

NRDAR Tribal (Human) Services



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Summary

Suggest that “injury” includes injured resources and impaired services

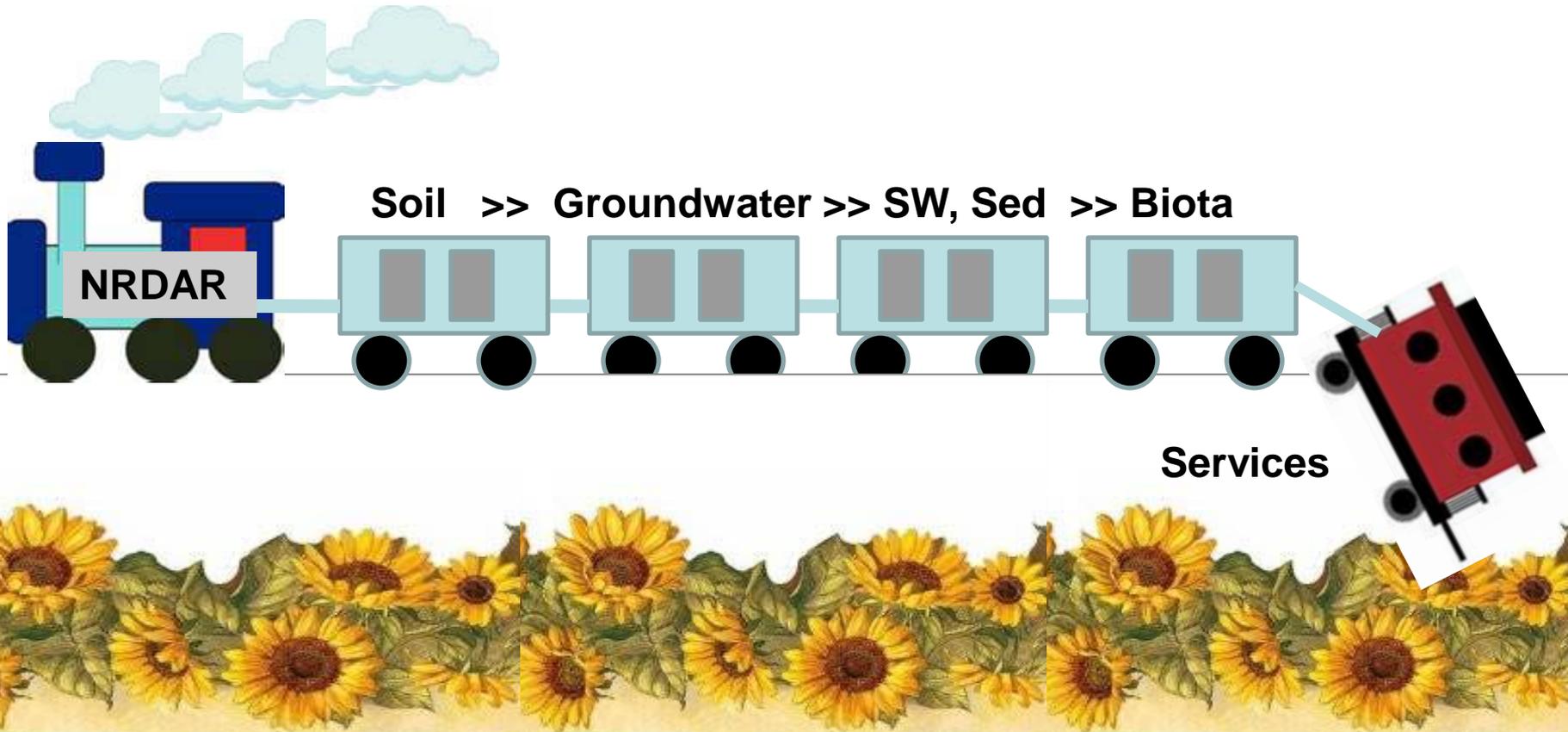
CERCLA remedies must protect human health. Services are impaired if health is not protected and if resources are unsafe to use at traditional (baseline) levels.

Services may also be impaired at habitat or landscape levels as well as individual resources or point locations. A Tribal construct based on natural law will be described.

Examples of services provided to tribes will be discussed.

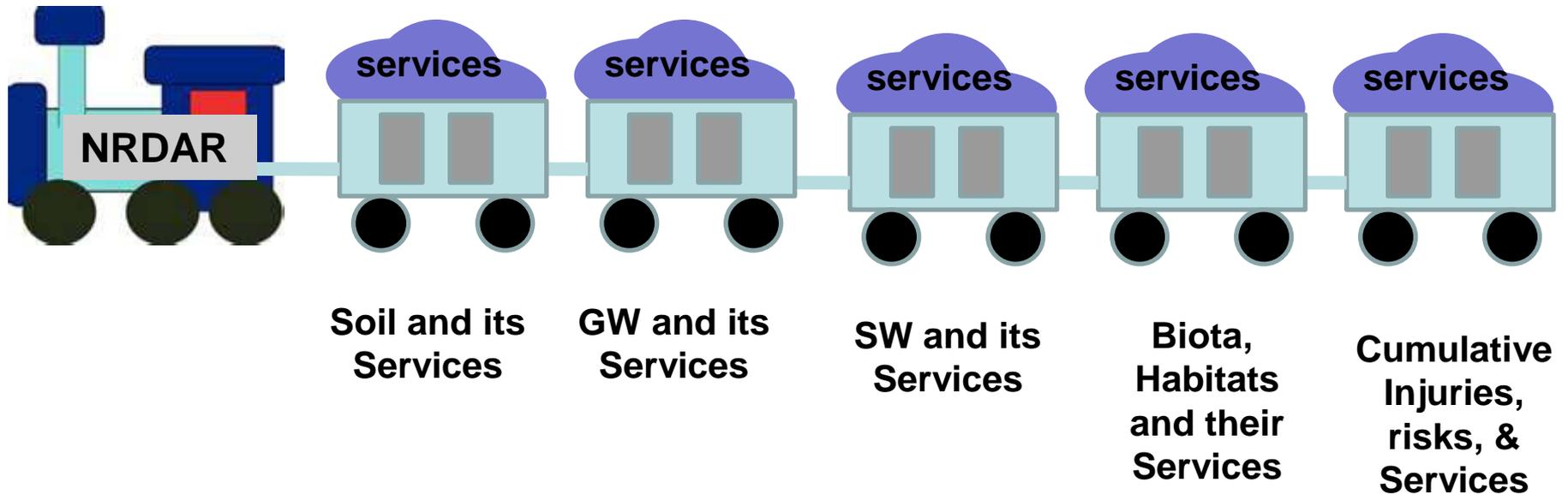
Examples of quantifiable measures of service reduction will be presented.

The Linear NRDAR Train



What the regulations actually say

Revised guidance emphasizes assessing and restoring
“resources and their baseline levels of services”



Injury Determination. The revised regs encourage the definition of baseline metrics and services before extensive quantification and valuation

- A. Describe affected resources (holistic and individual resources, like NEPA)
- B. Describe services provided by baseline conditions of the site & resources
- C. Describe reductions in services (narrative and semi-quantitative - PED)
- D. Services to people include sustaining health (life support) and well-being.

A major goal of NRDA is to make the environment and public "whole" for injury to, or loss of, natural resources and the services provided by those resources

Making Whole” Means ... Making the site clean enough to safely use in our traditional manner (as described in the Treaty of 1855 and translated into the CTUIR Exposure Scenario); restored enough in quality and quantity that the resources are sufficient to support those uses and services; protected/sustained through administrative & educational & capacity-building means; and accessible so Tribes are free to access, use, and *monitor* the site.



We need scholarships and a science center, not a cultural center

The role of human health in injury determination

Most numerical injury standards in the regs are based on risk to human health.

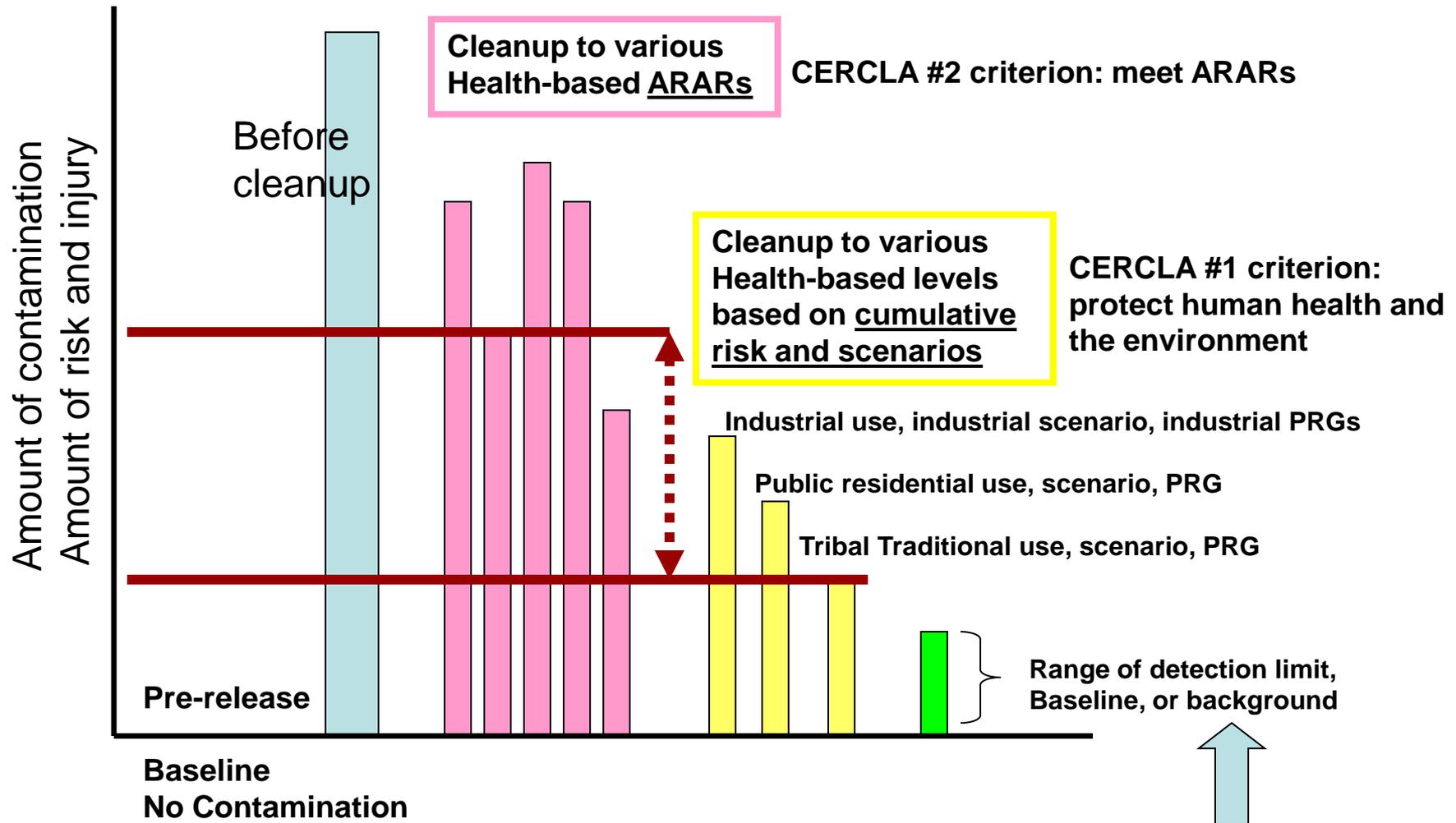
- drinking water standards (issued by fed, state, or tribe).
- fish advisory (issued by fed, state, or tribe).
- need for IC as part of a CERCLA remedy, thus limiting human use.
- therefore, the definition of injury includes excessive human health risk.
- this is known via the **CERCLA Baseline Risk Assessment** (not a health survey based on overt symptoms in already-sick people).

CERCLA:

If a resource or area is too contaminated to be safely used in a prescribed manner, a response action is taken to meet the two primary CERCLA criteria:

- (1) “protect human health and the environment [based on risk]”
- and*
- (2) “meet ARARs” [risk-based health standards]

Lax remedial goals and residual risk are directly tied to residual injury



NOTE: Services may be impaired even if ARARs or human risk-based concentrations are met. ERA may not show ecorisk but there may still be eco injury.

Regional Tribal subsistence exposure scenarios

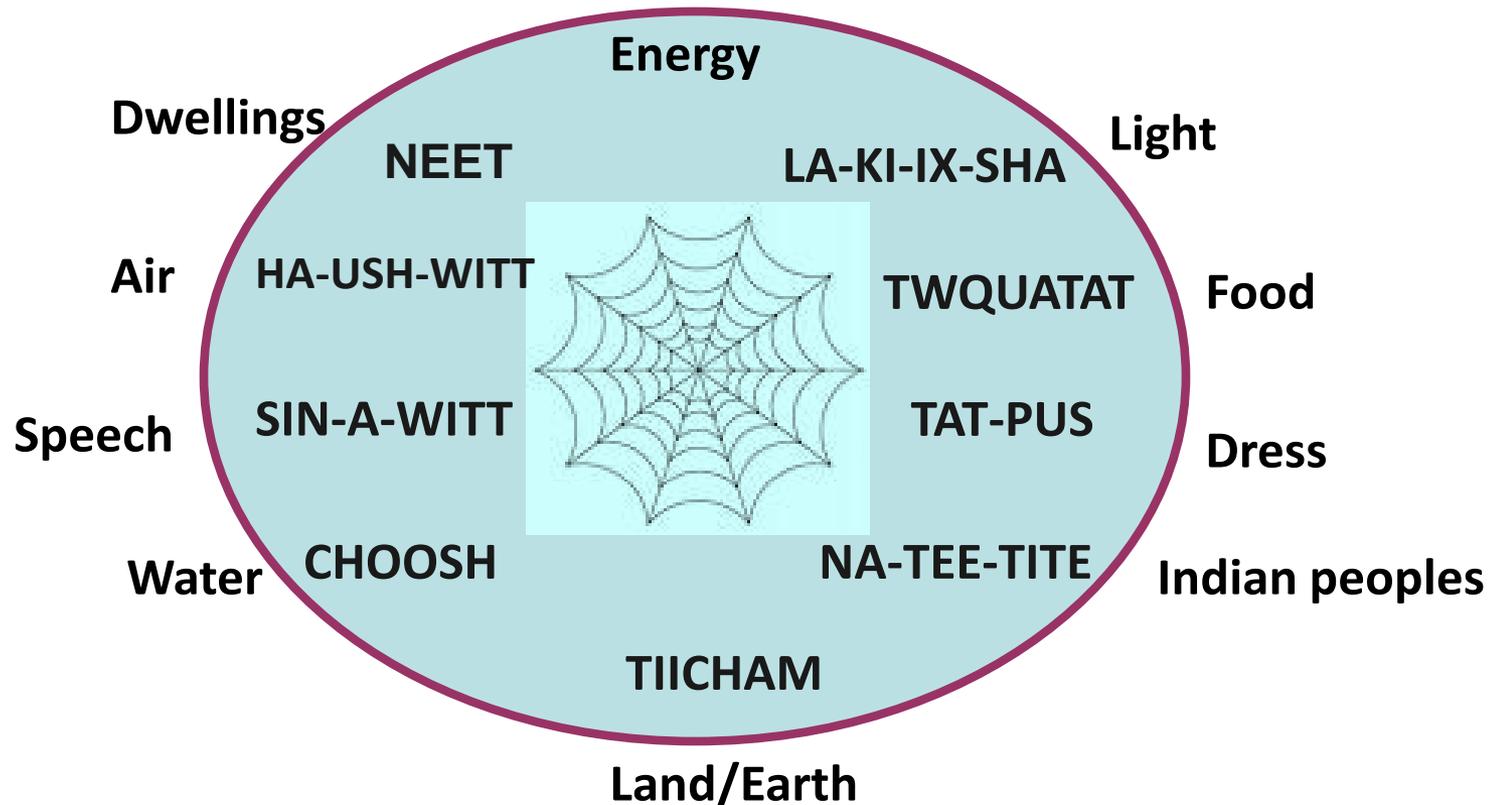
- (1) Describes how resources would be used if uncontaminated and fairly undegraded. Not necessarily contemporary average.
- (2) Describe eco-cultural zones (the environmental setting, EPA Ecoregion levels of PNV) and natural resource usage patterns;
- (3) Reconstruct the original local subsistence diet;
- (4) General and unique tribal exposure pathways such as hunting, gathering, making material items, fishing;
- (5) Identify direct exposure factors (activities and their frequency, duration and intensity, and resource use) in a **CERCLA-style format for use in baseline risk assessment (absent restrictions)**.



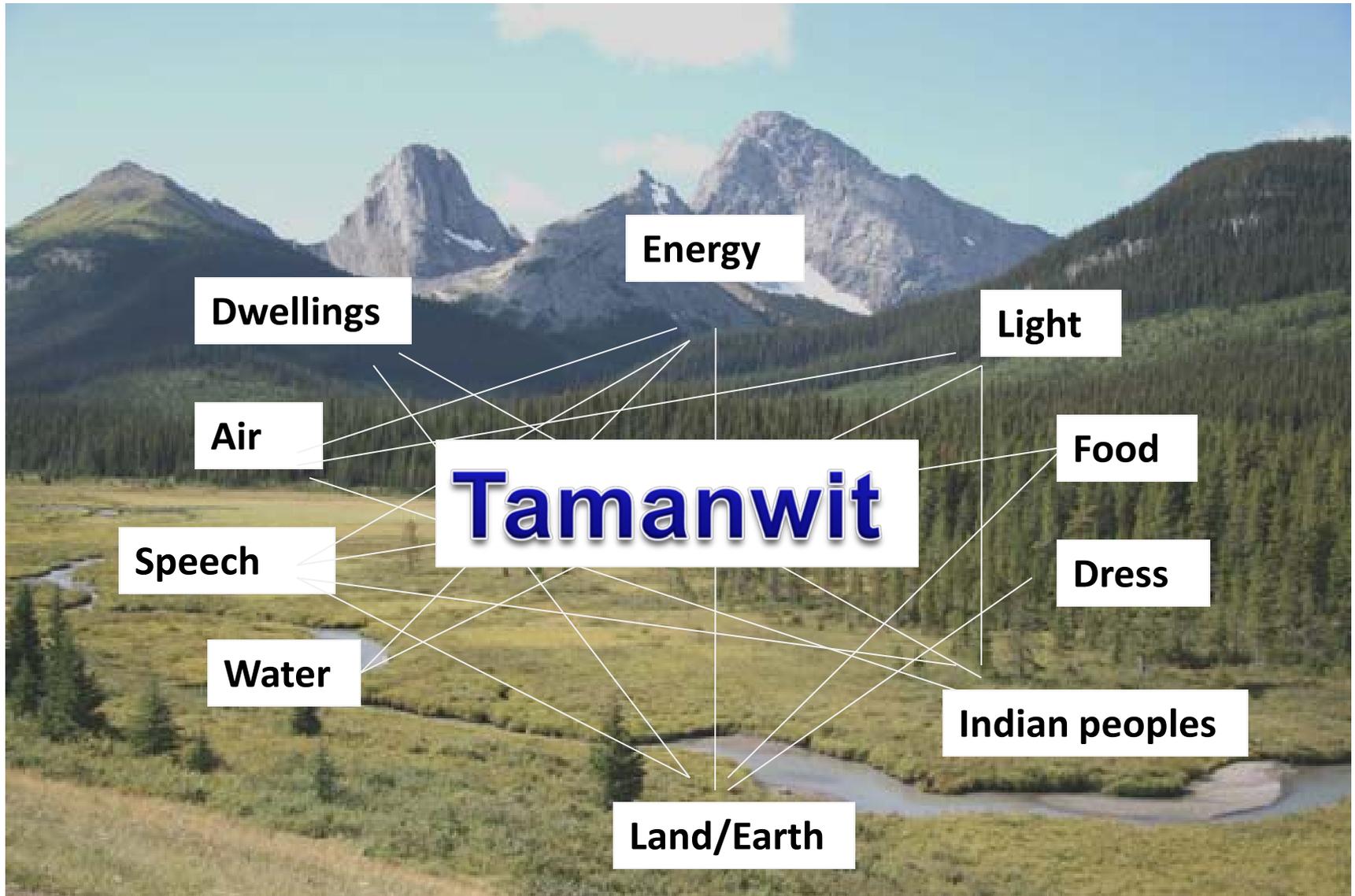
*Umatilla
seasonal
round*

Tamánwit (natural law)

- Ties food and serving order to the landscape
- Reflects explicit Treaty-identified resources
- Guides research into ecological process and restoration



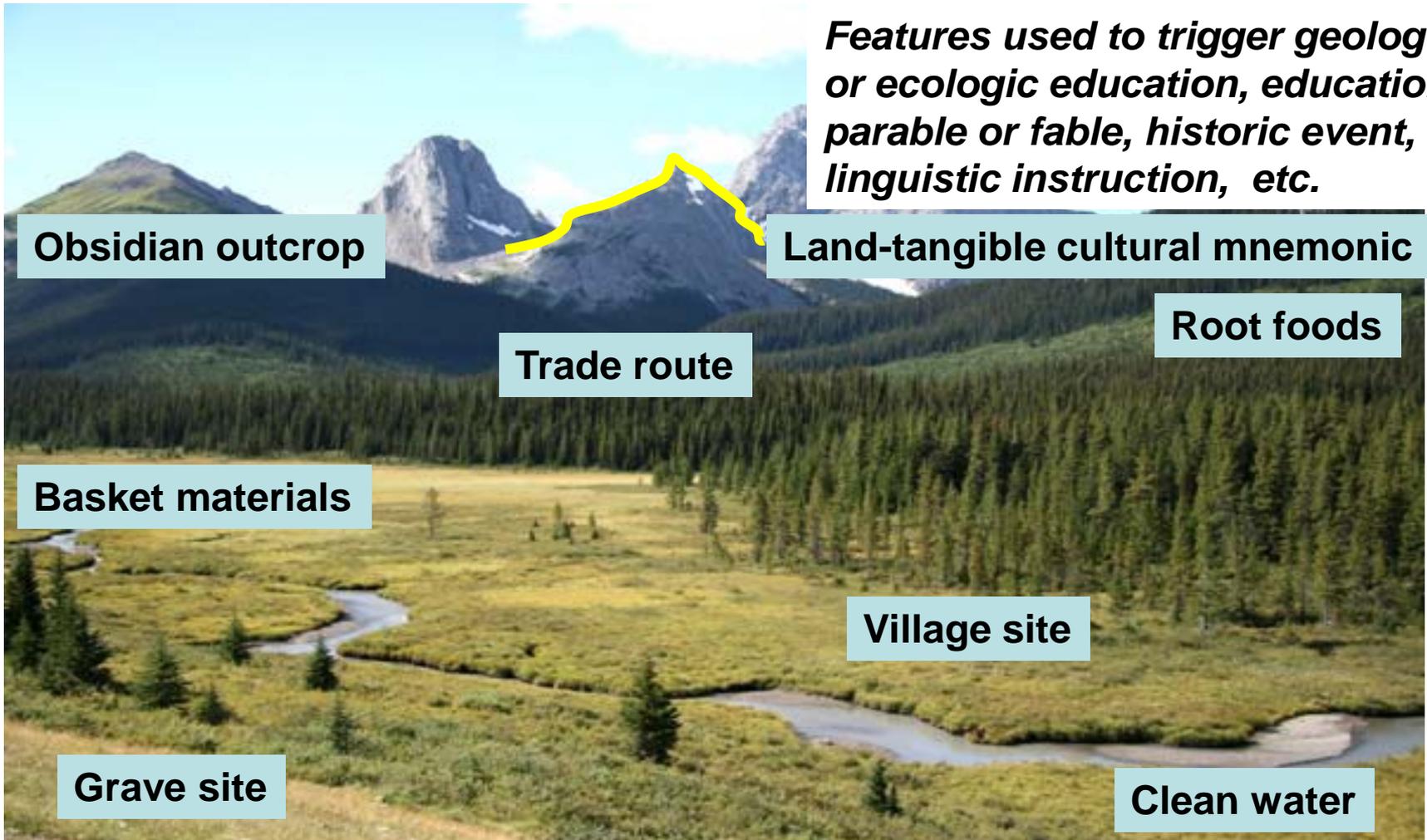
Remember the 'service landscape'



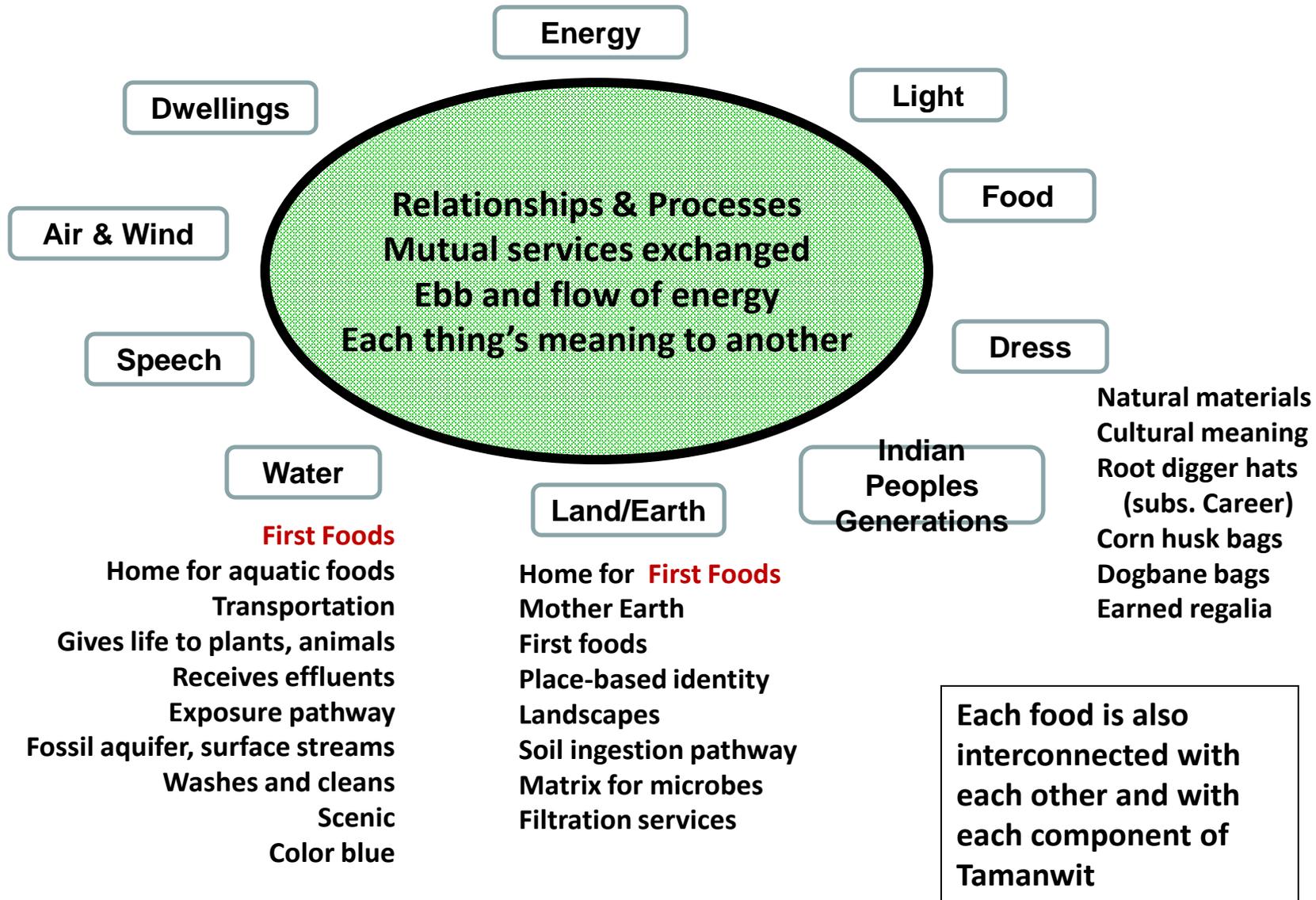
Before jumping into **release>>migration>>receptor>>dose>> risk/injury**
Before excavating (response action) or plan mitigation projects

Pause; see the **services & eco-cultural attributes in the ethnohabitat.**

Features used to trigger geologic or ecologic education, educational parable or fable, historic event, linguistic instruction, etc.

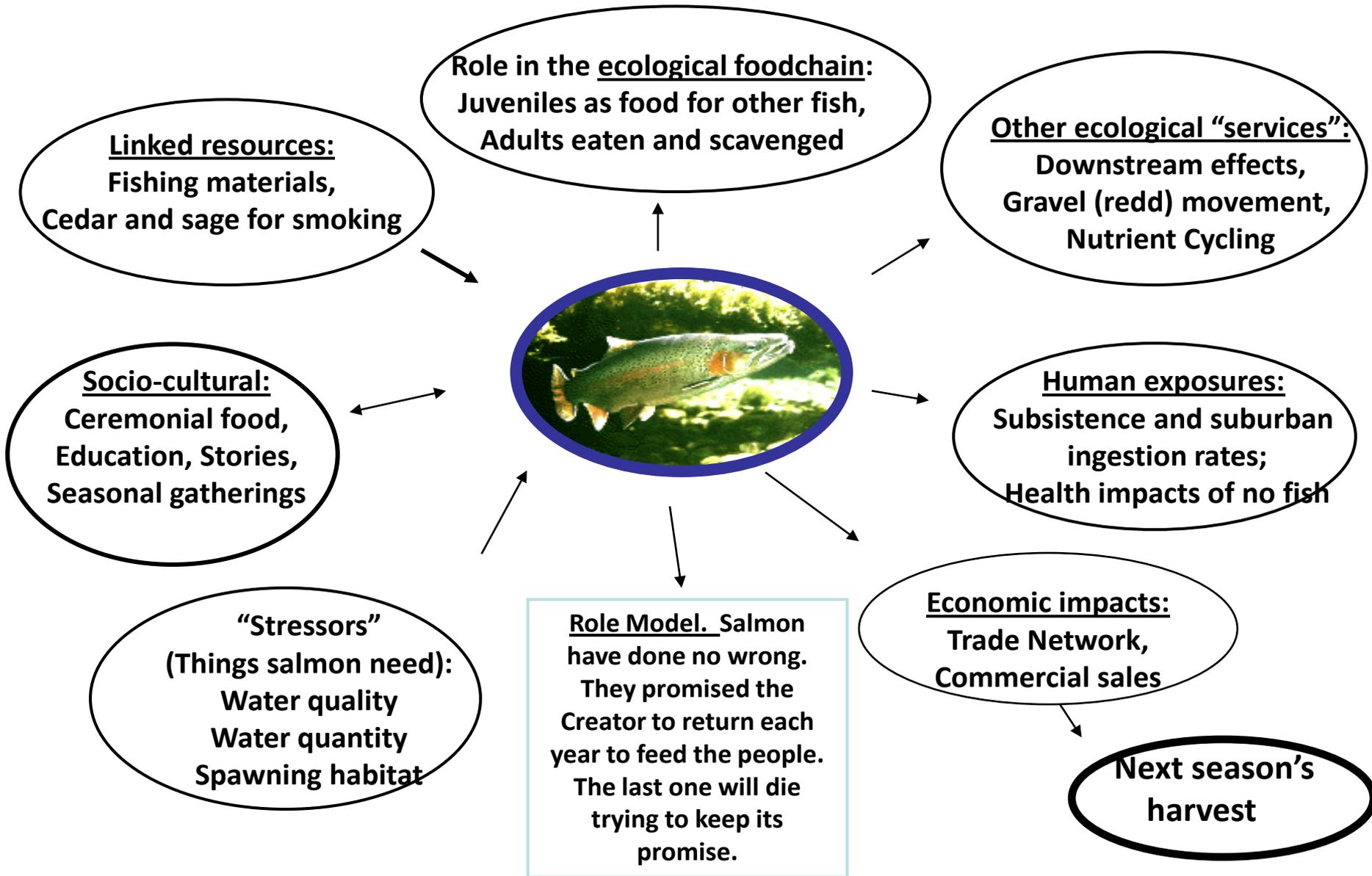


Using Tamanwit to describe a Place and its ecosystems & services



Using Tamanwit to describe an individual resource & its services

Salmon – Cultural Keystone and Ecological Keystone Species



What Human Uses (Services) are reinstated by “restoration & rehabilitation to *baseline*”?

1. Life support (health/risk): clean air, clean water, food, clean soil
 - **Tribes:** Activities/lifeways that can occur on uncontaminated (unrestricted) land: Enumerated in the Treaties (hunting, fishing, gathering, etc) and codified in our Traditional Use Exposure Scenarios.
 - **General public:** Activities/lifeways that can occur on uncontaminated (unrestricted) land: recreation, homesteading (residential farmer), work, etc, with public exposure scenarios.
2. Attributes of Quality of Life and Lifeways beyond health:
 - **Tribes:** community, cultural, ceremonial, religious, heritage, educational, linguistic, social services;
 - **General public** has parallel QoL-QALY-SAY services.

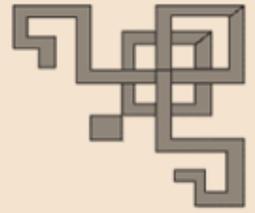
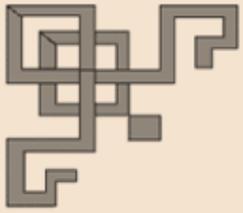
Resource**Baseline Services**Nexus to
release**Measures and data needs**

Ethnohabitat	Support for traditional lifeways and other heritage uses; the eco-cultural system	Lost visits, lost bequest, lost ceremonies, lost social-educational-economic opportunities, lost fiduciary trust, perception of contamination;
Water (with sediment and hyporheos)	Habitat for cultural keystone species; subsistence use; ceremonial use (sweatlodge). Basis is both risk and perception	Concentrations that result in reduced use. Thresholds = detection limit, individual and cumulative risk levels; standards. Data needs = areal extent, mass/volume (3D), temporal history & predictions.
Geologic resources	Gathering of plants; using sacred grounds for meeting and cultural activities; medium for vegetative growth; link to groundwater use.	Service losses from not being able to collect plants from it or hold cultural activities and feasts on it, or drill through it, or other pathways. Indirect injury related to release and cleanup, footprints of facilities that leaked; facilities required for disposal.
Viewshed and Landscape	Intact scape for places, names, songs, calendar, other services. Undisturbed physiographic profile.	Degrees of vision with undisturbed viewshed; Significance of direction or features of interruption (line of sight); distance to nearest replacement location; amount of noise, night light.
Biological resources	Subsistence fishing, hunting, and gathering; cultural recognition and uses; food, medicine, materials, clothing, and cultural activities; habitat for subsistence biota; Ecological or cultural keystone species; critical habitat.	Tissue concentrations above standards/risk levels for protecting human health in tribal diets, materials, and cultural activities, or other pathways. Individual keystone resources also evaluated separately.

Possible Metrics for Quantifying Loss of Human Services and Tracking Recovery of Services relative to Baseline (there are lots of things to count)

- **In addition to economic methods such as conjoint etc----**
- **Risk-acres (target risk level plus Tribal exposure scenarios)**
- **Spatial service-acre-years (weighted by importance) or gallon-yrs or acre-ft or viewshed degrees or habitat level, etc. Non-discounted depending on duration of injury (e.g., 10,000 years).**
- **Landscape ecology, large-scale metrics, indices for fragmentation and diversity related to human utility. Cultural HEA. Equity analysis to regain parity.**
- **Constructed scales (numbers of lost visits to TCP, universal harm scale, other community surveys, etc.)**
- **Tribal QALY-DALY-QOL, cultural keystone species**
- **Dependency webs to identify users, uses, and linkages**





Tribes have the right to expect Tribal-relevant methods to be used.

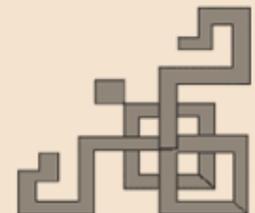
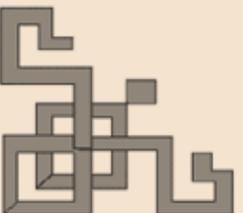
Tribes have the right to say whether resources have been injured.

Tribes have the right to expect equity and parity, especially if they bear a disproportionate impact:

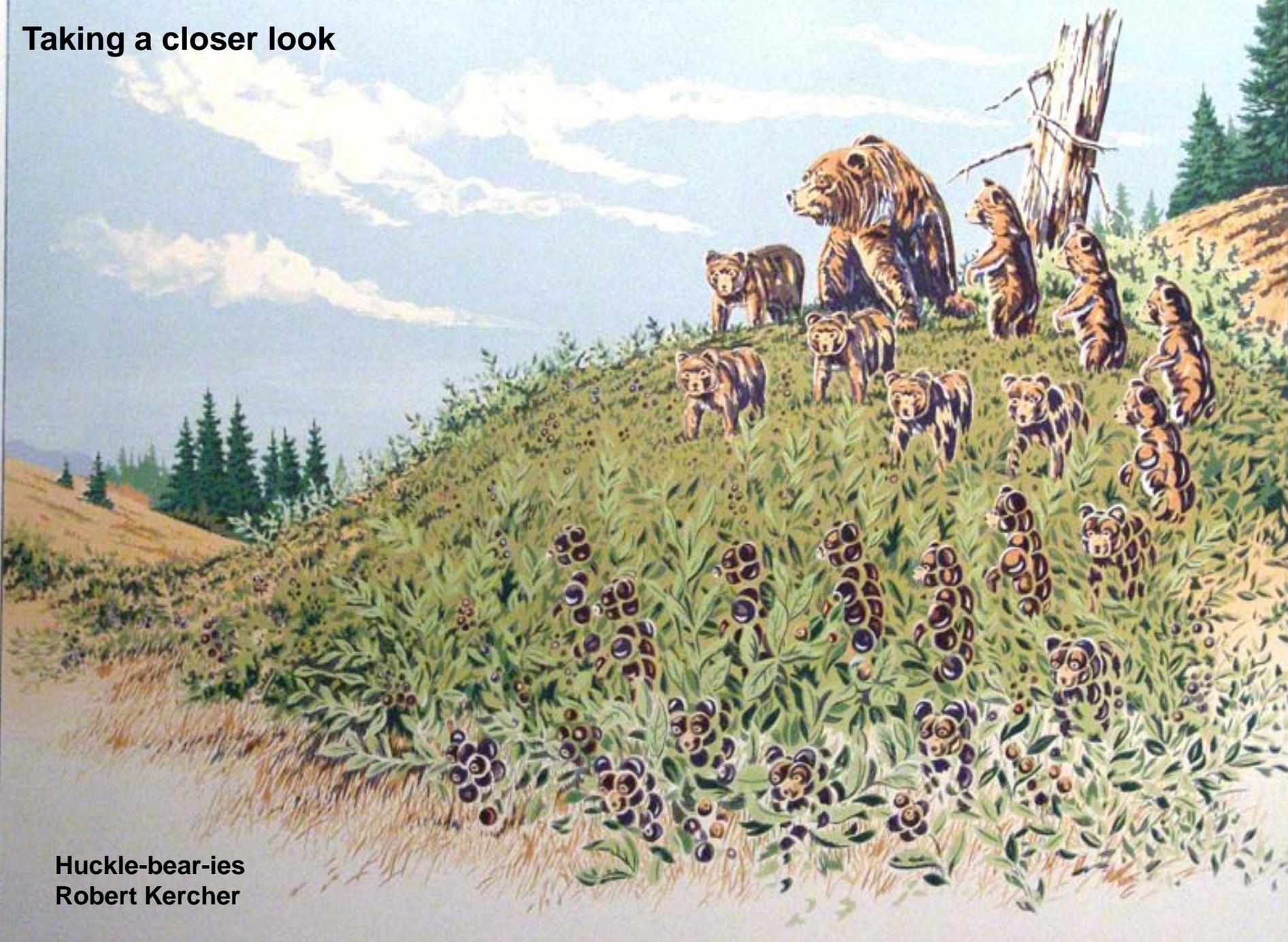
- **Tribal risks will likely be higher because they live closer to (embedded within) the local ecology.**
- **Tribal injuries will likely be higher due to the need for more stringent health standards and due to the greater importance of an area or resource to the traditional way of life.**

Tribes have the right to expect the government to be on their side.

(fiduciary Trust, Treaties, Executive Orders, judicial decisions, regulations, agmts.)



Taking a closer look



Huckle-bear-ies
Robert Kercher

The Diet – Multiple Lines of Evidence; Reconstruction with contemporary confirmation & research

- 1. Direct Observation (early explorers and naturalists)**
- 2. Early Records (e.g. traders, fish buying records)**
- 3. Foraging Theories –**
 - Return rates of calories expended vs calories obtained**
 - Ecological-based data – patch choice etc.**
- 4. Ecology and ecoregions, habitat types, potential natural veg.**
- 5. Archaeology – hard vs soft remains, excreta microscopy**
- 6. Paleomedicine – skeletal evidence, bone isotopes**
- 7. Traditional Environmental Knowledge, language, oral history and current use by a subset of tribal members.**
- 8. Ethnobotany**
- 9. Nutritional data, USDA databases, original research**

CERCLA is a risk-based regulation

Estimate Exposure

Estimate Risks & Impacts

Response Action

SCENARIO - EXPOSURE FACTORS
(reasonably maximum environmental contact rates)



Contaminant CONCENTRATION
in environmental media & biota

Risk Results

Cancer	Hazard Index
	100
10(-4)	10
10(-6)	1 = RfD
10(-7)	0.1

- a. Is target risk exceeded?
- b. Are ARARs exceeded?

If either is Yes, take response action. If action is needed, there is injury, depending on HHRA or ERA driver.

In order to make a risk-based decision we need the scenario.

These are the "bright lines" that define safe or not safe

NOTE: Services may be impaired even if human risk is below *de minimis* levels. ERA may not show ecorisk but there may still be eco injury.