

Urban Foraging in Municipal Parks and Public Schools

Opportunities for Policymakers

By Sabine Dabady and Philip B. Stark



Dandelions that spring up from yards, sidewalks, schoolyards, municipal parks, and open corner lots are commonly viewed as resilient weeds. To an urban forager, they are a prime example of edible, fresh, nutritious, free foods. US Forest Service research has found that harvesting wild foods in public spaces, specifically plants and fungi, already contributes (and could contribute more) to the nutritional needs of city residents.^{A,1} By supplying accessible, nutritious food, foraging could provide a supplementary food source within the urban and peri-urban landscape as part of a multi-pronged strategy to help address socioeconomic inequities in access to nutritious foods.

The success of foraging in the urban ecosystems of California depends on enabling city dwellers to safely and freely harvest plants in their local environment. Currently, urban foraging is often prohibited. In some places, it is unsafe due to soil contaminants, including metals and pesticides. Focusing policies on foraging on land that is under active public management, such as city parks and public schools, offers an immediate opportunity to increase access to wild and feral foods,^B to ensure the safety of harvested food, and to educate the public and land managers alike. Foraging is already practiced in both urban and rural settings, and is increasingly the focus of attention within urban green space planning.² Urban foraging is now at the periphery of the food system, much like farmers markets and community gardens once were. However,



English plantain (*Plantago lanceolata*) gathered while collecting samples for heavy metal testing in West Oakland.

with state support for institutions that make it safe and accessible in municipal parks and public schools, partnered with citizen education, foraging has the potential to become much more widely accepted and valued.

Urban Foraging as a legitimate practice on public lands

Policy recommendations include:

1. Increase Access to Public Lands for Foraging
2. Ensure Food Safety
3. Provide Participatory Nutrition and Culinary Education
4. Promote Integrated Pest Management
5. Facilitate Testing of Contaminated Soil

A. Foraging is already common and popular in many parts of America: the same Forest Service research in the northeastern US found that about 18 percent of residents foraged at least occasionally, making it a more popular activity than golf, football, or baseball.

B. In this brief, "wild foods" refer to those never domesticated; "feral foods" were once domesticated but have now propagated without help.

Nutritional Benefits of Urban Foraging

Berkeley Open Source Food (BOSF), a research group at UC Berkeley that promotes the consumption of wild and feral foods, maps the availability of foraged foods, measures their nutritional content, and tests them for environmental contaminants. BOSF has identified more than 100 wild and feral edible foods in the East Bay Area, and many more can be found throughout the state. Over the past three years, BOSF team members have conducted on-the-ground surveys in three “food deserts” in Richmond, Berkeley, and Oakland, estimating that, depending on the season, up to several thousand servings (each serving being half a loose cup) of culinary-quality greens are available at individual urban residential addresses.

The nutritional density of wild and feral foods can be greater than that of their domesticated counterparts.³ For instance, nutritional tests show that foraged dandelion has twice as much calcium and fiber and 2.5 times as much iron as store-bought dandelion. Mallow has more calcium than milk and eight times as much iron as spinach, by volume.⁴ Given the concentration of micronutrients in wild plants, policymakers can help advance food security by looking at how populations with poor access to nutritionally dense foods can get better access to these foods.

Urban Foraging’s Potential in an Inequitable Food Environment

At this time, urban foraging is on the periphery of the food system, but with public education and state support, it can grow in acceptance. It differs from other strategies to address nutrition and food security because it can help address some critical food-access challenges through a unique combination of proximity, variety, quality, and affordability.⁵

Foraged Foods Are Accessible

Many urban residents face time and travel costs that prevent them from purchasing fresh food. A USDA study found that people living in low-income areas who had

to travel more than a mile spent on average nearly 20 minutes traveling to a grocery store.⁶ They may take even longer to reach grocery outlets if they lack a car or efficient public transportation. In contrast, wild foods grow freely in many public and private spaces, and harvesting them requires a small amount of education, but no travel, waiting in line, or direct cost.

Foraged Foods Are Affordable

They do not need to be planted, fertilized, or watered. The only human input foraging requires is education to identify these nutritious free foods. By removing the structural barriers to foraging outlined below, foraging can become an incidental, opportunistic activity performed while going about one’s daily life. This is especially true in seasons when thousands of servings can sprout, or volunteer, at a single address.

Foraged Foods Can Be of Culinary Quality

Many people think of dandelions, mallow, purslane, and other wild plants as weeds—not as sources of food and medicine. Some who know that certain “weeds” are edible think of them as punishingly bitter or otherwise unpalatable survival foods. The reality is that many wild and feral plants, harvested at the right time, are culinary-quality ingredients. We must pay attention to both cultural and sensory barriers to wider consumption of wild and feral foods. Some wild greens, for instance, have stronger flavors or more complex or aggressive “mouth feel” than their domesticated counterparts.

Foraged Foods Can Supplement Dietary Nutrition

Foraging wild foods will not fully meet people’s nutritional needs or caloric requirements. Nor will foraging ensure food security in urban food deserts. But foraging can supplement nutrition in many communities by providing a biodiverse, fresh, affordable supply of greens that are rich in micronutrients and dietary fiber. Some communities have recognized and pursued the potential of wild and feral foods, such as those in Asheville, North Carolina (See Example A) and Seattle, Washington (See Example B). Those innovative programs may offer options for California to expand the use of wild foods to meet community needs.

EXAMPLE A: CONNECTING FAMILIES TO WILD FOODS

The Afikomen Project is a pilot foraging education program in Asheville, North Carolina, that combines outdoor education and nutrition in partnership with public schools.⁷ In 2012, the Asheville Metropolitan area had the ninth highest rate of food insecure families in the country,⁸ yet Asheville is located in the Katuah Bioregion—home to over 100 common local wild edibles. The Afikomen Project exemplifies a viable model for empowering families to forage as a supplemental method of combatting food insecurity.

EXAMPLE B: MAKING EDIBLE LANDSCAPES

Seattle has helped establish an edible urban forest, the Beacon Food Forest (BFF), on a seven-acre public utility lot.⁹ The community is growing a variety of plants from which locals can forage.¹⁰ The promotion of edible landscapes like those at BFF can encourage foragers to get involved in municipal land preservation and stewardship.¹¹ Bridging food production with forestry management, BFF is actively engaged in normalizing foraging within the park's land management practices. More study is needed, but it appears that BFF is building a model for integrating land access, food safety, and efforts to change eating perceptions associated with foraging.

Challenges and Recommendations to Facilitate Foraging

Access Challenge: Although wild foods are abundant and ubiquitous, agencies responsible for most public lands, including California state, regional, and local parks,¹² generally do not permit the disturbance or removal of plant parts without special permission. Penalties for removing plants include imprisonment and fines.¹³

Policy Recommendation 1: Increase Access to Public Lands for Foraging

Policymakers should develop pilot projects in local, county, and state parks (or other public lands) to participate in foraging experiments to determine whether education, signage, or policy changes can help control invasive species and increase food security. They should further consider ways to address legal barriers to sustainable foraging. These projects should be holistic programs that include components from the four policy recommendations that follow.

Food Safety Challenge: Non-foragers often express concern about the risk of accidentally consuming poisonous plants. Guided peer-to-peer field training can address this by teaching how to identify the most abundant wild foods in their neighborhoods that have no inedible or toxic look-alikes.

Policy Recommendation 2: Ensure Food Safety

Policymakers should invest in community research and training partnerships with ethnobotanists at universities and community colleges. They can support foraging community groups such as Berkeley Open Source Food to offer citizen foragers peer-to-peer instruction on safe and sustainable foraging techniques, identification of edible plants, and how to prepare and cook the plants.

Policy Recommendation 3: Provide Participatory Nutrition and Culinary Education

Policies that earmark funding for organizations and government agencies that provide participatory nutrition education to communities, particularly in low-food-access areas, could play a critical role in shifting tastes. For example, nutrition educators could partner with ethnobotanists to teach people about foraged foods. Moreover, research has shown that many people do not buy fresh food, possibly out of concerns about cost and preparation, or family reluctance to consume it.¹⁴ Presumably, the same issues will apply to foraged fresh foods. Researchers working at the intersection of psychology and child obesity prevention at Virginia Commonwealth University found that if wild foods are

treated with cultural humility—emphasizing culturally-appropriate cooking and preparation as well as recipes created in collaboration with communities—people will be more likely to accept them.¹⁶

Toxins Challenge: Exposure to herbicides, pesticides, and other agricultural chemicals as a result of eating foods foraged from public lands is a concern for foragers and would-be foragers. Most school districts and parks throughout California use herbicides and pesticides to control “weeds,” which led to the creation of restrictions on when, where, and what pesticides can be used near schools.¹⁷ Pesticides can be harmful to the workers who spray them and the environment. They can affect foragers through direct physical contact or by ingesting contaminated plants that otherwise would be safe to eat.

Policy Recommendation 4: Promote Integrated Pest Management

Policymakers should create a public database of school districts and parks in California that use integrated pest management (IPM) systems, which greatly reduce or provide safe alternatives to chemical pesticides. Foragers could then check whether an area uses IPM to know whether harvesting from the area is safe.^C Public agencies taking a lead in using IPM include the Los Angeles Unified School District and the City of Davis Parks and Community Services. Other public and city agencies not yet using IPM can move to do so.

Contaminated Soil Challenge: Many potential foragers are afraid to eat foods harvested near former or current industrial sites where the soils may be heavily polluted with heavy metals and organic chemicals from manufacturing. Wild plants may absorb these hazardous substances, thus exposing their consumers to a significant risk. In many places, local communities have considerable uncertainty about land use history and remediation. However, testing can yield some surprising results: For example, in one study conducted by BOSF, toxicological tests on samples of six edible species near a former shipping yard in West Oakland

found undetectably low levels of PCBs (polychlorinated biphenyls) and pesticides, including glyphosate; metal levels, including lead and nickel, were low enough in plant tissue not to be of concern, despite elevated levels in some soil samples.¹⁸

Policy Recommendation 5: Facilitate Testing of Contaminated Soil

Government agencies and cities can subsidize soil testing and plant tissue testing to ensure that plants are safe to eat. A modest (\$50 or less) one-time parcel tax per address could cover the costs of soil tests. Testing is particularly important in low-income, low-access areas that are disproportionately exposed to pollutants. Similar tests could be performed for other substances that pose health risks, such as polycyclic aromatic hydrocarbons (PAHs).

In conclusion, urban foraging can improve access to nutritious, affordable, and fresh foods for low-income communities, and policymakers can make immediate progress towards safe, sustainable foraging. By starting with public lands connected to schools and parks, policymakers in California (and elsewhere) can generate valuable evidence to inform wider policies. Foraging can become an important nutritional supplement, especially for urban communities with financial challenges and limited access to fresh food.

Sabine Dabady received her MPH from UC Berkeley School of Public Health in 2017. Philip Stark is a Professor of Statistics and Associate Dean of the Division of Mathematical and Physical Sciences at UC Berkeley.

This policy brief is partially based on research completed in the 2014 Berkeley Food Institute Seed Grant project “Reaping without Sowing: Urban Foraging, Sustainability, Nutrition, and Social Welfare,” a project undertaken by UC Berkeley faculty members Philip Stark, Thomas Carlson, and Kristen Rasmussen.

Special thanks to Charisma Acey, Rob Bennaton, Thomas Carlson, Kali Feiereisel, Nina F. Ichikawa, Alastair Iles, Barbara Laraia, and L. Ann Thrupp, for reviews and guidance in the development of this brief.

C. The University of California, as do other land grant universities, offers IPM courses and materials for land managers and the general public: <http://ipm.ucanr.edu/>

References

1. Robbins, Paul, Marla Emery, and Jennifer L. Rice. "Gathering in Thoreau's Backyard: Nontimber Forest Product Harvesting as Practice." *Area* 40 (2008): 265-277.
2. McLain, Rebecca J., Patrick T. Hurley, Marla R. Emery, and Melissa R. Poe. "Gathering 'Wild' Food in the City: Rethinking the Role of Foraging in Urban Ecosystem Planning and Management." *Environmental Studies Faculty Publications*. Paper 5. 2013. http://digitalcommons.ursinus.edu/environment_fac/5
3. Trichopoulou, A., E. Vasilopoulou, P. Hollman, Ch. Chamalides, E. Foufa, Tr. Kaloudis, D. Kromhout, Ph. Miskaki, I. Petrarchidou, E. Poulima, K. Stafilakis, and D. Theophilou. Nutritional Composition and Flavonoid Content of Edible Wild Greens and Green Pies: A Potential Rich Source of Antioxidant Nutrients in the Mediterranean Diet. *Food Chemistry* 70 (2000): 319-323. [http://dx.doi.org/10.1016/S0308-8146\(00\)00091-1](http://dx.doi.org/10.1016/S0308-8146(00)00091-1)
4. Stark, Philip B. Direct communication regarding unpublished research by T. Carlson, K. Rasmussen, and P.B. Stark. 2017.
5. Food Access Advisory Group. *Improving Food Access in California: Report to the California Legislature*. Sacramento, CA: doi: http://www.treasurer.ca.gov/chffcc/staff/2013/20130228/3_1.pdf
6. Ver Ploeg, Michele, Vince Breneman, Paula Dutko, Ryan Williams, Samantha Snyder, Chris Dicken, and Phil Kaufman. "Access to Affordable and Nutritious Food: Updated Estimates of Distance to Supermarkets Using 2010 Data". ERR-143, U.S. Department of Agriculture, Economic Research Service. Washington, D.C., November 2012.
7. No Taste Like Home. "The Afikomen Project. 2016." <http://notastelikehome.org/the-afikomen-project/>
8. Food Research and Action Center. "Food Hardship in America 2012." [http://www.childrenshungeralliance.org/assets/childrenshungeralliance/files/\\$cms\\$/100/1933.pdf](http://www.childrenshungeralliance.org/assets/childrenshungeralliance/files/cms/100/1933.pdf)
9. Husted, Kristofor. "Seattle's First Urban Food Forest Will Be Open to Foragers." National Public Radio, February 29, 2012. <http://www.npr.org/sections/thesalt/2012/02/29/147668557/seattles-first-urban-food-forest-will-be-free-to-forage>
10. Beacon Food Forest. <http://beaconfoodforest.org/>
11. Baker, Dana M. "Environmental Stewardship in New York City Parks and Natural Areas: Assessing Barriers, Creating Opportunities, and Proposing a New Way Forward." Yale School of Forestry & Environmental Studies, 2014. <http://hixon.yale.edu/research/fellowship/fellows/dana-baker>
12. East Bay Regional Park District. Ordinance 38, ch. 8, sec. 804. http://www.ebparks.org/Assets/_Nav_Categories/Activities/Ordinance+38+-+EBRPD.pdf
13. California State Parks. "General Provisions: Sec. 4306: Plants and Driftwood." https://www.parks.ca.gov/?page_id=21301 [http://dx.doi.org/10.1016/S0308-8146\(00\)00091-1](http://dx.doi.org/10.1016/S0308-8146(00)00091-1)
14. Cummins, Steven, Ellen Flint, and Stephen A. Matthews. "New Neighborhood Grocery Store Increased Awareness of Food Access But Did Not Alter Dietary Habits or Obesity." *Health Affairs* 33 (2014): 283-291. <http://content.healthaffairs.org/content/33/2/283.abstract>
15. Boone-Heinonen, Janne, Penny Gordon-Larson, Catarina I. Kiefe. "Longitudinal Associations With Diet in Young to Middle-aged Adults: The CARDIA Study." *Archives of Internal Medicine* 171 (2011): 1162-1170. <http://jamanetwork.com/journals/jamainternalmedicine/fullarticle/1106078>
16. Bean, Melanie.K., Laura Caccavale, Nadia Islam, Bethany Brady Spalding, Dominic G. Barrett, Stephanie Carrington, and Mary Dunne Stewart. "Cultural Humility of Nutrition Programming in Public Housing." *Health Behavior and Policy Review* 3 (2016): 176-186.
17. State of California. "Healthy Schools Act." (2000). http://apps.cdpr.ca.gov/schoolipm/school_ipm_law/hsa_final_text.pdf
18. Metal tests on soils are reported on the Berkeley Open Source Food website, under the heading "tests" (forage.berkeley.edu/tests), with details about the locations where samples were taken, and the results. Plant tissue samples of six species—*Stellaria media* (chickweed), *Taraxacum officinale* (dandelion), *Rumex crispus* (dock), *Malva sylvestris* and *M. neglecta* (mallow), *Tropaeolum majus* (nasturtium), and *Oxalis pes-caprae* (oxalis)—so far have all had undetectable levels of pesticides, including glyphosate, and of PCBs. Manuscript forthcoming.