

Traditional Ecological Knowledge: Sustaining Our Lives and the Natural World

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Traditional ecological knowledge has been defined as “a cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission. It concerns the relationship of living beings (including humans) with one another and with their environment.” (Wikipedia 2011) The term applies to aboriginal, indigenous, or other forms of traditional knowledge regarding local environmental resources (see sidebar). When harvesting plants using traditional ecological knowledge, Native Americans offer thanks and say a prayer before they harvest them (Baumflek and others 2010).

In this article, I will apply the term perhaps more broadly to include the current knowledge of all people and cultures in understanding the natural world around them—their ability to identify, appreciate, sustainably utilize, and steward the plants, fungi or mushrooms, and animals that inhabit natural landscapes such as forests, prairies, wetlands, deserts, and prairies. To be able to do this is a profound accomplishment because it connects us with the land in a tighter, more harmonious relationship.

Our children languish indoors working with their electronic devices and miss out on the marvelous beauty and diversity of the planet. Knowledge and appreciation of the natural world can add greatly to their feelings of harmony with and connectedness to the world, which can enhance feelings of self worth and awareness of being an integral part of a larger family.

A Historical Perspective in North America

In North America, indigenous populations used traditional ecological knowledge to provide basic life needs such as food and shelter at a time when grocery stores and pharmacies did not exist. Some Native Americans burned the forests to increase wild game

Characteristics of Indigenous Knowledge (IK) (synonymous with traditional ecological knowledge) (de Guchteniere and others 1999)

- IK is generated within communities
- IK is location and culture specific
- IK is the basis for decisionmaking and survival strategies
- IK is not systematically documented
- IK concerns critical issues of human and animal life: primary production, human and animal life, natural resource management
- IK is dynamic and based on innovation, adaptation, and experimentation
- IK is oral and rural in nature

populations and to increase the amount of berries (blueberries, for example) and other plant foods.

The use of wild plants for medicine and food in North America has been documented online in the Native American ethnobotany database (University of Michigan n.d.). The latest version of the Web site contains 44,691 items, including medicines, foods, drugs, dyes, fibers, and other uses of plants. This database documents the use of 4,029 species from 243 different plant families by 291 Native American groups. Roughly half of the plants species were used for medicine.

Mushrooms are not included in the Native American ethnobotany database. According to the University of Hawaii’s Department of Botany, mushrooms were not used as a major source of food by Native Americans. However, they were used for medicine as well as ceremonial, spiritual, and religious purposes. For example, puffballs were used to help stop bleeding or to dry out wounds.

European cultures who settled in North America were traditionally more reliant on domesticated food rather than foraging for wild foods ([University of Hawaii 2011](#)). However, to survive in the wilds of America and Canada, early pioneers had to adapt to their surroundings as had Native Americans. European colonists used wild plants for many purposes, including food, medicines, and artistic and structural purposes. As Baumflek and others (2010) noted, “For as long as people have lived in the St. John River watershed (of northern Maine), nontimber forest products have contributed greatly to their livelihoods and well-being.”

Similar to the Native Americans, English colonists did not apparently use mushrooms in a significant way for food ([University of Hawaii 2011](#)). Although the English and their colonies were widely recognized as being “mycophobic,” other European cultures used mushrooms extensively for food and likely pursued their mushrooms in America as well. For example, Slavic peoples in Russia and Eastern Europe are passionate mushroom collectors and eaters. Italians, Germans, and the Swiss are also fond of mushrooms.

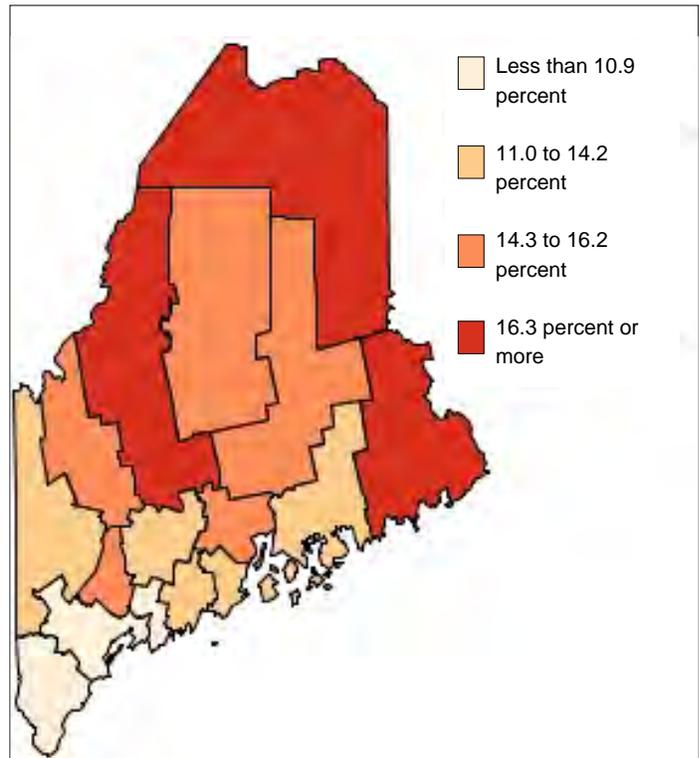
The Connection between Rural Poverty and Indigenous Knowledge

According to a recent UNESCO and CIRAN report ([de Guchteneire and others 1999](#)), one quarter of the world’s people currently live in severe poverty. In the United States, about 15.1 percent of the population suffers from the effects of poverty ([U.S. Census Bureau 2011](#)). Poverty is not just an urban or suburban problem. It also occurs in rural areas throughout the world, including New England. According to 2009 county-level poverty rate data maintained by the USDA Economic Research Service, a majority of the State of Maine exceeded 11 percent poverty with large parts of northern, central, and eastern Maine experiencing poverty levels that equaled or exceeded 14.3 percent.

Traditional ecological knowledge has always been important to poor rural people around the world for survival. According to [de Guchteneire and others \(1999\)](#), the Green Revolution was implemented with an objective of providing maximum yields through the introduction of new crop varieties. However,

adequate amounts of fertilizers and irrigation were necessary to achieve these yields. The Green Revolution was a success in production only in areas with good soils, a secure water supply, and adequate funds. The Revolution had little success in other marginally productive areas of the world that did not have these attributes. In such regions, as witnessed by the recent famine in the Horn of Africa, it is a life and death situation for millions. Traditional knowledge of edible plant foods, animal foods, and medicines helps people to better survive in these regions under normal conditions and perhaps even under catastrophic conditions.

In many parts of the world, traditional ecological knowledge helps sustain local populations and maintain natural resources for survival. However, using traditional ecological knowledge is becoming increasingly difficult under rapidly changing environmental conditions caused by factors such as drought ([de Guchteneire and others 1999](#)).



Poverty levels in Maine by county
(U.S. Department of Agriculture, Economic Research Service 2011)

Traditional Ecological Knowledge in New England

Fortunately here in New England, we are not subject to such catastrophic effects on human populations from severe climatic disturbances such as drought. However, for the rural poor in parts of New England, making do with less is a fact. Using traditional ecological knowledge, rural poor can collect and sell nontimber forest products directly to customers either along roadsides or at farmers markets or other locations. And collection of food from the forest for personal use can provide an alternative to the high cost of purchasing food products in grocery stores.

Baumflek and others (2010) note that nontimber forest products are beneficial to residents of northern Maine: "... northern forest residents from various ethnic heritages collect wild foods, medicines, and materials. In addition to economic and cultural resources, gathering provides numerous human health and well-being benefits by promoting outdoor exercise, providing foods that are dense with micronutrients, and reinforcing familial relationships." The authors interviewed gatherers and land managers, then developed a list of 120 different plants and fungi (Baumflek and others 2010, appendix 1) and described 29 of the most popular species in greater detail on a Web site that features their publication: http://www.nrs.fs.fed.us/sustaining_forests/conserv_ehance/special_products/maine_ntfp/plants/.

The 30 species include brown ash (*Fraxinus nigra*), Balm-of-Gilead (*Populus x P. gileadensis*), American beech (*Fagus grandifolia*), paper birch (*Betula papyrifera*), blueberries (*Vaccinium* sp.), common burdock (*Arctium minus*), Eastern white cedar (*Thuja occidentalis*), wild chives (*Allium schoenoprasum*), chokecherry (*Prunus virginiana*), coltsfoot (*Tussilago farfara*), comfrey (*Symphytum officinale*), highbush

cranberry (*Viburnum opulus*), dandelion (*Taraxacum officinale*), red-osier dogwood (*Cornus sericea*), fiddleheads (*Matteuccia struthiopteris*), balsam fir (*Abies balsamea*), flag root (*Acorus calamus*), fungi, goldthread (*Coptis trifolia*), beaked hazelnut (*Corylus cornuta*), sugar maple (*Acer saccharum*), pearly everlasting (*Anaphalis margaritacea*), pine species (*Pinus* sp.), common plantain (*Plantago major*), red raspberry (*Rubus idaeus*), rose species (*Rosa* sp.), spruce species (*Picea* sp.), St. Johnswort (*Hypericum perforatum*), wild strawberries (*Fragaria virginiana*), and sweet grass (*Hierochloe odorata*).



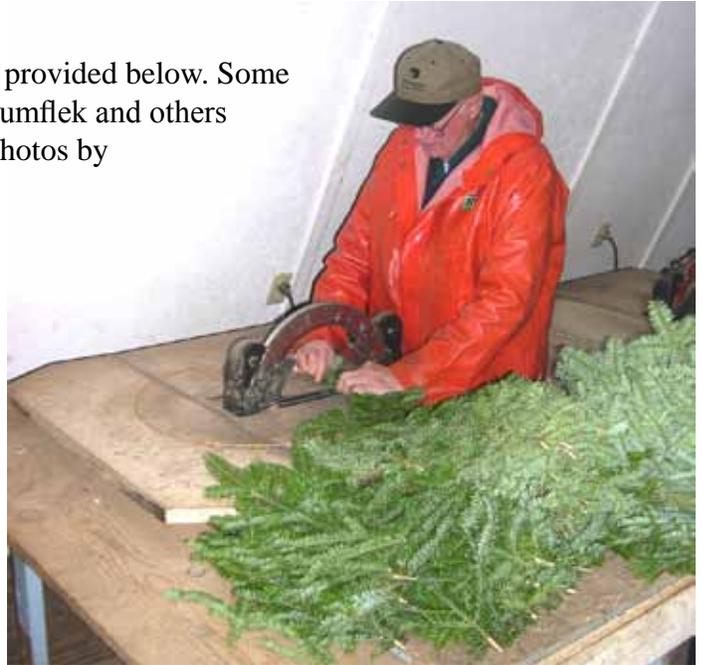
Sweet grass basket lid and basket (photo by Ken Dudzik)

Nontimber Forest Products in New England

A sample of nontimber forest products in New England is provided below. Some of these plant species overlap with the list provided by Baumflek and others (2010), and additional species are provided as well. (All photos by Roger Monthey unless otherwise noted.)

Foliage

- Balsam fir tips (*Abies balsamea*)
- Ground Pine (*Lycopodium* sp.)
- Reindeer Lichen (*Cladonia* sp.)
- Sweet Grass (*Hierochloa odorata*)



Balsam fir tips



Ground pine



Reindeer lichen for crafts

Nuts and Berries

- Hazelnuts (*Corylus* sp.)
- Black Walnut (*Juglans nigra*)
- American Beech (*Fagus grandifolia*)
- Blueberries and Cranberries (*Vaccinium* sp.)
- Juneberries (*Amelanchier* sp.)
- Blackberries and Raspberries (*Rubus* sp.)
- Black Huckleberry (*Vaccinium* sp.)
- Elderberry (*Sambucus canadensis*)

Ferns

- Fiddleheads or Ostrich Fern (*Matteuccia struthiopteris*)



Hazelnuts (photo by Dave Fuller)



Fiddleheads (photo on left by Dave Fuller)



Blueberries



Blackberries

Mushrooms¹

These edible mushrooms are relatively easy to recognize, with little chance of confusing their identity with others. They have been eaten by many people for many years with no ill effects, and they are widespread in their distribution and availability, according to mycologist George Barron in his recent book “Mushrooms of Northeast North America.” There are many species of edible Boletes or sponge mushrooms as well, but red-pored or orange-pored Boletes, especially those that stain blue, should be avoided.

- Orange Bolete (*Leccinum aurantiacum*)
- Slippery Jack (*Suillus luteus*)
- Granular-Dotted Bolete (*Suillus granulatus*)
- Black Trumpet (*Craterellus fallax*)
- Sidewalk Mushroom (*Agaricus bitorquis*)
- Meadow Mushroom (*Agaricus campestris*)
- Shaggy Mane (*Coprinus comatus*)
- Tippler’s Bane (*Coprinus atramentarius*)
- The Gypsy (*Rozites caperata*)
- Honey Mushroom (*Armillaria mellea*)
- Pig’s Ear (*Gomphus clavatus*)
- Golden Chanterelle (*Cantharellus cibarius*)
- Fairy Ring Mushroom (*Marasmius oreades*)
- Blewit (*Lepista nuda*)
- Oyster Mushroom (*Pleurotus ostreatus*)
- Delicious Lactarius (*Lactarius deliciosus*)



Shaggy mane



King Bolete (*Boletus edulis*)



Golden Chanterelle



Blewit



Black Trumpet

¹This is a very brief list of edible mushrooms. There are many others, but there are also poisonous ones. Consult field guides, experienced local pickers, and mycological clubs for information on edibility and poisonous species to avoid. Some of the field guides include:

- 1) National Audubon Society – Field Guide to Mushrooms by Gary H. Lincoff
- 2) Mushrooms of Northeast North America by George Barron
- 3) Mushrooms of Northeastern North America by Alan E. Bessette, Arleen R. Bessette, and David W. Fischer
- 4) Mushrooms Demystified by David Arora

Wreaths

- Birch (*Betula* sp.)
- Wild Cherry (*Prunus* sp.)
- Willow (*Salix* sp.)
- Red Osier Dogwood (*Cornus sericea*)
- Grapevine (*Vitis* sp.)
- Mountain Laurel (*Kalmia latifolia*)
- Tamarack or Hackmatack (*Larix laricina*)
- Sweetfern (*Comptonia peregrina*)
- Partridge Berry (*Mitchella repens*)



Red osier dogwood wreath

Coppicing Wood (Stump Sprouts)

Potential products include wood chips, firewood, fascines, charcoal, mushrooms, fencing, structures, crafts and baskets, furniture, and art.

- Black Locust (*Robinia pseudoacacia*)
- Maple (Red Maple – *Acer rubrum*, Sugar Maple – *A. saccharum*, Silver Maple – *A. saccharinum*)
- Oak (Red Oak – *Quercus rubra*, White Oak – *Q. alba*)
- Hickory (Pignut Hickory – *Carya glabra*, Bitternut Hickory – *C. cordiformis*, Shagbark Hickory – *C. ovata*, Mockernut Hickory – *C. tomentosa*)
- American Beech (*Fagus grandifolia*)
- Poplar (Quaking Aspen – *Populus tremuloides*, Bigtooth Aspen – *P. grandidentata*)
- Birch (Yellow Birch – *Betula alleghaniensis*, Paper Birch – *B. papyrifera*, Gray Birch – *B. populifolia*, Black Birch – *B. lenta*)
- Willow (*Salix* sp.)



Coppice or stump sprouts (red maple)

Maple Syrup

- Sugar Maple (*Acer saccharum*)



Sugar maple sap bucket (photo by Victoria Evans)



Birch baskets with Christmas foliage (balsam fir)



Willow sticks used in woven stick fencing and for other purposes with bark peeled (photo by Mark Krawczyk)

Native Trees and Shrubs² (plantings)

- Speckled Alder (*Alnus rugosa*)
- Serviceberry (*Amelanchier arborea*, *A. canadensis*, *A. stolonifera*)
- Bog Rosemary (*Andromeda polifolia*)
- Common Bearberry (*Actostaphylos uva-ursi*)
- Black Chokeberry (*Aronia melanocarpa*)
- Common Buttonbush (*Cephalanthus occidentalis*)
- Summer Sweet (*Clethra alnifolia*)
- Sweetfern (*Comptonia peregrina*)
- Dogwood (*Cornus alterniflora*, *C. amomum*, *C. racemosa*, *C. sericea*)
- Bunchberry (*Cornus canadensis*)
- American Hazel (*Corylus americana*)
- Wintergreen (*Gaultheria procumbens*)
- Witch Hazel (*Hamamelis virginiana*)
- Common Winterberry (*Ilex verticillata*)
- Common Juniper (*Juniperus communis*)
- Creeping Juniper (*Juniperus horizontalis*)
- Mountain Laurel (*Kalmia latifolia*)
- Common Spicebush (*Lindera benzoin*)
- Northern Bayberry (*Myrica pensylvanica*)
- Bush Cinquefoil (*Potentilla fruticosa*)
- Beach Plum (*Prunus maritima*)
- Rhodora (*Rhododendron canadense*)
- Rosebay Rhododendron (*Rhododendron maximum*)
- Swamp Azalea (*Rhododendron viscosum*)
- Pussy Willow (*Salix discolor*)
- American Elder (*Sambucus canadensis*)
- Broadleaf Meadowsweet (*Spirea latifolia*)
- Hardhack (*Spirea tomentosa*)
- Canada Yew (*Taxus canadensis*)
- Eastern Arborvitae (*Thuja occidentalis*)
- Lowbush Blueberry (*Vaccinium angustifolium*)
- Highbush Blueberry (*Vaccinium corymbosum*)
- American Cranberry (*Vaccinium macrocarpon*)
- Crowberry (*Vaccinium vitis-idaea*)
- Mountain Cranberry (*Vaccinium vitis-idaea minus*)
- Arrowwood Viburnum (*Viburnum dentatum*)
- Nannyberry (*Viburnum lentago*)
- American Cranberry Bush (*Viburnum trilobum*)



Balsam fir pillows



Birch bark accent panels



Common winterberry used as a decorative

²This list was abbreviated from a list developed for Coastal Maine by Bob Bittenbender of the Maine Audubon Society; however, many of these species can be grown in other parts of New England. These trees and shrubs are available from some plant nurseries. For another sample list from Connecticut, see the [Connecticut Native Tree and Shrub Availability List](#) from the Connecticut Department of Energy and Environmental Protection, Bureau of Natural Resources, Wildlife Division.

Baskets

- Brown Ash (*Fraxinus nigra*)



Brown ash basket

Conks (shelf-like fruiting bodies of wood-decaying fungi)

- Chaga (*Inonotus obliquus*) – medicinal
- Artist's Conk (*Ganoderma applanatum*) – art



Chaga (photos by Ken Dudzik)



Artist's conk (photo by Ken Dudzik)

Herbs

- American Ginseng (*Panax quinquefolia*) – medicinal
- St. Johnswort (*Hypericum perforatum*) – medicinal



American ginseng



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