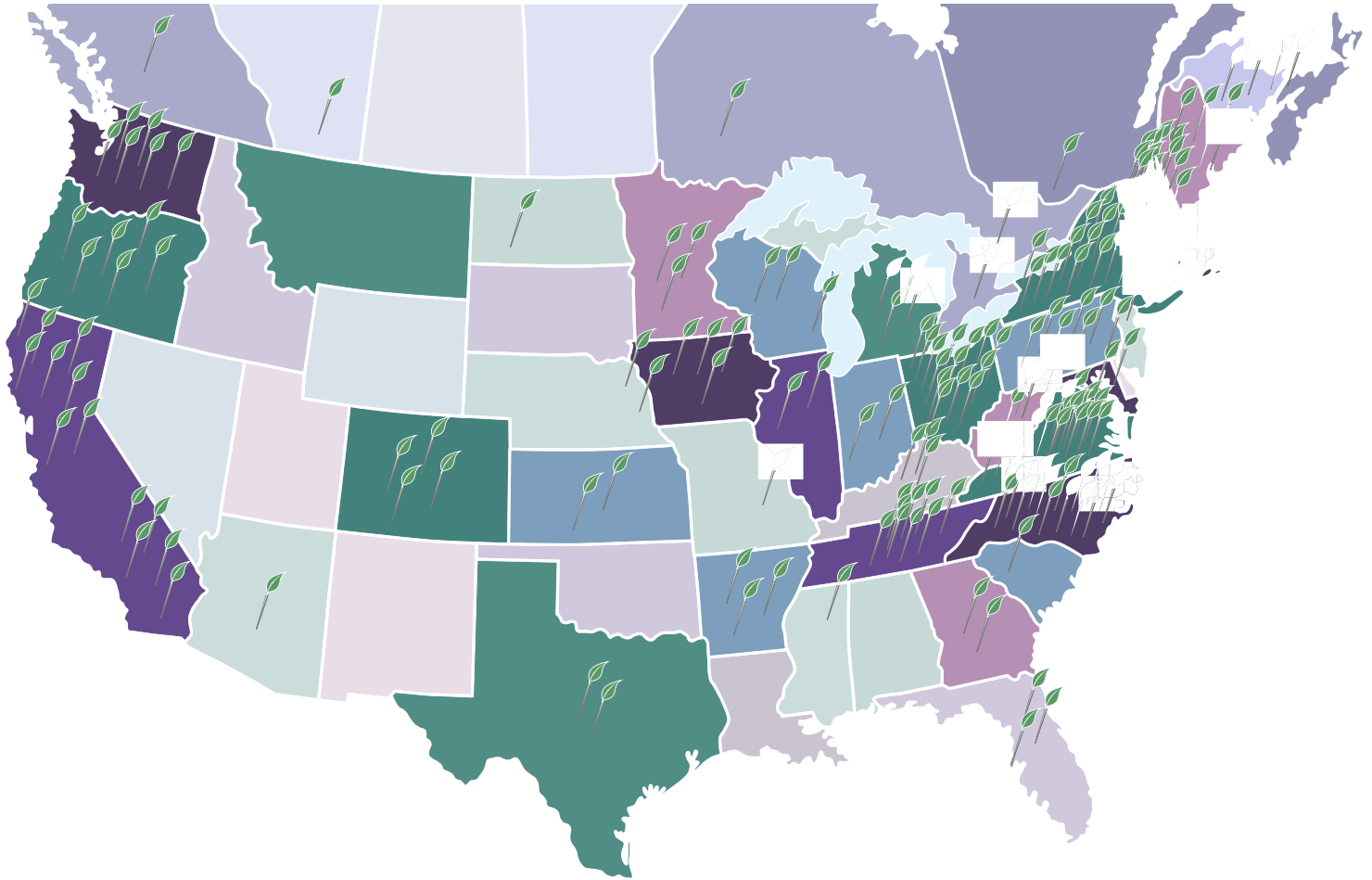
Restoration Herbs
Erie, PA

Sacred Mother Sanctuary
Peabody, KS

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

Sacred Plant Traditions
Charlottesville, VA

REGISTERED SANCTUARIES THROUGHOUT THE US & CANADA



Sacred Roots Herbal Sanctuary
Shepherdstown, WV

Saddleridge Sanctuary
Nashville, TN

Sage Mountain
E. Barre, VT

Seeds and Spores Family Farm
Marquette, MI

Seven Arrows Farm Botanical Sanctuary
Seekonk, MA

Sharondale Farm
Keswick, VA

Shaw Black Farms
Morning View, KY

Shindagin Hollow Woodland
Willseyville, NY

Singing Brook Farm/WiseWays Herbs
Worthington, MA

Sisters Sanctuary
Guilford, VT

Sisters Sanctuary
Guilford, VT

Solidago School of Herbalism
Deer Isle, ME

Soothing Herbs
Goshen, VA

Soulflower Farm
Asheville, NC

Spotted Horse Farm
Weston, WV

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 Place Where the White Pine Grows
Wakefield, QC

The Rare Seed Sanctuary
New Gloucester, ME

The Spring House
Nashville, TN

The Trillium Center
Conneaut, OH

The Wellspring Valley
Stahlstown, PA

Three Leaf Farm
Louisville, CO

Three Springs Farm
Waitsfield, VT

Traditions School of Herbal Studies
St. Petersburg, FL

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

Virginia Tech's Catawba Sustainability Center
Catawba, VA

Walker Mountain Botanical Sanctuary
Deerfield, VA

Wasabi Springs
Barnardsville, NC

Watershed Forest Farm
Marshall, 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
Hillsboro, WV

Windsong
Honor, MI

Wise Ways Herbs/Singing Brook Farm
Worthington, MA

Wise Woman Center
Woodstock, NY

Yew Mountain Center
Hillsboro, WV

A GREAT BIG WELCOME TO OUR NEWEST SANCTUARIES!

(Indicated in Green)

THE UpS FOREST GROWN VERIFIED PROGRAM

By John Stock

The Supply Chain

The traditional supply chain for forest botanicals looks something like this: A harvester (digger) goes into the woods and harvests plant material—roots, bark, or aerial parts. After initial processing that consists of washing and drying, the digger sells what they have harvested to a local root buyer, who buys from all of the diggers in a particular area. The root buyer then sells to the next step up the supply chain, the aggregator, who is purchasing from many root buyers in a region. The aggregator then sells up the chain to herbal product companies who value add and sell to the end consumer. Although there are mostly fair-minded root buyers, these people make their money by selling the botanicals for a higher price than the price they paid the digger.

This supply chain model has historically kept the prices of forest botanicals low enough that, with the exception of goldenseal and ginseng, it has not been economically viable to farm these plants. In order to make a profit, a farmer who has inputs and overhead such as land, planting stock, amendments, tools, and labor needs to sell their crop at a higher price than a root buyer is willing to pay. But to a digger, who in many cases only needs a root hoe or a sharp stick to harvest plants from the wild, almost any price paid is considered profit.

Here are some prices paid per dried pound to harvesters in 2019 (2019 prices from Ridge Runner Trading Company and Cornell Cooperative Extension):

- Trillium \$5.00
- Black Cohosh \$4.00
- Bloodroot \$8.00
- Goldenseal \$44.00
- False Unicorn \$100.00

We know now that due to loss of habitat and a growing appetite for herbal products, many of these forest botanicals are at-risk in the wild. If the amount of suitable habitat continues to decrease and utilization of at-risk species continues to increase, the survival of these plants is in question. It is becoming evident that in order to take pressure off of wild populations we need more farmers to intentionally cultivate forest botanicals. Partly because of UpS' advocacy for at-risk native medicinal plants over the last 25 years, consumers are realizing that the overharvest of medicinal plants from the wild is problematic.

Just like grocery shoppers who seek out organic food or ethically produced meat, herbalists and other end users have demonstrated a willingness to pay premium prices for forest-farmed botanicals. But how can an herb company or a consumer differentiate a wild ginseng root from an intentionally cultivated root? This is where the UpS Forest Grown Verification program comes in.

Forest Grown Verification

Forest Grown Verification (FGV) is a third-party verification program administered by UpS. Similar to the National Organic Program or Non-GMO certification, FGV uses record and document review, on-site farm inspection, and sales receipts to verify that a forest farmer is intentionally growing forest botanicals and not harvesting from the wild. Harvested plant material is then sold directly to herb companies who are able to market the product as UpS Forest Grown Verified. Because some consumers have demonstrated that they are willing to pay a higher price to support conservation practices, farmers receive a higher price for their crop. This premium price is more than the farmer would realize if their crop were sold to a local root buyer and enough to incentivize their forest farming efforts.

There is a core group of dedicated forest farmers currently participating in the FGV program, and Mountain Rose Herbs is now offering FGV products to consumers. They are currently selling FGV ginseng root, ginseng leaf, black cohosh root, black cohosh extract, blue cohosh extract, and whole plant ginseng extract.

The Future of FGV

UpS FGV is in part guided by an advisory board with deep experience in third party verification, forest farming, plant propagation, forest botanical processing, and purchasing.

FGV Advisory Board:

Margaret Bloomquist,
Research Assistant, NC State University

Chip Carroll,
UpS Botanical Sanctuary Steward and forest farmer

Mark Cohen,
UpS Advisory Board, Organic and FGV inspector

Katie Commender,
Agroforestry Program Director,
Appalachian Sustainable Development

Tanner Filyaw,
Director, Rural Action Sustainable Forestry Program

Ed Fletcher,
President, Native Botanicals, Inc.

In addition, UpS is collaborating with partner organizations throughout Appalachia to support the FGV program. Both the West Virginia Forest Farming Initiative (www.wvforestfarming.org) and the Appalachian Beginning Forest Farmer Coalition (www.appalachianforestfarmers.org) focus their efforts on forest farming as a way to increase economic opportunities and conserve forests and medicinal plants in Appalachia. Over the next year more farmers and herbal product companies are expected to enroll in



GIVING THE GREEN LIGHT TO HEALTHY WILD-SIMULATED GINSENG CULTIVATION

by Justin Wexler and Anna Plattner

the FGV program as a result of education and outreach efforts funded by the Benedum Foundation, NRCS Conservation Innovation Grant, USDA Beginning Farmer and Rancher Development Program, and Virginia Department of Agriculture Specialty Crop Block Grant. As a result of this funding farmers in participating states can receive cost share funds to help offset costs associated with the FGV program.

The UpS Forest Grown Verification program holds great promise toward advancing our efforts to conserve at-risk native medicinal plants. As mentioned earlier, UpS is working to add new farmers and distributors to the FGV supply chain. As consumers of herbal products, you can support these efforts by asking for FGV certified herbs and herbal products when you shop or buy supplies for your own medicine making. Anyone interested in learning how to enroll in the FGV program as a grower or distributor can email john@unitedplantsavers.org or call the UpS office at 740-742-3455. ■

John Stock is the UpS Director of Operations and Outreach.



Wild-simulated ginseng (*Panax quinquefolius*) plants growing amongst native companion plants at American Ginseng Pharm in the Catskill Mountains.

IN PASSING

*How swiftly the strained honey
of afternoon light
flows into darkness*

*and the closed buds shrug off
its special mystery
in order to break into blossom:*

*as if what exists, exists
so that it can be lost
and become precious*

– Lisa Mueller

American ginseng (*Panax quinquefolius*) loves shade but not too much shade. After seven years of direct observation of hundreds of acres of wild-simulated and wild ginseng, we've noticed a pattern. Old wild ginseng plants growing in deep shade grow extremely slowly. Likewise, in full shade, the wild-simulated seedlings of our ginseng plantings become stunted. Without brief periods of direct sunlight or full days of very bright indirect light, our plants look like seedlings for three years or longer, and they may not produce fruit for ten years or longer. In contrast, wild-simulated ginseng plants growing under canopy gaps frequently flower and fruit at three years of age. None of this is a surprise, of course; years of peer-reviewed studies have looked at the positive response of most forest understory plants to canopy gaps. This research has revealed what our ancestors already knew for millennia—even shade plants love a little boost in sunlight.

In American Ginseng Pharm's large wild-simulated ginseng plantings, which are spread out over a large swath of eastern New York State, we have plenty of opportunities to get to know American ginseng. Wild-simulated cultivation is a method in which ginseng seeds are planted in suitable forest habitat, under the leaf litter, with no tilling, soil amendment, or treatment with chemicals at any point over the life of the plant. It mimics the lifecycle of wild plants, and the end result is healthier plants and a healthier ecosystem. Our interest in understanding the variables that affect the growth of wild and wild-simulated American ginseng borders on obsession. To

sustainably grow wild-simulated ginseng on a commercial scale, we have to become intimately familiar with what forest conditions are most conducive to healthy, yet fast-growing, ginseng plants.

When we began planting seven years ago, we would never have dreamed of cutting down a large tree. The mature woods where we planted had a forest floor full of ginseng companion plants. The healthy high and multi-layered canopy provided what we believed was sufficient dappled light. During site preparation we limited our cutting to sapling-size trees that we could cut with pruners and loppers. But our ginseng grew very slowly, and we soon observed that productive plants receive short periods of direct sunlight. One of our managers at the time, Jamie Gillespie, who now runs his own innovative agroforestry operation, recommended that we experiment with altering the light regime through careful thinning of trees. As the sun moves through the sky, this provides an even layer of bright filtered light through sunflecks, a concept explored in recent research (Wagner & McGraw, 2013). Carefully thinning the canopy mimics the lighting created by the natural disturbances of an old-growth forest, such as blow-downs and branch breakage from wind, ice, lightning strikes, and old age. This beneficial cutting results in a healthier forest community and much faster growth in our ginseng plantings. But there are also bad ways to cut trees.



Ashley Schoenborn, American Ginseng Pharm manager, walking through a mature sugar maple forest with ideal sunlight dappling the forest floor.

Throughout the Northeast, selective timber cuts are a problem. These logging jobs unintentionally create large, even-aged patches of a small species of a native understory tree, the striped maple (*Acer pensylvanicum*). These thickets produce a dense shade that is severely limiting to herbaceous species diversity, including ginseng. We have also seen stunted growth of wild ginseng plants found growing in dense thickets of young American beech (*Fagus grandifolia*) trees, a habitat that is locally called, among other epithets, beech hell. As a result of beech bark disease, which is slowly killing American beech trees throughout the Northeast, the parent trees send up suckers and create practically impenetrable thickets. Such thickets are also created by selective, or high grade,



Careful thinning of a young forest that is recovering from a prior logging.

logging jobs. “Beech hell” produces a dense shade that, over time, leads to a forest floor nearly devoid of native understory plants, including American ginseng.

This is ironic: the logging jobs that bring in so much sunlight also create too much shade. And major disturbance by poor timber operations is known to cause a long-term decrease in wild ginseng populations (Chandler & McGraw, 2015). The area affected by logging operations in the Catskill Mountain region is vast and barely noticeable until you step into the forest. The extent of logging has limited many of our wild-simulated ginseng plantings to recently logged forests, making our job in providing the optimal environment for wild-simulated ginseng much trickier and more time-consuming. It is particularly difficult to create ideal wild-simulated growing conditions in the mess of sun and shade of recently logged land.

Through observation and experimentation, we have learned how to carefully choose and cut unhealthy or overcrowded trees to create the perfect light regime for both our ginseng and for wild companion plants. At the same time, we remove invasive species and carefully choose our cuts to maintain native tree species diversity. Our method of gentle thinning is supported by recent research on canopy disturbance. Ginseng growth and the growth of associated plant species increase following disturbances and boosts in sunlight (Chandler & McGraw, 2017). However, a gap that is too small may have little effect on the understory plant community, while a huge canopy gap may destroy it, burning the tender leaves of established ginseng plants and killing ginseng seedlings. In contrast, the optimum canopy gap increases biodiversity and forest health (Kern et al, 2014), and the results can be dramatic, as the forest understory transforms into a sea of lush, green native perennials, a veritable carpet of American ginseng, blue cohosh (*Caullophylum* spp., wild leeks (*Allium tricoccum*), Christmas fern (*Polystichum*

acrostichoides), bloodroot (*Sanguinaria canadensis*), and other forest botanicals.

Our alteration of the landscape to sustainably produce medicines and to encourage biodiversity is not without precedent. Native people have beneficially altered the environment around the globe—including in our region—with prescribed burns and shifting cultivation for many thousands of years. In Eastern North America, the boost in sunlight by mimicking natural disturbance not only increases biodiversity, but also makes edible fruit-bearing plants, such as the red mulberry and the pawpaw, produce larger yields of sweeter fruit. Some medicinal understory plants, such as black cohosh (*Actaea racemosa*) and American spikenard (*Aralia racemosa*), stay small for many years in dense shade, awaiting the creation of a sunny canopy gap so that they can grow much larger and finally bloom and fruit.



Wild-simulated ginseng seedlings growing within a cluster of close friends, including rattlesnake fern (*Botrychium virginianum*), maidenhair fern (*Adiantum pedatum*), blue cohosh (*Caulophyllum giganteum*), and waterleaf (*Hydrophyllum virginianum*).

These species are likely pre-adapted to take advantage of sudden influxes of light, and American ginseng seems to be among them (Chandler & McGraw, 2017). We find that healthy wild-simulated ginseng plants require a light regime that is around 70% shade, a stark contrast to the 80-90% shade that is often recommended to new growers. To better understand the direct effects of the light regime and other variables on our wild-simulated ginseng, we have partnered with Karam Sheban, a master's student at Yale University. He has made dozens of research plots in our wild-simulated plantings as part of a study that will quantify the importance of the many environmental variables that affect the health and growth of wild-simulated American ginseng, including light.

We hope that the next seven years of cultivation and observation will lead to new and better methods for cultivating wild-simulated ginseng sustainably on both the small and large scale. For landowners with forested parcels, wild-simulated ginseng cultivation is likely the only



Authors Anna Plattner and Justin Wexler with a four-prong wild ginseng plant.

economically-sustainable alternative to a bad selective logging job. Wild-simulated cultivation will also take the burden off of overharvested wild ginseng populations. We hope that our experience with wild-simulated ginseng cultivation will prove useful and encouraging to other forest farmers interested in growing this ancient plant. ■

Anna Plattner, general manager of American Ginseng Pharm, and Justin Wexler, co-manager and manager of the company's medicinal herb farm, live in the Hudson Valley of New York State. When not cultivating wild-simulated ginseng, Anna and Justin teach classes on forest farming, lead walks on native land use and folklore, and assess properties as part of their independent company, Wild Hudson Valley. Outside of work, Anna and Justin steward the diverse ecosystems of their ninety-acre United Plant Savers-certified botanical sanctuary in Cairo, NY. Justin is the author of "Identifying Ginseng Habitat," a guide to the plant species associated with wild ginseng. Anna and Justin can be contacted through www.wildhudsonvalley.com, and more information about American Ginseng Pharm can be found at www.americanginsengpharm.com.

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25 YEARS
1994-2019



Our Work Includes

- Identifying which wild medicinal herb species are currently at risk
- Fostering new botanical sanctuaries and maintaining the Botanical Sanctuary Network
- Raising consumer awareness on the use of sustainably-harvested ingredients
- Creating a sustainable future for goldenseal through our Hope for Hydrastis program

Our Mission

Our 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.

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- /unitedplantsavers
- @UnitedPlantS

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Your dollars help to support medicinal plant research and conservation. Members receive our annual journal and perks. Join online or mail your \$35 membership check to: United Plant Savers, PO Box 147, Rutland, OH 45775.

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Visit The Sanctuary

To learn about upcoming events, or to schedule a tour, a visit, or a rental, please contact: United Plant Savers Office: (740) 742-3455 or office@unitedplantsavers.org



Medicinal Plant Conservation Program

6 Weeks in Fall/Spring. Participants learn identification, conservation & cultivation, sustainable wild harvesting practices, medicine making & more.



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- Rooms • Camping
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Talking Forest Trail

A 6-mile, information-laden trail that represents years of effort by UpS staff & our supporters. Experience the splendor of this forested herbal treasure chest!



Art Fellowship Program

We welcome artists to spend time at the sanctuary exploring their artistic perspective as it relates to the role of native medicinal plants in the ecosystem through our Deep Ecology Artists Fellowship. Apply online.



Visit our website to learn more about the Forest Grown Verification Program and its benefits for producers.

WWW.UNITEDPLANTSАVERS.ORG

UpS INTERNSHIP CREATES OPPORTUNITIES IN APPALACHIAN OHIO

by Brenna Dobos and Bailey Grenert

The UpS internship program, also known as the Medicinal Plant Conservation Certificate Program, has played a prominent role in the story of United Plant Savers and the nonprofit's lasting impact on the herbal community over the past 25 years. The internship program began in the late 1990s under the guidance of Paul Strauss and continues to inspire plant allies in North America and beyond with two six-week sessions every year.

This experiential program takes place on the 379-acre UpS Botanical Sanctuary in Rutland, Ohio each spring and fall, connecting people to plants—and to each other—in an intimate, intentional, and enduring way. Interns live at the Sanctuary and learn medicinal plant conservation and land stewardship through a variety of hands-on activities. These activities include identifying, cultivating, and making medicine from native plants, attending classes with local herbalists and sustainable forestry experts, and experiencing the ethnobotany of Appalachia through facilitated field trips and independent excursions. After six weeks at the Sanctuary, the “green spark” follows interns home as they move forward with their lives and inspire folks back in their own communities. Many interns go on to study clinical herbalism or sustainable farming, open their own apothecary, educate others about medicinal plant conservation, buy land, and build community. Interns are crucial in spreading the UpS mission far and wide.

In 2017, UpS funded its first AmeriCorps position at the Sanctuary to maintain trails, educate visitors, engage in outreach activities, and build capacity for the growing nonprofit. This position created new opportunities for interns to remain in the area and stay involved in UpS' vital work. A few former interns have managed to stay in the neighborhood as AmeriCorps service members advocating for medicinal plant conservation and sustainable forestry, educating community members and fellow interns, maintaining the Sanctuary grounds, engaging in service projects in Appalachian Ohio and building capacity for UpS' nonprofit organization.

Bailey Grenert, Cierra Bailey, and Brenna Dobos are former interns who transplanted to Southeast Ohio for AmeriCorps positions. Bailey and Brenna are the current AmeriCorps members at United Plant Savers, and Cierra completed her term with our partner organization, Rural Action Sustainable Forestry. As AmeriCorps service members, they have been given the opportunity to stay in the community, build capacity at UpS, and gain valuable experience. ■

United Plant Savers' Medicinal Plant Conservation Certificate Program

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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



UNITED PLANT SAVERS' 25TH ANNIVERSARY CELEBRATION AND GRAND OPENING

by Bailey Grenert and Brenna Dobos

United Plant Savers' 25th Anniversary was celebrated on the Fall Equinox, September 21-22, 2019 at the UpS Botanical Sanctuary in Rutland, Ohio. The occasion also marked the Grand Opening of the Center for Medicinal Plant Conservation, a momentous achievement for UpS in our 25th year. We are grateful to have shared the celebration with 250 of our friends, family, neighbors, plant allies, and longtime members from all over North America. The two-day event featured presentations by Rosemary Gladstar, Paul Strauss, and Steven Foster as well as performances by 1,000 Faces Mask Theater, Doug Elliot, Høly River and Intermittent Animals.

The festivities were kicked off by an unparalleled performance from 1,000 Faces Mask Theater of Rappahannock County, Virginia depicting threats posed to medicinal plants by human activities. 1,000 Faces evoked an emotional response from the crowd and ended on a message of intentional stewardship in ecological recovery.

"Never doubt that a small group of thoughtful committed citizens can change the world; indeed, it is the only thing that ever has." – Margaret Mead

Rosemary Gladstar's heartfelt welcome address told the story of United Plant Savers' creation and how it coincided with the birth of the modern herbal renaissance. Following this, Paul Strauss gave a moving speech that detailed his introduction to herbal medicine, sustainable farming, and his deep connection to the land and community in which UpS plays a defining role. Paul and Rosemary organized fellow herbalists to form United Plant Savers in 1994 as a nonprofit dedicated to native medicinal plant conservation. Together they instilled a sense of community centered on the UpS Botanical Sanctuary and influenced change in the greater herbal community.

Distinguished author and photographer, Steven Foster presented a heartfelt dedication to Dr. James A. Duke, the beloved botanist for whom the Jim and Peggy Duke Center for Medicinal Plant Conservation is dedicated. Dr. Duke and Peggy Kessler Duke, his wife and botanical illustrator, published several preeminent texts covering botanical and herbal medicine resources. Foster and Duke teamed up on notable publications including the *Peterson Field Guide to Medicinal Plants of Eastern and Central North America*. In addition, a memorial ceremony for Duke was held at Heart Pond by those who knew him closely. Some of his ashes were spread across the pond in remembrance of his life and gifts to the herbal community.

The evening's entertainment began with Doug Elliot, an herbalist, naturalist, and storyteller from North Carolina, who set the tone for a night of music and celebration. A longtime friend of UpS, Elliot captured the audience with his harmonica playing, vivid storytelling, and lively sing-along songs accompanied by Jameson Price of Høly River.

Høly River (formerly Lobo Marino), an experimental folk duo from Richmond, Virginia, performed a powerful set with themes of water protection and environmental and political activism. Between sets, Nathan Wright gave a short speech connecting the themes of activism in Høly River's music with the mission of UpS. Wright is one of the leaders of MackinawOde (Heart of the Turtle), a water protection action group in Michigan.

The Intermittent Animals from Columbus, Ohio lightened the mood with upbeat folk jams that got the crowd dancing. Eventually, the evening wound down with late night campfire songs, dips in Heart Pond, and sleepy campers wandering back to their tents.

On Sunday guided hikes were led by Marc Williams, Tanner Filyaw, Lonnie Galt-Theis, Betzy Bancroft, Rebecca Wood, and Chip Carroll. Each guide shared extensive plant knowledge and personal UpS stories with their group.

We are immensely grateful to our members who made this event possible—we couldn't do this without you all. Thank you to the native medicinal plants and their habitats that inspired the creation of United Plant Savers.

Finally, thank you to everyone who joined us for this special weekend. Stay tuned for a fall, 2020 UpS reunion featuring workshops, music, hikes, and camping at the Ohio Sanctuary! ■



1000 faces sign at the opening ceremony



Rosemary Gladstar and Paul Strauss telling stories at the opening



MPCA recipient, Monica Cady and Nathan Wright



View of the new center from the prairie



New sign at the entrance to the sanctuary



2020 ANNUAL MEDICINAL PLANT CONSERVATION AWARD

— Recipient —

HOWIE BROUNSTEIN

by Alex Queathem

Howie Brounstein, primary instructor and cofounder of the Columbines School of Botanical Studies is the well-deserved recipient of the 2020 Medicinal Plant Conservation Award.

Howie Brounstein is a teacher who has a classroom without a roof. He spends over a thousand hours every year in the forests working with the plants and his students. His unique teaching style sets him apart from the rest. His witty sense of humor keeps students enthused and attentive, even during the drier topics. Every joke, gesture, and song is layered with knowledge from decades of personal experience and observation. He adapts curriculum throughout the years encompassing scientific changes and generational trends. Howie teaches through repetition, espousing that it is the key to mastery and securing the information in long-term memory.

Howie's career in herbalism legally started in 1982 with the founding of Columbines Wizardry & Herbs, Inc. As an herbal manufacturer of quality wildcrafted herbal products, his intentionally small business supplied high quality, bioregional herbs to the local communities throughout the west.

In 1994, Howie conducted research on rare, threatened, and endangered plant species by locating and documenting new populations of protected plants. His plant sighting reports were submitted to the Oregon Natural Heritage Program's database. In 1995 and 1996

he conducted more research on the Isla Magdalena Reserva Biologica, a remote island off the coast of Patagonia.

At the same time, Howie's teaching career was also blossoming. He taught at many schools, including seven years at Michael Moore's Southwest School of Botanical Medicine. Columbinex and Wizardry and Herbs, Inc. changed its focus in 2006, evolving into the Columbinex School of Botanical Studies, which Howie co-founded with his own student, Steven Yeager. The school is in operation today and is located in Eugene, Oregon.

Howie is the primary instructor of this three-plus year program for the Columbinex School. The school offers a unique educational program ranging from entry level lectures in community herbalism to a three-plus year apprenticeship program that focuses on topics of college level botany and ecology, ethical wildcrafting principles, plant pharmacy, physiology, and clinical herbalism. Operating for over thirty-six years, Columbinex School specializes in field programs where the majority of the classes are outside working with the plants. The school also runs a low-cost, community-oriented teaching clinic where Howie passes on his clinical skills to students and helps the community on their personal healing journey.

Columbinex School field experiences are in the forests of the Cascade Mountains regardless of elevation or forecasted weather conditions. Columbinex' students are well prepared for any future field work, camping, or personal adventure and will have obtained many life-long skills from this program. Howie teaches less familiar skills like the language of field botany and dichotomous keys. Many Columbinex graduates have moved on to well-regarded positions in plant fields and are making dramatic decisions that are impacting the Earth.

Howie is a bioregional herbalist with teaching populations that he has monitored for nearly four

decades. Watching their growth and effects of different impacts, he has shared many valuable skills for wildcrafting in the most ethical ways possible, focusing on when not to harvest to maintain sustainability. Students walk away with invaluable lessons on the long-term view of plant populations and their relationship with the ecosystems.

Howie played a significant role in developing Forest Service permits for non-timber forest products. These permits regulate many materials such as fungi, nuts, seeds, berries, and medicinal and edible plants for wildcrafters and foragers.

Howie coined the phrase "Wildcrafting is Stewardship", which is a core practice at the Columbinex School. Always advocating, Howie says, "Every time my apprentices harvest anything, I ask them what 'wildcrafting is stewardship' means to them. The answers become personalized for each individual. To me, it means if you take care of the earth, the earth will take care of you. I am a caretaker of these wild plants, returning year after year to many places to watch and protect the plants that support me."

Howie truly deserves this award. He has dramatically influenced many people in this world and has dedicated his life and health to the woods, the plants, and his students. He is bringing awareness to the herbal community on plant-lust and how to protect the plants first and foremost.



Closeup Plant Examination

Howie created the Wildcrafting Checklist to reflect the mission behind the school and his own personal beliefs. Howie explains, "The majority of the wildcrafters are looking for a way to connect with nature for the day, have fun, and finish with some plants for food, medicine, fiber, or art. These wildcrafting guidelines are for you."

You can find more information on both Howie and the Columbinex School of Botanical Studies on Facebook, Instagram, YouTube, and at www.botanicalstudies.net. ■



Opening Circle panorama. photo by Heidi Sundstrom

PLANTING THE FUTURE AT HERB PHARM: 2019

By Alexis Durham

On June 15, Herb Pharm welcomed over 250 people to our farm in southern Oregon for our *Planting the Future* conference, a benefit for United Plant Savers. The day was filled with informative workshops and plant walks featuring local and regional instructors as well as current and past UpS Board members. A variety of regional vendors sold bulk herbs, seeds, handmade herbal products, and herbal elixirs, and lunch was accompanied by singer-songwriter Jaimee Simundson. 2019 marked a special milestone for both organizations, as United Plant Savers celebrated its 25th anniversary and Herb Pharm its 40th.

Classes appealed to a variety of skill levels and interests, which included bioregional herbs and foods with Herb Pharm's Lead Educator, Autumn Summers; the herbalist's path to giving back with UpS Secretary, Bevin Clare; endangered plants in essential oils with UpS board member, Kelly Ablard; the ins and outs of running a production herb farm with the owners of Oshala Farm, Jeff and Elise Higley; and the interconnectedness of all things through story with native storyteller, Thomas Doty.

Other topics included good harvesting methods and quality control practices with Herb Pharm co-founder, Ed Smith; an appreciation of Rose with UpS Advisory Board Chairperson, Mindy Green; the ecology of seaweeds with wildcrafter, James Jungwirth; aloe diversity with former UpS board member, Richo Cech; substitutes for at-risk species in clinical practice with UpS President, Kat Maier; and wildcrafting in a warming world with author and wildcrafter, Scott Kloos. We were thrilled to offer a botanical illustration intensive with Kathleen Harrison, ethnobotanist and co-founder of Botanical Dimensions, who also taught a class on new ways of seeing tobacco (*Nicotiana tabacum*) based on various cultural traditions.

There were a variety of herb walks around our 80-acre Certified Organic farm, including creating an herb garden in the spirit of the elders with UpS board member, Helen Lowe Metzman; uses of wild weeds and culinary plants with former UpS board member, Jane Bothwell; and a tour of the many UpS "At-Risk" and "To-Watch" plants with Herb

Pharm's Farm Supervisor, Mark Disharoon. UpS Treasurer, Steven Yeager, led a walk that celebrated the beauty of botanical language; Farm Manager, Matt Dybala, offered a hands-on experience with UpS species cultivated at Herb Pharm; and UpS Founding President, Rosemary Gladstar, with Edward Fletcher, owner and COO of Native Botanicals, Inc., led an herb walk through our 500-species Botanical Education Garden.

Herb Pharm and UpS have a long history, and Herb Pharm was among UpS' earliest supporters. In the 1990s, when wildcrafting was still very common and wildcrafted material was considered the "gold standard" in herbalism, we purchased directly from ethical wildcrafters for many of our extracts. We saw firsthand that roots were getting smaller as prices were getting higher, and concern about the future of herbs like goldenseal (*Hydrastis canadensis*) increased. When Rosemary Gladstar called on herbalists to raise awareness of the impending scarcity of traditional American medicinal herbs, it was clear to us that this was a cause worth supporting.



UpS Founding President Rosemary Gladstar with Ladies Mantle in Herb Pharm's Botanical Education Garden. photo by Bert de la Cruz

Herb Pharm Farm Manager Matt Dybala pots up a young Black Cohosh on his plant walk. photo by Bert de la Cruz

Herb Pharm co-founders Ed Smith and Sara Katz. photo by Heidi Sundstrom

Our co-founder, Sara Katz, joined the UpS Board in 1998 and was board president from 2008 to 2018. Around 15 to 20 years ago, the Herb Pharm farm was designated a UpS Botanical Sanctuary at the inception of that program, and in 2004 we planted rows of poplar trees along the creek that runs through our farm, extending the riparian area and creating more habitat for eastern woodland plants. Since the purchase of the land in 1994, the number of “At-Risk” and “To-Watch” species thriving around the farm has grown to include pleurisy root (*Asclepias tuberosa*), trillium (*Trillium* spp.), echinacea (*Echinacea purpurea*), lobelia (*Lobelia inflata*), lomatium (*Lomatium dissectum*), Oregon grape (*Mahonia aquifolium*), goldenseal (*Hydrastis canadensis*), black cohosh (*Actaea racemosa*), blue cohosh (*Caulophyllum thalictroides*), bloodroot (*Sanguinaria canadensis*), stoneroot (*Collinsonia canadensis*), cascara sagrada (*Frangula purshiana*), slippery elm (*Ulmus fulva*), spikenard (*Aralia racemosa*), and false unicorn root (*Chamaelirium luteum*). We grow the vast majority of these species for conservation and education purposes, and most of them will never be harvested for use in our products.

Herb Pharm is truly thankful for the many opportunities we have been afforded to support United Plant Savers and their mission to protect native medicinal plants of the U.S. and Canada and their native habitats. Twelve years ago, we adopted goldenseal, which we honored on our original logo as part of UpS’ Adopt an At-Risk Plant program. We’ve also made significant contributions towards the construction of the recently-opened *Center for Medicinal Plant Conservation* on UpS’ Goldenseal Sanctuary in Ohio. We continue to share our appreciation for the plants and this organization with others by supporting UpS’ *Partners in Education* program, providing each graduate of our Herbaculture Intern Program with a UpS membership.

This *Planting the Future* conference was the fourth that Herb Pharm has organized and hosted, and we are excited for the future, as we continue to share our love of herbs and herbalism with others. We are profoundly grateful to all of the attendees, teachers, vendors, volunteers, and UpS Board members as well as Herb Pharm’s incredible farm and landscape crews, whose efforts were absolutely critical in preparing for this event. Above all, we give thanks to the plants for bringing us together for this day of education and celebration. While both organizations have grown, Herb Pharm and United Plant Savers still share many core values, and we look forward to future collaborations that highlight our shared beliefs in the importance of conservation, cultivation, education, and research around vulnerable North American species. ■

Alexis Durham is an Herbalist and Botanical Affairs Supervisor at Herb Pharm. She has a bachelor’s degree in Herbal Science from Bastyr University and a management degree from Clemson University. Alexis has taught at several herb schools, conferences, and community events and continues to be passionate about education in her role at Herb Pharm, where she oversees the Herbaculture Intern Program and coordinated the Planting the Future conference. She loves the dynamic nature of her position and also assists with regulatory review, quality assurance, and new product development and enjoys speaking with customers and leading tours.

UpS IN THE NEWS

United Plant Savers was acknowledged with two awards in 2019. The first was *Nutrition Business Journal’s* “Stewardship Award” along with a detailed article on the history and success of UpS titled, “United Plant Savers Works to Keep the Wild West Out of Wildcrafting and Preserve Native Herbs”. The second award was “Sustainable Partner” from Rural Action based in Ohio. These two awards honor our dedication in working with rural land owners to grow medicinal plants as well as our work with the herbal products industry to improve the supply chain of wild botanicals.



“Over the past 25 years, UpS has brought together a diverse mix of perspectives and voices from industry, academia, and diehard herbalists to create programming designed to shepherd herbs toward a sustainable future, despite the intensive pressures of growth cycles of the supplement world. “UpS chose the route of inclusion,” says McGuffin. “That’s part of the reason why it’s remained relevant all of these years. They’re not only talking to themselves.”



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 2019-2020 schools and programs:**

Appalachian Ohio School of Herbal Medicine

Rutland, OH
herbsheal.com

ArborVitae School of Traditional Herbalism

New York, NY
arborvitaeny.com

Bastyr University Herbal Sciences

Kenmore, WA
bastyr.edu

Blazing Star Herbal School

Ashfield, MA
blazingstarherbalschool.typepad.com

Blue Otter School of Herbal Medicine

Fort Jones, CA
blueotterschool.com

Botanica

New River, AZ

Chestnut School of Herbal Medicine

Weaverville, NC
chestnutherbs.com

Columbines School of Botanical Studies

Eugene, OR
botanicalstudies.net

Dandelion Herbal Center

Kneeland, CA
dandelionherb.com

Florida School of Holistic Living

Orlando, FL
holisticlivingschool.org

Green Comfort School of Herbal Medicine

Washington, VA
greencomfortherbschool.com

Green Girl Herbs and Healing

Hopewell, NY
greengirlherbs.com

Green Turtle Botanicals

Nashville, IN
greenturtlebotaniclas.com

Greenwood Herbals

Limerick, ME
greenwoodherbals.com

Herb Pharm

Williams, OR
herb-pharm.com/connect/internship

Herbal Academy of New England

Bedford, MA
herbalacademyofne.com

Herbal Sage Tea

Pomeroy, OH
herbalsage.com

Heartstone Herbal School

Van Etten, NY
heart-stone.com

Jean's Greens

Castleton, NY
jeansgreens.com

Luna Farm Herbal Gardens and Botanical Sanctuary

Troy, IL
lunaherbco.com

Magnolia School

Glouster, OH

Maryland School of Integrative Health

Laurel, MD
muih.edu

Milagro University of Herbal Medicine

Orlando, FL
milagroschoolofherbalmedicine.com

Mockingbird Meadows Eclectic Herbal Institute

Marysville, OH
mockingbirdmeadows.com

Moonwise Herbs

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 Herbalism

Montpelier, VT
vtherbcenter.org

Wintergreen Botanicals Education Center

Allenstown, NH
wintergreenbotanicals.com

HERBAL BUSINESS MEMBERS

101 CBD

Ventura, CA
101cbd.org

21 Drops

Delray Beach, FL
21drops.com

A Wild Soap Bar

Manor, TX
awildsoapbar.com

ABRA Therapeutics

Dallas, TX
abratherapeutics.com

ADLIB Clothing

Asheville, NC
adlibclothing.com

AH2Os Herbal Products & Services

Great Mills, MD

All Good Products

Morro Bay, CA
allgoodproducts.com

Alkemists Laboratories

Garden Grove, CA
alkemist.com

Alternatives For Wellness

Waltham, MA
alternatives-eds.com

American Ginseng Pharm

Preston Hollow, NY
americanginsengpharm.com

American Medicinal Arts

Trinity, TX americanmedicinalarts.com/store

Amulette Studios

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amulettestudios.com

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ancestralherbology.com

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angelinaskincare.com

Apoterra Skincare Co.

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apoterra.com

Apothecary Tinctura

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apothecarytinctura.com

Aromafloria

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aromafloria.com

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artemisiabotanicals.com

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Asheville, NC
ashevillerravenandcrone.com

Atmosphoria LLC

Morrisville, VT
www.atmosphoria.com

Barefoot Botanicals

Doylestown, PA
barefootbotanicals.net

Bloomin' Art

Asheville, NC

Blue Crow Botanicals

Gill, MA bluecrowbotanicals.com

Botanical Kitchen

Waltham, MA
botanickitchen.com

Braidstream Music

Asheville, NC
braidstream.com

Burmeister Ginseng

Wausau, WI
burmeisterginseng.com

Dandelion Herbal Center

Kneeland, CA
dandelionherb.com

Desert Sage Herbs

Chandler, AZ
desertsageherbs.com

Doe River Farms

Roan Mtn, TN

Earth Mama Organics

Clackamas, OR
earthmamaorganics.com

Eaton's Creek Farm

Joelton, TN

Elixirs for Life

Calgary, Alberta
elixirsforlife.ca

Empowered Herbs

Chimacum, WA

Equinox Botanicals

Rutland, OH
equinoxbotanicals.com

Essence of Thyme Ltd

Langley, BC
essenceofthyme.com

Everyday Alchemy Tonic Co.

Laytonville, CA

Fat of the Land Apothecary

Catskill, NY fatofthelandapothecary.com

Five Flavors Herbs

Oakland, CA
fiveflavorsherbs.com

Forrest Green Farm LLC

Louisa, VA
forrestgreenfarm.com

Franny's Pharmacy

Asheville, NC
frannyspharmacy.com

Frontier Natural Products

Norway, IA
frontiercoop.com

Gaia Herbs

Brevard, NC
gaiaherbs.com

Genie's Dream

Gatlinburg, TN

Gig Harbor Naturopathic Medicine

Olalla, WA
gigharbornaturopathic.com

Golden Apple Healing Arts, LLC

Neenah, WI
drmarthalibster.com

Golden Needle Acupuncture

Fletcher, NC
goldenneedleonline.com

Goldthread Herbs

Florence, MA
goldthread-herbs.myshopify.com

Goosefoot Acres Inc

Valley City, OH

GRD Healing Arts Clinic

Dunwoody, GA
grdhealth.com

Green Dragon Botanicals

Brattleboro, VT
greendragonbotanicals.com

Green Girl Herbs & Healing

Hopewell Junction, NY
greengirlherbs.com

Guayaki Sustainable

Rainforest Products
Sebastopo, CA
guayaki.com

Head To Toe

Black Mountain, NC

Healing Spirits Herb Farm & Education Center

Avoca, NY
healingspiritsherbfarm.com

Health & Wisdom Inc.

Arcola, MO
health-and-wisdom.com

Heartwood Forest Farm

Cedar, MI
heartwoodforestfarm.com

Heather's Herbs

Charlottesville, VA
heathersherbs.com

Hedge Witch Apothecary

Gibsonia, PA
hedgewitchapothecary.com

Herb Pharm

Williams, OR
herb-pharm.com

Herbal Lodge

Petoskey, MI
herballodge.com

Herbal Revolution

Union, ME
herbalrev.com

Herbalism Roots

Denver, CO
herbalismroots.com

Herbalist & Alchemist, Inc.

Washington, NJ
herbalist-chemist.com

Herbiary

Asheville, NC
herbiary.com

Herbolab

Taguig, Metro Manila
herbolab.com

Herbs Etc.

Santa Fe, NM
herbsetc.com

Herbs For Life

York, ME
herbs-for-life.com

Herb Wise Therapeutic Botanicals

Cobb, CA
herbwisetherapeuticbotanicals.com

Higher Mind Incense

Port Ludlow, WA
highermindincense.com

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Paramount, CA
holywild.me

Homestead Apothecary

Walnut Creek, CA
homesteadapothecary.com

Insight Herbals

Macedon, NY
insightherbals.com

Jade Mountain Wellness

Burlington, VT
jademtwellness.com

Jean's Greens

Castleton, NY
jeansgreens.com

Jewels That Dance

Asheville, NC
jewelsthatdance.com

Kim Manley Herbals

Dillon Beach, CA
kmherbals.com

Kroeger Herb Products

Boulder, CO
kroegerherb.com

Kuumba Made

Tucson, AZ
kumbamade.com

La Abeja Herbs

Austin, TX
laabejaherbs.com

Laura's Botanicals

Richmond, VA
etsy.com/shop/laurasbotanicals

Laurel Whole Plant Organics

Sausalito, CA
laurelskin.com

Leaf People Skin Care

Basalt, CO
leafpeople.com

LearningHerbs LLC

Shelton, WA
learningherbs.com

Live Botanical

Portland, OR
livebotanical.com

Loess Roots
Stanton, NE
landscapingrevolution.com/Loess_Roots/loess_roots.html

Mako Labs LLC
Delray Beach, FL
21drops.com

Malaprop's Bookstore Cafe
Asheville, NC malaprops.com

Mama Jo's Sunshine Herbals
Indian Harbor, FL
mama-jos.com

Mangum Pottery
Weaverville, NC
youngbloodbikes.com

Maison/Made
New York, NY
maisonmade.co

Marvin's Organic Gardens
Kings Mills, OH
marvinsorganicgardens.com

Medicine Hunter Inc.
Leverett, MA
medicinehunter.com

Mellie Mac's Garden Shack
Black Mountain, NC

Mindful Life Nutrition
Dallas, TX
mindfullifenutrition.com

Mom's Organic Market
Rockville, MD
momsorganicmarket.com

Moon & Bloom
New York, NY
moonandbloom.com

Moon Bath
Boulder, CO
moonbath.com

Moonmaid Botanicals
Cosby, TN
moonmaidbotanicals.com

Mother Earth Foods
Parkersburg, WV
motherearthworks.com

Mountain Rose Herbs
Eugene, OR
mountainroseherbs.com

Mountain Run Farm
Big Island, VA
mountainrunfarm.com/history

Native Remedies
Oshkosh, WI
nativeremedies.com

Natural Hope Herbals
Millersburg, NY
naturalhopeherbals.com

Nature's Storehouse
Tryon, NC
naturesstorehousenc.com

New Chapter
Brattleboro, VT
newchapter.com

Noell Crystals ApS
Helsingør, Denmark
noellcrystals.com

North Country Herbalist Guild
St Paul, MN
nchg.org

Northica Media
Winnipeg, MB, CAN
northica.com

Oneka Elements
Frelighsburg, QC
onekaelements.com

Oshala Farm
Grants Pass, OR
oshalafarm.com

Perry Hill Farm
Millbrook, NY
<http://perryhillfarm.com>

Pharma Botanica
Mona Vale, NSW, Australia
pharmabotanica.com.au

Plant Spirit Oracle
State College, PA
plantspiritoracle.com

Radicle Wellness
Bishop, CA
radiclewellness.com

Railyard Apothecary
Burlington, VT
railyardapothecary.com

Rasa Koffee
Boulder, CO
wearerasa.com

RE Botanicals
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rebotanicals.com

Red Moon Herbs
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redmoonherbs.com

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ridgerunnertrading.com

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Lake Placid, NY
root-alchemy.com

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rootsmedicinegardens.com

S.A. Plunkett Naturals
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saplunkett.com

Sacred Moon Herbs
Dripping Springs, TX
sacredmoonherbs.com

Sacred Plant Traditions
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sacredplanttraditions.com

Sage Mountain Retreat Ctr.
East Barre, VT
sagemountain.com

Sandy Mush Herb Nursery
Leicester, NC
<http://sandy-mush-herbs.com>

Senses of the Soul
Calgary, AB
sensesofthesoul.ca

Seven Arrows Farm
Attleboro, MA
sevenarrowsfarm.com

Seven Sisters Gallery
Black Mountain, NC
sevensistersgallery.com

Shagbark Seed & Mill
Athens, OH
shagbarkmill.com

Sister Fox
St Petersburg, FL
thesistersfox.com

Solidago School of Herbalism
Deer Isle, ME
solidagoherbschool.com

Soulfire Sanctuary
Swannanoa, NC
soulfiresanctuary.com

Southern Oregon Bokashi
Talent, OR
sobokashi.com

Starwest Botanicals
Sacramento, CA
starwest-botanicals.com

The Captain's Bookshelf
Asheville, NC
captainsbookshelf.com

The Garden Continuum, Inc.
Bellingham, MA
thegardencontinuum.com

The Ginkgo Tree
Cannington, Ontario, Canada
theginkgotree.ca

The Green Clinic: Herbal and Traditional Healing
Wakefield, QC

The Grow Network
Paonia, CA
thegrownetwork.com

The Middle Aged Spread
Taos, NM
themiddleagedspread.com

The Royal Treatment Veterinary Center
Chicago, IL
royaltreatmentveterinarycenter.com

The Scarlet Sage Herb Co.
San Francisco, CA
scarletsage.com

The Urban Apothecary
Toronto, Ontario, Canada
urbanapothecary.ca

Therapeutic Thymes
Lancaster, PA
therapeuticthymes.com

Traditional Medicinals
Sebastopol, CA
traditionalmedicinals.com

Vibrant Souls
Boulder, CO
soulvibrance.com

Vineyard Herbs Teas & Apothecary Vineyard
Haven, MA
vineyardherbs.com

Vital Plan, Inc.
Raleigh, NC
vitalplan.com

Vitality Works
Albuquerque, NM
vitalityworks.com

West Village Market & Deli
Asheville, NC
westvillagemarket.com

Wholesale CBD Providers
Las Vegas, NV
wholesalehempandcbd.com

Wild Carrot Herbals LLC
Enterprise, OR
wildcarrotherbals.com

Wild Muskoka Botanicals
Dwight, Ontario, Canada
wildmuskoka.com

Wildcraft Herbs
Asbury Park, NJ
wildcraftherb.com

WishGarden Herbs
Louisville, CO
wishgardenherbs.com

Woodland Essence
Cold Brook, NY
woodlandessence.com

WTS Med Inc.
Montpelier, VT
wtsmmedproducts.com

Yellow Emperor
Eugene, OR
yellowemperor.com

Youngblood Bicycles
Asheville, NC
youngbloodbikes.com

Zack Woods Herb Farm
Hyde Park, VT
zackwoodsherbs.com

Zensations Apothecary
Baltimore, MD
zensationsbyjen.com

Herbal business members have a unique opportunity to educate their customers about issues surrounding the sustainable supply of our native medicinal plants. More information about the corporate member program is on our website.



United Plant Savers

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