Confederated Tribes of the Umatilla Indian Reservation
Department of Natural Resources
ENERGY AND ENVIRONMENTAL SCIENCES PROGRAM

Hanford's River Corridor

A past, present, and future examination from the CTUIR tribal perspective

Background

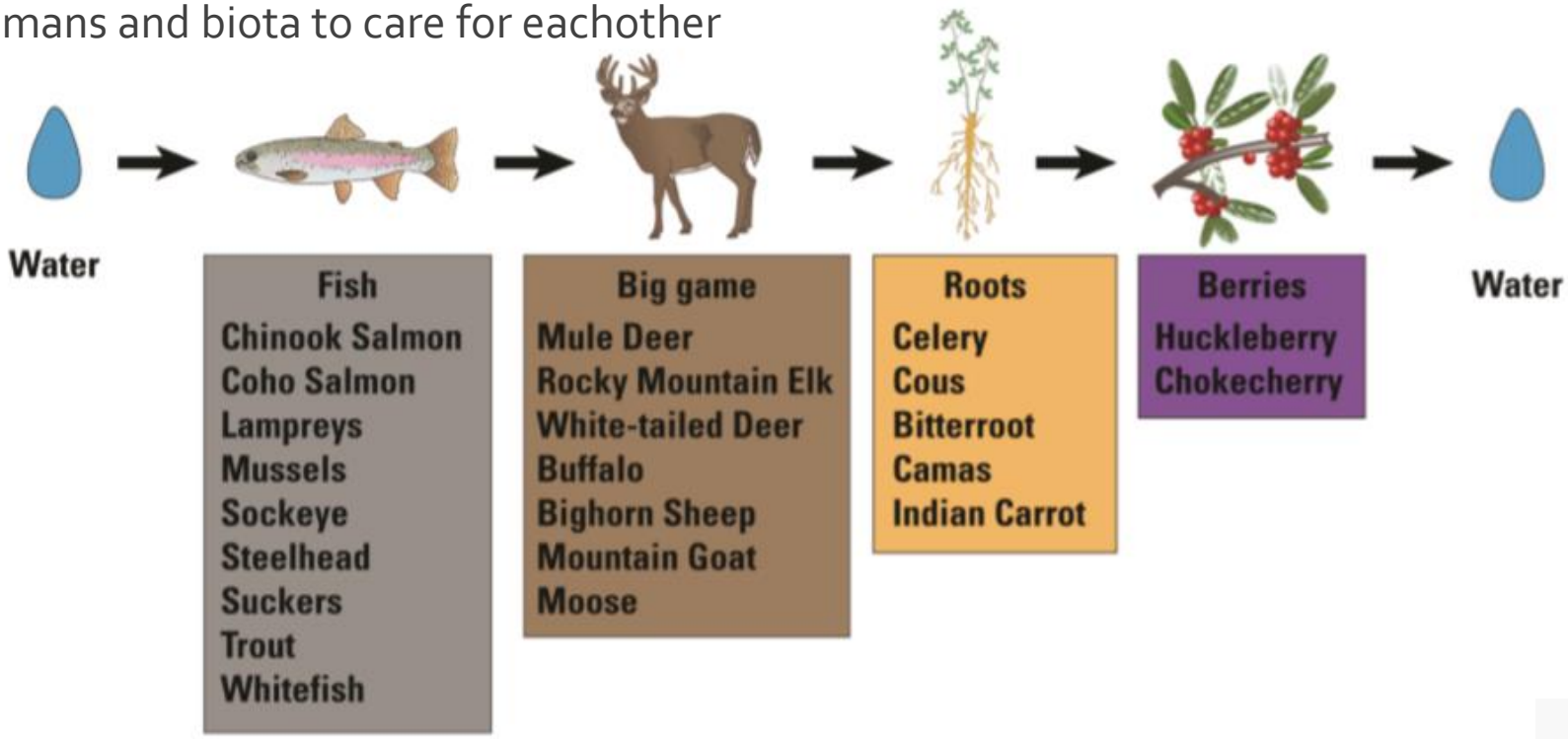
In the beginning the creator asked of the creatures of the earth, 'who will take care of the people?' and it was Salmon who said first, "I will".

The Tribes were spiritually and economically connected to the River

- **Subsitence Use**
  - The river provided plentiful clean water for drinking and bathing
  - The river nourished and sustained plentiful ***First Foods***
- **Cultural Use**
  - Religious gatherings, ceremonies, and burials
  - Crafting and building culturally important items
- **Economic Use**
  - Gathering place for trading and economic diversification

The First Foods

- From the CTUIR creation belief is born Tamánwit and the importance of taking care of the land to ensure the first foods will continue to take care of the tribal people
- To protect, restore, and enhance the First Foods – water, salmon, deer, cous, and huckleberry – for the perpetual cultural, economic, and sovereign benefit of the CTUIR
- **Reciprocity** between humans and the other biotic life forms arises from the creation belief
- A moral and practical obligation for humans and biota to care for eachother
- **Ecosystem Resilience**
- Spatial distribution of serving order
- Clean water required for First Foods



First Foods Cultural Expressions- Community Feasts

Celery Feast: February

Salmon Feasts: April, Celilo, Columbia River

Root Feasts: April – May

Huckleberry Feasts: July - August

First Foods Cultural Expressions- Community Celebrations

Celebrations/War Dances
New Years Celebration
Root Feast Pow-Wow
Treaty Day Celebration
4th of July
Round Up

Men's Round Bustle
Sometimes First Kill Ceremony Requirement

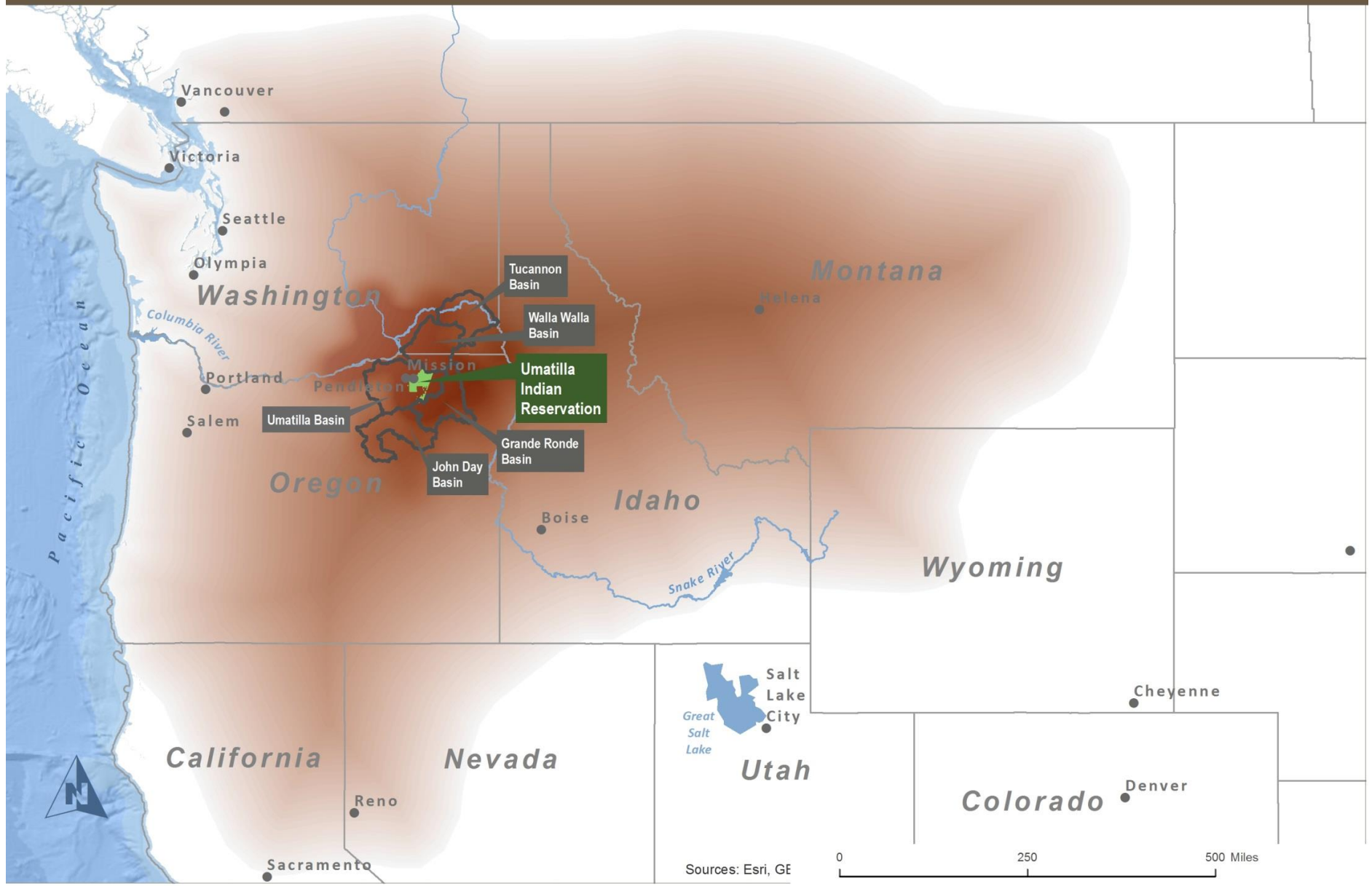
Women's Basket Hat
(Buckskin Dresses)
Sometimes First Digging/Picking Requirement

First Foods Cultural Expressions- Individual Ceremonies

Men's Foods
First Salmon
First Kill

Women's Foods
First Digging
First Picking

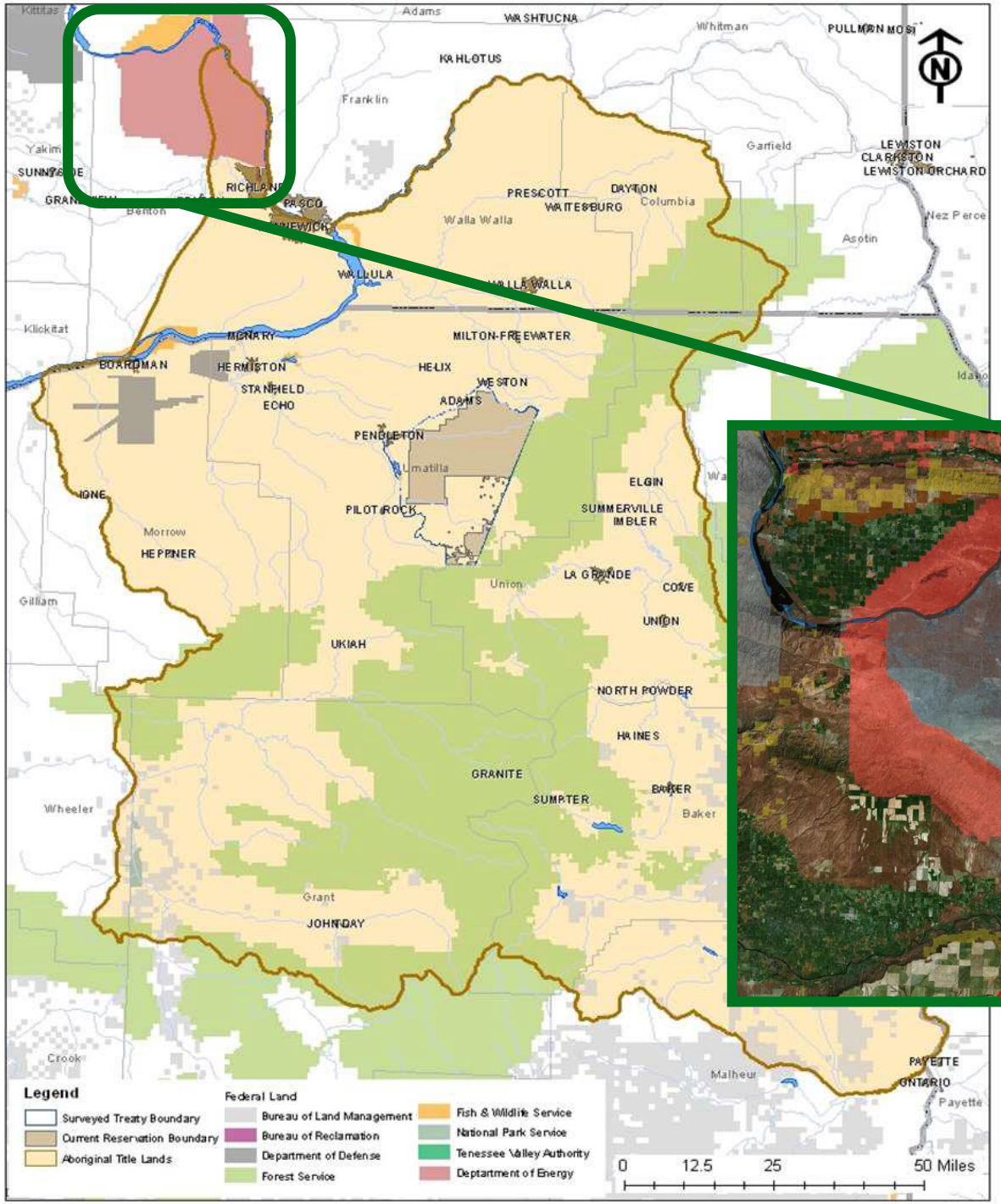
Traditional Use by the Cayuse, Umatilla, Walla Walla Tribes



This map reflects traditional and customary areas used by the Cayuse, Umatilla and Walla Walla people over different seasons at or before treaty negotiations. Areas of heavier use are identified with darker color saturation. Data and information used to create this map includes the 1855 Treaty negotiation minutes, adjudicated use areas, oral histories information and documentation from literature. This map reflects non-exclusive traditional uses beyond current reservation boundaries, aboriginal lands and ceded lands defined by the Indian claims Commission findings – all of which are judicially established as inadequate to reflect the total extent of CTUIR uses, interests and rights under the Treaty. In many instances, the CTUIR Member used those areas in common with other tribes.

Treaty of 1855

Basis of government-to-government relationship between the United States and the Cayuse, Wallla Walla, and Umatilla people (Confederated Tribes)



Ceded 6.4 million acres and retained 250K acres for the Reservation

- Tribes were in a difficult place to accept the conditions of a treaty
- Reserved the right to hunt, fish, gather foods and medicines, and pasture animals on ceded lands
- Treaty of 1855 remains in effect and is very recent history to the Confederated Tribes
- Reservation land reduced from 250K to 172K acres in

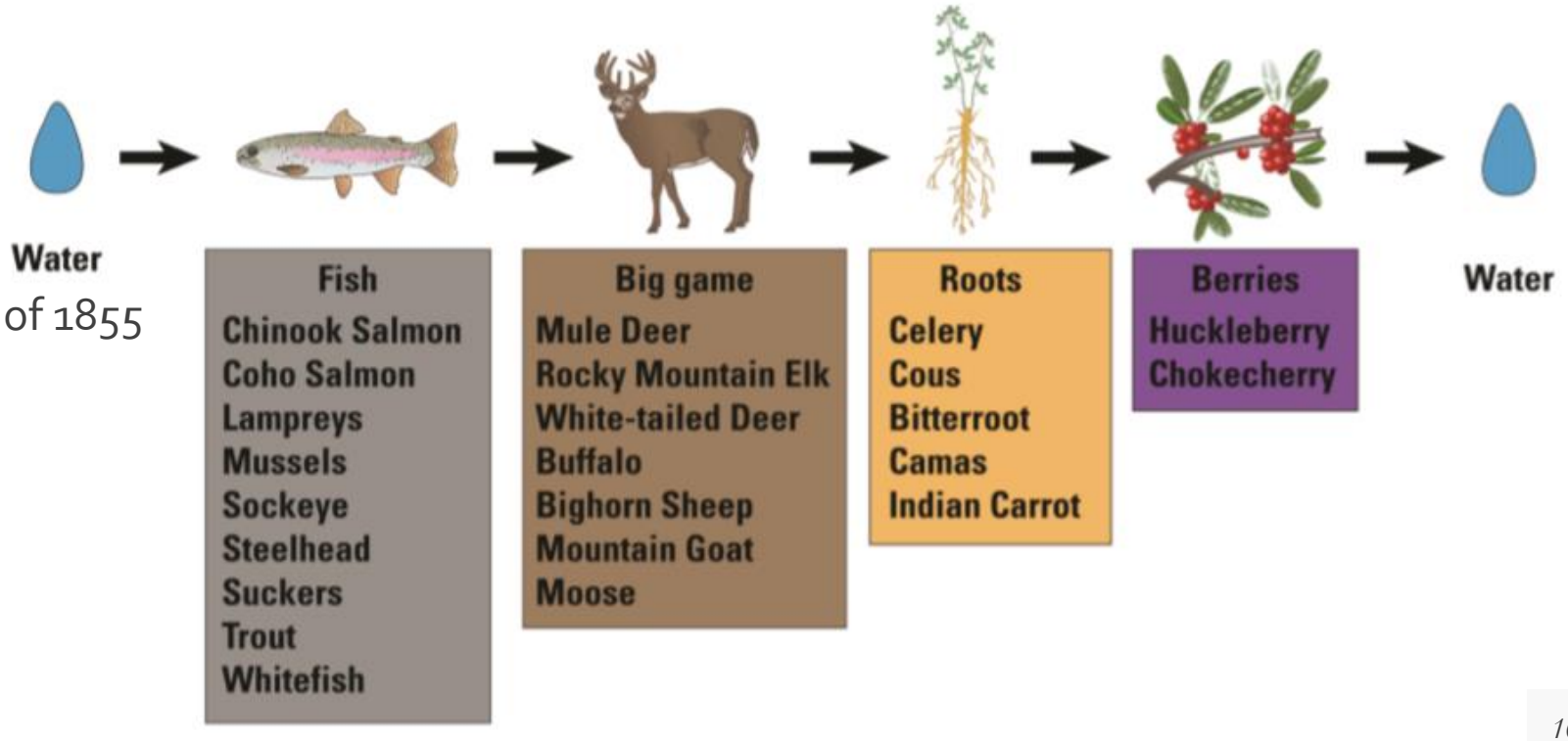
Treaty Rights Linked to First Foods through Tamánwit (natural law)

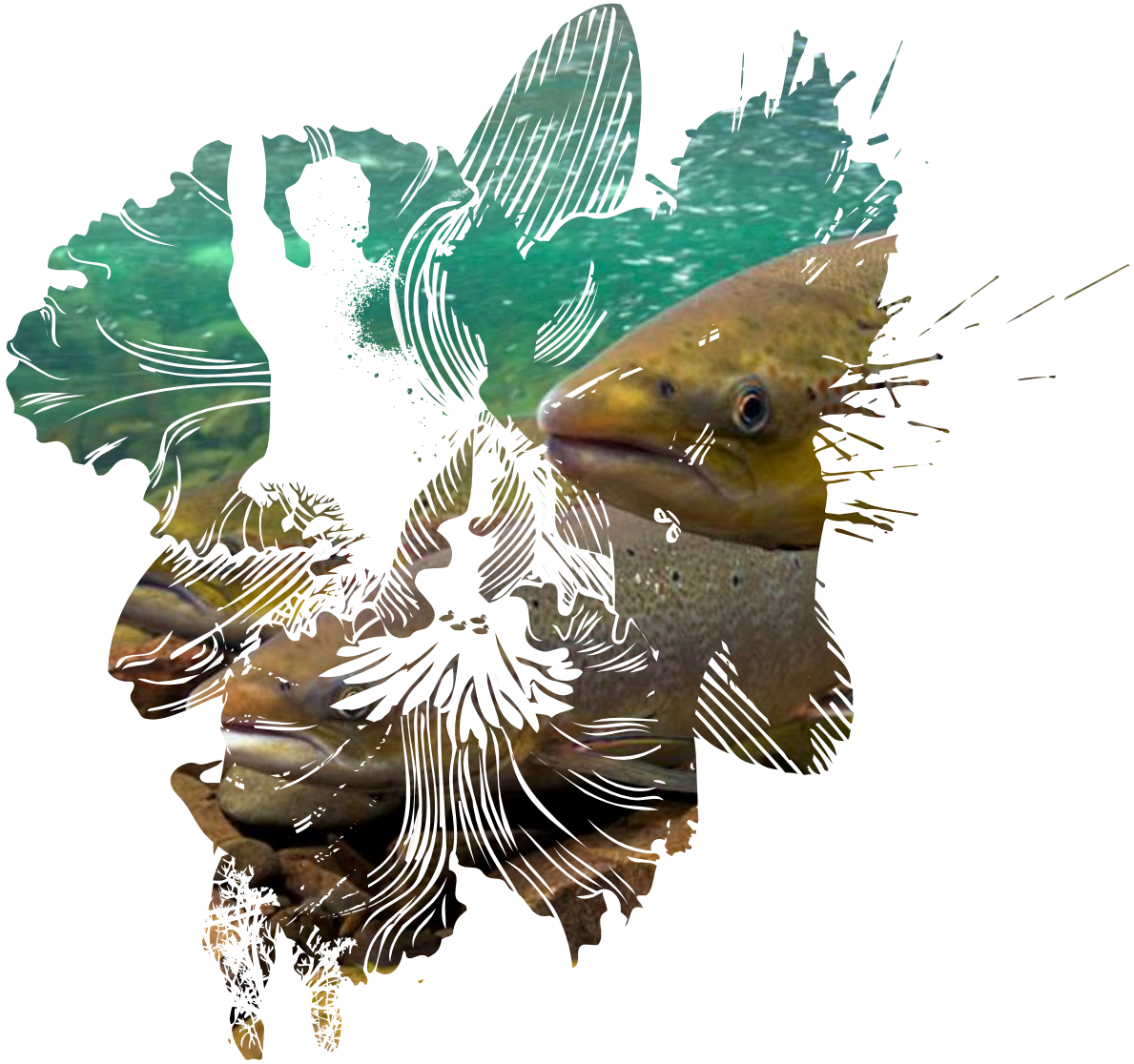
- Ties First Foods and serving order to the landscape
- Reflects explicit Treaty-identified resources
- Guides research into ecological process and restoration
- World View – TEK – Ways of knowing and relating
- Ways of valuing and establishing worth

Cúuš (Water)	Núsux (Salmon)	Yáamaš (Deer)	Xáwš (Cous)	Wíwnu (Huckleberry)
Water Rights	Fishing Rights	Hunting Rights	Gathering/Grazing Rights	

First Foods at the Center of the River Vision

- To protect, restore, and enhance the First Foods – water, salmon, deer, cous, and huckleberry – for the perpetual cultural, economic, and sovereign benefit of the CTUIR
- We will do this by using traditional ecological and cultural knowledge and science to inform:
  - Population and habitat management goals
  - Natural resource policies and regulatory mechanisms
- Reciprocity
- Ecosystem Resilience
- Departmental Mission
- Spatial distribution of serving order
- First foods as they relate to the Treaty of 1855





Present

Hanford Post-Contamination

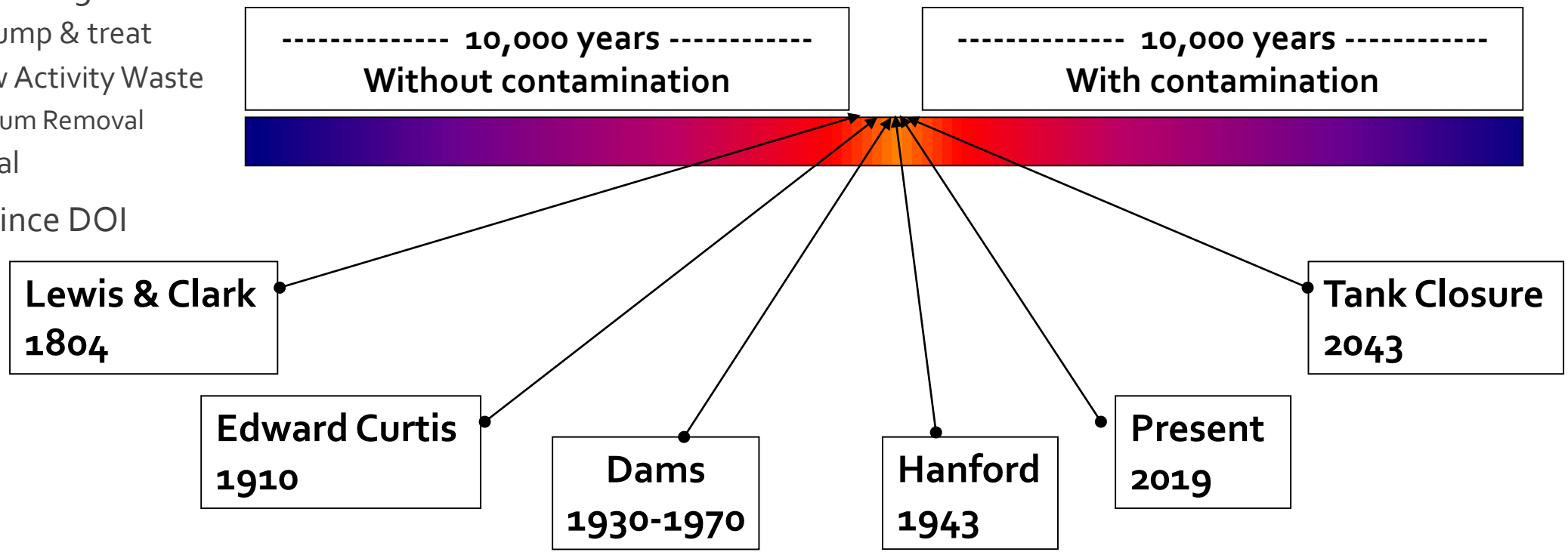
A look at Hanford and the Tribe's involvement since the contamination of the lands

Why are the Tribes Involved at Hanford?

- Ceded Lands (Treaty 1855)
- Nuclear Waste Policy Act – CTUIR as "Affected Indian Tribe" (1982)
- Hanford Policy (Approved BOT Resolution 07-009)
  - Pre-1855 Conditions or Equivalent
  - Protect River
  - No new nuclear missions
  - Long-term partners/co-managers (long-term stewardship)
- CERCLA/Superfund
  - Cleanup (remediation)
    - Feds, states, tribes authorized to respond to release of contamination to protect public health and the environment
    - Recover response costs
  - Natural resource restoration (damage assessment)
    - Make public whole for injury to natural resources caused by contamination
- Indian Self Determination and Education Assistance Act (25 USC 46, Subchapter IV)
  - Transfer management responsibilities of the Hanford Reach National Monument from the USFWS to the CTUIR

Tribal Planning Horizon

- CTUIR planning horizon is not limited by regulatory bounds, such as those defined for performance assessments in DOE O 435.1 and DOE M 435.1 (1000 years @ 100 meters).
  - The tribes have documented ancestors using the land over 10,000 years ago
- CTUIR is not optimistic that institutional controls or caps can be maintained for hundreds of years by government agencies.
  - In Europe a 100 miles is long distance and 100 years is short in time, in the USA 100 miles is a not far and 100 years is a long time
- Some progress is being made
  - Groundwater pump & treat
  - Direct Feed Low Activity Waste
    - Tank Side Cesium Removal
  - K sludge removal
- USA- 242 years since DOI



Recent History of CTUIR/DOE LTS efforts

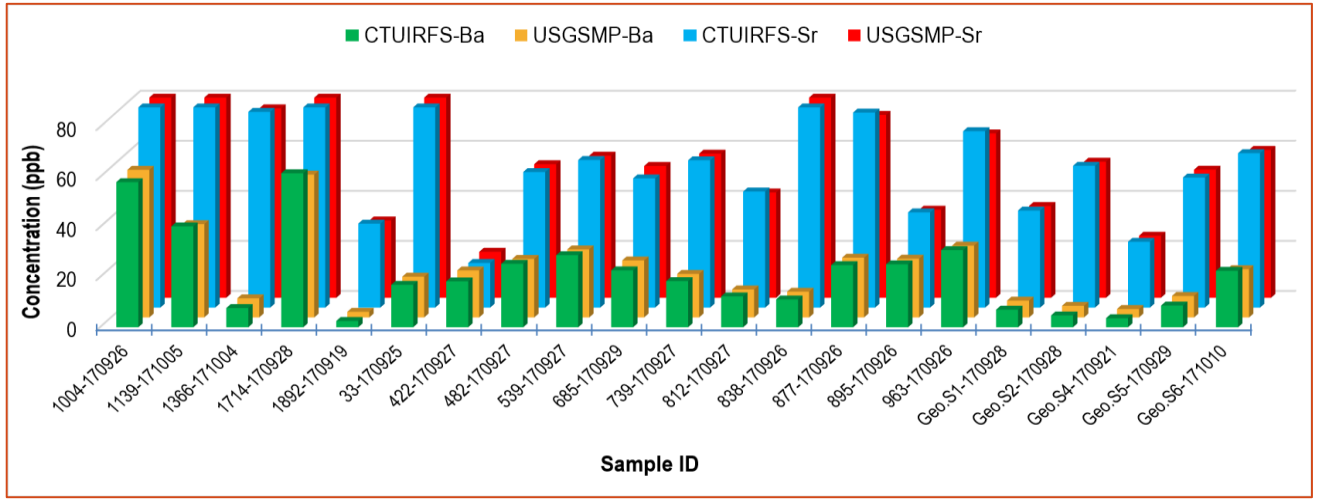
- **2003 – 2010:** Ongoing discussions/negotiations with the USDOE to establishing LTS/LM capacity at the CTUIR.
- **2006**: Initial seed collection on Hanford lands
- **2006**: Initial plant propagation
- **2011**: Initial plantings on Hanford lands (Laliik-Rattlesnake Mountain))
- **2011- 2015**: Field Station Construction and Systemization.
- **2015**: DOE/CTUIR Access MOU Signed.
- **2016**: First Hanford plants grown at Field Station.
- **2016**: CTUIR/USFWS MOU for botanical projects on the HRNM.
- **2016-2017**: Laboratory Quality System developed and implemented (NELAC accreditation in July 2017).
- **2017**: First large planting project on Hanford lands (Saddle Mountain)
- **2018**: Tribal access and sampling protocols and agreements developed (completed in FY2019).
- **2018**: GIS-based Tribal Risk Calculator project started.
- **2018**: Planting activities continuing (HRNM, PNSO).
- **2018**: First soil screening project using XRF.
- **2019**: Risk calculator and CALPUFF Models completed.
- **2019**: Artificial Mussel ion exchange based cumulative sampler studies initiated for Strontium and Uranium uptake

CTUIR Hanford-Related Activities

- CTUIR Field Station
  - Environmental Monitoring- Analytical laboratory
  - Botanical Mitigation- Greenhouses
- STEM Education to Develop Tribal Scientists
- Review and comment on cleanup process
- Cultural resource monitoring and compliance (Cultural Resources Protection Program)
- Natural resource damages assessment
  - Hanford Natural Resource Trustee Council
- Long-term Stewardship
  - First Foods focused restoration
  - Tribally specific environmental monitoring
  - Risk modelling to understand changes in resource availability
  - Cultural monitoring to protect cultural areas

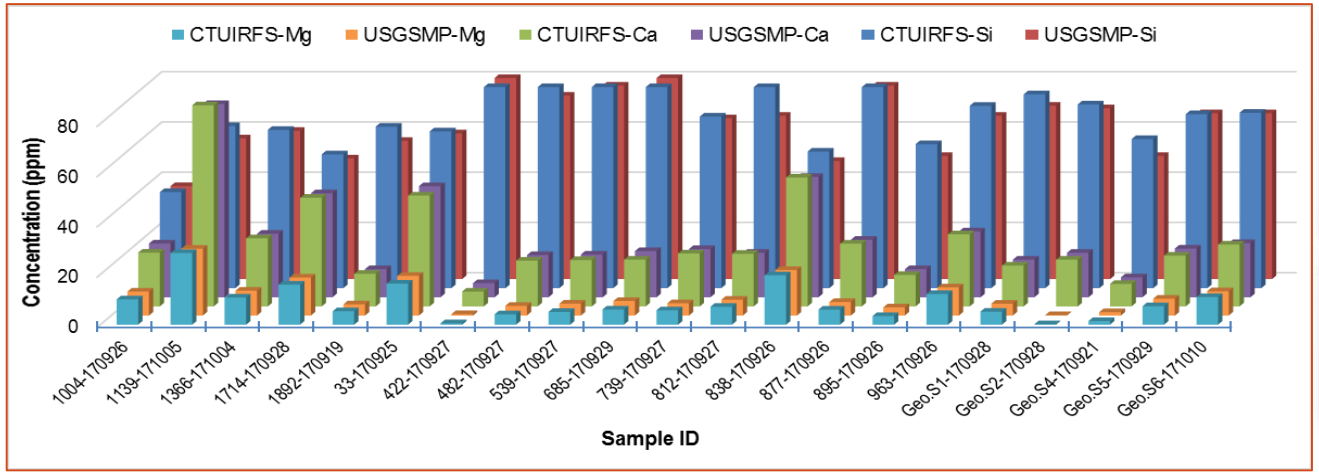
Laboratory – Initial TNI Accreditation Through ORELAP in 2017

- SW-846 EPA 6010: Metals in soil, sediment, and sludge
- SW-846 EPA 7473: Mercury in soil, sediment, and sludge

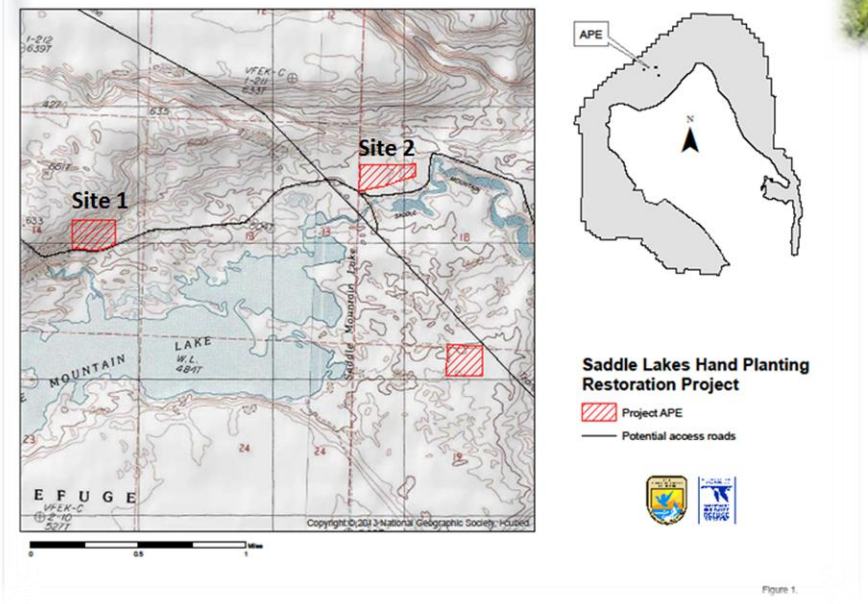


CTUIR Field Station and USGS Menlo Park Science Center Analytical Results Comparison

The average Relative Percent Difference between CTUIRFS and USGSMP results was 7.2%.



Botanical Restoration

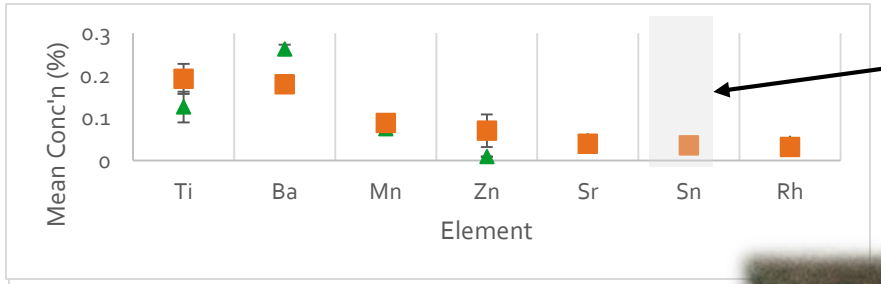


- Native seed inventory includes 107 tribally relevant species.
- Developed a small seed farm.
- Developed the use of a soil moisture sensor to automate greenhouse irrigation.
- Produced 39,500 plants in FY17 and replanted ~12 acres.
- On target to produce 40,000 seedlings in 2018 and replant 11 acres.
- On-going cheatgrass control field trials.

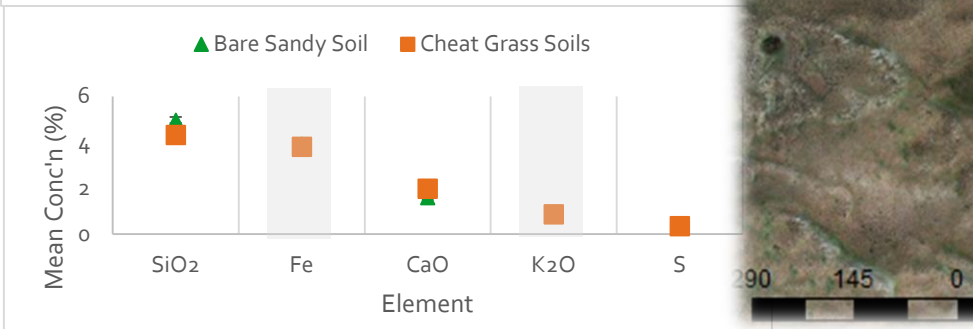
Field Sampling Using XRF

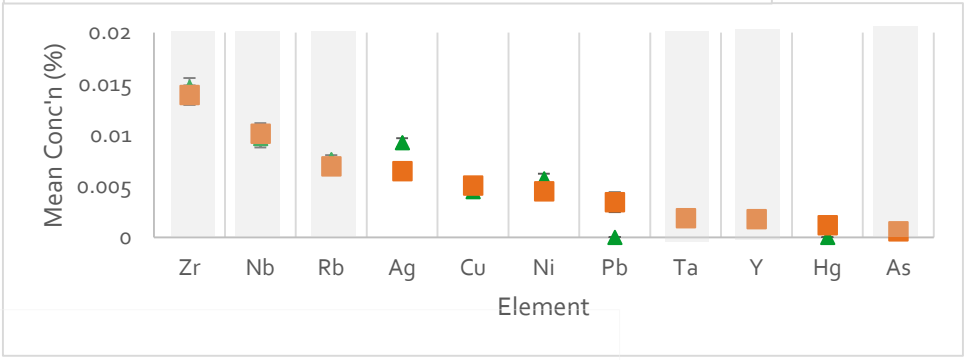
» Purpose:

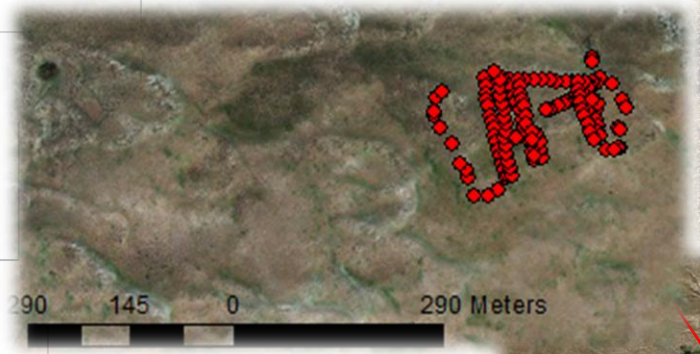
- Test XRF field protocols
- Assess difference in soil composition between areas with cheat grass and no cheat grass.



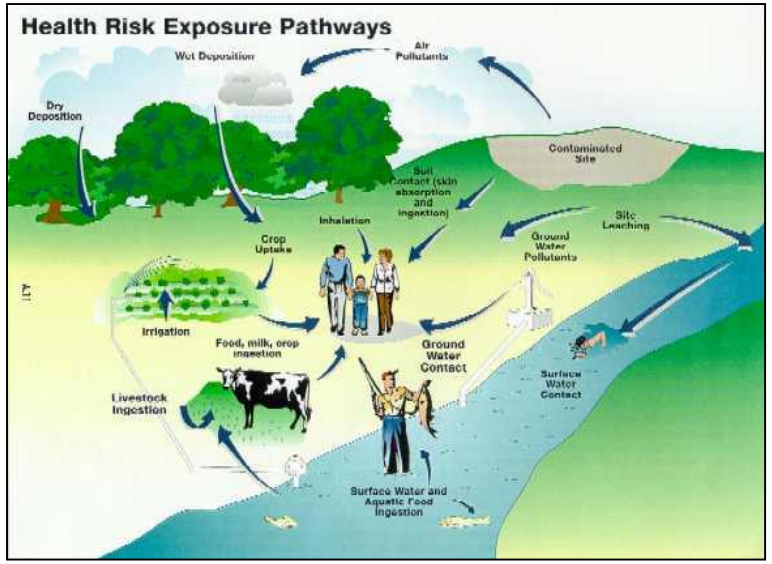
Shading implies statistical similarity at 99% level



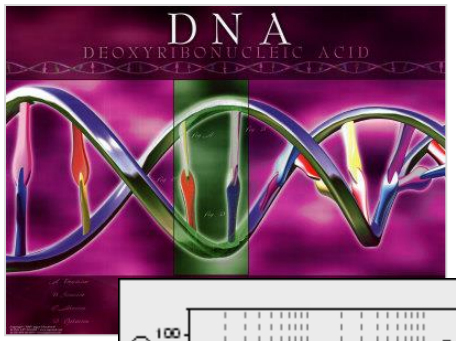


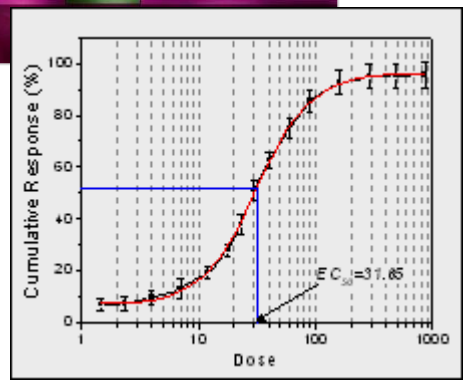


Toxics, Environmental health, risk assessment, tribal lifeways



Pathway analysis, exposure rates during traditional tribal activities using traditional resources.





Dose-Response

Toxicity evaluation

Fish toxics; Health advice

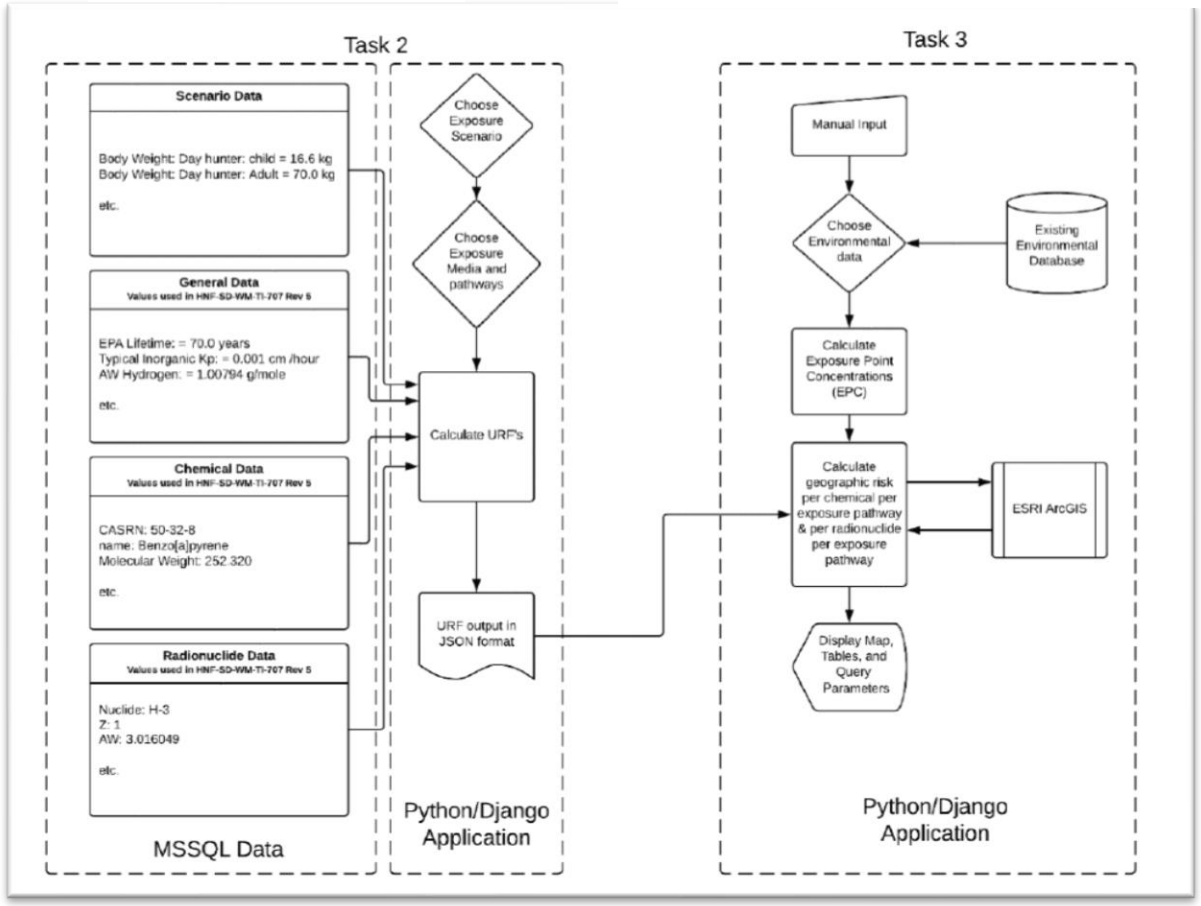
Risk Calculations

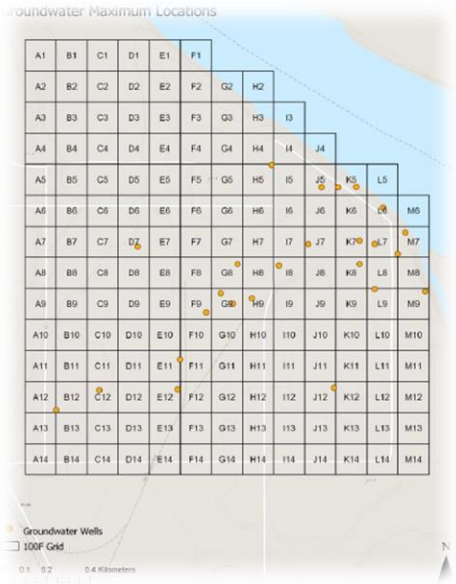
$$SL_{w\text{-}sol\text{-}nc\text{-}der}\ (mg/kg) = \frac{THQ \times AT_{ow}\left(\frac{365\ days}{year}\right) \times ED_{ow}\ (25\ years) \times BW_{ow}\ (70\ Kg)}{EF_{iw}\left(250\ \frac{days}{year}\right) \times ED_{ow}\ (25\ years) \times \left(\frac{1}{RfD_o\left(\frac{mg}{kg\text{-}day}\right) \times GIABS}\right) \times SA_{ow}\left(\frac{3300\ cm^2}{day}\right) \times AF_{ow}\left(\frac{0.2\ mg}{cm^2}\right) \times ABS_d \times \left(\frac{10^{-6}\ Kg}{1\ mg}\right)}$$

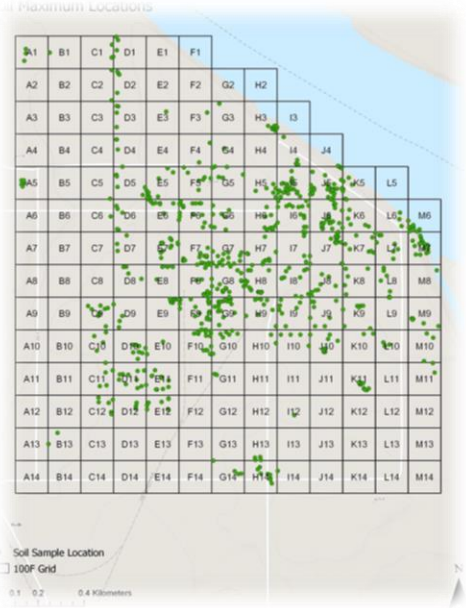
Tribal Risk Calculator

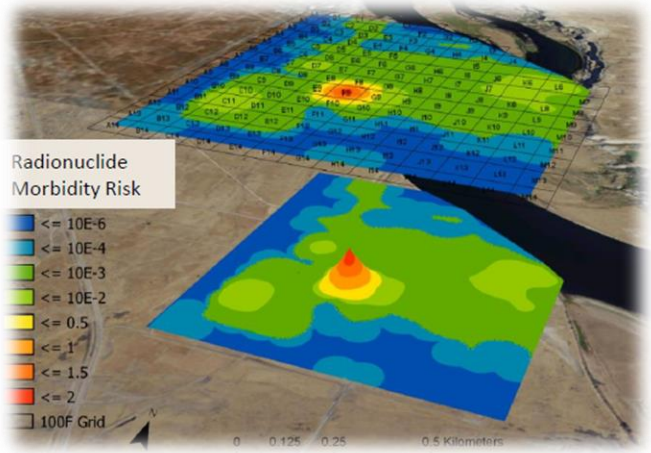
URF Calculations

Conc'n → Risk → GIS Display



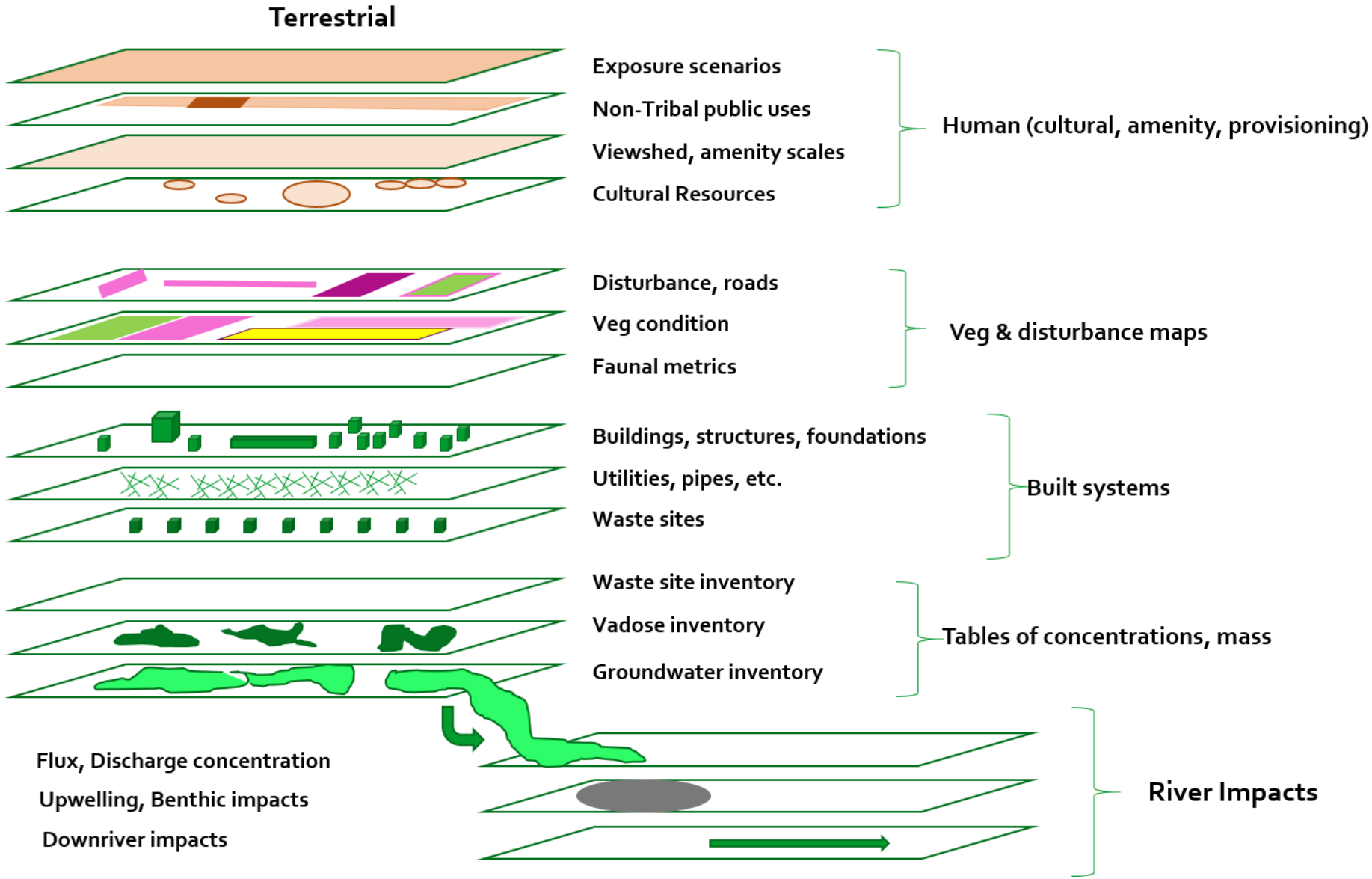






$$R_k^{HQ} = \sum_i \sum_j ([C_{j,k}] \times [URF_{i,j,k}^{HQ}] \times [tf_{i,j}])$$

Natural Resource Damage Assessment



Summary of CTUIR Hanford Policy Cultural Resource Goals (Resolution 07-009)

- A **100% survey of the Hanford Site** must be completed and all cultural resources must be properly documented.
- Adequate monitoring must occur of sacred sites, traditional cultural properties, archaeological sites, and cemeteries. Any impact from human or natural activity must be resolved.
- Adequate patrols must be provided where public access is allowed. Violation of cultural resource law shall be prosecuted to the fullest extent of the law.
- The USDOE must implement the
  - USDOE Policy for Management of Cultural Resources and
  - The Hanford Cultural Resources Management Plan.
- Formal agreements must be written for special areas such as but not limited to
  - Gable Mountain, Rattlesnake Mountain and the Hanford Reach.
- Ancestral human remains, including potentially contaminated human remains and other resources, must be protected.
- Policies and procedures to protect human remains should be consistent with the CTUIR policies and procedures for the protection of ancestral human remains.

Summary of CTUIR Hanford Policy Future Use Goals (Resolution 07-009)

- Hanford and Hanford-affected lands and resources should not be further developed unless explicitly permitted by the CTUIR Board of Trustees through government-to-government consultation.
- The CTUIR should get first right of refusal for remediated lands if any land is removed from federal ownership or transferred to another entity.
- CTUIR will work toward being long-term partners and managers of all the lands and resources at Hanford.
- The CTUIR will continue to be proactively engaged in the management of natural and cultural resources at or affected by the Hanford Site.

CTUIR's Vision for Future Management of Hanford Lands*

- **CTUIR Definition of Long-Term Stewardship**: All activities necessary to ensure protection of natural, cultural, and historical resources, the health of tribal people, and the environment following completion of remediation, disposal, or stabilization of a site or a portion of a site…..
- **CTUIR Long-Term Stewardship Vision**: The CTUIR desires to return to its former role as stewards of the lands and resources at Hanford…..
- **CTUIR Commitments to DOE for Long-Term Stewardship:**
  - CTUIR will work toward being long-term partners and managers of all of the lands and resources at Hanford.
  - CTUIR will work collaboratively and respectfully with the USDOE, Yakama, Nez Perce, and Wanapum, and local communities, in managing Hanford Lands and resources.
  - The CTUIR will prudently use funding provided by the USDOE to maintain the technical, legal, and political capacity needed to fulfill its role as a co-steward and co-manager of Hanford Lands and resources.

* CTUIR, 2016. CTUIR Perspective on Long-Term Stewardship, Position paper presented to USDOE-RL, October 6, 2016, Richland, WA

Substantial Existing Tribal Resource Management Capacity

Organization →	CRPP	ESP	FFP	FP	RFAP	WP	IT	PW	PS	Ataw	Cayuse	TCI
Resource Monitoring												
Aquatic and terrestrial species				x		x						
Botanical species	x	x			x							
Groundwater and surface water		x				x						
Surface and vadose zone soils		x										
Air quality and meteorological monitoring		x										
Natural Resource Management												
Game management						x						
Revegetation		x				x						
Weed management					x							
Fire protection					x			x	x			
Facilities Management												
Managing public access							x		x			
Surveillance								x	x			
Health and safety monitoring		x										
Data and records management							x				x	
Inspection and maintenance of remediation systems		x										
Inspection and maintenance of institutional controls (IC)					x			x	x			
Managing inactive facilities									x			
Cultural and Historical Resource Management												
Cultural resource reviews										x		
Cultural resources surveys										x		
Records keeping										x		
Curation												x
Preservation										x		x
Outreach	x											x
Access Control												
Patrolling								x	x			

CTUIR Capacity and Hanford site Mission Essential Services Contact (Section C.4.9)

	Section Num	Section Title
⯪	C.4.9.1.1	Comprehensive Land Use Planning
⯪	C.4.9.1.2	NEPA 5-Year Supplemental Analysis
★	C.4.9.1.3	Land Use Planning
★	C.4.9.2	Site Access and Use
⯪	C.4.9.3	Post-Cleanup Surveillance and Maintenance
★	C.4.9.4	Tribal Nations
★	C.4.9.6.1	Program Development, Coordination and Integration
★	C.4.9.6.2	National Historic Preservation Act Section 106 Compliance
★	C.4.9.6.3	Information Management for Cultural Resources
★	C.4.9.6.4	Curation Services and Collections Management
⯪	C.4.9.7.1	NEPA Planning and Program Support
★	C.4.9.8.1	Environmental Monitoring
★	C.4.9.8.2	Ecological Monitoring Compliance
★	C.4.9.8.3	Biological Controls
⯪	C.4.9.8.4	Environmental Regulatory Management
⯪	C.4.9.8.5	Environmental Mitigation Strategy Planning
⯪	C.4.9.8.6	Environmental Permits and Compliance
☆	C.4.9.9.1	Meteorological and Climatological Services
☆	C.4.9.9.2	Seismic Monitoring
☆	C.4.9.10.1	Hanford External Dosimetry Program
☆	C.4.9.10.2	Hanford Internal Dosimetry Program

★	Significant Experience or Capacity
⯪	Some Experience or Capacity
☆	Little or No Experience or Capacity

Access and Sampling Protocols

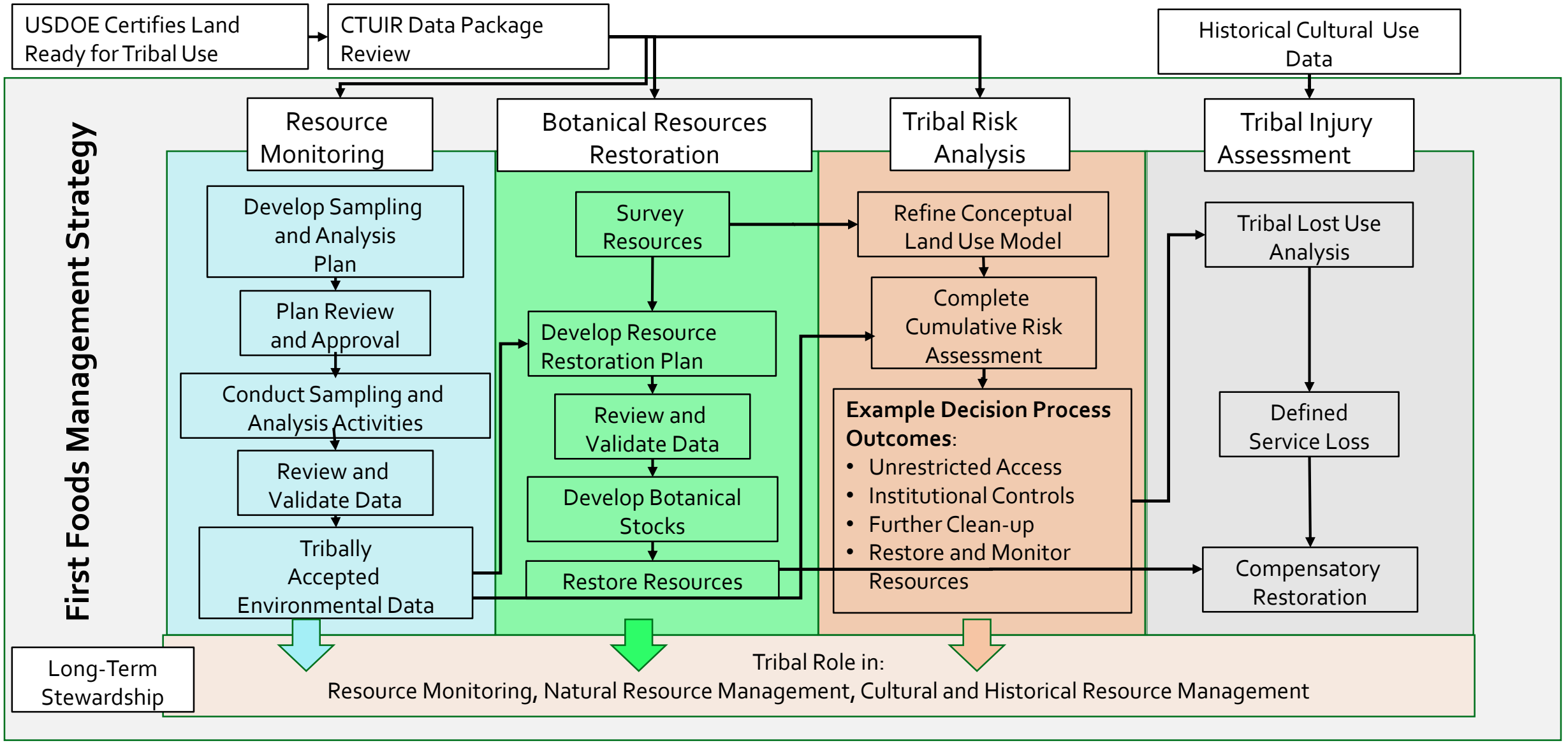
- Worked with sampling subcontractor and site contractor to:
  - Document step-by-step procedures for completing the sampling actions in a manner that is compliant with the applicable and relevant regulations, rules, orders, and requirements.
  - Document training requirements for tribal sampling staff.
  - Identify and document notification requirements and site access requirements.
  - Document site waste management and waste handling requirements and procedures.
- Sampling documents were prepared to comply with TNI standards for field sampling and measurement organizations.
  - Needed for The NELAC Institute National Environmental Field Activities Program (TNI NEFAP) accreditation.
- Final drafts of all documents were completed in 2019.

Future

Long Term Stewardship

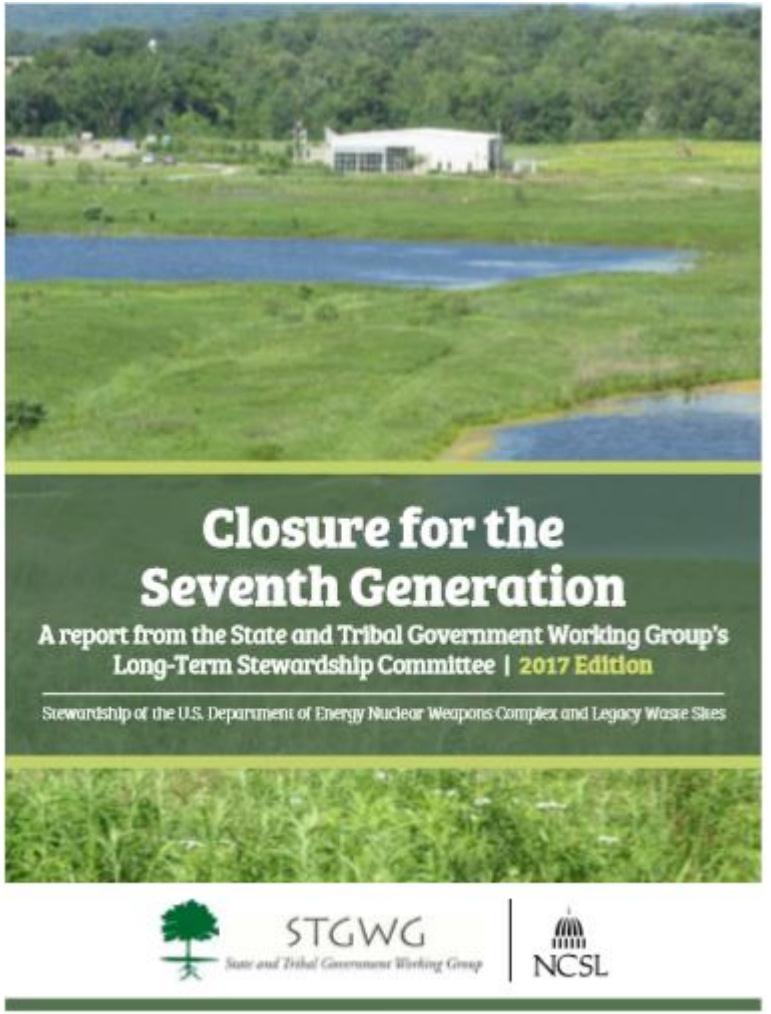
A look toward the next 10,000 years

CTUIR's Vision for Future Management of Hanford Lands

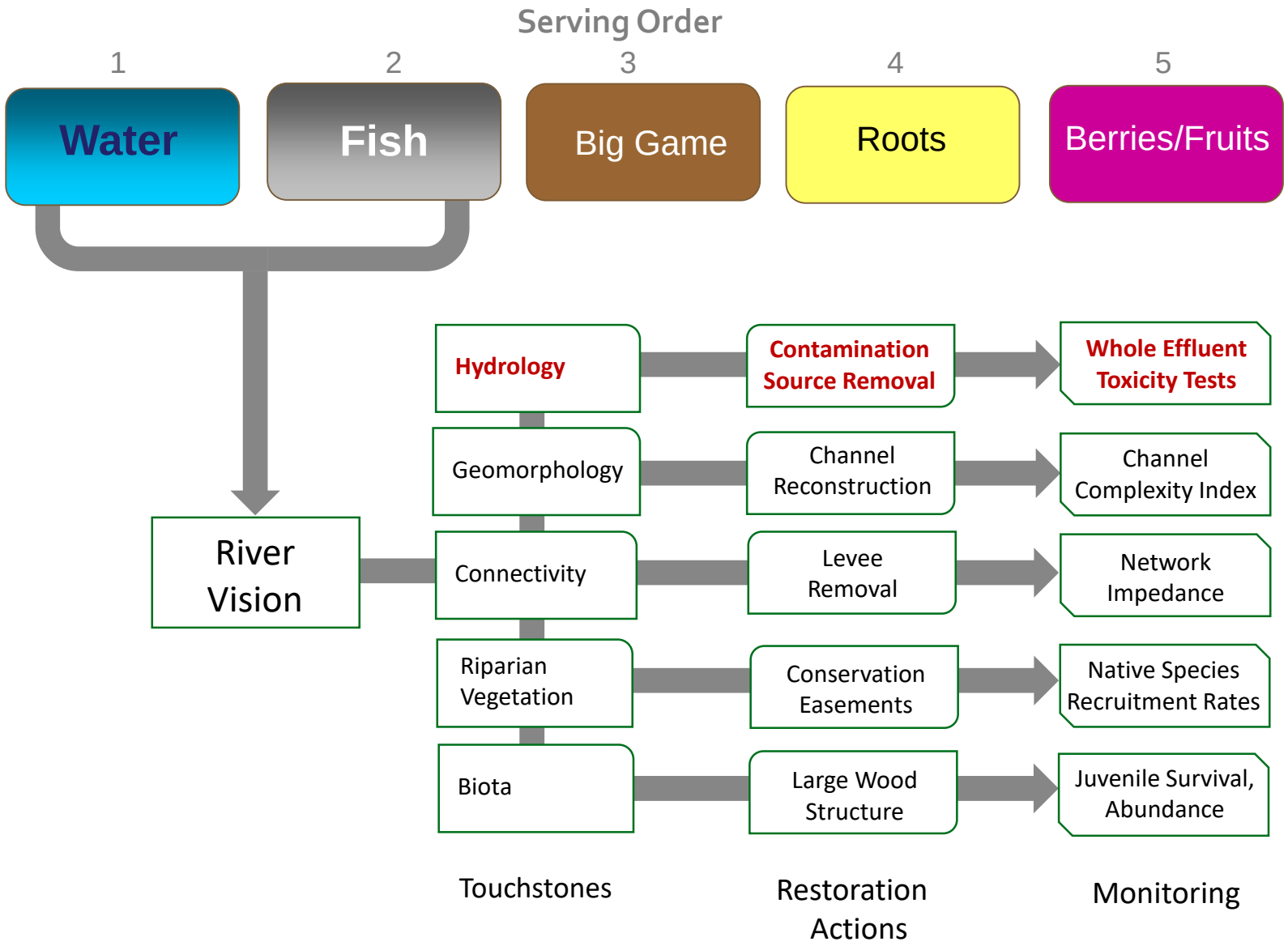


End-State Vision for Management of Hanford Lands

- CTUIR will work toward being long-term partners and managers of all of the lands and resources at Hanford. CTUIR expects the federal government to fulfill its Trust responsibility to enable the CTUIR to fully participate in this long term multi-generational mission.
- Hanford Long Term Stewardship Program Plan (April 2012)
- Closure for the Seventh Generation Report (2017)
- Long Term Stewardship (LTS)
  - Definitions are different between reports
  - Important to have similar conceptual model
  - DOE Program Plan should incorporate Tribal Viewpoints
  - Access and Use



First Foods River Vision Restoration Activities and Monitoring



End-State Vision for Hanford Lands

- Hanford lands, including the Hanford Reach National Monument, remain a contiguous land segment that is **CLEAN**, **RESTORED**, **PROTECTED**, **ENHANCED**, and **ACCESSIBLE**.
- **CLEAN** – Remaining contamination below CTUIR health-based standards.
- **RESTORED** – Site wide restoration of resources and ecosystem services.
- **PROTECTED** – Permanently protecting the quality and quantity of CTUIR cultural and natural resources across the Hanford site.
- **ENHANCED** – Continual improvement in the quality and quantity of accessible CTUIR natural resources on the Hanford site.
- **ACCESSIBLE** – Safe and open access by CTUIR members to our traditional lands and resources throughout the Hanford site.

CTUIR *DNR*
ENERGY AND
ENVIRONMENTAL SCIENCES

Thank You

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