Culturally important native plants: considerations for agroforestry systems

Jeremiah R. Pinto

17 September 2019
Agroforestry in the Pacific Northwest Workshop, Spokane, WA
Context and Objectives

1. Indigenous peoples, native plants, and nurseries
2. Intertribal Nursery Council
3. TEK, the Target Plant Concept, and Western Science
4. Considerations for agroforestry
5. Examples*
Indigenous Traditional Ecological Knowledge in Agroforestry

Introduction
Communication around the world has practical diverse and evolving forms of agroforestry for centuries. While both indigenous and non-indigenous practitioners have developed agroforestry practices of great value, in this publication, we focus on the role of indigenous, traditional ecological knowledge. Indigenous communities include American Indians, Alaskan Natives, Carolinians and Pacific Islanders, and others. Because indigenous groups have lived in the same area for long periods of time, each generation has built on the knowledge of the previous generation through observation and experimentation. In this manner, indigenous groups have evolved innovative ways to manage bioculturally diverse ecosystems. These ecosystems are managed to provide food, fuel, building materials, agricultural, and other-cultivating work, housing, and tending equipment, baskets, and cultural spaces essential to life and maintaining cultural traditions. Many agroforestry practitioners in the United States are learning from those complex systems.

A Changed Landscape
Within the United States, many indigenous communities and practitioners continue to carry on traditional management practices, but others struggle to do so. While some indigenous communities have been able to continue managing their ancestral homelands, others have faced displacement, loss to political boundaries, laws, regulations, economic incentives, and non-indigenous practices that have impacted their traditional ways of life. This has been a challenge—of not impossible—to continue traditional management practices. Some ancestral homelands have become cities, towns, and subdivisions. Others are managed by state and federal agencies or private individuals and companies whose management goals are different from the indigenous people's. Even when tribes and indigenous communities have been able to retain or ensure management rights to land, they may need to do a significant amount of management (e.g. clearing, burning, pruning, planting) in order to remove invasive plants and to maintain the landscape (e.g. to provide food, medicine, and cultural materials, etc.).

Additionally, climate change is altering wind, fire, disease, drought, and flooding patterns as well as the suitable ranges for many of the species upon which indigenous people traditionally rely. On top of this, invasive species continue to cause dramatic ecological changes. Thus, traditional practitioners are adapting their practices to the new conditions of today and in preparation for tomorrow. Many of these practices can inform climate change adaptation management.

Learning from Traditional Ecological Knowledge
As the same time that indigenous practitioners are adapting to changing conditions, there is a burgeoning interest among landowners and land managers to manage their lands as more complex ecosystems. Whether they are small woodlots, a large farm, or manage public lands, many people wish to use several objectives on one piece of property. These objectives are often similar to the objectives for which indigenous communities traditionally managed, which include:

- Fruit
- Firewood
- Building and building materials
- Culinary and medicinal herbs
- Clean and abundant water
- Wildlife habitat
- Privacy
- Reduction of hazardous fuels around the home and valued resources
- Treaty
- Recreation spaces
- Cultural values
- Sacred and historic sites
- Educational opportunities
Propagating native plants for restoration using western science and traditional knowledge

Jeremiah R. Pinto

25 July 2019, Tribal Alliance for Pollinators, webinar
Native Americans and Plants

History of:
- Food
- Shelter
- Textiles
- Medicine
- Ceremony
Native Plants on Indigenous Lands

Contemporary Management Needs:
- Reforestation
- Restoration
- Wildlife
- Bioengineering
- Invasive Species
- Disturbance
- Climate Change
- Landscape
Contemporary Management

Assisted with Modern Tools and Concepts:

- Greenhouses
- Climate control
- Irrigation systems
- Mechanical equipment
- Plant physiology
- Fertilizers
- Target plants
- Etc.

(Fuchigami and Nee 1987; Burr 1990)
Native Plants on Native Lands

Additional Needs

• Cultural
  – Preservation
  – Education
  – Availability
  – Economic
  – Food
  – Medicine
  – Textiles
Potential Conflicts with Traditional Ideals

Plant Production Concerns:

• Artificial
  – Spirituality
  – Connectedness

• Trophic levels
  – Medicine
  – Textiles

• Genetics
Interesting start

2001 Invitation to discuss tribal nurseries

- All tribes invited
- Existing nurseries
- Interested

Formalized a nursery group
The INC is a USDA Forest Service run, tribally guided, organization for advancing the interests of native peoples involved with plant production in nurseries
Intertribal Nursery Council

Special emphasis nursery topics include:

• Technology transfer and information sharing
• Conservation education
• Preservation of Traditional Ecological Knowledge
• Reforestation
• Restoration
• Nursery training
Finding a Balance

Goal:
• Successful use of plant materials on Indigenous lands

Means:
• Use both science and Traditional Ecological Knowledge
• Build trust
• Engage community
Not an Easy Task

“Successful integration will require a thorough and thoughtful synthesis where concepts are considered within their cultural context and not as bits of knowledge or information to be inserted into the prevailing scientific framework.”

From: Indigenous peoples restoration network (SER online)
Acknowledging There Is No “One Size Fits All” Approach

Create space for:
• Creativity
• Adaptability
• Expansion
• Inclusion
Traditional models

1. Need for seedlings
2. Nurseries grow seedlings
3. Seedlings are planted
4. Nurseries grow seedlings
5. Need for seedlings
6. Seedlings are planted
New model

Need for seedlings

Evaluate for 5 years

Define target plant

Nurseries grow seedlings

Establish outplanting trials

Everything is connected!!
The Target Plant Concept:

A holistic approach to native plant restoration

- Nursery – Client Partnership
- Outplanting Site
- Quality Not Appearance
- Three key, often overlooked approaches — these guide the process.

1. Outplanting Objectives?
2. Site Conditions?
3. Limiting Factors?
4. Mitigating Measures for Limiting Factors?
5. Species and Genetic Sources?
6. Stocktype?
7. Outplanting Tools and Techniques?
8. Outplanting Window?

Eight questions based on objectives and site characteristics. Answers define the target plant material.

Grow target plants in nursery

Outplant and evaluate survival and growth up to 5 years

Landis & Wilkinson 2014
Incorporating TEK in the TPC

• An opportunistic approach to native plant restoration and reforestation

Concept attributes:
1. Objectives
2. Site evaluation
3. Limiting factors
4. Mitigating measures
5. Genetics
6. Plant material
7. Tools & techniques
8. Outplanting window

Indigenous inputs:
• Consultation
• Trophic level consideration
• Education opportunities
• Traditional plant selection
• Ceremony
Native plant production and agroforestry are highly related!

“When land managers incorporate trees with crops and or livestock in an integrated, intentional, interactive and intensive way, they are practicing agroforestry.” Agroforestry Note 44

Multi-species management
- Satisfy multiple objectives
- Leveraging resources
- Workhorse species
- Less complicated?

Native plants associated with GSG diet and pollinators (Dumroese et al. 2016).

Woodland Restoration Project
Cultural Objectives
Wildlife Objectives
Considerations for Agroforestry

Multi-purpose forest management:
- Food
- Firewood
- Water
- Wildlife
- Recreation
- Fuel reduction
- Education

Added benefits:
- Medicinal herbs
- Ceremonial items
- Basketry and building materials
- Accessibility

Photo credits: Jeremy Ojua
Sturgeon-nose canoe building

Traditional build with forest materials
- Artisan: Dr. Shawn Brigman
- Priest River Experimental Forest: Dr. Marcus Warwell
- Western white pine, bitter cherry, Rocky Mountain maple, ocean spray, ponderosa pine
Tribes and Their Nurseries

Stillaguamish Tribe, Arlington, Washington

• Native plants
  – Fisheries
  – wholesale

2010 Intertribal Nursery Council
Tribes and Their Nurseries

Confederated Salish and Kootenai Tribes

- Forest and native plant nursery
Confederated Tribes of Grand Ronde

- “Plants for people: bringing traditional ecological knowledge to restoration”
- Plant materials program
- Education
- Enhance gathering and accessibility

Photo credits: Jeremy Ojua and the CTGR
Tribes and Their Nurseries

Seneca Nation

- Native Plant Policy
- Landscaping Public Buildings
- Elder’s Circle
- Youth Garden
- Community Gardens

Photo credits: Ken Parker and Seneca Nation
Tribes and Their Nurseries

Hopi Tribe
- Range restoration
- Riparian restoration
- Culturally significant plants
- Education

Photo credits: Steven Lomadafkie, David Steinfeld, Tom Landis, and the Hopi Tribe
Tribes and Their Nurseries

Mescalero Apache

• Forestry
• Native plants
  – Food
  – Construction materials
  – Ceremony

Photo credits: Robin Chimal and the Mescalero Apache Tribe
Tribes and Their Nurseries

Navajo
• Forest and native plant nursery

Photo credits: Jesse Mike and the Navajo Nation
Tribes and Their Nurseries

White Mountain Apache
• Forest and native plant nursery

2013 Intertribal Nursery Council
Keweenaw Bay Indian Community

- Native plants
  - Restoration
  - Fisheries
  - Pollinators
  - Medicinal
Finding a Balance

Goal:
• Successful agroforestry practices on your land

Means:
• Use both science and Traditional Ecological Knowledge
• Research
• Build trust
• Engage community
Thank You!
Ahehee’!

Jeremy Pinto
jeremy.pinto@usda.gov