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Contemporary Foraging as a Lever for Plant Conservation and Plant Awareness: Evidence from Denmark, Southern Scotland and Tel Aviv–Jaffa

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Abstract

Wild-food foraging is booming across the Global North, but its meaning—and its value for plant conservation—differs sharply between settings. We compare three case studies: Denmark, an intensively cultivated country with a book- and app-led revival; Southern Scotland, a post-industrial landscape whose foragers are largely incomers with a media-sourced repertoire; and Tel Aviv–Jaffa (Israel), where Nordic-inspired "neo-foraging" coexists with an eroding Arab–Palestinian oral tradition. Pooling three independently collected ethnobotanical datasets (2012–2021; Denmark: questionnaires n = 27 and interviews n = 10; Southern Scotland: questionnaires n = 12 and interviews n = 9; Tel Aviv–Jaffa: interviews only, n = 10), we record 153 wild-food taxa—136 plants (including three macroalgae) and 17 fungi—in 51 plant families. Read through the Latvian (Riga) sociology of foraging, all three cases sit on the delocalised, "lifestyle" side of the forager spectrum. Yet, all three converge on one under-exploited fact: foraging can train ordinary urban people to see, name, track and value wild plants. The apparent contradiction between gathering plants and conserving them, we argue, is resolved by the target flora rather than by the practice itself: harvest risk is concentrated in a small minority of rare, range-edge and habitat-specialist taxa, whereas plant awareness is built through repeated encounters with the commonest species—precisely those whose gathering is demographically trivial. Where foragers anchor their teaching in this ordinary, ubiquitous flora, their role is not merely compatible with plant conservation but quintessential to it. Foragers are, thus, an under-used constituency of citizen educators capable of countering plant awareness disparity (also termed "plant unawareness"), provided their enthusiasm is coupled to a stewardship ethic, and we set out how conservation actors might mobilise rather than merely regulate this potential.

Keywords: foraging; wild food plants; plant awareness disparity; plant unawareness; common species; traditional ecological knowledge; cultural ecosystem services; urban foraging; environmental education; ethnobotany; biocultural diversity

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1. Introduction

For most of human history, foraging—the search for and gathering of wild foods and resources—was the defining mode of subsistence; cultivation, by contrast, rests on the

intensive management of domesticated species often morphologically remote from their wild relatives [1]. In the Global North, foraging never fully disappeared. Still, over the last two decades, it has been recast from a marker of poverty and rurality into a fashionable, aspirational and even gastronomic practice. Festivals, field guides, mobile applications, social media groups, and Michelin-starred kitchens now converge on the wild, and the same plants once used as famine foods are reinterpreted as delicacies [2].

Two forces have accelerated this revival. The first is the New Nordic Cuisine, whose 2004 manifesto foregrounded purity, seasonality, locality and foraged ingredients; through restaurants such as Noma, it moved the wild from the margins into elite kitchens and, from there, into popular culture [3–5]. The second is the COVID-19 pandemic, which pushed people outdoors and online at the same time, catalysing a surge in foraging content and participation [6]. These developments have made foraging both more visible and more delocalised: increasingly it is learned not from elders on the land but from books, apps and screens.

This matters for conservation. Ethnobotany sits at the crossroads of biological and cultural diversity, and the erosion of local ecological knowledge is widely recognised as a driver of biocultural loss [7,8]. At the same time, plant conservation is chronically under-resourced relative to animal conservation—a bias attributed to plant awareness disparity: the human tendency to overlook plants and undervalue their importance. This bias was historically labelled "plant blindness", a term now increasingly replaced by non-ableist alternatives such as "plant unawareness" and "plant awareness disparity" [9–11]. Crucially, Balding and Williams argue that this bias is common but not inevitable: people immersed in plant-affiliated practices—the very kind of practice foraging represents—acquire the language and attention that let them detect, recall and value plants [9]. Foraging is, therefore, doubly relevant to a conservation agenda: it is a site where traditional ecological knowledge is being lost and reinvented, and a potential intervention against plant awareness disparity.

But foragers are not all the same, and neither is foraging. The sociology of foraging developed by the Latvian (Riga) school—Grivins, Tisenkopfs and colleagues at the Baltic Studies Centre—provides the analytical vocabulary for this study. Grivins shows that if foraging is treated merely as "engaging with wild products", all foragers look alike. In contrast, attention to their diverging knowledge claims, motivations and uses reveals sharply distinct groups [12]. That work distinguishes, at one pole, utilitarian foragers whose practice is vertically transmitted, embedded in local identity and oriented to provisioning and household economy—the pattern that still characterises much of the Baltic and wider Eastern European countryside, where wild products remain woven into culture, diet and even informal markets [13,14]—and, at the other, the lifestyle forager: late-onset, formally taught, urban or peri-urban, and motivated by nature connection, novel flavours and a rejection of industrial agri-food [12,15]. Contemporary foraging in Northern Europe and the urban Mediterranean is overwhelmingly this second, delocalised kind, and our three cases document this variant—foraging among urban and peri-urban middle classes.

The conservation valence of this lifestyle foraging is ambiguous. It can be a cultural ecosystem service that reconnects urban and post-industrial publics with nature, delivering physical activity, well-being and food-system literacy [16–18]; it can also generate pressure, since over-harvesting by inexperienced "newcomers" has driven local declines elsewhere [19,20]. Whether the current wave becomes a force for habitat stewardship or degradation depends on who forages, what they know, and why they do it—and these vary across settings, even among cases that share the same lifestyle register. It also depends, as we argue below, on which plants are gathered: harvest risk and educational value are distributed very unevenly across the flora, and much of the apparent contradiction between picking plants and protecting them dissolves once that distribution is made explicit.

Comparative work placing contrasting urban biocultural settings side by side is scarce. Therefore, we examine three case studies of contemporary lifestyle foraging that together span a gradient of delocalisation. The first is Denmark, among Europe's most intensively cultivated countries, where roughly 62% of the land area is agricultural and more than 90% of that area is arable [21], yet it nonetheless hosts a vigorous book- and app-led revival concentrated in and around its cities. The second is Southern Scotland, a rural, post-industrial landscape whose contemporary forager community is composed largely of incomers carrying a generic, media-sourced repertoire with little place-specific tradition, yet who teach actively [22]. The third is urban and Mediterranean: Tel Aviv–Jaffa, where foraging is split between an ageing cohort of Arab–Palestinian knowledge-holders and Jewish–Israeli "neo-foragers" who model themselves on the Nordic revolution. Read together through the lens of Riga sociology, these cases isolate a common process—the delocalisation of foraging knowledge among urban classes—while revealing where and why it is resisted and, above all, what it makes possible for conservation.

We address four questions: (RQ1) What is the taxonomic diversity of foraged wild-food taxa across the three areas? (RQ2) Through which channels is foraging knowledge transmitted, and what does the balance between vertical and horizontal/oblique transmission imply for the conservation of traditional ecological knowledge? (RQ3) What motivations and conservation-relevant perceptions characterise contemporary foragers across the three study settings? (RQ4) What conservation risks and, especially, what opportunities emerge—how is the apparent contradiction between harvesting plants and conserving them best resolved, and how might foraging and foragers be mobilised for plant conservation, awareness and environmental education?

2. Materials and Methods

2.1. Study Design, Case Studies and Pooled Datasets

This study integrates three independently collected ethnobotanical datasets under a common analytical frame. The datasets differ in instrument, season, and sampling effort, so we treat the pooled corpus qualitatively and report region-level figures separately rather than as a single homogeneous sample; we applied no inferential statistics across the regions. In all three settings, sampling was opportunistic—convenience and snowball recruitment through foraging-related networks, associations and online communities—rather than probabilistic. This strategy likely over-represented experienced foragers and, especially, individuals engaged in teaching or promoting foraging; this applies in particular to the Scottish dataset, which was recruited partly through foraging associations. We account for this recruitment bias when interpreting the results (Sections 4.6 and 4.7). Across all three settings, we defined foraging as the non-commercial-to-artisanal gathering of wild or semi-domesticated and naturalised plants and fungi for food, drink, or home medicine. Each case study is described below, and Table 1 summarises the same information for comparison.

Denmark (Northern Europe; national, online). We distributed a self-administered questionnaire through foraging-related Facebook groups as an open call (n = 27; no geographic screening; anonymous) in early May 2021, along with ten semi-structured online interviews (15–60 min; n = 10) conducted in the same period with foragers recruited through the same channels. Because the questionnaire was anonymous, we cannot establish whether any interviewee also completed it; therefore, we report the two instruments separately rather than summing them. Respondents reported up to 20 folk taxa each, with parts used, intended use, season and preparation. Because the call was national, anonymous, and administered online, participants could be residents anywhere in Denmark—in Jutland as well as on the islands (e.g., Zealand, Funen, Bornholm)—and the localities where individ-

ual plants were gathered were not systematically recorded. No locality-level mapping of Danish harvesting sites is, therefore, possible, and the Danish dataset should be read as a national, rather than regional, snapshot (see also Table 1 and Section 4.7).

Table 1. Comparative overview of the three case studies.

Variable	Denmark (N. Europe)	Scotland (N. Europe)	Tel Aviv–Jaffa (Urban IL)
Participants/instrument	Questionnaire n = 27 + interviews n = 10	Questionnaires n = 12 + interviews n = 9 (5 with expedition) (21 participants)	Semi-structured interviews only, n = 10
Location	National (online open call; gathering localities not recorded—Jutland and islands both possible)	Scottish Borders, Lothian, D&G, Fife	Metropolitan Tel Aviv–Jaffa
Fieldwork	May 2021	Summer 2012	2020–2021
Distinct taxa recorded	83	62	36
Dominant families	Rosaceae, Asteraceae, Brassicaceae, Amaryllidaceae	Rosaceae (berries), plus fungi	Moraceae, Rutaceae, Malvaceae, Asteraceae
Dominant knowledge source	Books, apps (Vild Mad), courses	Books, internet, social media, classes	Online/New Nordic vs. eroding oral
Transmission mode	Horizontal/oblique	Horizontal/oblique (incomers)	Split: oblique vs. eroding oral
Economic motivation	Very limited	Non-commercial; some artisanal	Substantial (chefs, shops; ~60%)

Southern Scotland, United Kingdom (Northern Europe; Scottish Borders, Lothian, Dumfries and Galloway, and Fife). Fieldwork over one month in summer 2012 comprised nine semi-structured in-person interviews with foragers resident in Southern Scotland—five including a foraging expedition—and twelve standardised email questionnaires distributed via the Scottish Wild Harvest Association (SWHA) and Galloway Wild Foods (n = 21 participants) [22].

Tel Aviv–Jaffa, Israel (urban Mediterranean). Ten semi-structured interviews (25–60 min, conducted in Hebrew and later translated) were carried out in 2020–2021 with local foragers, chefs and food professionals (eight) and two Arab–Palestinian residents of Jaffa (n = 10), covering plants gathered, parts used, preparation, seasonality, subsistence and sale, and the impact of COVID-19.

2.2. Taxonomic Reconciliation

Taxa were identified from the common (vernacular) names reported by participants; these folk taxa were then matched to scientific names using regional floristic references and reconciled to accepted names and families using Plants of the World Online (POWO) and World Flora Online (WFO) [23,24], with family circumscriptions following the Angiosperm Phylogeny Group IV (APG IV) classification [25]. We assigned Levantine caper material to *Capparis spinosa* subsp. *aegyptia* (Lam.) Kit Tan & Runemark, the name accepted in POWO, under which *Capparis zoharyi* Inocencio, D.Rivera, Obón & Alcaraz is placed as a synonym following the revision of the *Capparis spinosa* group [26]. Fungal nomenclature followed Index Fungorum (https://www.indexfungorum.org/, accessed on 14 July 2026). Throughout, we distinguish region-level records (a taxon counted once in each region in which it was reported) from distinct taxa (a taxon counted once across the whole corpus).

Folk taxa that could not be resolved beyond genus are reported as "sp." and counted once per genus per region; taxa reported only as cultivated escapes or garden plants were retained where participants gathered them from unmanaged ground.

2.3. Analysis and Ethics

We summarised taxonomic composition, parts used, seasonality, and use categories and thematically coded interview transcripts for knowledge transmission, motivations, and conservation-relevant perceptions; coding was inductive, and verbatim quotations illustrate each theme. In all three studies, informed oral consent was obtained before recording began, and the research adhered to the Code of Ethics of the International Society of Ethnobiology (https://www.ethnobiology.net/what-we-do/core-programs/ise-ethics-program/code-of-ethics/, accessed on 14 July 2026) [27]; the Scottish study additionally observed the confidentiality of participants' gathering sites.

3. Results

3.1. Taxonomic and Biocultural Diversity (RQ1)

By region, the pooled corpus comprised 83 taxa in Denmark (73 plants, including two macroalgae, and 10 fungi), 62 in Southern Scotland (52 plants, including one macroalga, and 10 fungi), and 36 in Tel Aviv–Jaffa (all plants). Because several taxa were recorded in more than one region, these 181 region-level records correspond to 153 distinct wild-food taxa—136 plants (including three macroalgae) and 17 fungi—across 51 plant families (60 families in all, including fungi). Figure 1 summarises the taxonomic structure of the corpus. In Denmark, the most-cited taxa were *Allium ursinum*, *Urtica dioica*, *Taraxacum* sp., *Sambucus nigra*, *Alliaria petiolata* and *Rosa canina*. In Scotland, berries dominated—eight of the eleven most-collected taxa were berries, led by bramble (*Rubus fruticosus* agg.) and blaeberry (*Vaccinium myrtillus*). In Tel Aviv–Jaffa, consensus taxa included *Citrus* × *clementina*, *Malva* spp., *Sinapis arvensis*, *Foeniculum vulgare*, and *Allium neapolitanum*.

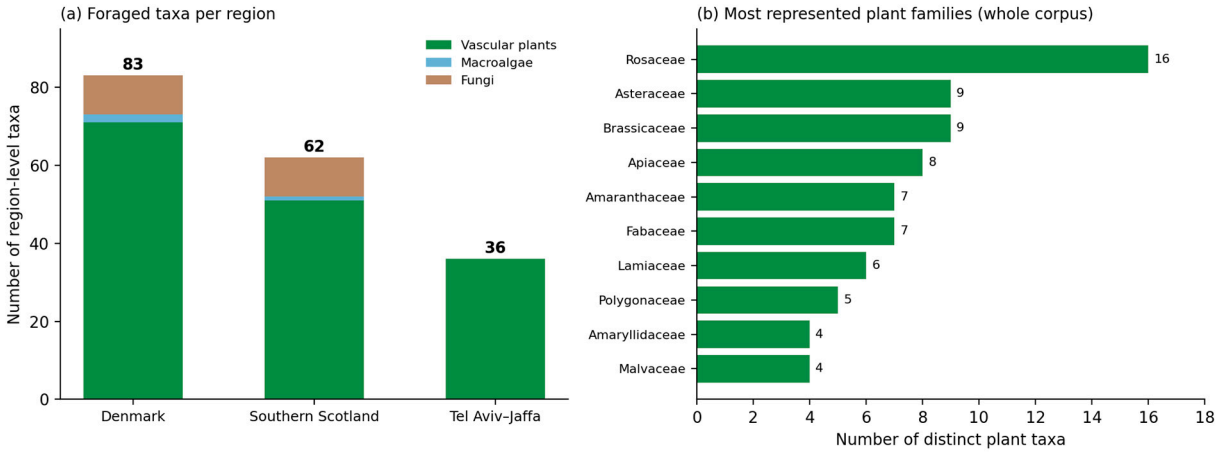

Figure 1. Taxonomic structure of the pooled corpus: (**a**) number of region-level wild-food taxa recorded in each study area, by organism group (vascular plants, macroalgae, fungi); (**b**) plant families contributing the largest numbers of distinct taxa across the whole corpus (fungal and algal families excluded).

Two cross-context signals stand out. First, a small "charismatic core" travels across the three settings: *Allium ursinum* and *Urtica dioica* were recorded in all three, while *Vaccinium myrtillus*, *Rubus idaeus*, *Rosa canina*, *Boletus edulis*, *Cantharellus cibarius* and *Sambucus nigra* recurred across the two Northern European cases. This shared core is precisely the delocalised, screen-borne repertoire predicted by the lifestyle-forager model [12]. Second,

instructive absences recurred: despite the long Danish and Scottish coastlines, macroalgae were largely overlooked in Denmark, even though comparable British work found algae among the most foraged resources [22]—an underused, low-impact opportunity. Table 2 lists the complete inventory of foraged taxa recorded across the three case studies. Figure 2 shows one of the Levantine taxa recorded in the Tel Aviv–Jaffa case study growing on unmanaged urban ground.

Table 2. Complete inventory of wild- and semi-domesticated food plant and fungal taxa recorded across the three case studies. Region codes: DK = Denmark; SCO = Southern Scotland; IL = Tel Aviv–Jaffa.

Taxon	Family	Region(s)
Abies alba Mill.	Pinaceae	DK
Achillea millefolium L.	Asteraceae	DK·SCO
Aegopodium podagraria L.	Apiaceae	DK·SCO
Agaricus campestris L.	Agaricaceae	SCO
Alliaria petiolata (M.Bieb.) Cavara & Grande	Brassicaceae	DK·SCO
Allium neapolitanum Cirillo	Amaryllidaceae	IL
Allium scorodoprasum L.	Amaryllidaceae	DK
Allium sp.	Amaryllidaceae	DK
Allium ursinum L.	Amaryllidaceae	DK·SCO·IL
Arctium minus (Hill) Bernh.	Asteraceae	SCO
Armoracia rusticana P.Gaertn., B.Mey. & Scherb.	Brassicaceae	DK
Arum palaestinum Boiss.	Araceae	IL
Asparagus aphyllus L.	Asparagaceae	IL
Atriplex littoralis L.	Amaranthaceae	DK
Atriplex patula L.	Amaranthaceae	DK
Auricularia auricula-judae (Bull.) Quél.	Auriculariaceae	DK
Bellis perennis L.	Asteraceae	DK
Beta vulgaris L.	Amaranthaceae	SCO
Betula pubescens Ehrh.	Betulaceae	DK
Bistorta officinalis Delarbre	Polygonaceae	SCO
Blitum bonus-henricus (L.) Rchb.	Amaranthaceae	SCO
Boletus edulis Bull.	Boletaceae	DK·SCO
Boletus sp.	Boletaceae	DK
Calocybe gambosa (Fr.) Donk	Lyophyllaceae	DK
Calvatia gigantea (Batsch) Lloyd	Agaricaceae	SCO
Cantharellus cibarius Fr.	Cantharellaceae	DK·SCO
Cantharellus pallens Pilát	Cantharellaceae	DK
Capparis spinosa subsp. *aegyptia* (Lam.) Kit Tan & Runemark	Capparaceae	IL

Table 2. *Cont.*

Taxon	Family	Region(s)
Capsella bursa-pastoris (L.) Medik.	Brassicaceae	DK
Cardamine pratensis L.	Brassicaceae	SCO
Castanea sativa Mill.	Fagaceae	DK·SCO
Centaurea cyanus L.	Asteraceae	DK
Chamaenerion angustifolium (L.) Scop.	Onagraceae	DK
Chenopodiastrum murale (L.) S.Fuentes, Uotila & Borsch	Amaranthaceae	IL
Cichorium intybus L.	Asteraceae	IL
Citrus aurantium L.	Rutaceae	IL
Citrus japonica Thunb.	Rutaceae	IL
Citrus × *clementina* hort. ex Tanaka	Rutaceae	IL
Cochlearia officinalis L.	Brassicaceae	DK
Conopodium majus (Gouan) Loret	Apiaceae	SCO
Coprinus comatus (O.F.Müll.) Pers.	Agaricaceae	SCO
Corchorus olitorius L.	Malvaceae	IL
Corylus avellana L.	Betulaceae	DK·SCO
Crambe maritima L.	Brassicaceae	DK
Crataegus laevigata (Poir.) DC.	Rosaceae	DK
Crataegus monogyna Jacq.	Rosaceae	SCO
Craterellus cornucopioides (L.) Pers.	Cantharellaceae	DK
Craterellus tubaeformis (Fr.) Quél.	Cantharellaceae	DK
Crithmum maritimum L.	Apiaceae	SCO
Cytisus scoparius (L.) Link	Fabaceae	SCO
Equisetum sp.	Equisetaceae	DK
Eugenia uniflora L.	Myrtaceae	IL
Fagus sylvatica L.	Fagaceae	DK·SCO
Filipendula ulmaria (L.) Maxim.	Rosaceae	DK·SCO
Foeniculum vulgare Mill.	Apiaceae	IL
Fragaria vesca L.	Rosaceae	SCO
Fraxinus excelsior L.	Oleaceae	SCO
Fucus serratus L.	Fucaceae	DK
Galium aparine L.	Rubiaceae	SCO
Galium odoratum (L.) Scop.	Rubiaceae	DK
Glebionis coronaria (L.) Cass. ex Spach	Asteraceae	IL
Glechoma hederacea L.	Lamiaceae	DK
Heracleum sphondylium L.	Apiaceae	SCO
Hippophae rhamnoides L.	Elaeagnaceae	DK·SCO
Honckenya peploides (L.) Ehrh.	Caryophyllaceae	DK

Table 2. *Cont.*

Taxon	Family	Region(s)
Hydnum repandum L.	Hydnaceae	DK·SCO
Hypericum perforatum L.	Hypericaceae	DK
Laccaria amethystina (Huds.) Cooke	Hydnangiaceae	SCO
Laetiporus sulphureus (Bull.) Murrill	Fomitopsidaceae	SCO
Lamium purpureum L.	Lamiaceae	DK
Lathyrus japonicus Willd.	Fabaceae	DK
Lathyrus odoratus L.	Fabaceae	IL
Laurus nobilis L.	Lauraceae	IL
Lepidium latifolium L.	Brassicaceae	DK
Ligusticum scoticum L.	Apiaceae	SCO
Liriodendron tulipifera L.	Magnoliaceae	DK
Lupinus pilosus L.	Fabaceae	IL
Lycium barbarum L.	Solanaceae	DK
Macrolepiota procera (Scop.) Singer	Agaricaceae	SCO
Malus sylvestris (L.) Mill.	Rosaceae	DK·SCO
Malva nicaeensis All.	Malvaceae	IL
Malva sylvestris L.	Malvaceae	IL
Matricaria discoidea DC.	Asteraceae	DK
Mentha aquatica L.	Lamiaceae	SCO
Mesembryanthemum crystallinum L.	Aizoaceae	IL
Morus alba L.	Moraceae	IL
Morus macroura Miq.	Moraceae	IL
Morus nigra L.	Moraceae	IL
Myosotis ramosissima Rochel	Boraginaceae	DK
Myrica gale L.	Myricaceae	SCO
Myrrhis odorata (L.) Scop.	Apiaceae	DK·SCO
Myrtus communis L.	Myrtaceae	IL
Nasturtium officinale W.T.Aiton	Brassicaceae	SCO
Neoboletus sp.	Boletaceae	DK
Opuntia ficus-indica (L.) Mill.	Cactaceae	IL
Origanum vulgare L.	Lamiaceae	DK
Ornithogalum pyrenaicum L.	Asparagaceae	DK
Oxalis acetosella L.	Oxalidaceae	DK·SCO
Oxalis pes-caprae L.	Oxalidaceae	IL
Palmaria palmata (Linnaeus) Weber & Mohr	Palmariaceae	SCO
Plantago major L.	Plantaginaceae	DK
Polypodium vulgare L.	Polypodiaceae	DK

Table 2. *Cont.*

Taxon	Family	Region(s)
Primula elatior (L.) Hill	Primulaceae	DK
Prunus avium (L.) L.	Rosaceae	DK·SCO
Prunus cerasifera Ehrh.	Rosaceae	DK
Prunus domestica L.	Rosaceae	DK
Prunus spinosa L.	Rosaceae	DK·SCO
Reynoutria japonica Houtt.	Polygonaceae	DK
Rheum rhabarbarum L.	Polygonaceae	DK
Rhus typhina L.	Anacardiaceae	DK
Ribes nigrum L.	Grossulariaceae	DK·SCO
Ribes rubrum L.	Grossulariaceae	SCO
Ribes uva-crispa L.	Grossulariaceae	SCO
Rosa canina L.	Rosaceae	DK·SCO
Rubus chamaemorus L.	Rosaceae	SCO
Rubus fruticosus L. agg.	Rosaceae	SCO
Rubus idaeus L.	Rosaceae	DK·SCO
Rubus plicatus Weihe & Nees	Rosaceae	DK
Rubus sanguineus Friv.	Rosaceae	IL
Rumex acetosa L.	Polygonaceae	SCO
Rumex sp.	Polygonaceae	IL
Salicornia europaea L.	Amaranthaceae	DK·SCO
Salvia hierosolymitana Boiss.	Lamiaceae	IL
Sambucus nigra L.	Viburnaceae	DK·SCO
Sinapis arvensis L.	Brassicaceae	IL
Smyrnium olusatrum L.	Apiaceae	SCO
Solidago canadensis L.	Asteraceae	DK
Sorbus aucuparia L.	Rosaceae	SCO
Sparassis crispa (Wulfen) Fr.	Sparassidaceae	SCO
Spinacia oleracea L.	Amaranthaceae	IL
Stellaria media (L.) Vill.	Caryophyllaceae	DK
Symphytum officinale L.	Boraginaceae	SCO
Syringa vulgaris L.	Oleaceae	DK
Taraxacum officinale F.H.Wigg.	Asteraceae	DK·SCO
Thymus polytrichus A.Kern. ex Borbás	Lamiaceae	SCO
Tilia cordata Mill.	Malvaceae	DK
Trifolium pratense L.	Fabaceae	DK
Triglochin maritima L.	Juncaginaceae	DK
Tropaeolum majus L.	Tropaeolaceae	IL
Typha latifolia L.	Typhaceae	SCO
Ulex europaeus L.	Fabaceae	SCO

Table 2. *Cont.*

Taxon	Family	Region(s)
Ulmus glabra Huds.	Ulmaceae	DK
Ulva lactuca L.	Ulvaceae	DK
Urtica dioica L.	Urticaceae	DK·SCO·IL
Urtica pilulifera L.	Urticaceae	IL
Urtica urens L.	Urticaceae	DK·IL
Vaccinium myrtillus L.	Ericaceae	DK·SCO
Vaccinium oxycoccos L.	Ericaceae	SCO
Vaccinium vitis-idaea L.	Ericaceae	DK
Vicia sepium L.	Fabaceae	DK
Viola odorata L.	Violaceae	DK
Viola sp.	Violaceae	DK
Vitis vinifera L.	Vitaceae	IL

Figure 2. *Capparis spinosa* L. (Capparaceae) in flower on unmanaged ground in Tel Aviv, Israel. The caper is among the wild-food taxa recorded in the Tel Aviv–Jaffa case study; Levantine material is referred here to subsp. *aegyptia* (Lam.) Kit Tan & Runemark, following the treatment adopted in Section 2.2 [26]. Photo: Andrea Pieroni.

3.2. Knowledge Transmission: A Gradient from Elders to Apps (RQ2)

All three cases sit on the delocalised, "lifestyle" side of the forager spectrum, but they arrange themselves along a gradient. In Denmark, although about half of interviewees recalled childhood foraging with (usually female) relatives, that exposure was sporadic and confined to "common" species; almost all named books, apps (Vild Mad) and courses as their principal source.

> *"I've taken some foraging classes with Meyers and with Thomas Laursen, so now I know something myself."*—LO, Denmark.

Southern Scotland occupies the same pole, albeit more extreme. Only a small minority of the 21 participants were native Scots; most were incomers from England (and individually from Germany, Poland or a childhood in Kenya), and even those who began foraging with parents described a shallow, berry-centred inheritance later overwritten by books (Mabey; Irving), the internet and social media. Only two participants regarded foraging as a Scottish tradition. The knowledge in play is, thus, generic and delocalised—"popular" rather than place-specific—a pattern already documented among contemporary British foragers [22].

Tel Aviv–Jaffa shows the same delocalisation split along identity lines. The Arab–Palestinian women interviewed foraged because their mothers did—a living oral tradition—yet feared its disappearance, and the study found no Arab–Palestinian under 40 continuing it. The Jewish–Israeli foragers described their practice as "cutting-edge" and as "discovering" the city, citing the Nordic revolution rather than the nearby knowledge-holders.

> *"The revolution came from the other direction—the New Nordic Cuisine broke into the world consciousness. . . suddenly provided a whole value framework from which more accurate food was born."*—foraging guide, Israel.

The conservation-relevant point is that the three cases suggest a potentially convergent pattern: an eroding, place-specific, orally transmitted corpus is being replaced by a standardised, delocalised and highly transmissible one. Given the regional, temporal and methodological differences among the three datasets (Section 4.7), this convergence should be read as indicative rather than demonstrated: differences in study period, season, recruitment and instrumentation may also contribute to the observed similarities. This mirrors the still-vertical, identity-embedded transmission that the Riga school documents for the Baltic and Eastern European "utilitarian" model [14], in which knowledge of how to identify, pick, process, and preserve wild products is handed down across generations and tied to local culture. Delocalisation, in other words, is not inevitable—but in our three urban and peri-urban settings, it dominates.

3.3. Motivations: Product, Process, Health and Identity (RQ3)

Motivations were plural and overlapping. A first axis ran between product and process—the seasonal, scarcity-charged pursuit of a specific catch (Danish informants coined "foraging FOMO") versus the value of the activity itself. A second axis concerned health, physical and mental motivations: varied diet, activity, "clean" food, and calm and restoration.

> *"I just think it's fantastic to get something that no one else has done anything to; sprayed it or packaged it. . . they haven't done anything to it."*—CH, Denmark.

A third axis was identity, dominant in Tel Aviv–Jaffa, where gathering wild plants was a way to "own the land" and to author a New Israeli Cuisine distinct from both the global food industry and the neighbouring Arab–Palestinian tradition from which many of the same plants derive. In Scotland, the dominant register was pleasure, nature connection and atavistic satisfaction—"we are hunter-gatherers really at heart"—with several participants also anticipating that foraging could again become a survival skill.

These profiles map closely onto Grivins' lifestyle and recreational forager categories [12,28]: late-onset, formally taught, and motivated by nature connection, novel flavours and a rejection of industrial agri-food, in contrast to the utilitarian, provisioning-driven forager of Eastern Europe [14]. Economic motivation nonetheless diverged sharply: it was negligible in Denmark; non-commercial by design in Scotland; and substantial in Tel Aviv–Jaffa (~60% of interviewees sold foraged plants, rising during COVID-19), a reminder

that even within lifestyle foraging, the recreation-to-livelihood spectrum described by the Riga school [13] is present.

3.4. Conservation-Relevant Perceptions (RQ4)

Foragers were themselves attentive to conservation. The most common concern, voiced spontaneously across sites, was over-harvesting beyond a species' reproductive capacity; many framed their practice as foraging "with respect towards nature" and identified inexperienced "newcomers" as the main risk [20]. Danish interviewees were also acutely aware of contamination and avoided roadsides and railways.

> *"I am very conscious about where I pick it. It's never along a road or a railroad. . . where they don't spray all kinds of poisons."*—CR, Denmark.

Scottish participants articulated an explicit sustainability ethic—"you only take what you need, and you leave enough to grow. . . and enough for other people"—and worried that the culinary boom was drawing in unskilled foragers; the very existence of the SWHA reflects a collective effort to keep gathering responsibly. Asked about the future, informants across all three sites overwhelmingly expected foraging to grow, attributing this to a broad "return to nature" accelerated by the pandemic—precisely what makes the conservation question urgent, since a larger, less experienced forager population magnifies both the risk of over-harvesting and the opportunity to cultivate plant awareness at scale.

4. Discussion

Placed side by side, these three case studies do more than document variety: they expose an opportunity that the conservation community has scarcely begun to exploit. The recurring anxiety in the foraging literature—that a delocalised, fashionable revival erodes place-based knowledge and adds pressure to sought-after species—is well founded, and our data are consistent with it. But it is only half the story. The same practice that delocalises knowledge also generates, at scale and largely for free, what plant conservation most conspicuously lacks: a public that actually notices plants. The remainder of this discussion argues that foraging is best understood not merely as a risk to be managed but as a latent conservation infrastructure that could be mobilised—and that the apparent contradiction between gathering and conserving is resolved, in practice, by the flora on which foragers concentrate.

4.1. A Shared Process, Unevenly Realised: The Delocalisation of Foraging Knowledge

Beneath very different surfaces, the three cases reveal a common trajectory. In Denmark, Scotland and Jewish–Israeli Tel Aviv–Jaffa alike, foraging knowledge is migrating from place-based, kin-transmitted tradition towards a standardised corpus carried by books, apps, courses, social media and a globalised culinary movement [7,29]. Scotland is the limiting case: a forager community composed largely of incomers, carrying a generic British repertoire learned from national handbooks and screens, with almost no place-specific tradition surviving [22]. The sociology of foraging clarifies what is at stake. The Riga school's utilitarian forager—the gatherer with still-embedded, vertically transmitted knowledge of the Baltic and Eastern European countryside, for whom wild products remain part of identity, diet and even informal economy [13,14]—shows that delocalisation is not inevitable; it is a contingent outcome of urbanisation, migration and the collapse of intergenerational transmission. Our three cases are the Western, urban counterpoint to that model: delocalisation is best understood as a gradient governed by land-use history, migration and the social infrastructure of transmission. Its cost is the attrition of fine-grained, habitat-specific knowledge; its unexpected benefit, developed below, is transmissibility.

4.2. Foraging Against Plant Awareness Disparity: A Plausible but Unproven Awareness Dividend

Plant awareness disparity—the tendency to overlook plants, rank them below animals, and treat them as an undifferentiated green backdrop—is one of the deepest obstacles to plant conservation, and decades of formal environmental education have struggled to shift it [9,10]. Foraging is often assumed to shift it almost as a by-product of pleasure: to gather, even casually, is to begin acquiring the cognitive apparatus on which conservation values rest—a working botanical vocabulary, a seasonal calendar, an eye for micro-habitat, and a personal, embodied reason to care whether a species thrives.

The motivations that drive contemporary urban and peri-urban foragers plausibly reinforce this. Across our three settings, people gather not out of necessity but for reconnection with nature and the turning seasons; for the novelty, sensory pleasure and cultural prestige that wild flavours acquired in the wake of the New Nordic movement [3–5]; for health, freshness and provenance; and as a deliberate rejection of opaque, industrialised food chains, often articulated as a search for greater food autonomy. Our informants display corresponding attentiveness: Danish and Scottish foragers distinguish micro-sites and monitor phenology, while Israeli neo-foragers re-map their city as edible terrain.

Whether this attentiveness actually amounts to an "awareness dividend" for biodiversity conservation, however, is better treated as an open empirical question than as an established outcome. Balding and Williams argue that plant awareness disparity is cultural and, therefore, reversible through exactly such plant-affiliated practices [9], and urban foraging has been shown to reconnect people with biodiversity and to enable everyday interactions with nature [16,30]. Yet, reconnection and botanical knowledge are not the same thing as conservation awareness, much less pro-conservation behaviour: the evidence that foraging measurably increases concern for, or action on behalf of, wild plant populations is thin, largely indirect and mostly self-reported, and the same acquired attention can be turned towards harvesting a species just as readily as towards protecting it. The prudent reading is, therefore, that foraging offers a plausible, cheap and rapidly growing opportunity to counter plant awareness disparity and to enlist a motivated public in plant conservation—potentially a valuable asset for instruments such as the Global Strategy for Plant Conservation [31]—but that converting that opportunity into measurable conservation gain, rather than assuming it follows automatically, is the real task, and its magnitude remains unknown. Therefore, we advance the "awareness dividend" explicitly as a hypothesis emerging from our findings—one that future longitudinal and intervention studies should test directly—and not as an empirical outcome demonstrated by the present study.

This caution matters because the same practices carry real costs wherever harvest pressure concentrates on vulnerable taxa, and a growing, largely non-local "lifestyle" public is precisely the profile most likely to misjudge it. Most of the taxa recorded here are common and resilient, and light gathering of nettles, brambles, elder or dandelions poses no conservation risk. A minority, however, do not fit that pattern. Several are habitat specialists whose populations are already contracting for reasons unrelated to foraging: cloudberry (*Rubus chamaemorus*) and small cranberry (*Vaccinium oxycoccos*), both reported in Scotland, depend on intact peatlands that are themselves degrading, while the coastal specialists sea kale (*Crambe maritima*, Denmark), sea pea (*Lathyrus japonicus*, Denmark) and Scots lovage (*Ligusticum scoticum*, Scotland) occupy narrow, disturbance-sensitive strandlines. At least one is locally scarce across parts of its range: spiked star-of-Bethlehem (*Ornithogalum pyrenaicum*), recorded in Denmark, is the "Bath asparagus" long gathered in south-west England, where it is nationally scarce, confined to a few counties and listed on several vice-county rare-plant registers. In the Levantine setting, the constraint is explicitly regulatory: Israel protects several hundred wild plant species by law and has banned

the gathering of culturally central species such as za'atar (*Origanum syriacum*, since 1977) and akkoub (*Gundelia tournefortii*, since 2005), issuing large numbers of fines—a regime that turns wild-food gathering into a contested arena of conservation, heritage and rights. Notably, neither species was reported by our Tel Aviv–Jaffa participants, which may reflect the ban's chilling effect on what people are willing to declare. The conservation significance of the foraging revival is, therefore, double-edged: its promise as a source of awareness and stewardship is plausible but unproven, whereas its capacity to add pressure to rare, range-edge, coastal, peatland and legally protected taxa is concrete and immediate. Any serious attempt to mobilise foragers for conservation should, thus, be paired with basic safeguards—steering effort towards abundant taxa, respecting protected species and sites, and building simple harvest etiquette into the very apps, courses and networks through which the practice now spreads.

4.3. Resolving the Contradiction: Common Plants as the Conservation Sweet Spot

At first sight, foraging and plant conservation pull in opposite directions. Conservation asks the public to leave plants where they are; foraging asks it to pick them, and a movement that recruits ever more pickers looks, on that reading, like a problem to be contained. The tension is real, but it is not a property of foraging as such: it is a property of which plants are foraged. The ecological consequences of gathering depend on the abundance and life history of the target species, on the plant part removed and on harvest intensity, rather than on the act of gathering itself [32]. Stripping bulbs, roots or whole rosettes from a small, isolated, habitat-specialist population is a demographic event; taking a handful of leaves, flowers or fruits from a widespread, fast-reproducing, often ruderal or synanthropic species is, at the intensities documented here and in comparable urban settings elsewhere [33], not one.

Our corpus is overwhelmingly of the second kind. Nettles, brambles, elder, dandelion, garlic mustard, mallow, wild fennel, mulberries, plantain, and chickweed—among the most frequently cited taxa across the three settings—are also among the most abundant plants in the anthropogenic landscapes where our participants live. Several are naturalised or invasive aliens (*Reynoutria japonica*, *Solidago canadensis*, *Oxalis pes-caprae*, *Opuntia ficus-indica*) whose removal is, if anything, welcome [33]. The decisive point, however, is that the educational return runs opposite to the conservation risk. Plant awareness is not built by rare encounters with rare organisms: it develops where people interact frequently with plants directly relevant to their own lives [34], and urban living erodes it by thinning everyday contact with nature [35]. Common plants are, by definition, the ones a city-dweller meets daily—in the pavement crack, the park edge, the roadside verge—and they are, therefore, at once the best teaching material available and the material that can be gathered with the least consequence—provided harvesting remains light in intensity and directed at abundant, resilient populations. On the ordinary flora, the interests of the educator and those of the conservationist coincide most closely.

This is where the forager's role becomes quintessential rather than merely tolerable. A forager who teaches a hundred urban learners to recognise, name, follow through the seasons and value *Urtica dioica*, *Taraxacum* sp., *Sambucus nigra*, *Malva sylvestris*, or *Plantago major* imposes negligible demographic pressure while dismantling plant awareness disparity at exactly the point where it is densest—the undifferentiated green backdrop these species constitute for most people [9,11]. That is not a marginal gain, because the constituency capable of defending rare and threatened plants has to be recruited somewhere, and nobody learns to see a flora by beginning with its rarities. The corollary is equally clear: the contradiction returns the moment foraging is organised around scarcity, novelty and prestige—the gourmet logic of the rare ingredient that the New Nordic movement

inadvertently exported, which surfaces in miniature in the "foraging FOMO" our Danish informants described. The conservation-relevant intervention is, therefore, not to restrict foraging but to shift its centre of gravity from the rare and charismatic towards the common and abundant, inverting a prestige hierarchy that currently rewards the opposite. Two qualifications keep this from becoming complacency. Commonness must not be equated with invulnerability to harvest: the ecological consequences of gathering depend on life-history traits, reproductive biology, the plant organ collected, harvesting intensity and frequency, and regeneration capacity [32], and common species can decline rapidly; because they carry most of the biomass and most of the ecological interactions in a system, their depletion matters even where extinction is not in prospect [36–38]. An education anchored in the abundant must still carry explicit knowledge of what is not to be picked—the protected, peatland, strandline and range-edge taxa identified in Section 4.2. Keeping common species common, and teaching people to notice them, is a conservation objective in its own right, and one that foragers are unusually well placed to serve.

4.4. Foraging as a Cultural Ecosystem Service: From Lifestyle to Lifeline

Framing foraging as a cultural ecosystem service integrates these threads while guarding against a Western blind spot. Our three cases invite a "lifestyle" reading—provisioning, well-being, food-system literacy, and nature connection [16–18]—but the sociology of foraging insists this is only one end of a spectrum. The Riga school's work on wild-product economies shows that the same practice can be a household livelihood strategy and even an informal market, one whose value rises in times of crisis [13,14]; the substantial commercial gathering we recorded in Tel Aviv–Jaffa sits on that continuum. Recognising both ends matters for conservation, because it widens the constituency with a direct stake in healthy habitats. The practice also carries hazards when demand outpaces stewardship [19,20], but demand can be steered [33]. The Danish algae paradox is instructive: abundant, fast-growing littoral resources are almost ignored, so actively promoting them and other resilient taxa could relieve pressure on heavily targeted charismatic species such as *Allium ursinum*. Managing the wave, rather than resisting it, is the realistic—and ambitious—conservation posture: foraging is a ubiquitous practice that planners and policy have largely overlooked [39].

4.5. Identity, Gastronationalism and Whose Knowledge Counts

Foraging is entangled with identity, and this too has conservation consequences. In Tel Aviv–Jaffa, the accounts of our Jewish–Israeli participants suggest a "New Israeli Cuisine" that borrows Levantine plants while distancing itself from the Palestinian tradition; we present this as an interpretation emerging from the interviews conducted here, rather than as an established characterisation of the wider culinary field. In Scotland, foraging is widely perceived as "foreign" or un-Scottish even though it is practised largely by incomers—the label mislocates the practice. In each case, recognition determines which knowledge is documented, funded and perpetuated [4]. We stress, moreover, that the Arab–Palestinian perspective reported in this study rests on two interviews only, and is, therefore, treated throughout as an illustrative case rather than as evidence representative of the wider Arab–Palestinian tradition (Section 4.7). Equitable, participatory documentation of local knowledge-holders—the ageing Arab–Palestinian women of Jaffa, the "studied" Scottish foragers who deliberately reconstruct local tradition, and the Danish course networks that curate what is taught—is, thus, not only an ethical imperative but a practical conservation strategy: it captures place-specific expertise before it is lost and broadens the base of plant awareness.

4.6. Foragers as Citizen Educators: A Distributed Conservation Workforce

The most actionable finding of this comparison is that contemporary foraging already has its own teaching infrastructure—one that could function as a distributed conservation-education workforce. In every case study, a committed minority actively transmits knowledge: Danish course leaders, Israeli professional guides, and—most strikingly—the roughly one-third of Scottish participants who teach through classes, blogs and real-time identification on social media. A caveat applies here: because recruitment—particularly in Scotland—proceeded partly through foraging associations and online foraging communities, experienced foragers and active teachers are likely over-represented in our samples, and the prominence of this citizen-educator role may, therefore, partly reflect the recruitment strategy rather than a broader characteristic of forager populations (Sections 2.1 and 4.7). With that qualification, read through the environmental-education literature [40], these actors are grass-roots citizen educators: lay practitioners who build ecological literacy in others by modelling direct, embodied engagement with local biota. Four features make them well suited to the task. First, they teach through desire rather than duty, aligning motivation—food, pleasure, health—with attentiveness to habitat, phenology and sufficiency; the lesson lands because the learner wants the plant. Second, they are horizontal and participatory: crowdsourced identifications, foraging courses and communal meals resemble citizen science and peer-learning networks more than top-down instruction, and they reach precisely the urban and post-industrial publics most estranged from nature [16]. Third, the delocalisation described in Section 4.1 becomes an asset here: a standardised, screen-borne corpus is far more transmissible than an oral tradition tied to a single valley, so one skilled forager could, in principle, seed plant awareness in many learners—a plausible proposition, though not one our data directly demonstrate. Fourth—and this is the decisive point—what they teach is overwhelmingly the common flora, so their reach can be scaled with minimal commensurate ecological cost, provided harvesting remains light and centred on abundant, resilient taxa—an asymmetry that formal conservation education, tied as it is to reserves, rarities and permissions, cannot match. The obvious caveat is quality control: media visibility privileges the most searchable and charismatic content and can spread thin or unsafe information [41], so a stewardship ethic must travel with the identification knowledge.

The strategic implication is that conservation actors should partner with, rather than merely police, this workforce. The attention that gathering cultivates is relational and outward-facing: to harvest responsibly is to learn where a species grows, when it fruits and how much can be taken without depleting it, and foragers routinely externalise that knowledge through the same books, courses and social media channels that recruited them [41]. Urban foraging in particular can rebuild a sense of belonging to—and responsibility for—the living fabric of the city, converting anonymous green space into named and valued habitat and giving marginalised publics a recognised stake in it [42,43]; where it doubles as a route to food security and food sovereignty, it binds nutritional self-reliance to place-based knowledge of local biodiversity [44]. At its most developed, this attentiveness shades into an explicit ethic of reciprocity—the understanding that sustained taking obliges giving back and caring for the source—that maps closely onto relational stances long articulated in indigenous plant knowledge [45]. Whether foraging reliably produces that outcome remains untested, but the practical steps that would allow it to are clear enough: co-designing citizen-science monitoring of harvested populations with foragers, steering attention towards the common, abundant and under-recorded species of everyday urban ground, embedding protected-species and habitat-stewardship messaging in the courses, apps and networks foragers already trust, and crediting the elders whose place-based knowledge anchors the practice. Bringing ethnobotanical practice and botany-education

research together around this constituency is itself a concrete and largely unexploited route to raising plant awareness [46]. Understood in this light, the contemporary foraging revival is less a threat to be policed than one of the largest and cheapest latent reservoirs of plant-conservation awareness and voluntary stewardship now available—but only if that latent potential is actively converted into stewardship rather than left to become simply more harvesting.

4.7. Limitations

Several limitations qualify these conclusions. All three samples are small and opportunistically self-selected (Section 2.1), so the findings are indicative patterns rather than statistical generalisations, and no formal saturation test was applied. The datasets are also seasonally and methodologically uneven: the Danish material was gathered through a single spring-administered online questionnaire with no geographic screening (so gathering localities across Jutland and the islands cannot be resolved) and so under-represents late-summer and autumn taxa, notably fungi; the Scottish sample, recruited through a foraging association, over-represents enthusiasts and teachers—a bias that bears directly on the prominence of the citizen-educator role discussed in Section 4.6—and the Tel Aviv–Jaffa sample includes only two Arab–Palestinian participants, which is too few to characterise that tradition and should be read as illustrative only. The three case studies were also carried out almost a decade apart (2012 versus 2020–2021), so region and period are confounded. We also note that the argument developed in Section 4.3 rests on an inference rather than a measurement: we did not quantify harvest volumes, and the claim that awareness gains concentrate on common taxa while harvest risk concentrates on rare ones follows from the composition of our inventory and from the wider literature, not from direct observation of either process. Comparisons across cases should, therefore, be read as heuristic rather than definitive, and the patterns we report as hypotheses to be tested.

5. Conclusions

Across the three case studies—Denmark and Southern Scotland in Northern Europe and urban Mediterranean Tel Aviv–Jaffa—contemporary foraging is taxonomically diverse (153 wild-food taxa in 51 plant families), plural in motivation, and, read through the Latvian (Riga) sociology of foraging, sits firmly on the delocalised, "lifestyle" side of the forager spectrum. For plant conservation, this is double-edged: it erodes place-based traditional ecological knowledge and, through an expanding cohort of newcomers, risks over-harvesting rare, coastal, peatland, and legally protected taxa. Yet, the two sides are not distributed symmetrically across the flora: harvest risk concentrates in a small minority of vulnerable taxa, whereas the hypothesised awareness dividend is generated by the commonest plants of everyday urban ground—taxa that can be gathered, taught and celebrated at minimal ecological cost when harvesting is light and directed at abundant, resilient populations.

Where foragers anchor their teaching in that ordinary flora, their contribution to plant conservation is not incidental but quintessential, and foragers themselves constitute a largely self-motivated constituency of volunteer citizen educators who could help build the plant-conserving public that policy has struggled to create. Conservation actors should, therefore, treat foraging communities as an ally to be mobilised rather than a nuisance to be regulated: co-producing sustainable-harvest guidance, promoting common, resilient and under-used resources such as coastal macroalgae and ruderal urban greens, documenting the knowledge of elders alongside the enthusiasm of neo-foragers, and coupling identification skills to an explicit stewardship ethic.

Future work should broaden and balance comparisons across seasons, regions and social groups—including settings such as the Balkan Peninsula and Eastern Europe, where utilitarian, vertically transmitted foraging persists—moving from small purposive samples towards systematic and quantitative designs; quantify harvest pressure on high-demand taxa and identify thresholds for sustainable gathering; and test directly, rather than assume, whether foraging measurably increases plant awareness and pro-conservation behaviour.

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Informed Consent Statement: Verbal informed consent was obtained from all participants prior to each interview. Written consent was not collected because the interviews were conducted in informal community settings during ethnobotanical fieldwork, and the research involved minimal risk. The use of verbal consent was considered more culturally appropriate and less intrusive than requesting written signatures. Before each interview, participants were informed about the aims of the study, the voluntary nature of their participation, their right to refuse to answer any question or to withdraw at any time without consequences, the confidential treatment of their information, and the intended scientific publication of anonymised data.

Data Availability Statement: All data supporting the findings of this study are contained within the article.

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