Traditional ecological knowledge and ecological restoration :

restoring relationships between land and community

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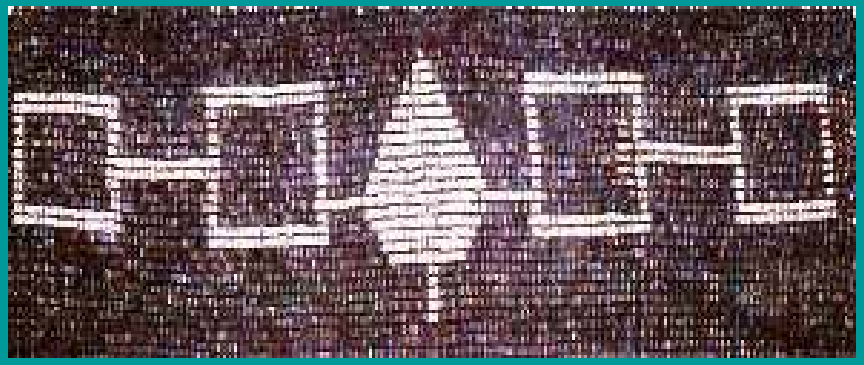
SUNY ESF

Two neighboring centers of ecological knowledge

Traditional Ecological Knowledge (TEK)



Onondaga Nation

Scientific Ecological Knowledge (SEK)

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The complex issues of living sustainably on the planet require a diversity of intellectual approaches

Genetic diversity → Biological Evolution

Intellectual diversity → **Cultural evolution**

Restoring pre-settlement ecosystems of may not be possible without also understanding the relationship of indigenous people to the land.

This requires thoughtful exploration of Traditional Ecological Knowledge.

Task: defining TEK

- By academics
- By native people

What is Traditional Ecological Knowledge?

- The cumulative body of knowledge, practice and belief concerning the relationship of living beings to one another and to the physical environment

- an attribute of societies with historical continuity in resource use practice

“the intellectual twin to science”
Vine DeLoria, Jr.

How do native people define TEK?

"Traditional knowledge is a way of life -wisdom is using traditional knowledge in good ways. It is using the heart and the head together."

From Alaska Native Science Commission

It sets out the rules governing the use of resources - respect, an obligation to share. It is dynamic, cumulative and stable.

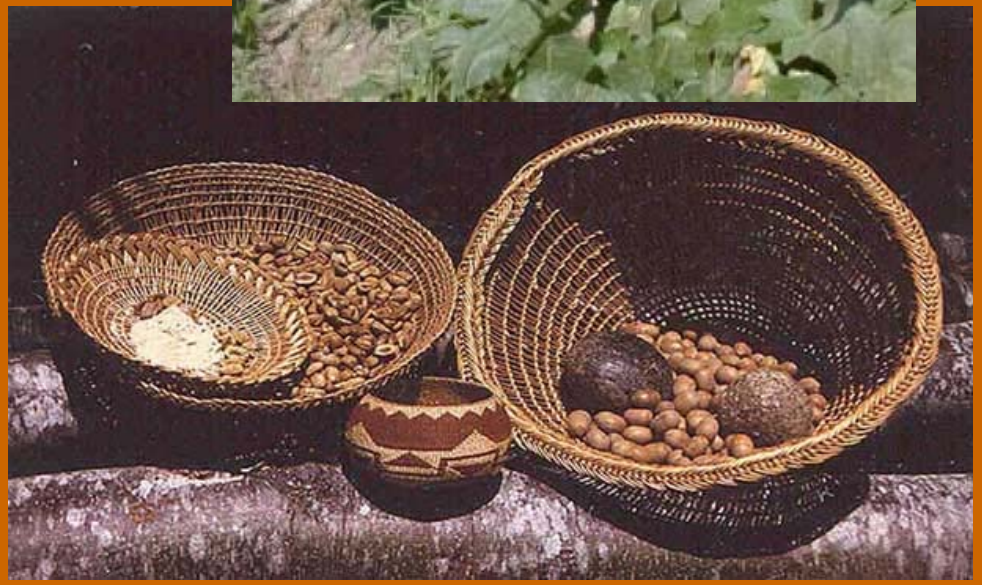
- **" It is practical common sense based on teachings and experiences passed on from generation to generation".**

- **"It is knowing the country. It covers knowledge of the environment - snow, ice, weather, resources - and the relationships between things."**

- *"It is holistic. It cannot be compartmentalized and cannot be separated from the people who hold it. It is rooted in the spiritual health, culture and language of the people".*

What does TEK include?

- Resource inventory, monitoring,assessment
- Environmental modification
- Classification, nomenclature
- Knowledge of landscape,climate,dynamics
- Knowledge of species interactions
- Harvesting strategies,management
- Successional dynamics



Agricultural knowledge

Traditional Ecosystem Management Knowledge

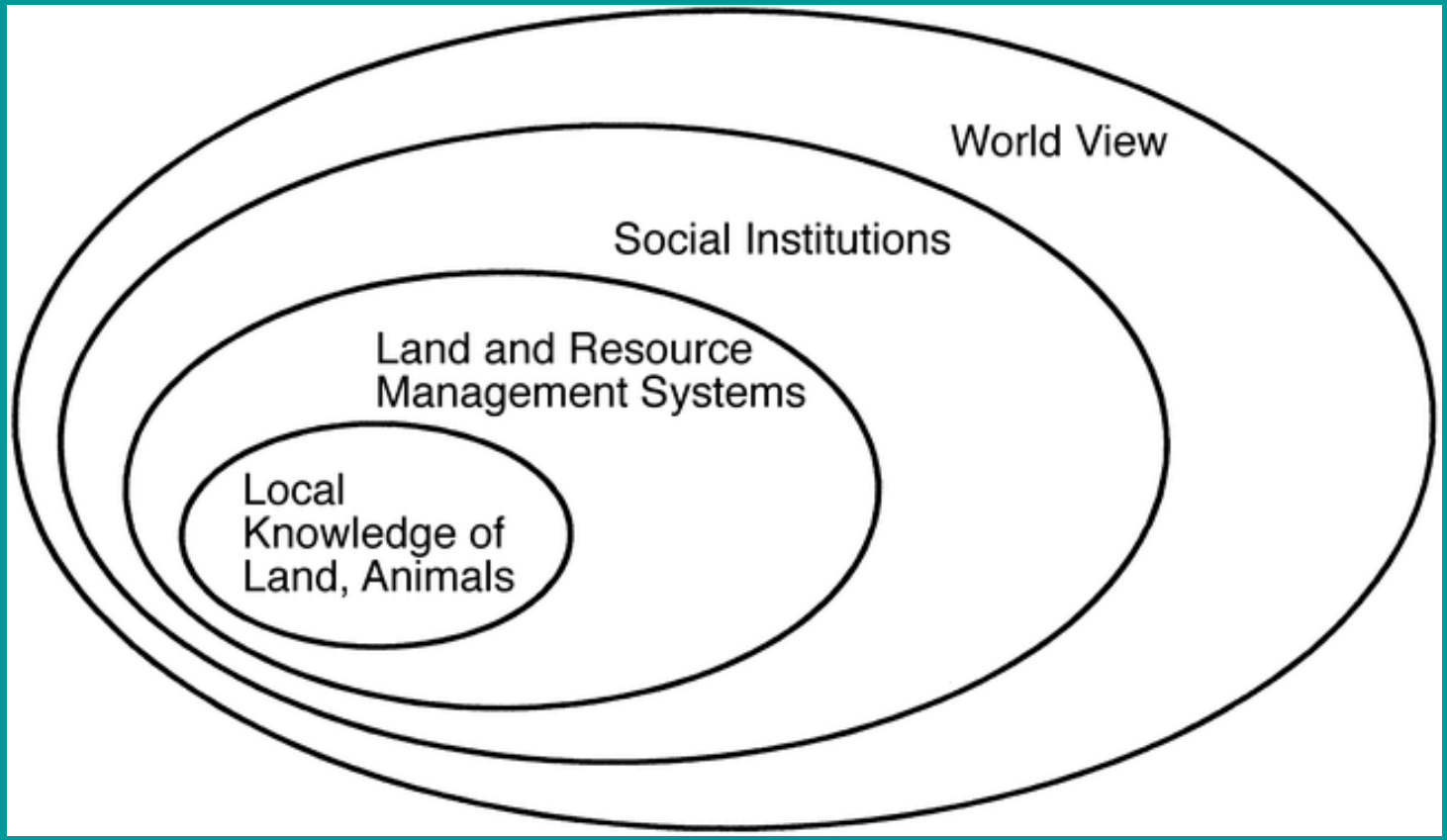
Medicine Knowledge

Knowledge of landscape change

Population dynamics and regulation

Knowledge of climate change

More than just empirical “data” ….. a whole way of knowing



Levels of Analysis in TEK
Berkes 2000

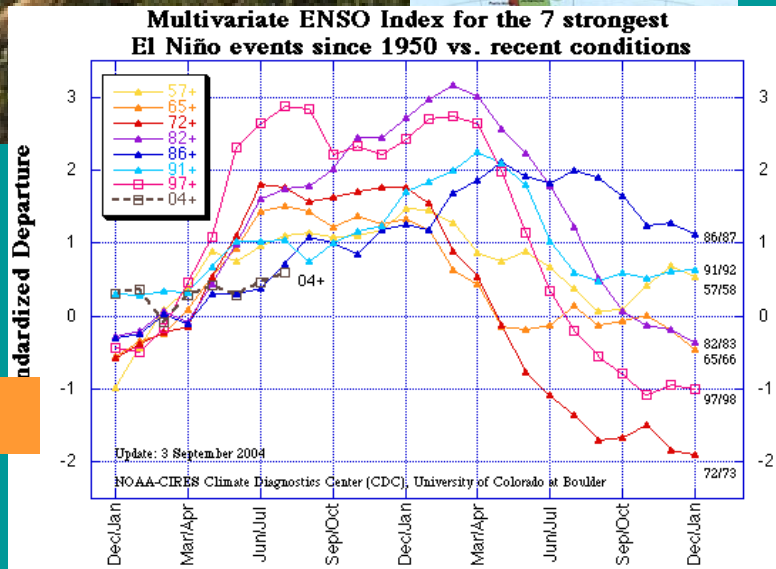
Similarities between TEK and SEK

- Both based on observation of nature
- Both yield detailed empirical information of natural phenomena and relationships
- Information is interpreted in a cultural context
- Both have predictive power

Predictive power of TEK

Quecha observation of Pleiades

Alternative cropping strategies



Prediction and response to El Nino

How does TEK differ from SEK?

- TEK is qualitative, SEK is mainly quantitative
- TEK is holistic, SEK is more reductionist
- TEK is based on diachronic data, SEK on synchronic data

TEK is generated by the resource users themselves

SEK is generated by scientific professionals

Differences between SEK and TEK cont'd

TEK is not merely a body of information. It is embedded in a social, ethical and spiritual context

- TEK has a moral basis, SEK is "value-free"
- TEK explanations have spiritual components, SEK is purely mechanistic
- TEK has an intuitive component,while SEK is purely rational
- source: Berkes, F. 1992

Of what intrinsic value is TEK?

- intellectual and cultural tradition
- evolving source of knowledge of relationships with human and more than human world
- Potential new paradigm for relationship to natural world
- Alternative to dominant materialist worldview

PRACTICAL SIGNIFICANCE OF TEK

(from IUCN Programme on Traditional Knowledge for Conservation, 1986)

* TEK for new biological and ecological insights.

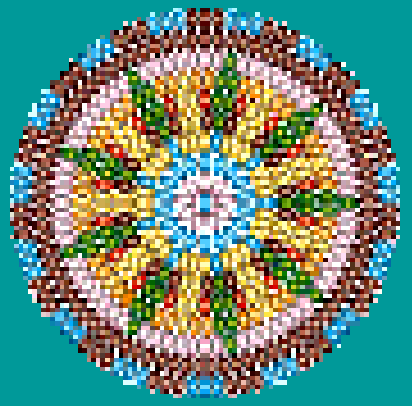
*TEK for resource management

*TEK for protected areas and conservation education

*TEK for development planning

*TEK for environmental assessment

*TEK for commodities



Source of “new” biological insights

- Caribou herd management (Mander,1991)
- Badger and Coyote
- Sphinx moth pollination (Nabhan 1997)
- Hudson Bay Eider (Nakashima 1993)
- Desert tortoises forage plants (Nabhan 2000)
- Bowhead whale census (Huntington 2000)
- Wild chiles and frugivorous birds (Tewksbury et al 1999)

Inuit knowledge of Hudson Bay Eider (Nakashima 1992)

Biological insights of Inuit far exceeded knowledge of wildlife managers

- Range
- winter behavior
- demography
- mortality patterns

"*Sacred datura leaves, sacred datura leaves,*

eating your greens intoxicates me,

making me stagger and dizzily leap."

O'odham song,translated by Russell 1908,

Nabhan 1997

Privileging of knowledge…….

Grant,V. and K. Grant. 1965. Behavior of Hawk moths on flowers of Datura metaloides. Botanical Gazette 144:280-284

TEK is an important, overlooked resource in ecological restoration

- Knowledge for reference ecosystems
- Land management practices
- Alternative ecological models
- Restoration of cultural relationships

What should the reference ecosystem be ?

Information on reference ecosystems may be embedded in:

- Scientific ecological knowledge
- Traditional ecological knowledge:
  - oral history
  - ethnographies
  - harvesting practices
  - management practices
  - material culture

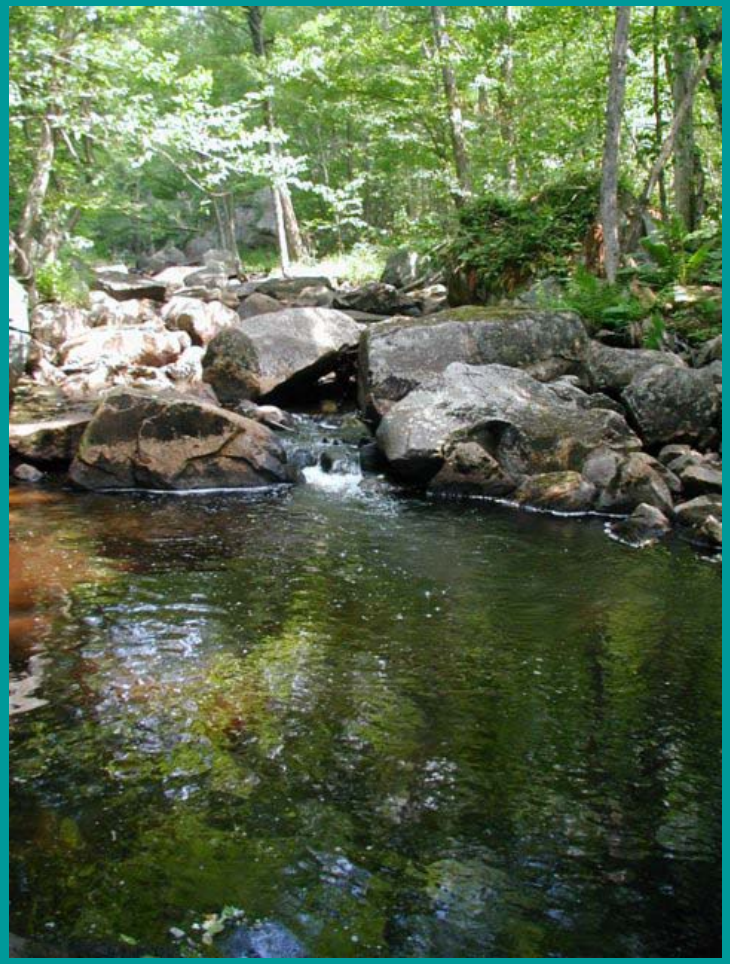
Language as repository of ecological knowledge

Desert tortoise

Remnant landscapes as sources of ecological knowledge

- Prairies/Walpole Island

Material culture as sources of ecological knowledge



“The acid test of our understanding is not whether we can take ecosystems to bits on pieces of paper, but whether we can put them together again in practice and make them work”.

AD Bradshaw 1983

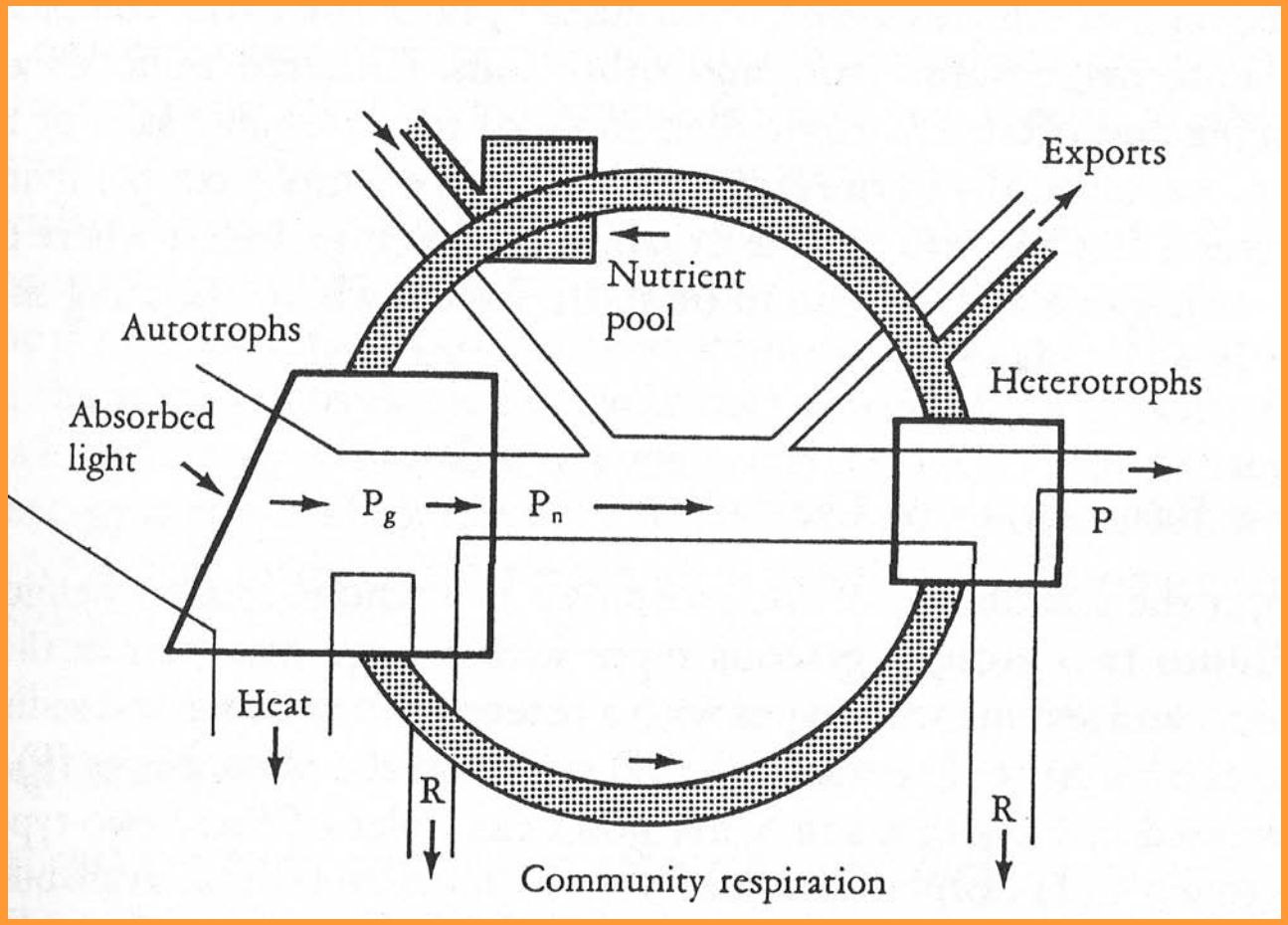
The National Research Council defines restoration as:

The return of an ecosystem to a close approximation of its condition prior to disturbance. In restoration, ecological damage to the resource is repaired. Both the structure and the function of the ecosystem are recreated. Merely recreating the form without the function, or the function in an artificial configuration bearing little resemble to a natural resource, does not constitute restoration….the goal is to emulate.

NRC 1992

An SEK approach

The ecosystem as machine: a collection of interacting parts



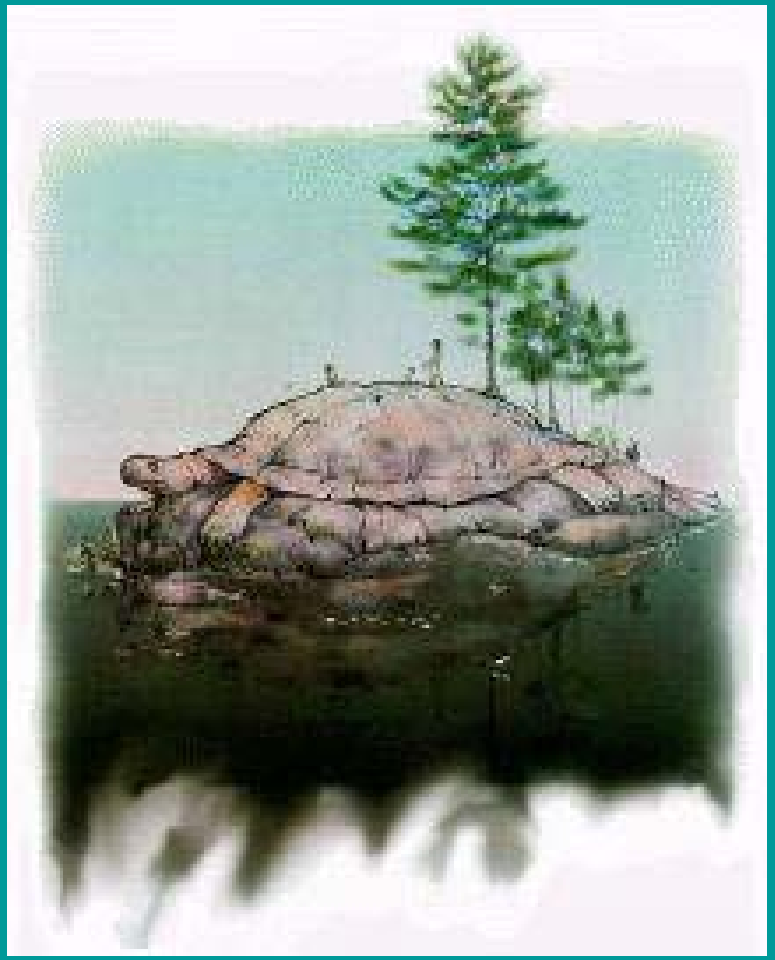
Western paradigm: Nature as “object”

Through a different lens…

What does land “mean”?

What does restoration mean?

Beyond ecosystem services to cultural services and relationships



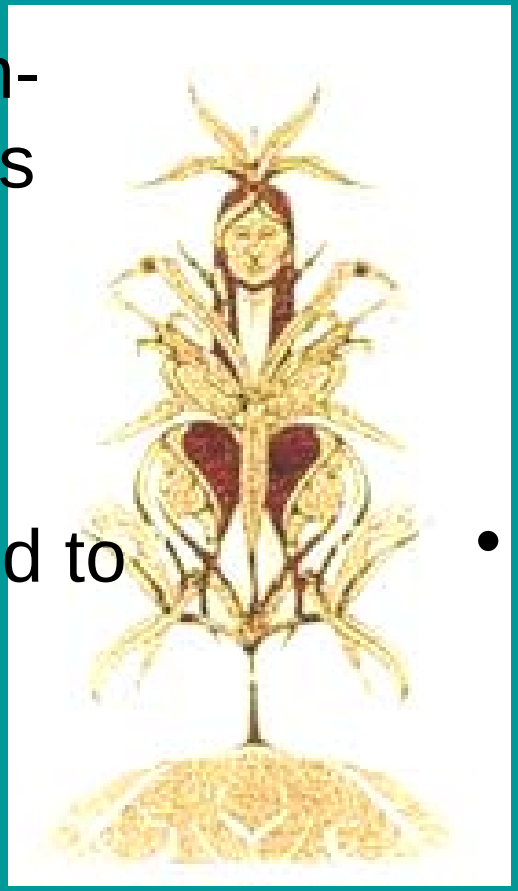
Ecosystem as community of sovereign ”persons”

Indigenous paradigm:

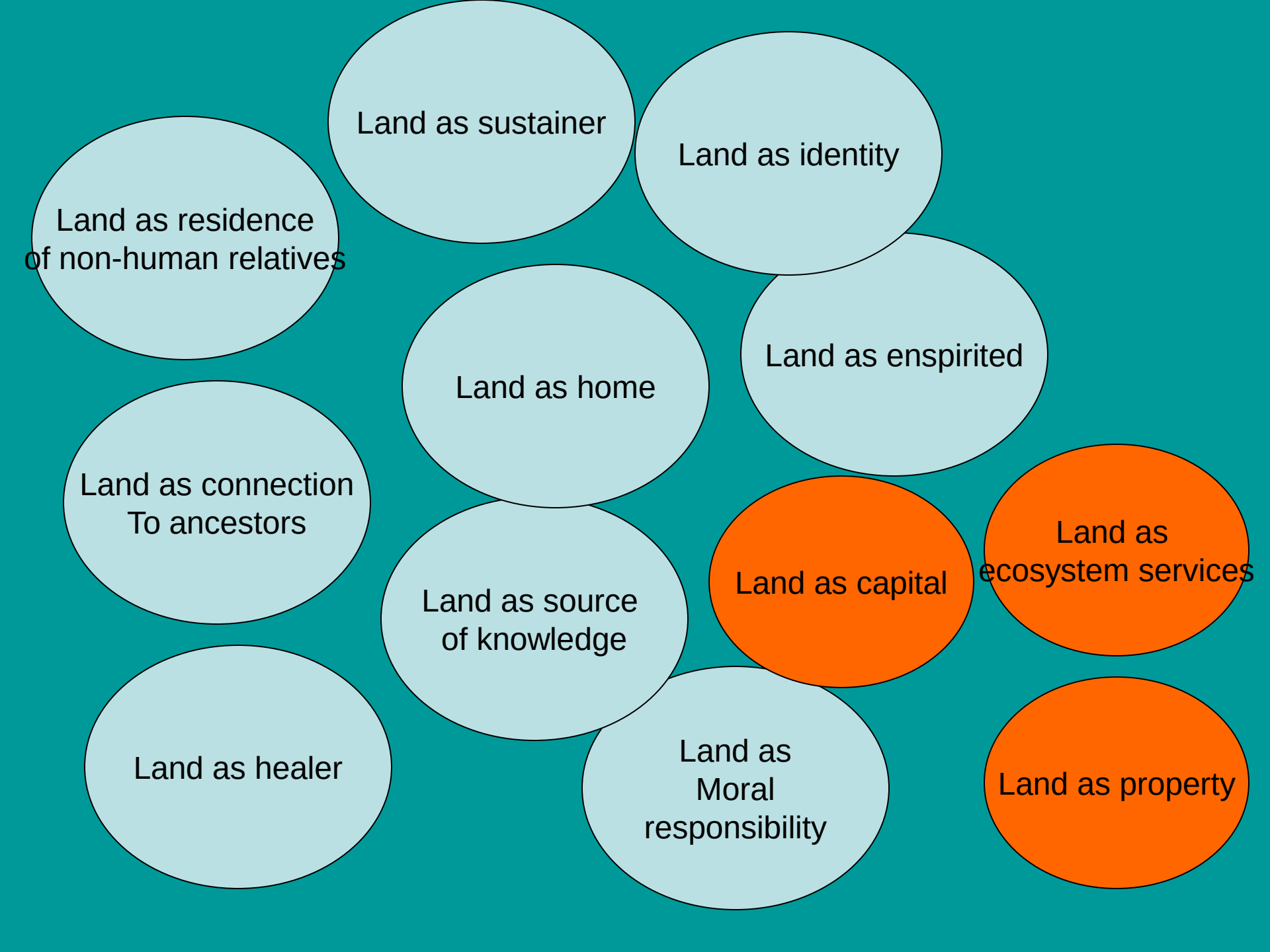
nature as “subject”

Indigenous paradigm: nature as “subject”

- Other species are understood as non-human persons- as relatives
- Treated with the same respect owed to human persons



- Ecosystem services viewed as gifts which are attached to responsibility
- Reciprocity: sustain those who sustain us


Land as sustainer
Land as identity
Land as residence
of non-human relatives
Land as home
Land as enspirited
Land as connection
To ancestors
Land as source
of knowledge
Land as capital
Land as
ecosystem services
Land as healer
Land as
Moral
responsibility
Land as property

Land as:

As source of belongings?

or

A source of belonging?

“ Cultural survival depends on healthy land and a healthy, responsible relationship between humans and the land. The traditional caregiving responsibilities which maintained healthy land need to be expanded to include ecological restoration.

Ecological restoration is inseparable from cultural and spiritual restoration, and is inseparable from the spiritual responsibilities of care-giving and world-renewal.

Collectively and individually, these indigenous spiritual values must be central to the vision of community ecological restoration. Western science and technology, is a limited conceptual and methodological tool-the “head and hands” of restoration implementation. Native spirituality is the “heart, that guides the head and hands.

Indigenous Environmental Network 1994


It is not the land which
is broken,
but our relationship to it

Restoration Goals

- Restoration of ecosystem structure and function, species composition, ecosystem services

- Restoration of relationships between land and community

Bio-cultural Restoration

Two paradigms of ecological restoration

- Restoration of ecosystem structure and function for delivery of ecosystem services
- Imposed solution for equilibrial outcome
- Time frame: decades

- eg Cairns, National Research Council

- **Restoration of relationship to land**
- **Respect, reciprocity**
- **Partnership with natural processes**
- **Time frame:**

  generations

- **Indigenous Peoples Restoration Network**

Different ways of knowing, different contributions to restoration:

Scientific ecological knowledge:

restoration of ecosystem structure and function

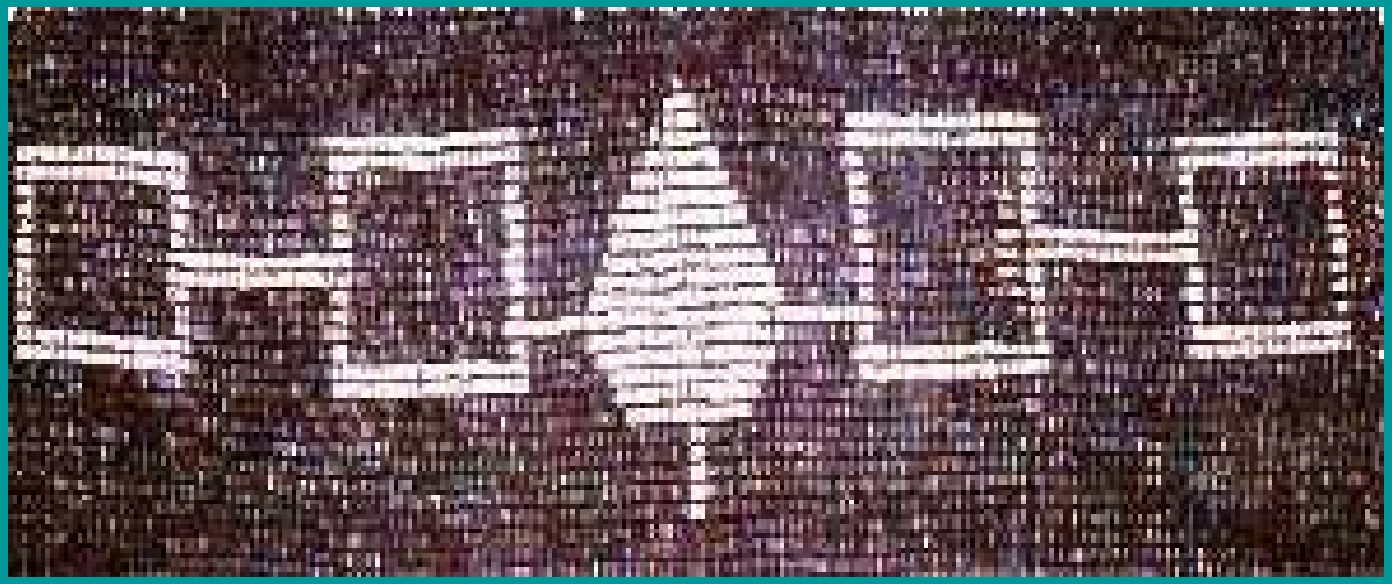
Traditional ecological knowledge:

Restoration of relationship

Restoration of processes and composition

The Onondaga Nation vision for Onondaga Lake

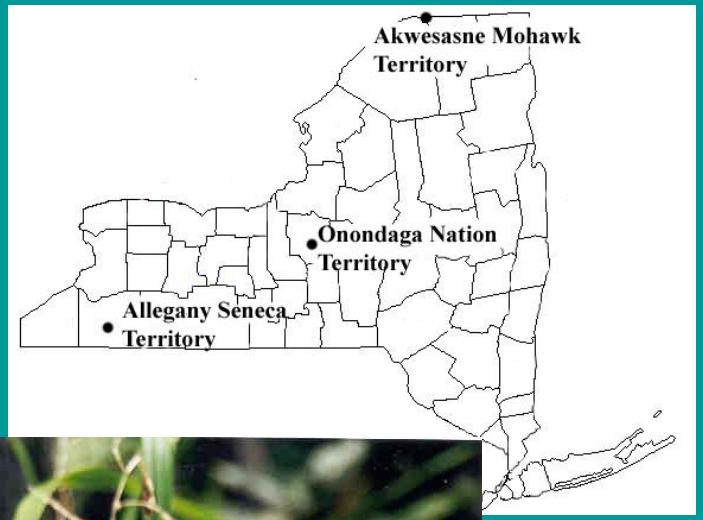
Healing for land and for people



Case Study Sweetgrass: a Cultural keystone species

- Medicine
- Basketry
- Ceremony
- Economic value
- Cultural value

Haudenosaunee basketmakers reported sweetgrass is becoming more difficult to find in traditional gathering areas.



Anthoxanthum nitens
(Weber) Y. Schouten & Veldkamp

Patterns of historic decline in sweetgrass

Decline due to:

Habitat destruction

Succession

Fragmentation

Overharvesting?

Initiated successful restorations

Graduate Student: Daniela Shebitz

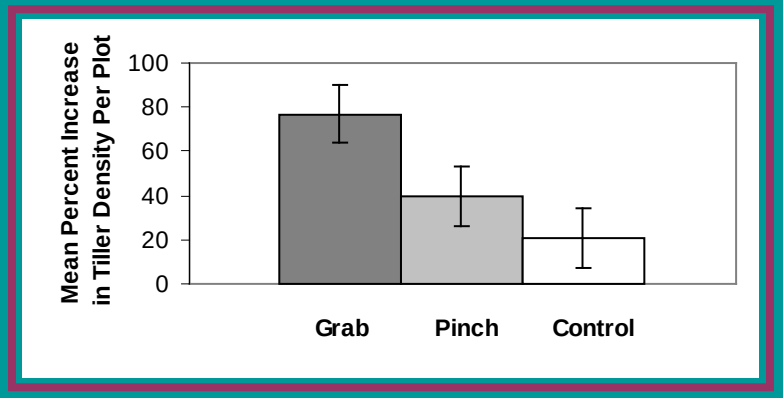
What is the role of traditional harvesters in restoration?

- Western paradigm: conserve threatened plant by limiting people and harvest. People as outside “threat” to system

- Indigenous paradigm: If we use a plant respectfully it will flourish. If we ignore it, it will go away. People as “inside” participant in system

Harvesting stimulates sweetgrass growth

- **The lowest success of sweetgrass occurred in unharvested control plots**



- **Traditional harvesting practices appear to stimulate growth of sweetgrass**

Graduate student: Laurie Galluzzi

Reciprocity and respect

- “If we use a plant respectfully, it will stay with us and flourish. If we do not show it respect it will go away” (TEK)
- Use creates disturbance gaps which can stimulate compensatory growth and reduce resource competition through reduced density. (SEK)

Wingaashk kenomagwen:

Lessons from sweetgrass

- Reciprocity: plants sustain people, people sustain plants by an active role
- Restoration of harvesting relationship is important to success of the plant
- Biocultural restoration: simultaneous restoration of plant community and human relationships
- Our flourishing is mutual

To restore the plants…..
restore the harvesters

Biocultural restoration

Common ground

a possible symbiosis between ways of knowing?

Corn supports beans, increases light availability

Beans fertilize soil, use light efficiently by positioning leaves opposite to corn

Squash shades ground and suppress weeds

….and so all are fed

Envisioning a symbiosis…

scientific knowledge

guided by

traditional knowledge

and wisdom

….and so all are fed