From Time Immemorial

Perspectives on Tribal Risk Assessment to Protect Heritage/Traditional/Subsistence Resources and Lifeways

Barbara Harper
bharper@amerion.com

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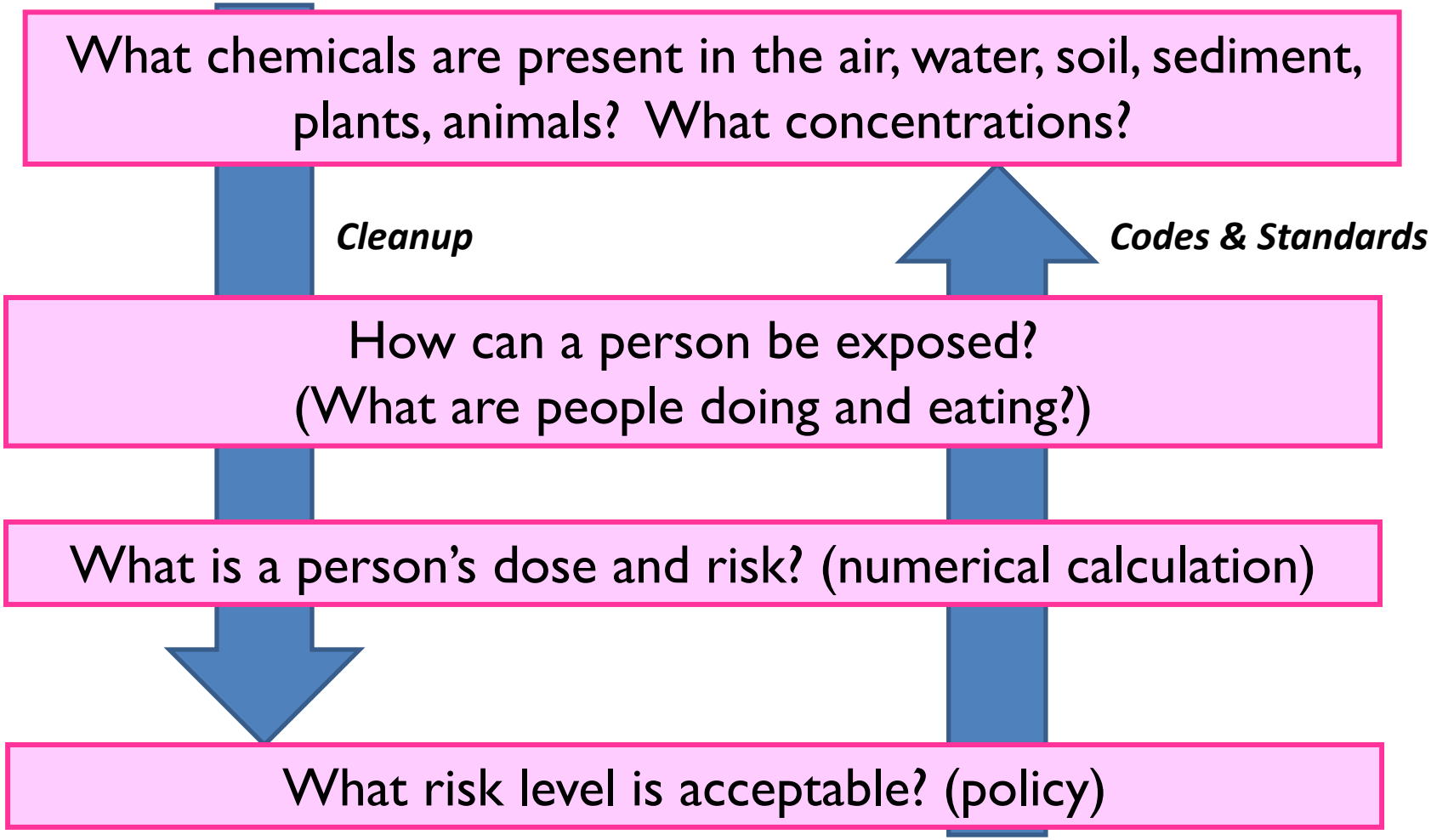
Topics

- How clean must natural resources be in order to support ***traditional*** uses?
  - Eating traditional foods
  - Living in heritage/homeland areas
- How do you know if cleanup levels or new standards will be protective of those uses?
  - Regulators use Risk Assessment and its variants such as health impact assessment or public health assessment to estimate risks and protect human health.
- NRDA Applications
- Pitfalls and Tricky Questions
- Suggested documentation

Basic Risk Questions



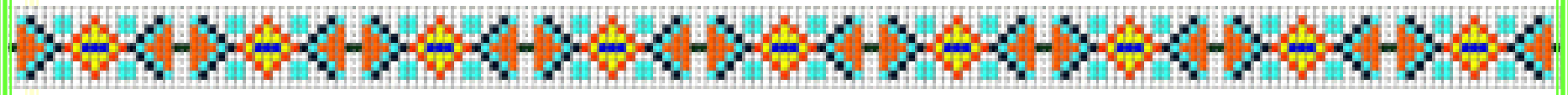
Contamination present

How much risk?

How much should you eat?

"Helping Tribes make healthy decisions"

"Here is what is in your fish; you decide how much to eat"



Here is how much fish we eat

"Tribes helping EPA protect human health & environment"

Gov: it is your job to make sure it's safe

Risk Calculation

SCENARIO - Set of activities and diet used to develop EXPOSURE FACTORS (environmental contact rates; RME).

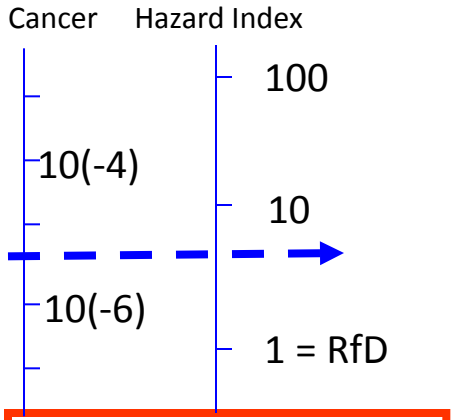
Contaminant identification and CONCENTRATION in environmental media & biota. Screening Levels; Nature & Extent.

DOSE of each chemical to people

How TOXIC is each chemical?

RISK ESTIMATE

Are there sensitive subpopulations?



What risk level is acceptable? What health effects could occur?

The Scenario is a framework into which contamination data is fed.

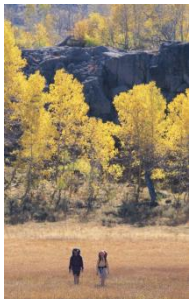
The CERCLA scenario describes *baseline* land use assuming no contamination and adequate natural resources.

Traditional scenarios reflect a generally undegraded environmental quality, not necessarily a specific year.

What is a “Scenario”?

Why do we need them?

Ecologically-Based exposure scenarios for use in risk assessment that reflect traditional subsistence Tribal lifestyles in CERCLA format



Where you live

What you do

What you eat

Scenario – a set of activities and diet(s) that describe a lifestyle and its degree of environmental contact

Exposure factors – the numbers or rates that explain the frequency, duration, and intensity of exposure for each pathway

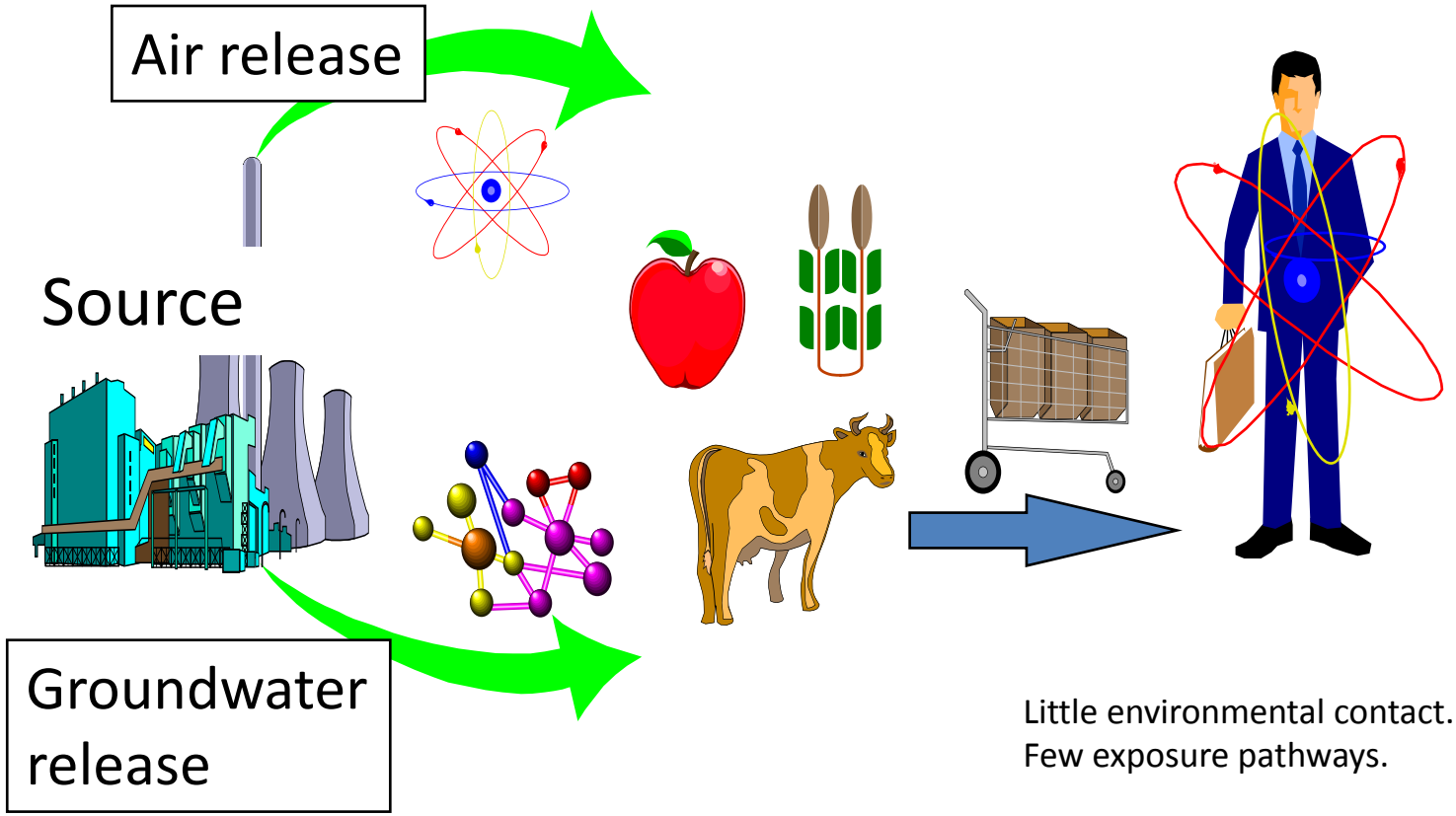
Baseline scenarios describe how the resources are used if they are available and are not contaminated.

Basic concept:

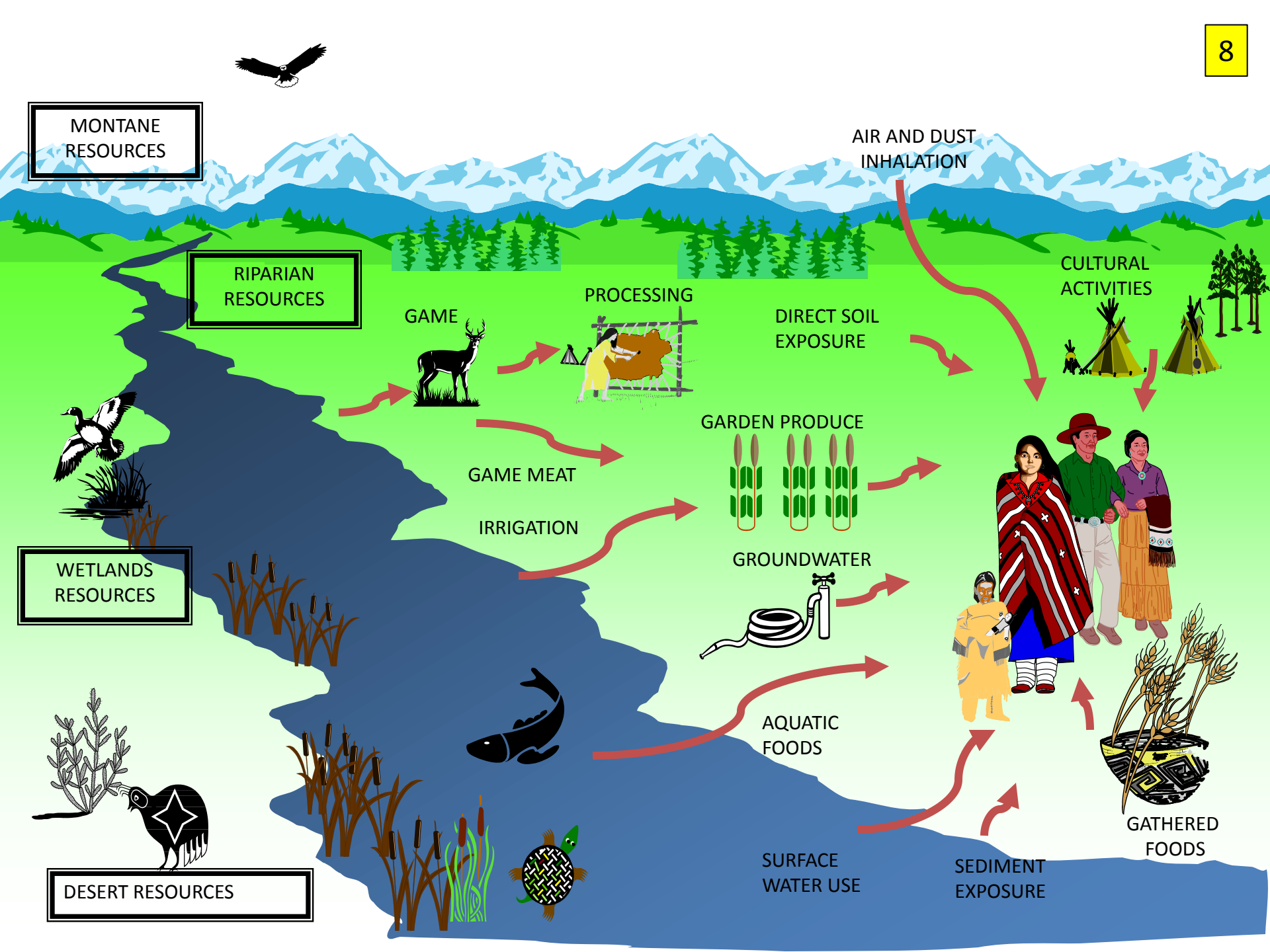
People live in ecosystems and use local resources.

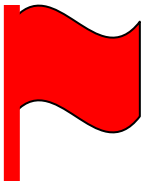
Typical statements: The forest is the pharmacy. The ecology is our backyard. The landscape is our Bible and teacher. People are equal with animals, not better. Indigenous cultures emerge from the landscape.

Typical Exposure Assessment Model
- Suburban lifestyle

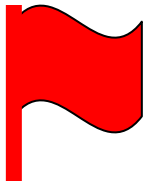


Little environmental contact.
Few exposure pathways.


MONTANE RESOURCES
RIPARIAN RESOURCES
WETLANDS RESOURCES
DESERT RESOURCES
AIR AND DUST INHALATION
CULTURAL ACTIVITIES
GAME
PROCESSING
DIRECT SOIL EXPOSURE
GARDEN PRODUCE
GAME MEAT
IRRIGATION
GROUNDWATER
AQUATIC FOODS
GATHERED FOODS
SURFACE WATER USE
SEDIMENT EXPOSURE



Red-Flag Issue



"No one is actually fully traditional now, are they?"

Reason for asking: this is a way to justify a reduced exposure frequency and/or duration, whether intentional or not.

Answer: The RIGHT to practice traditional lifeways exists no matter how many or few do so at any given time. Tribes are encouraging more people to return to this healthier lifestyle.

Requirement -- Driving Factors

There are primary legal drivers:

- ⇔ **Federal Fiduciary Trust Obligations**
- ⇔ **Treaties between Indian Nations and the US Government – "*supreme law of the land*"**
- ⇔ **Aboriginal rights for non-treaty tribes**
- ⇔ **Health and Environmental Protection laws**
- ⇔ **Cultural Resource Protection and Access laws**
- ⇔ **Executive Orders (e.g. 12898-EJ/subsistence, 13005)**
- ⇔ **Tribal Codes and Standards**

The Federal Fiduciary Trust Obligation

The federal government has control over human actions that affect natural resources, so courts characterize it as the trustee of these resources. The trustee must protect the trust asset for the beneficiary as if it were his own (CWA, SDWA, NEPA, etc.)

When the US government took control of the land from its original sovereigns (tribes), it became the new trustee. The tribal cession of land was based on a promise (Treaties) that the federal government would protect the tribes' lifeways, which incorporated traditional harvest. The courts have enforced this promise through the trust concept. The federal government is deemed trustee of all Indian lands and resources, including those off the reservation that support traditional harvest.

Some federal courts have concluded that the United States' obligation to protect treaty rights extends to the protection of the resources on which those rights depend

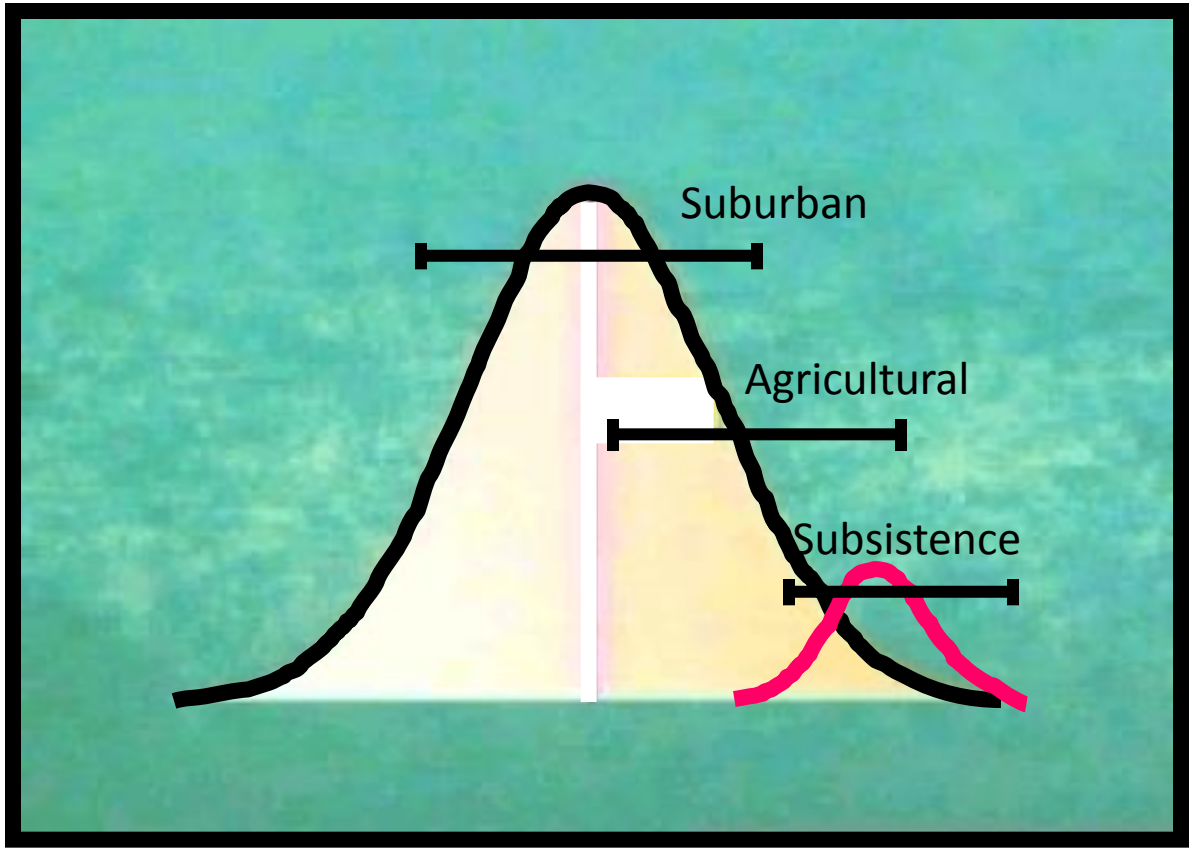
Executive Order 12898 of February 11, 1994
Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

3–302. ***Human Health and Environmental Data Collection and Analysis.*** To the extent permitted by existing law, including the Privacy Act, as amended (5 U.S.C. section 552a): (a) each Federal agency, whenever practicable and appropriate, shall collect, maintain, and analyze information assessing and comparing environmental and human health risks borne by populations identified by race, national origin, or income.

Sec. 4–4. ***Subsistence Consumption of Fish and Wildlife.***
4–401. ***Consumption Patterns. In order to assist in identifying the need*** for ensuring protection of populations with differential patterns of subsistence consumption of fish and wildlife, …

Ranges and Co-Risk Factors; Differences between populations

Ranges in Exposures based on Activities and/or Lifestyles



Traditional lifestyles are not just the extreme tail of a general population exposure range, but many discrete LIFESTYLES with legal protection.

Same issue with tribal surveys

Developing a traditional lifeways scenario

Heritage
Rights-based
Traditional
Subsistence

What is a Traditional Lifestyle?

May be individual uses or a WHOLE LIFE.

a) VERY important to define this up front.
b) Are you protecting fishing, or the whole fishing lifestyle with health, social, and cultural aspects?
c) Are you protecting visits to a place or an area that supports the entire lifestyle?

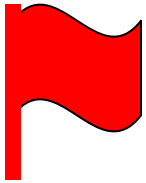
Two approaches to Traditional Scenarios

1. A residential scenario where the Tribal person lives and obtains all the resources needed for survival from the assessment area. If that area is small, the Tribal RME uses gardens and livestock to replace native resources.

….. OR

2. A mobile scenario where the Tribal RME visits the assessment area seasonally and obtains only a small portion of what is needed for survival from that area.

Neither is right or wrong. Just be sure you know what you are getting out of the consultation process.



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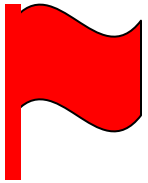


"The original lifestyle was mobile and seasonal, so you probably wouldn't live at the site, just visit?"

Answer: If all of our aboriginal territory, or all of Hanford, were being assessed and returned to us, we would utilize the larger area. However, since the risk assessment is being done on a small area, we have to assume that we live only there, just as the residential farmer does, but using more natural resources from that area.

Examples of Scenarios (from least to most exposure)

Recreation – visits the site, no groundwater use. Ranges from infrequent hiking through, to children playing on a beach.

Occupational or Industrial – a worker spends 8 hour workdays, 5 days a week, for 30 years working on site. May be a construction worker, excavator, groundskeeper.

Suburban Resident – ¼ acre, maybe with a cow, garden, city water or groundwater. Spends up to 24 hrs, 7 days, 365 days per year, typically only 30 years. May leave for work or school.

Residential Farmer – a person who lives on his land, grows most or all of his food, drinks the groundwater, spends up to 24 hrs, 7 days, 365 days per year, for 70 year lifetime.

Tribal Subsistent Resident – Several have been developed.

Ask the Right Question – Fish Consumption Rate Example

1. **Do you want to know current average (suppressed) rates for public health and risk assessment?**
2. **Do you want to know about the subsistence group, elders, traditionalists, or other parts of the Tribe?**

   It may not be appropriate to average everyone within a tribe.
3. **Do you want to document the true traditional, subsistence, Treaty-protected rate?**

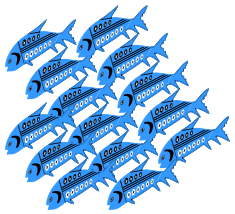
Defining the temporal scope of the scenario

<u>Contemporary suppression of resource use.</u>

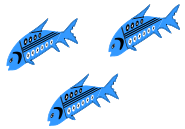
Contemporary uses may be restricted due to contamination (e.g., fish advisories, contaminated sites), legal limbo (rights of access), etc.

-- Do you want to know current exposures for public health reasons?

-- Do you want to know what risks would be if people used the resource in an unrestricted manner (e.g., a baseline CERCLA risk assessment)?



Past



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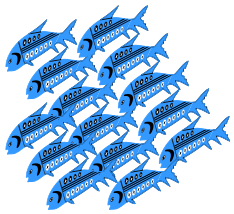


Future

Do you know if your Tribe is bimodal? Status of fishing rights? Policies?

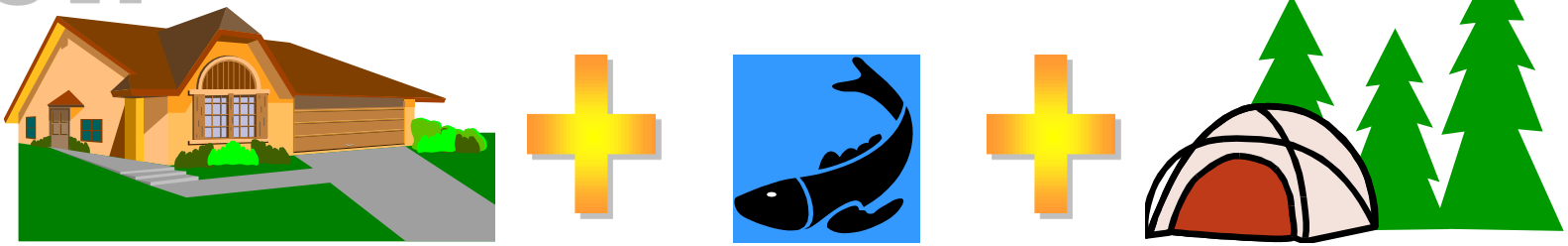
Cross-sectional data are modern statistical averages, not a cultural description of either a traditional or current subsistence lifestyle or diet.

Subsistence Hunting and Gathering

Restricted access is not a "baseline" assumption even if it is current condition

"Subsistence" is a <u>way of life</u>

NOT:



Wrong Mental Models → **Wrong Analytical Methods**

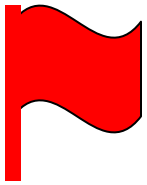
- **'Culture' is not an optional lifestyle choice; it is identity**
- **Cultural risk is not supplemental recreational or ceremonial activities.**
- **Cultural risk is not a perceptual byproduct of "real risk"**
- **Cleaning up to regain *most* of the original use does not restore *most* of the culture; *<u>all</u>* of the culture is affected.**

Traditional resource management used prescribed burns to increase food and medicinal plants.

Today's equivalent is transmission line rights of way with early-successional plant communities, more browse for game, better berries.

These areas are not remote areas; they are subsistence grocery stores without re-entry time limitations.

Pesticide registration needs to incorporate traditional environmental knowledge.



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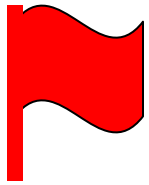
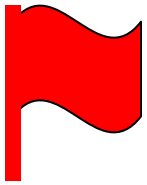


"What do you do at the site?"

Bad Answer: It is a sacred area and we hold ceremonies there several times a year, and our elders go there to pray.

This answer may be totally true, but it results in a visitor-level cleanup and restoration rather than cleanup to support actually living there. Risk Assessment uses exposure frequency and duration to calculate risk; less frequency of visits allows more contaminants to remain.



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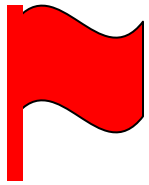
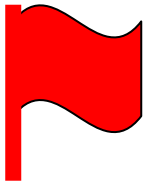


"What resources do you gather from the site?"

Answer: The scenario reflects everything needed to live within the assessment area, no matter how large or small that area is. The risk assessment constrains the person to living in that area. Therefore, we will substitute resources from that area into the diet, but not reduce the diet to only what is available in a small area. The exception to this is if we knowingly agree to restricted use, seasonal visits, or limited gathering.

Do NOT answer this question with statements such as "we gather berries there every fall." Short visits do not require much if any cleanup. It also assumes that the rest of the food is uncontaminated (or "background").



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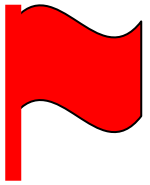


"***Doesn't the Treaty require you to live on the reservation and only visit U&A places seasonally?"***

Answer: The Tribal scenario is a full-time occupancy scenario. It describes what is required to live within the assessment area, with as much use of native foods as is possible. This is the same concept as a rural residential scenario.

Answer: Reservations were intended to provide all the resources necessary to live traditionally. As the homeland was constricted, more intensive reservation uses may be required, such as substituting gardens for wild-gathered foods. In either case, the land must be clean enough for full self-sufficiency.

Methods

METHODS used to develop regional subsistence exposure scenarios.

(1) description of eco-cultural zones (the environmental setting);

(2) reconstruction of an original subsistence diet using multiple lines of evidence;

(3) determining general and unique tribal exposure pathways through activities of traditional people, such as hunting, gathering, making material items, fishing;

(4) identification of direct exposure factors (activities and their frequency, duration and intensity, and resource use); and,

(5) quantification of exposure factors into metrics that can be used in the development of CERCLA-style exposure scenarios.

Language & Oral Tradition

Culture

Traditional Ecological Knowledge

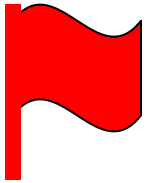
Ethnobotany

Historical records

Physiology, for physiological coherence

Exposure science

Ecology



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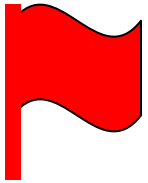


Should we do a food consumption survey or a plant usage survey to get actual current tribal data?

Reason for asking: this is a way to justify a reduced intake and therefore to allow higher contaminant levels, whether intentional or not.

Answer: Today's uses may be reduced for many reasons, but the scenario describes traditional uses, and the uses that we will resume after restoration is complete. Cross-sectional surveys dilute traditional uses with modern lifestyles.

Culture areas roughly track ecological zones

Figure 24. Important Subsistence Foods (after Driver and Massey 1957)

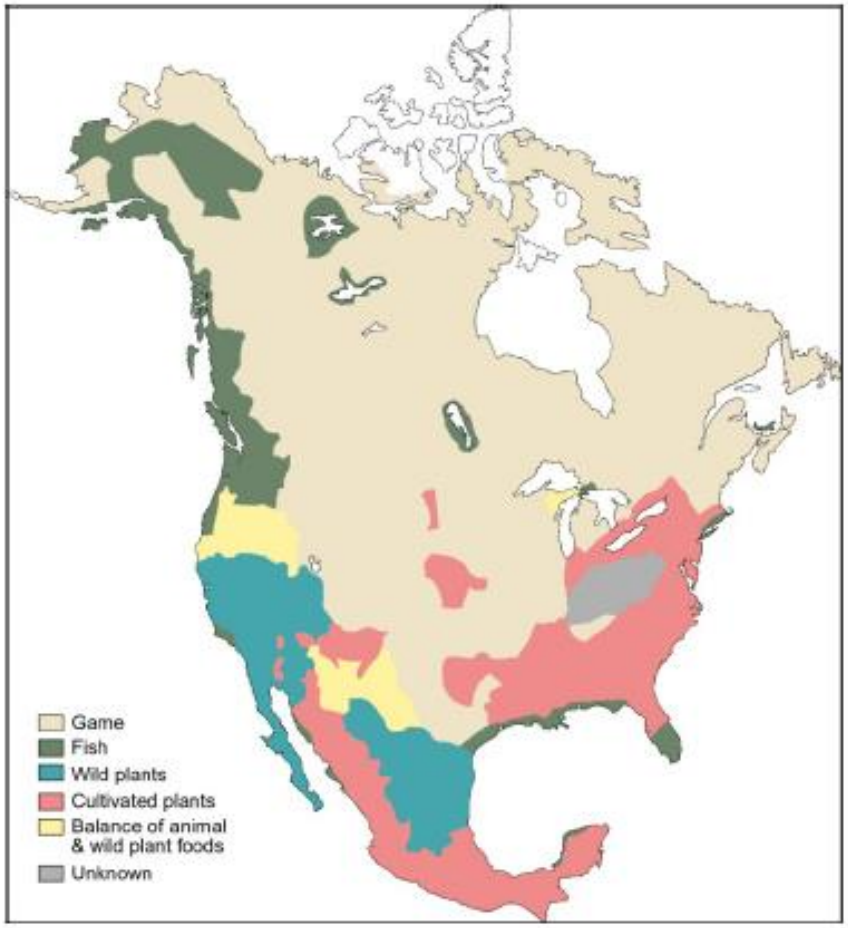
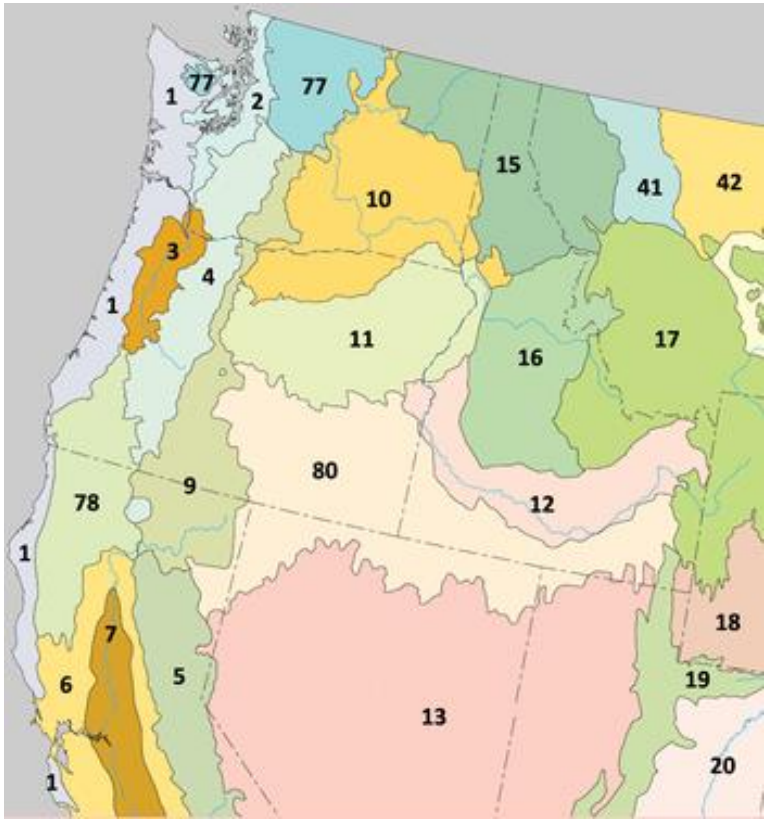
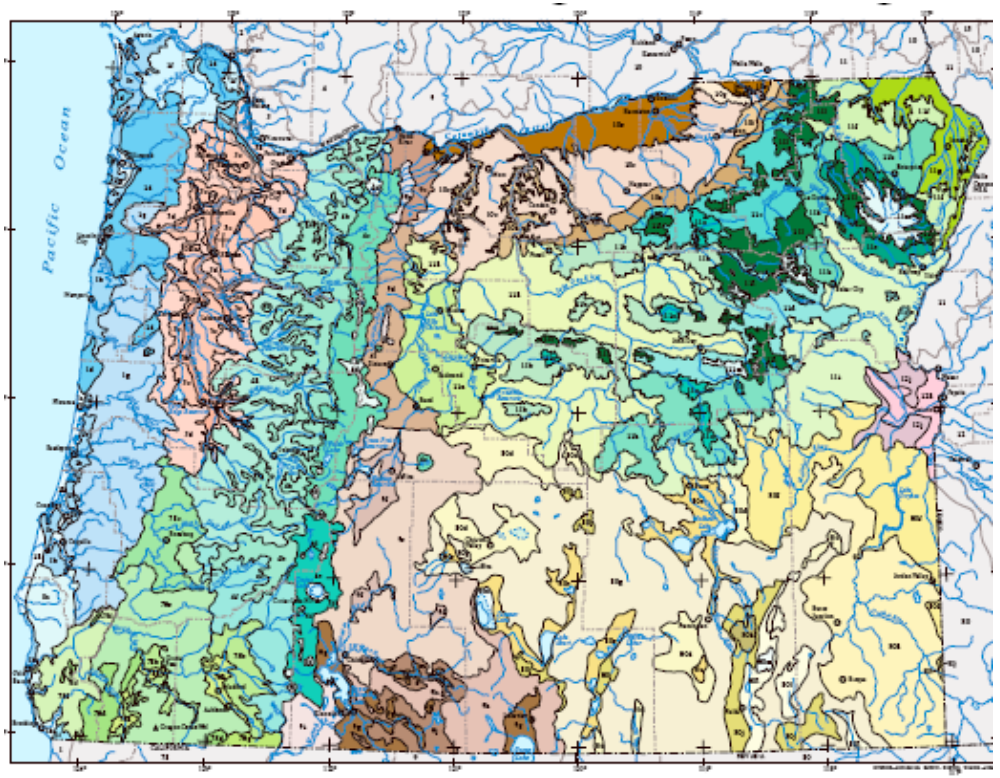


Figure 23. Dominant Subsistence Food Categories (after Driver and Massey 1957)

Sources: Waldman 2000, Driver and Massey 1957, National Geographic 2005.



Western Level III Ecoregions



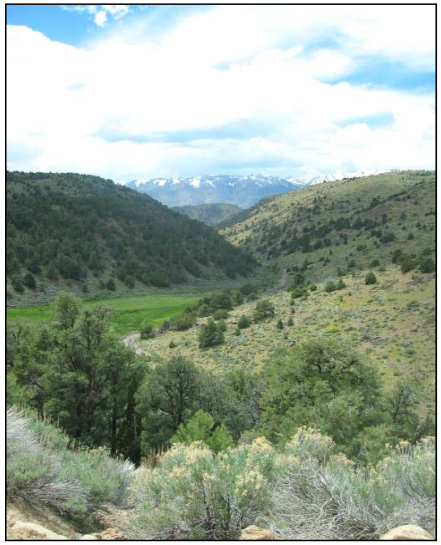
Level IV Ecoregions of Oregon

States also have habitat descriptions.

Describing Traditional Subsistence Diets

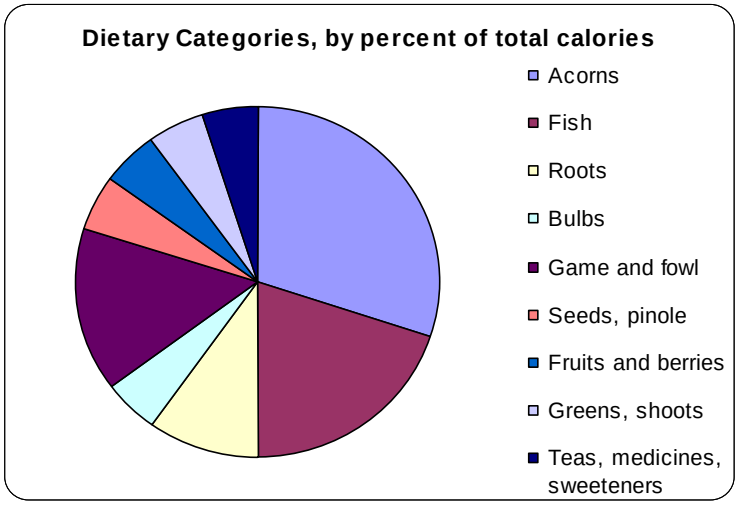
1. **What natural resources are present that are edible, medicinal, or materially useful. Typically ~ 200 species for multi-habitat tribes. But we do not want to list all of them.**
   - **Ecological information**
   - **Anthropological information**
   - **TEK and interviews with cultural and academic experts**
2. **Identify staples with rough apportions among food categories. NOT a simple substitution of food pictures, but description of what the diet actually was/is.**
3. **Estimate quantities and percents of calories among food groups**
4. **Check USDA nutritional database – kcal/100g portion of actual or nearest food (same plant family), same food prep method.**
5. **Ensure totals of 2000 kcal/day and about 1500 grams/day (about 3 lbs/day)**

<u>Tribal Diet examples.</u> Depending on political history, there may be multiple tribes and habitats on one reservation. Distinct dietary patterns may persist in blended tribes. Must know local tribal history.
All are ~ 2000 kcal/day and ~ 1500 grams.



Washoe Tribe – Pinyon-juniper/Tahoe region, from eastern Sierra Nevada to Great Basin floor steppe and marshes.

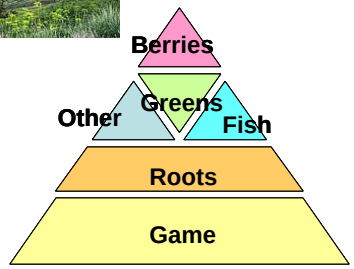
Elem (Pomo), Clear Lake CA. Fish, game, tule, acorns



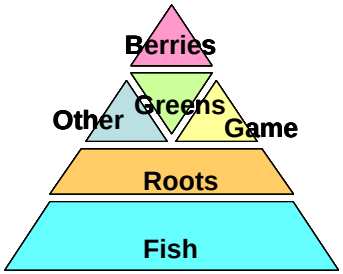
Three CTUIR Tribes – Two basic habitat types

Food Category	Grams per day	Kcal per day	% of kcal
Fish	620 (Boldt decision)	1000	40
Game, Fowl, Eggs	225	400	16
Roots	500	500	20
Berries, fruits, nuts	125	125	7
Greens, medicines, tea, grain	300	300	12
Sweeteners, mushrooms, other	125	125	5

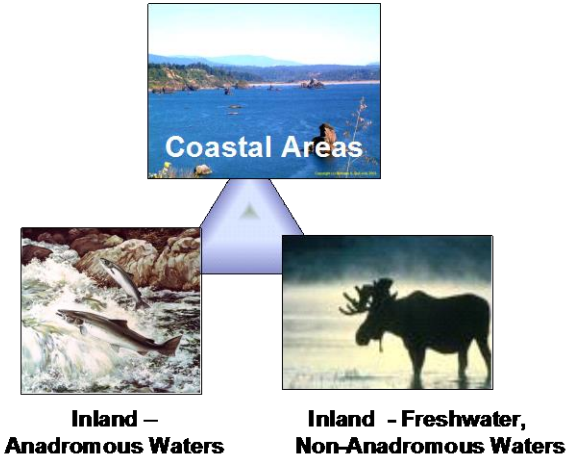
Cayuse (Upland peoples)



Walla Walla, Umatilla (River peoples)



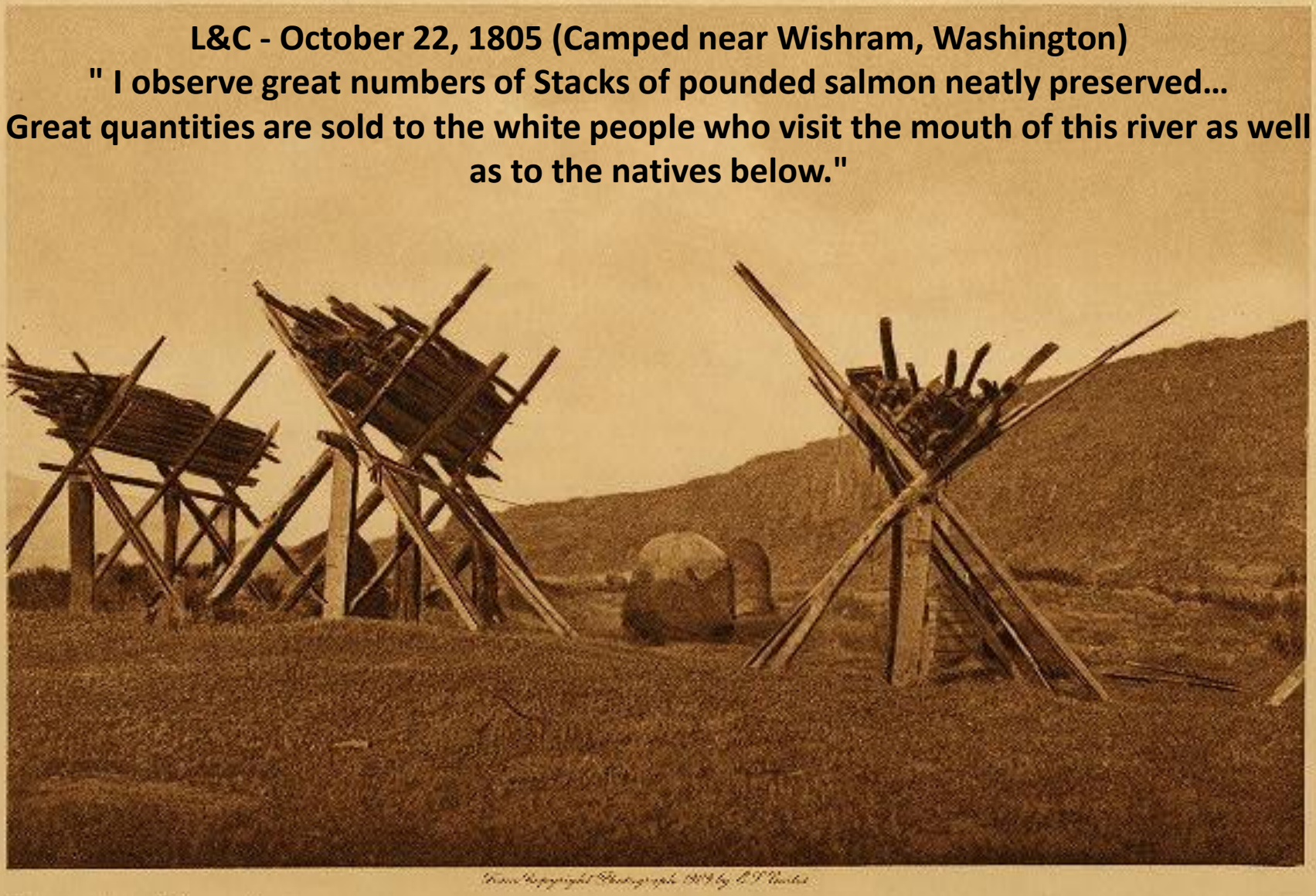
Maine – 25% wetlands. Three bounding case diets for the 3 major habitat types. Allows hybrid diets for site-specific or tribe-specific use.



Example – Maine Inland Anadromous

Category	*Percent of 2000 Kcal*	*Daily kcal*	*Daily grams*
Resident fish and other aquatic	10%	200	115 gpd
Anadromous-marine fish; shellfish	10%	200	115 gpd
Game, large and small	30%	600	343 gpd
Fowl and Eggs	6.5%	130	65 gpd
Roots, Tubers, Bulbs	10.5%	211	326 gpd
Berries, Fruits, Seeds, Nuts, Grain, other above-ground veg.	22.5%	290	210 gpd
Greens, Tea	5%	100	300 gpd
Honey, Maple syrup	5.5%	110	45 gpd

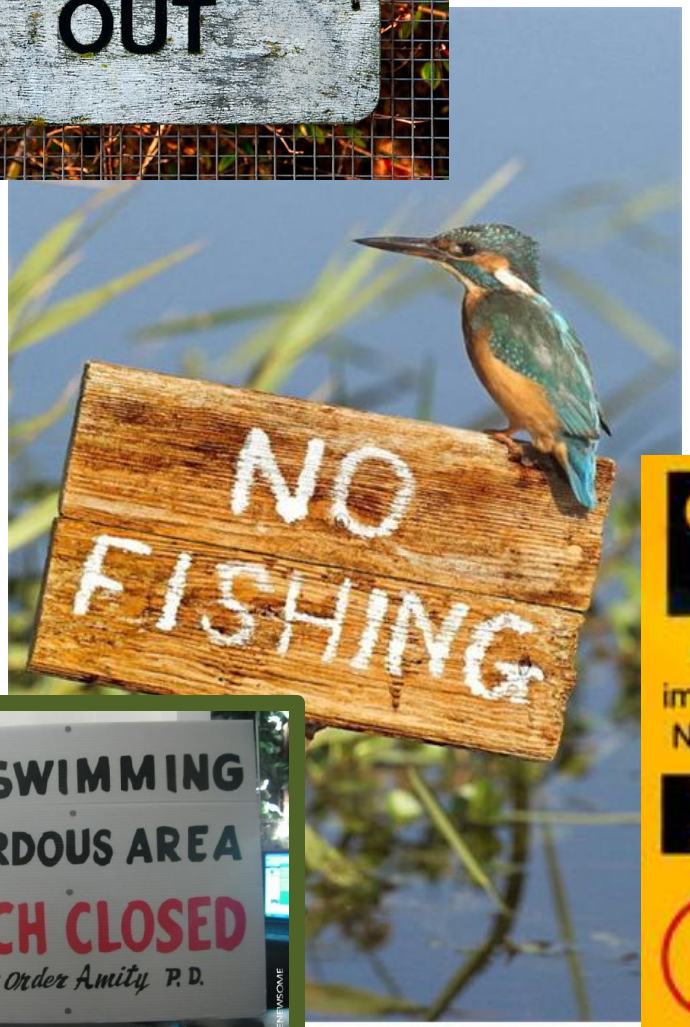
L&C - October 22, 1805 (Camped near Wishram, Washington)
" I observe great numbers of Stacks of pounded salmon neatly preserved… Great quantities are sold to the white people who visit the mouth of this river as well as to the natives below."



Caches along the Columbia ***(photo by Curtis, 1906)***

Contemporary Fish Surveys

Asking people what they eat now simply measures the effectiveness of fish advisories. Almost every water body has mercury-based restrictions.



Fish Consumption Rates used in Regulation and Risk Assessment

Amount Eaten	Rationale
6.5 gpd	EPA Office of Water quality current rate for water quality standards
17.5 gpd	EPA Office of Water Quality proposed rate for the general population
48.5 gpd	EPA & FDA recommend rate eating 2 6-ounce meals per week
63.2 gpd	CRITFC average for current fish consumers; about 1 pound/week
142 gpd	EPA recommended CRITFC 95th percentile for current consumers
175 gpd	Oregon
389 gpd	CRITFC 99th percentile minus subsistence "outliers"
454 gpd	1 pound per day; commonly cited level by Tribal members
540 gpd	Harris and Harper rate for true current Umatilla subsistence
620 gpd	Boldt Decision cited 500 lbs per capita – Columbia River
	Used in Hanford risk assessments; half resident / half anadromous
650 gpd	Walker mid-range of top 10% of Yakama members using the Columbia River during the 1950s and 1960s
1000 gpd	Walker estimate of pre-dam rates for Columbia Plateau Tribes (Celilo)

In addition to food intake:

Including but not limited to:

- **exposure while gathering, preparation**
- **residual soil on native plants**
- **higher inhalation rates while outdoors**
- **cultural activities not related to food**
- **reed gathering and basketmaking**
- **making many other implements**
- **Sweatlodge**
- **Contact with contaminated materials, shared items**
- ***frequency, duration***
- ***intensity of activity and environmental contact***

Example: think about all typical subsistence activities and how they affect exposure through food, soil, water. And air

	Hunting and associated activities	Fishing and associated activities	Gathering and associated activities	Sweatlodge and associated activities	Totals for major exposure factor categories
Food, Medicine, Tea, other biota ingestion (diet)	*n* deer /yr diet; Total large-small game, fowl. Organs eaten	*n fish* /yr diet; Total pounds or meals/day-wk-yr; Organs eaten.	Includes foods, medicines, teas, etc.	No food, but herbal particulates are inhaled.	Must account for all calories. Extra factor for 100-200 plant species; parts eaten
Soil, sediment, dust, and mud ingestion	Terrain types; Degree of dermal contact; How much dirt and mud,,,,	Sediment contact, dust and smoke if drying; weir construction in mud.	External soil on plants; cooking method such as pit cooking; ingestion when gathering.	Includes building the sweat lodge and getting materials..	Must also include living area, roads, and gap identification.
Inhalation rates	Days per terrain; Exertion level; hide scraping; load & grade,,,,	Exertion level – nets and gaffing methods; cleaning effort.	Exertion level for load and grade; or gardening. Include making items.	Includes building the lodge, chopping firewood, singing.	Must account for exertion levels; smokes and smudges.
Groundwater and Surface water pathways	Drinking water; wash water; water-to-game pathways.	Drinking water; incidental ingestion	Drinking water, cooking water, etc.	Steam in lodge; drinking water during sweat.	Must account for hydration in hot arid climate plus sweat lodge.
	Possible – total hunting hours or days per year	***Possible – total fishing hours or days per year***	***Possible – total gathering hours or days per year***	***Possible – total hours per year***	**GAPS – identify extra items that need explicit inclusion.**

Differences in Exposure Factors

Exposure Factor	Traditional Lifeway	Suburban Lifestyle
Fish Ingestion	500 – 1000+ grams/day	6.5 – 17.8 gpd
Soil Ingestion	400 mg/day + events	50 mg adult, 200 child
Inhalation	30 cu. meters / day	20 cu. m.
Drinking Water	3L/d + 1L sweatlodge	2 L/d
Exposure Frequency	365 days/yr	350 days (varies)
Exposure Duration	70 years (+ generations)	30 years
Sweat Lodge, Other	yes	no

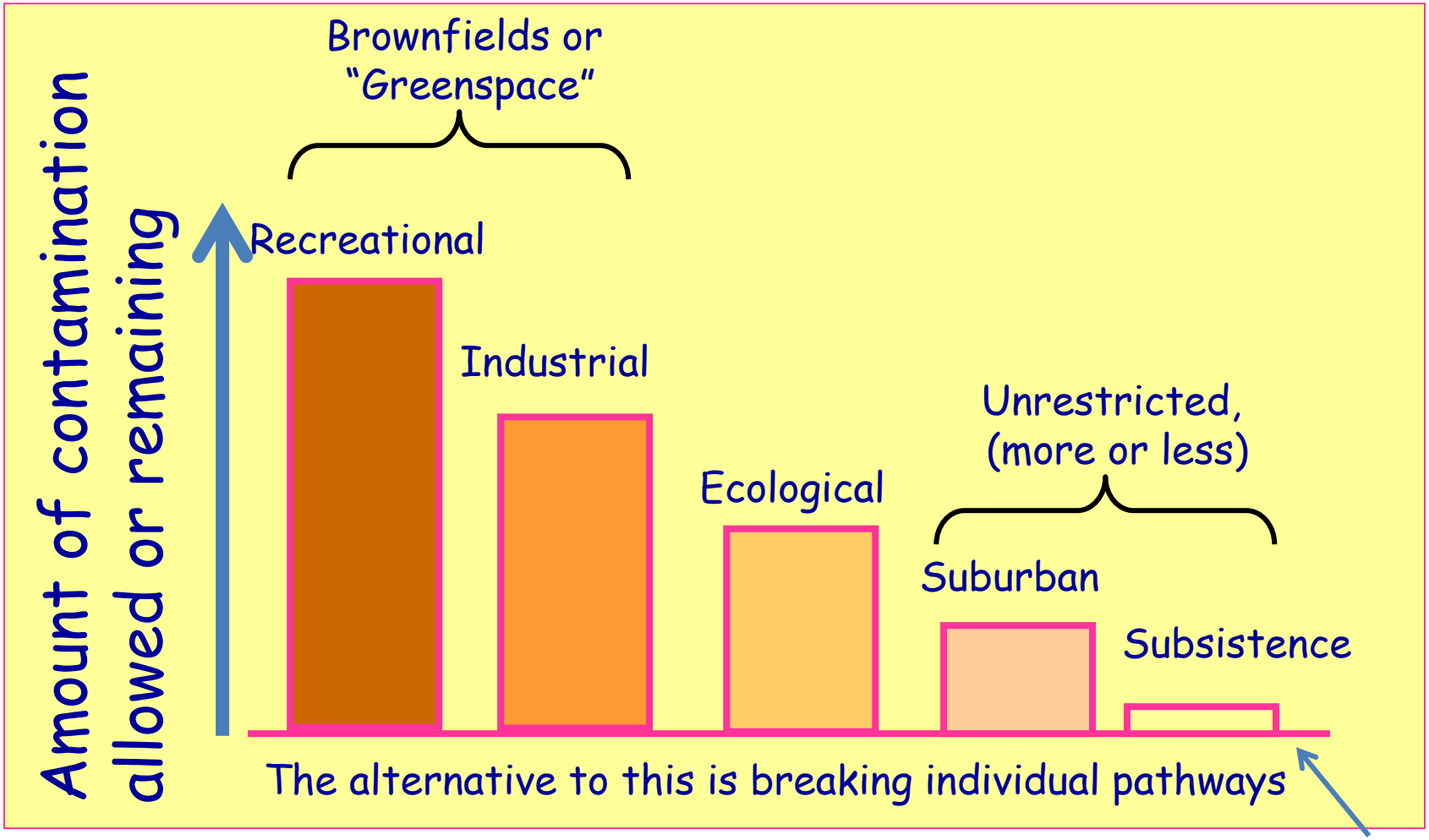
Other Considerations and Tricky Questions

Triple Sigma -- 3Σ

The risk assessment should include

1) ALL COCs (contaminants of concern). Preferable not to screen any contaminant out by comparing concentrations to existing standards.
2) ALL media (air, surface water, groundwater, soil, food, plants, complete diet, sweat lodge).
3) ALL pathways of exposure (inhalation, ingestion, dermal, unique activities).
4) Full lifetime (children may be evaluated separately).

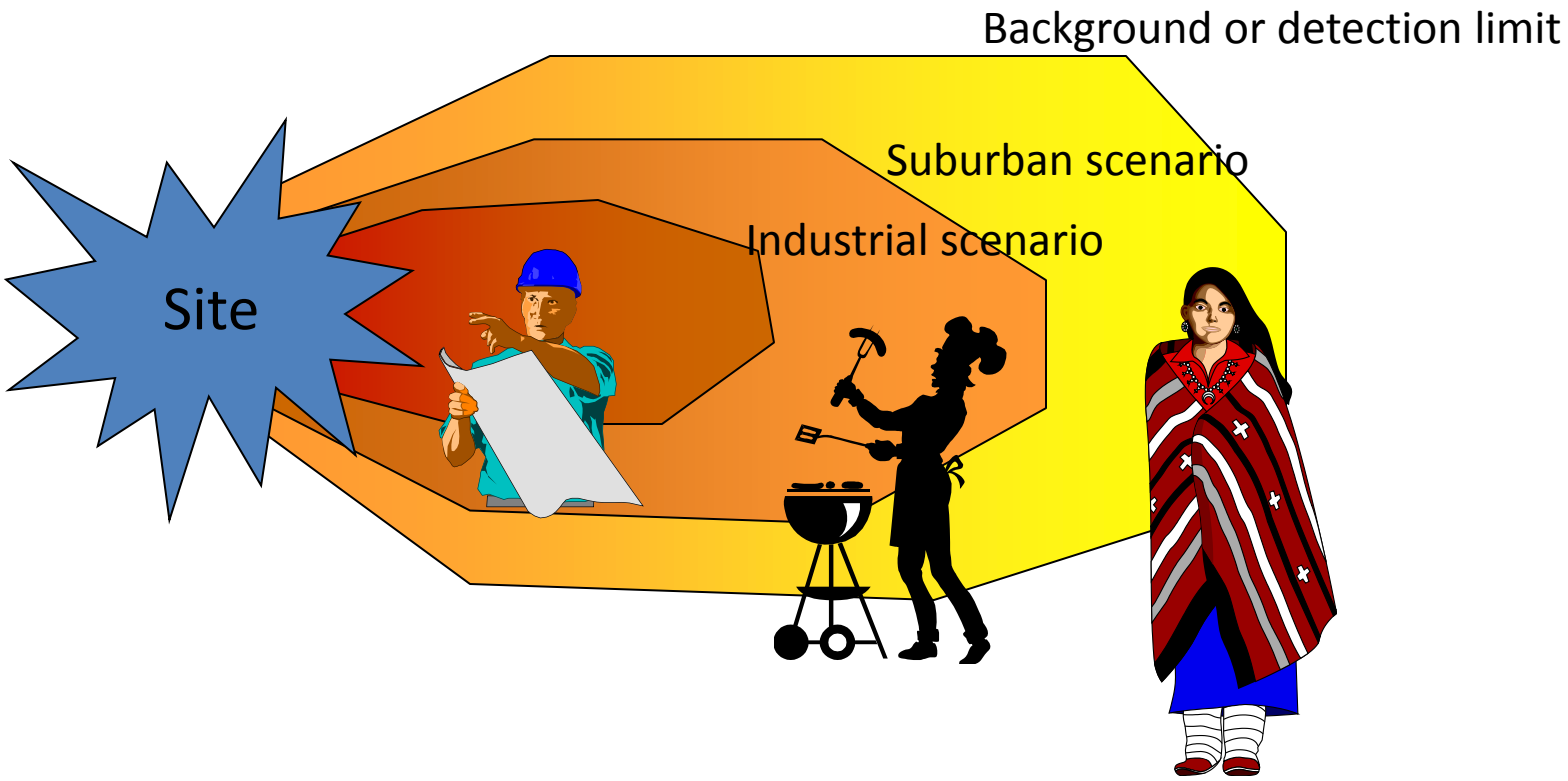
PAFU – Preserving All Future Uses

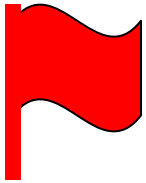


Cleaning to background or tribal standards ensures that all other uses are also safe.

Site Assessment:

Defining the “Zone of Risk” or “Nature and Extent of Contamination”





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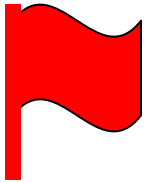


"If we meet regulatory standards, such as drinking water standards, isn't that safe for everyone?"

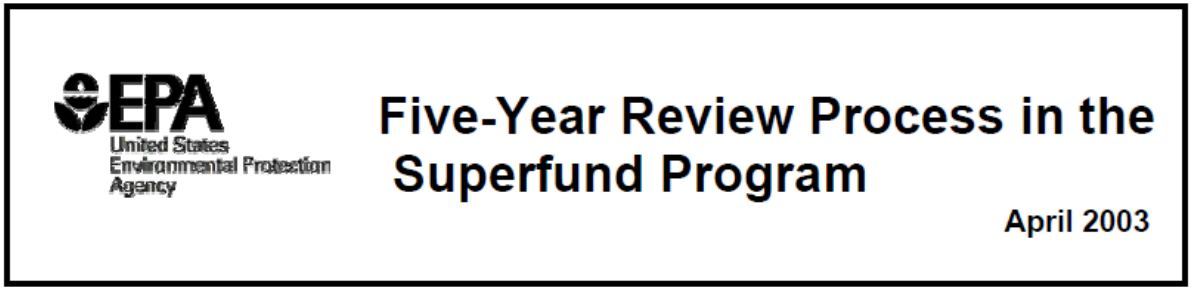
Answer: No. Drinking water standards were developed for one contaminant at a time, and do not consider other water pathways, other non-water pathways, multiple contaminants, nor tribal ingestion rates. Risk levels for individual drinking water contaminants can be quite high, and are even higher when summed together. CERCLA risk-based cleanups could require lower levels of individual contaminants if many are present, or if multiple pathways are present.

Risk Assessments ⟷ Remedies

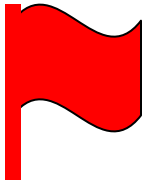
Perfect, Gold-plated multipathway, multi-contaminant cumulative, holistic risk assessment

Remedies are still usually media-specific. Pathways are still broken one at a time. Remedial goals are based on <u>single contaminants in individual media,</u> not on cumulative risk. The most common argument against cleaning to background is land use (zoning, recreation, cultural visits but not full subsistence).

UU/UE
Post-Remedy 3Σ Risk Assessment



"A Five-Year Review may be required or appropriate when a remedial action leaves hazardous substances on the site at levels that do not allow for **unlimited use and unrestricted exposure**. Unlimited use and unrestricted exposure (UU/UE) means that there are **no restrictions placed on the potential use of the land or other natural resources**. In general, if the selected remedy relies on restrictions of land, groundwater, or surface water use by humans or if any physical or engineered barrier is part of the remedy, then the use has been limited…"



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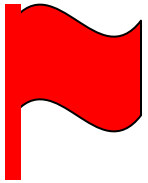


- **A scenario-based cleanup means cleaning up for only that use and lesser uses, not more intensive uses. Future land use options may not be protected.**
- **If we agree that we make only seasonal visits, then the site is not cleaned up for our full-time subsistence use.**
- **Cleaning and restoring the surface may not include treating groundwater, for instance.**

NRDA Applications

Health risk-based ecosystem services

Health-based institutional controls, or land use restrictions, are de facto proof of NRD lost use and injury.

Tribal NRDA has a national problem with inadequate representation of tribal health, well-being, ecosystem services, cultural uses,

Tribes are Trustees!! On and Off reservation

§101(16) Definition of Natural Resources - Defines "natural resources" as "land, fish, wildlife, biota, air, water, ground water, drinking water supplies, and other such resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by the United States ... any State or local government, any foreign government, [or] any Indian [T]ribe."

Tribal Natural Resource Trustees
"Tribal Chairmen (or heads of the governing bodies of Indian Tribes), or persons designated by Tribal officials, shall act as Tribal Trustees for natural resources belonging to, managed by, controlled by, or appertaining to the Indian Tribe, or held in trust for the benefit of such Indian Tribe, or belonging to a member of an Indian Tribe, if such resources are subject to a trust restriction on alienation [40 CFR §300.610]. The Secretary of the Interior may act as Trustee on behalf of a Tribe at the Tribe's request."

http://www.epa.gov/superfund/programs/nrd/trustees.htm

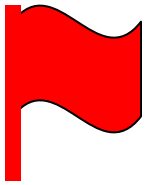
DOI/DOJ Must Recognize Tribes as Trustees in Usual and Accustomed Areas (off-reservation)

Problem: **Federal land managers often protect land *FROM* tribal use and deny tribal access and use other than recreational/ceremonial visits.**
Rationale: **Resource responsibility, regulatory or enforcement authority, and lack of recognition of Treaty/aboriginal rights.**

NPS PROPOSED RULE FOR TRIBAL GATHERING OF PLANTS IN PARKS (APRIL 20, 2105)
RIN 1024-AD84; National Park Service, Department of the Interior

Opposition says:
The NPS regulations at 36 CFR § 2.1(a), prohibit the "possessing, destroying, injuring, defacing, removing, digging, or disturbing from its natural state:
(i) Living or dead wildlife or fish, or the parts or products thereof, such as antlers or nests.
(ii) Plants or their parts or products thereof.

Tribal use is a consumptive use but not a destructive use; it is a form of sustainable management



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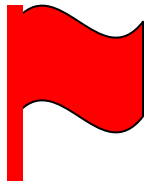


"The site is zoned industrial, therefore cleanup to residential standards is not required. Land use dictates cleanup levels."

Problem: Zoning or NEPA land use decisions are short-term. Future changes in land use may not be protected. Future land uses may be prohibited due to residual contamination.

Problem: An area zoned as greenspace or recreational may not be clean enough to support future residential development (tribal or city). A wildlife refuge may not be very clean.

Problem: An area previously used for agriculture may not be clean enough to support future residential development (tribal or city).

NRDA Overview

Baseline condition
Pre-release;
"but for" the release

Contamination;
Operations

Interim lost use

Recovery to baseline; we are "made whole."

Restoration, compensation or "damages" for past and future lost use

Remediation

CERCLA - NRDA (when not integrated)

Baseline condition
Pre-release;
"but for" the release

Contamination;
Operations

Interim lost use

Recovery to baseline; we are "made whole."

Handoff for new mission

NRDA:
- evaluate data quality and adequacy of characterization;
- re-sample for verification of risks and injuries to abiotic and biota, and people
- review closure plan, closure completion
- is the site safe for unrestricted use? (a service). Are ICs required? Monitoring?
- is the site revegetated or actually restored?
- is more remediation and restoration needed?

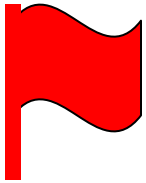
Remediation:
- Removal, treatment, disposal
- Landfill closure, monitoring
- Institutional controls
- Caps, barriers, fences, signs
- Brownfields
- Protect human health and Env per cumulative risk reduction; meet individual contaminant standards (ARARs)

Challenge: CERCLA-NRDA Disconnect

- EPA
- Cleanup
- Ignorance of tribal exposure scenarios; need to be used to set remedial goals
- Chemists, risk assessors, engineers, modelers who do not understand NRDA
- DOI, Tribes
- Restoration
- Ignorance of the risk basis of injury (e.g., institutional controls, resource advisories)
- Ecologists, Economists who do not understand CERCLA

DOI/DOJ may think they do NOT have to protect tribal health, just restore resources.

NRDA is about people and culture and landscapes, too



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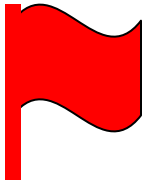
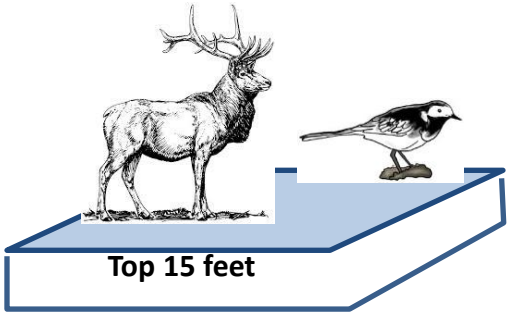


If natural resources are restored, aren't all Tribal uses of those resources also restored?

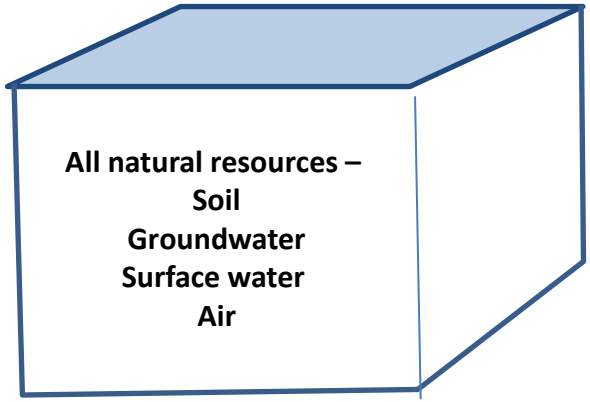
Answer: Not unless tribal foodchain exposures were used to determine whether biota are clean enough for human use, and traditional exposure factors and diets were used. If natural resources are uncontaminated, we can use as much or as little as we need to, and still be safe.

Wildlife Refuge



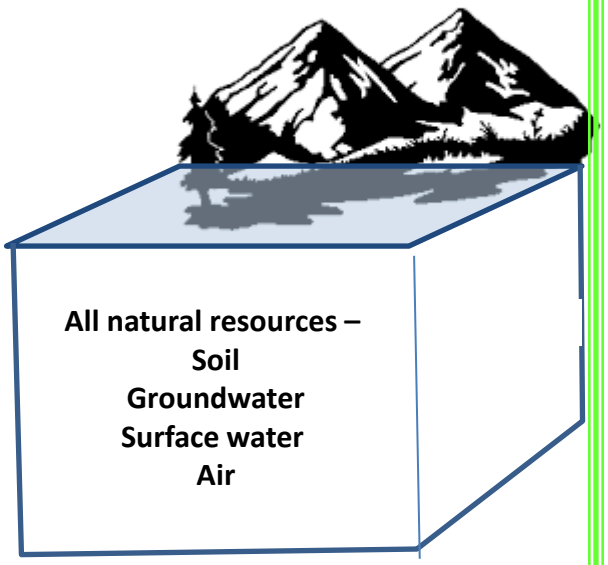
Surface cleanup
GW may be restricted
Human health not considered
Surficial restoration
No foodchain to humans
Tribal uses may be prohibited

Traditional Living Support



<u>Wildlife plus people</u>
Triple Sigma risk assessment
Human health thresholds
Cumulative risk considered
Lost human use = injury
Adheres to guidance better

Homeland Made Whole



<u>Wildlife plus people plus landscapes</u>
Full risk and human use
Ecosystem services
Cultural mapping, other tools
Adheres to guidance best

Challenge: Recognize Human Health Risk as one Basis of Injury

Since IC = Injury, and since ICs are based on excess risk, it follows that excess risk = injury

- **This is not a replacement or alternate to the normal biota-only approach to injury assessment. It simply recognizes that there are health-based definitions of injury as well as the normal biota-based definitions.**
- **Many injury thresholds are health based: MCL, fish advisories, site closures, as well as AWQS (human and/or biota).**
- **Institutional controls to protect human health are based on actual measured (or modeled) concentrations. ICs are not simply precautionary, but based on actual concentration data. Concentration data are used to calculate risks and also are compared to generic standards. If risks are too high, or standards are exceeded, either a remedial action is taken or an institutional control is imposed.**

Endstate: "Making a Tribe Whole"

Means … Making the entire site clean enough to safely use in our traditional manner (as described in the Treaty and translated into the Exposure Scenario); restored enough in quality and quantity that the resources are sufficient to support those uses across Hanford and HRNM and full nature & extent & time; and protected/sustained through administrative & educational means; and accessible (our access and use is returned to us). This includes capacity building to become Hanford's long-term stewards.

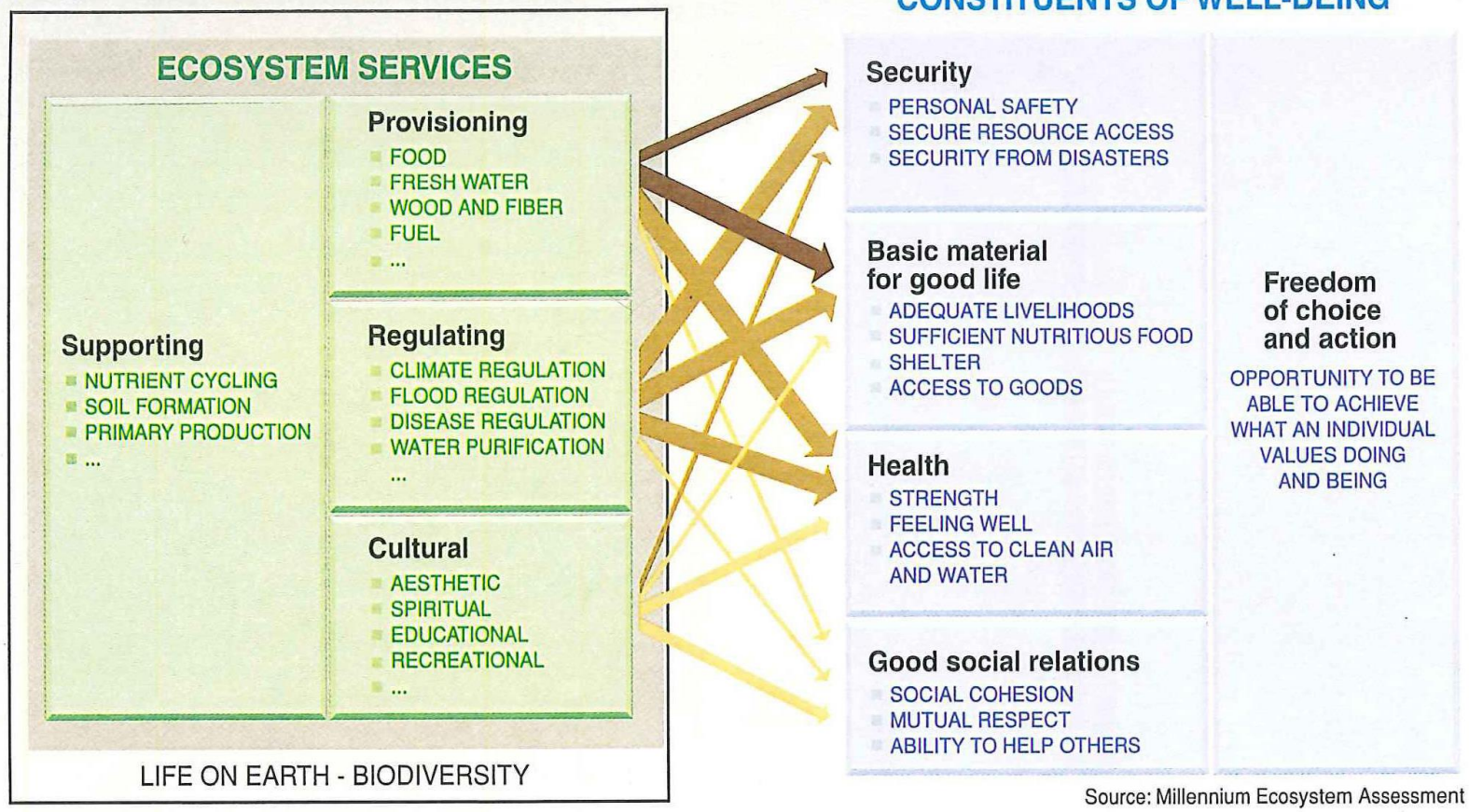
Example of a policy statement:

> "[to] pursue further clean-up where Tribal health, rights, and resources are not fully protected or restored"
>
> "[that] [the Site's] lands and resources should be restored to their pre-release environmental conditions, or equivalent to those that existed at the time of the Treaty of 1855."

Basic Needs

Clean fresh air
Clean cold water
Clean vibrant ecology
Clean wholesome foods
Clean healthful medicines

Linkages between Ecosystem Services and Human Well-being



Source: Millennium Ecosystem Assessment

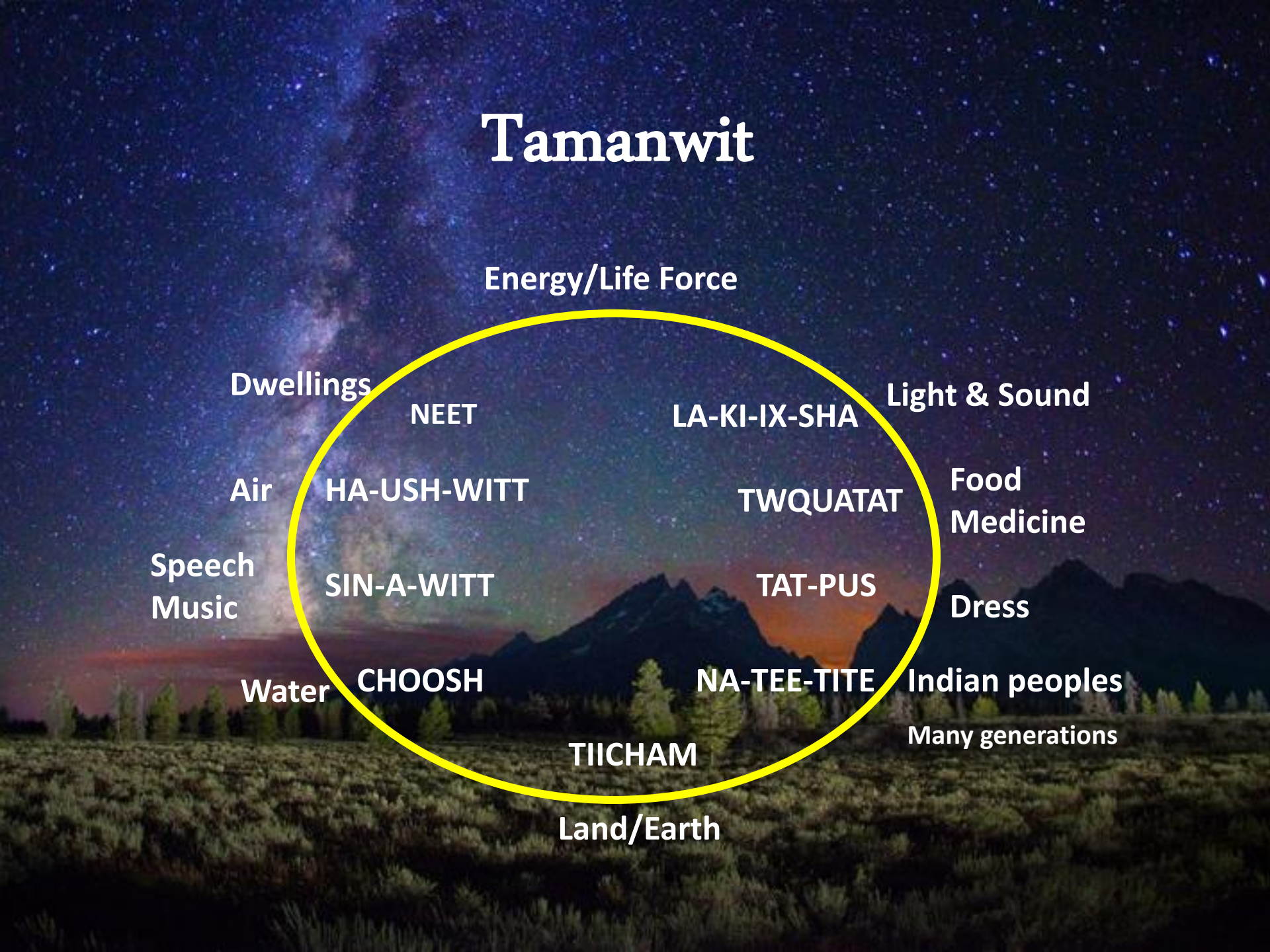
ARROW'S COLOR
Potential for mediation by socioeconomic factors

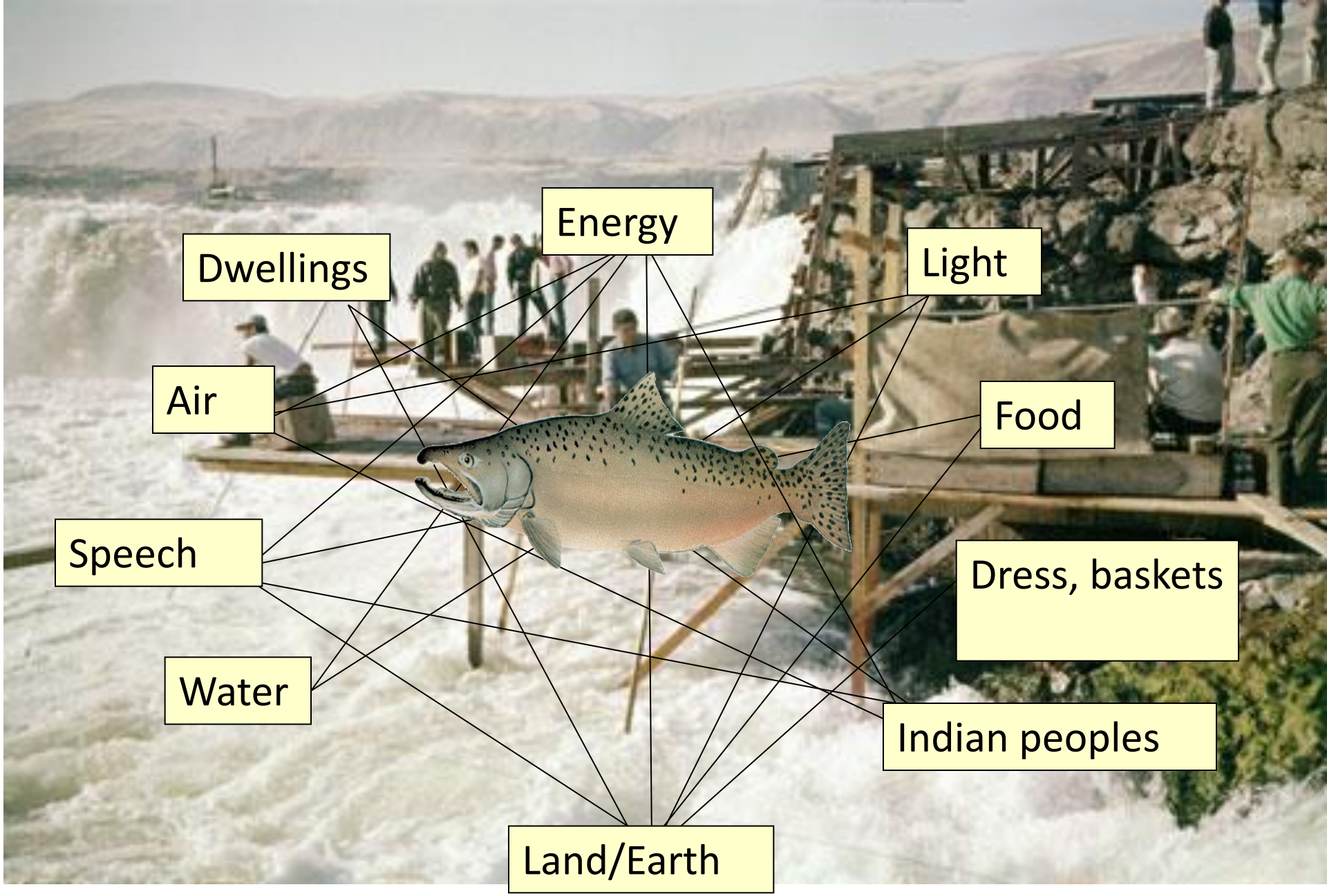
- Low
- Medium
- High

ARROW'S WIDTH
Intensity of linkages between ecosystem services and human well-being

- Weak
- Medium
- Strong

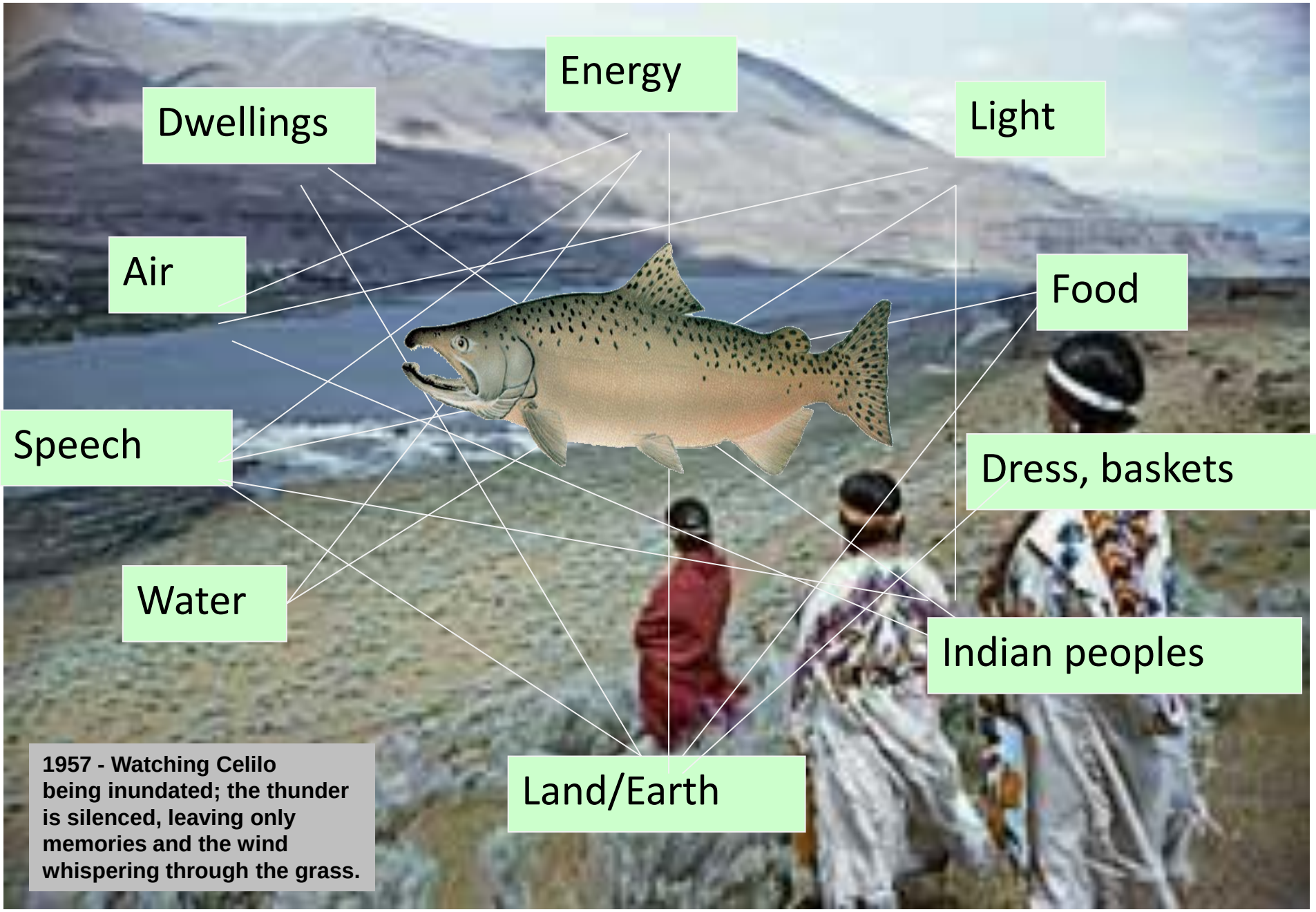
Tamanwit


Energy/Life Force
Dwellings
NEET
LA-KI-IX-SHA
Light & Sound
Air
HA-USH-WITT
TWQUATAT
Food
Medicine
Speech
Music
SIN-A-WITT
TAT-PUS
Dress
Water
CHOOSH
NA-TEE-TITE
Indian peoples
Many generations
TIICHAM
Land/Earth



Celilo Falls, Columbia River,1956

Major fishing area for 10,000 years; source of food, heritage, social cohesion, trade. The Tamanwit of this area held the Columbia Basin culture together, and sustained tribal health and well-being. The falls were thunderous and rainbows danced in the mist.



The Tamanwit overlay slowly fades away as individual links are broken

Examples of injury from service loss (43 CFR 11.62 and .71)

- Exceedance of human health/risk-based standards such as drinking water standards or ambient water quality standards. (43 CFR 11.62(b))

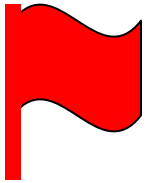
- Exceedance of human health/risk-based action or tolerance level [most common example is a fish advisory; tribal uses of NR are more intensive and require specific CERCLA exposure scenarios].

- "use is restricted as a result of the discharge or release."
  [also a health/risk-based CERCLA determination.]

- "Determine the services normally produced by the injured resource, which are considered the baseline services or without-a-discharge-or-release condition."

- "Identify interdependent services ….to discover significant secondary services that may have been disrupted by the injury."

Pitfalls; Tricky Questions



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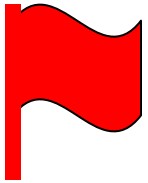
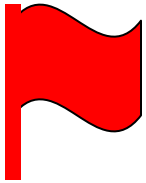


"Can cultural resources be addressed under NRDA?"

Answer:

1. NRDA is about restoration of natural resources and their uses, including cultural use.
2. NHPA and NEPA apply to all NRDA projects
3. However, NHPA can conflict with CERCLA and NRDA and can interfere with cleanup and restoration projects.



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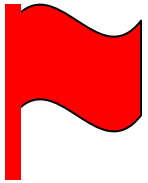
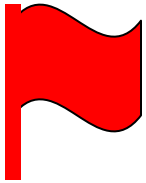


"Can't you practice your culture somewhere else?"

"Isn't this other area 'equivalent' to the injured site?"

Answer:

1. Culture is tied to the land, and sacredness can't be transferred.
2. NRD seeks to make the injured party whole and may seek to acquire the equivalent ecosystem services somewhere else (or provide an exchange parcel).
3. A cultural center or an interim "fishing experience" does not substitute for the lost fishery and its societal importance. Damages based only on user days or dsay is inadequate.



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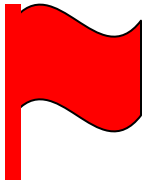
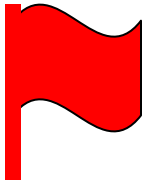


"What if we allow some hunting and gathering; isn't that all you really want to do culturally?"

Answer: No. Limited resource use is an institutional control because we could not safely use the area any more intensively than that limited use. Conservation use is an institutional control and restricted access. Greenspaces or parks are institutional controls. Industrial use is an institutional control, even if the euphemism "safe for unlimited industrial use" is proclaimed. If it is clean enough for us, then it is safe for anyone, anytime.



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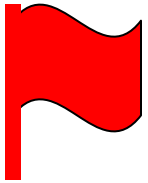
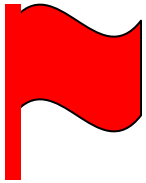


Isn't the assessment area too small to support a traditional lifestyle?

Answer: If the assessment area is small, its boundaries constrain us to living in a small area (the same as for the residential farmer), which intensifies resource uses. Practically speaking, we are forced to substitute domestic plants and animals for our native foods, but the pathways and amounts are substantially the same.



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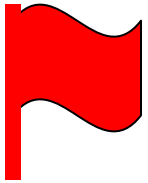
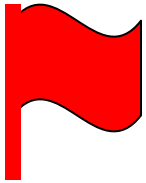
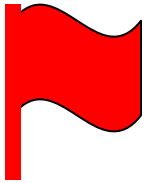


Should we use "real tribal data" since average body weights may be greater for tribal members?

Answer: The scenario reflects an active outdoor lifestyle, not the sedentary lifestyle forced on many people. The sedentary lifestyle is not traditional. Traditional people really do remain active their entire adult lives. If we really evaluated the "coherent person," the residential farmer would also have different non-suburban exposure factors.



Red-Flag Issue



We can reduce your risk by simply breaking an exposure pathway, or reducing your time on site, since no exposure = no risk, right?

Answer: In the chain or risk probabilities, risk may be "managed" by restricting access. However, there may still be ecological and cultural risk. There is also lost use (NRDA) for any degree of restriction from a full-time residential/subsistence use.

Suggested Documentation

1. **Tribal Narrative**
2. **Exposure Scenario**
3. **Tribal Lost Use/Injury/Ecosystem services**
4. **Environmental Codes and Resolutions**

Assume that Tribes have standing in both CERCLA & NRDA

Baseline
Pre-release

Interim lost use

1. Baseline Tribal Narrative
(Resource & cultural use explained)

2. Tribal Exposure Scenario
(Set cleanup goals)

3. Tribal lost use/Injury
(IC delineation, Restoration goals)

Recovery to baseline

NRDA Trustees
DOI, DOJ
States
Tribes
Ecologists, Ecotox

Handoff for new mission; no communication, little overlap in technical expertise

Remediation
EPA
States
(Fed, e.g., DOE)
Modelers, engineers

Problem: different agencies, double educational hurdles, double legal challenge. Burden is on Tribes.

Confederated Tribes and Bands of the Yakama Nation v. U.S., 2007 WL 2570437 (E.D. Wash. 2007) (allowing federal, state, and tribal trustees to recover reasonable nrd assessment costs prior to establishing final amount of natural resource damages – how early in the process can Tribes be funded?)

- **Scenario report – A. Tribal history**
  - **The section on Tribal history describes factors such as whether Tribes have moved or have been consolidated on reservations, historical reports such as trading records, and linguistic and oral history that describes how Tribes identify with and use natural resources.**
  - **This information is needed to understand lifeways as they existed prior to significant resource degradation, the abundance and cultural importance of specific resources, cultural affiliation, etc.**

- **Scenario report – B. Environmental Setting.**
  - **The ecological description provides information about plants, animals, biodiversity, relative proportions of different habitat types, seasonality, and physiographic features of the environment.**
  - **This information is needed to support estimates of dietary staples (the resources that are most abundant and reliable), and environmental characteristics that affect contact rates with soil, sediment, and water (for example, proportion of wetlands versus dry upland habitats).**

- **Scenario report – C. Natural Resource Use**
  - **Ethnobotanical and ethnohistorical literature describes the general diversity of plants used for food, medicine, or materials in various regional ecotypes and helps derive dietary intake values. This section is both general to a County and specific to the site.**
  - **Traditional ecological knowledge (TEK) combines anthropological and environmental knowledge with tribal knowledge, teaching, and observation.**

- **Scenario report – B. Environmental Setting.**
  - **The ecological description provides information about plants, animals, biodiversity, relative proportions of different habitat types, seasonality, and physiographic features of the environment.**
  - **This information is needed to support estimates of dietary staples (the resources that are most abundant and reliable), and environmental characteristics that affect contact rates with soil, sediment, and water (for example, proportion of wetlands versus dry upland habitats).**

- **Scenario Report – D. Diet**
  - **In some cases, a complete diet may have been identified in the foraging theory literature, but more often the major dietary staples are identified but not fully quantified within a nutritionally complete diet.**
  - **Information about natural resources and their abundance and uses is used to estimate relative importance of the major food categories. This is combined with nutritional information to estimate a nutritionally complete subsistence diet.**