



Site-Specific Proposal For Modifying the Default MTCA Fish Consumption Exposure Parameters

Prepared for

MTCA Science Advisory Board

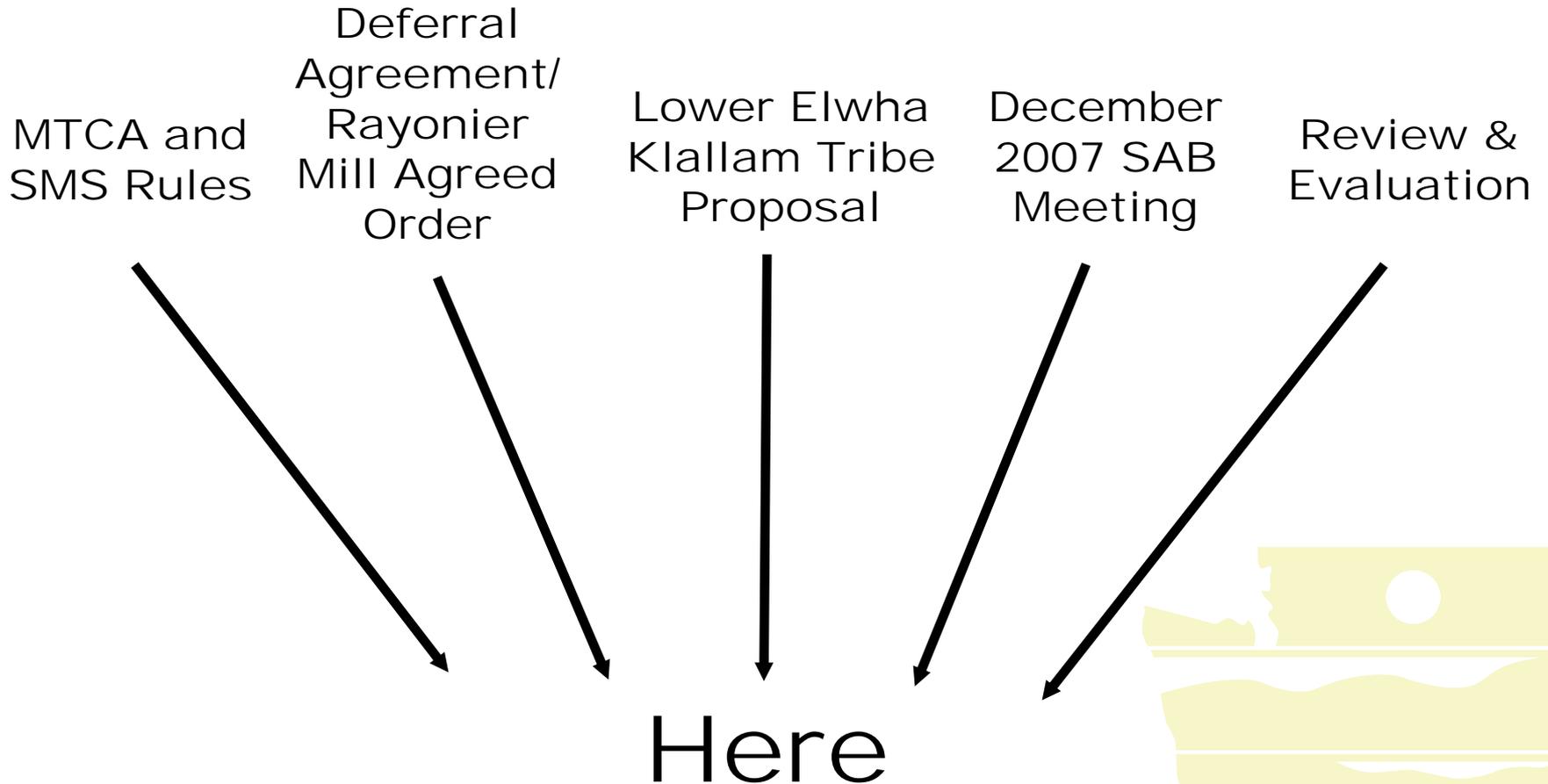
March 11, 2008

Agenda

- Overview of fish consumption questions and recommendations
- Audience comment
- Board review and responses
- Status reports
 - 2008 Legislative Session
 - MTCA Five Year Rule Review



How Did We Get Here?



Reasonable Maximum Exposure (RME)

Who are we trying to protect?

- MTCA Definition: “...the highest exposure that can be reasonably expected to occur for a human or other living organisms at a site under current and potential future site use.”
- CERCLA Definition: “...the highest exposure that is reasonably expected to occur at a Superfund site...”
- Common Features
 - ❑ High end – but not worst case – estimates of individual exposures
 - ❑ Conservative but within a realistic range of exposures
 - ❑ Reasonable because it is a product of several factors that are an appropriate mix of average and upper-bound estimates
 - ❑ High end – between the 90th and 99.9th percentile of the exposure distribution

Fish Consumption Rates

- MTCA default is 54 g/day X 0.5 diet fraction (effectively 27 g/day)
- Studies show tribes and other ethnic groups eat a lot more fish than recreational fishers
- MTCA provides flexibility to develop site-specific fish consumption rates when necessary to protect human health
- Modification of some exposure parameters, including fish consumption rates, requires consultation with EPA, DOH and the SAB



MTCA Rule Equation – Surface Water

$$\text{CUL}^* (\mu\text{g/L}) = \frac{\text{RISK} \times \text{ABW} \times \text{AT} \times \text{UCF}}{\text{CPF} \times \text{BCF} \times \text{FCR} \times \text{FDF} \times \text{ED}}$$

RISK = Acceptable cancer risk level

ABW = Average body weight (70 kg)

AT = Averaging time (75 years)

UCF = Unit conversion factor

CPF = Carcinogenic potency factor

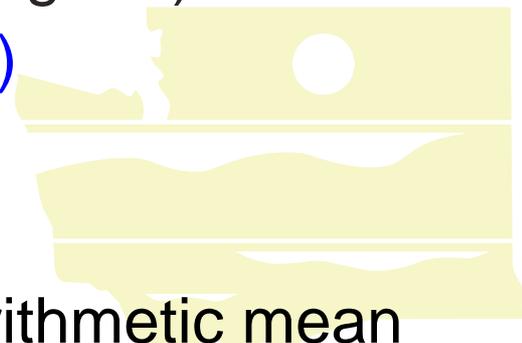
BCF = Bioconcentration factor (liters/kilogram)

FCR = Fish consumption rate (54 g/day)

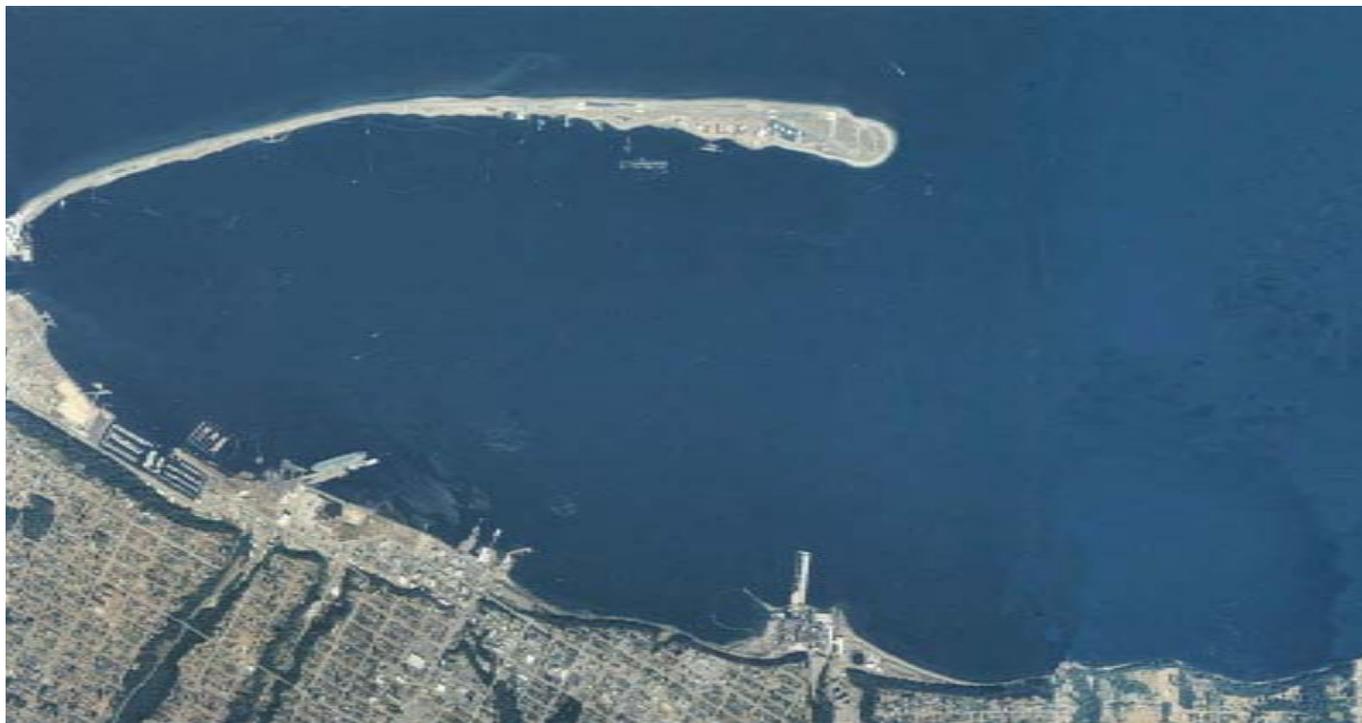
FDF = Fish diet fraction (0.5) (unitless)

ED = Exposure duration (30 years)

* Compliance based on UCL 95 on the arithmetic mean

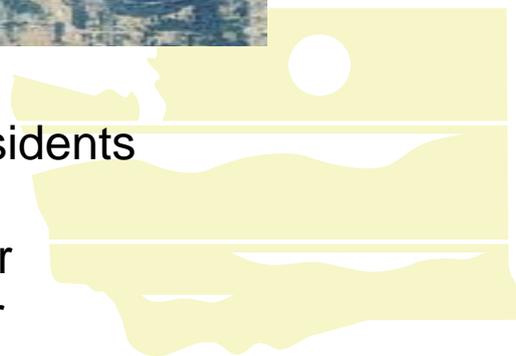


Human Health Risk Assessment



Human Health Risk
Assessment Will be
Designed to Evaluate

Adult and child residents
Worker
Recreational fisher
Subsistence fisher



Lower Elwha Klallam Tribe (LEKT) Recommendations

	MTCA Default Parameters	LEKT Recommendations
Fish Consumption Rate (g/day)	54	583
Fish Diet Fraction (unitless)	0.5	1
Average Body Weight (kg)	70	79
Exposure Duration (years)	30	70
Averaging Time (years)	75	70

December 14th SAB Meeting

- Presentations:
 - EPA risk-based decision-making framework
 - Report on LEKT health issues
 - LEKT recommendations and rationale
- Questions and answers
- Reviewed the initial questions posed by Ecology
- Decided on next steps
 - Deconstruct the initial questions
 - Collect additional information
 - Perform additional evaluations



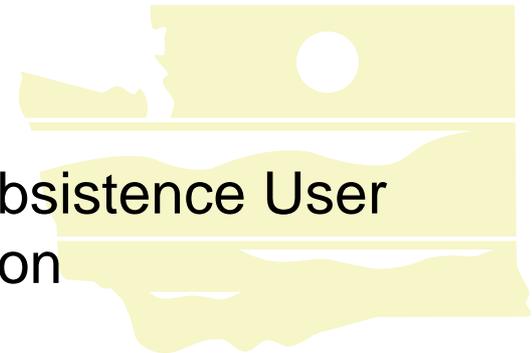
Activities Since the December Meeting

- Ecology met with the SAB chairperson and individual Board members to refine the questions.
- Ecology met with and/or obtained information from EPA, Malcolm Pirnie, the Lower Elwha Klallam Tribe, other State agencies and other Ecology programs.
- Ecology evaluated the available information and prepared the background materials that were distributed to the Board.



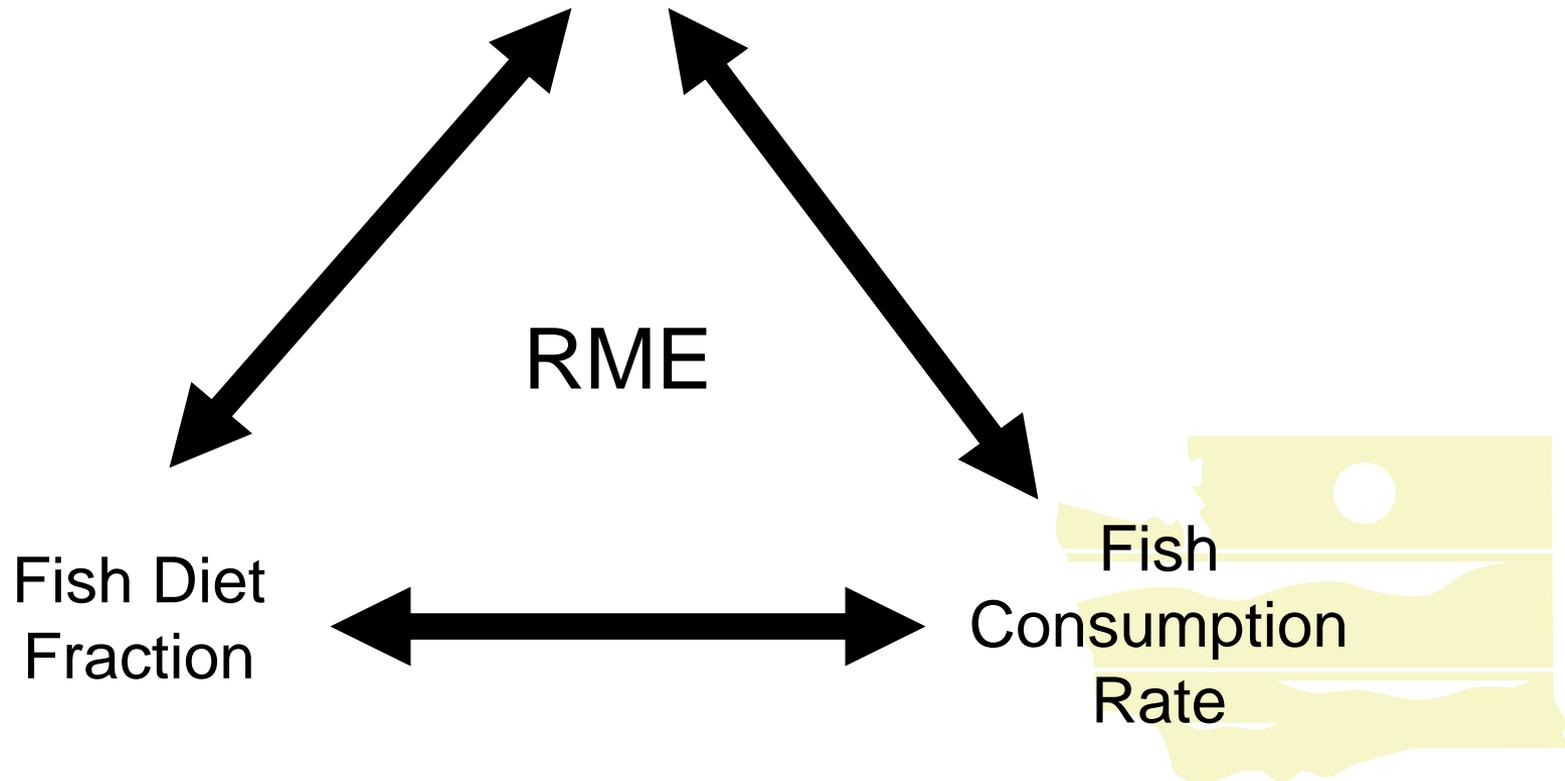
Information Materials

- December 2007 Board Meeting
 - Framework for Selecting and Using Tribal Fish and Shellfish Consumption Rates for Risk-Based Decision Making at CERCLA and RCRA Cleanup Sites in Puget Sound and the Strait of Georgia
 - Lower Elwha Klallam Tribe Fish Consumption and the EPA Region 10 Framework
 - Local Sea Food and Lower Elwha Klallam Tribal Health
- March 2008 Board Meeting
 - Questions and Background Information
 - Scientific Considerations for Identifying Subsistence User Ingestion Rates in Port Angeles, Washington



Ecology's Evaluation

Site = Extent of Contamination
(Determines amount of shellfish habitat, etc)

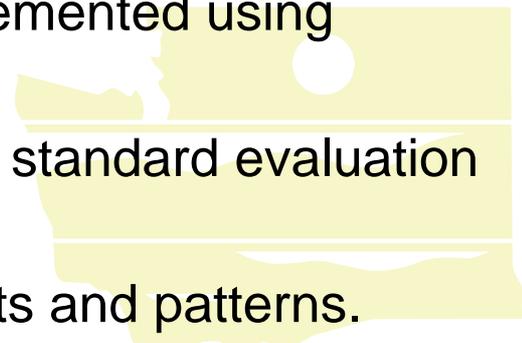


Ecology's Conclusions

- Ecology believes that the MTCA exposure parameters do not provide a reasonable basis for estimating fish consumption exposures for members of the Lower Elwha Klallam Tribe (LEKT).
- Ecology believes that the Suquamish survey provides a sound basis for estimating the shellfish consumption for LEK Tribal members.
- Ecology believes that the current MTCA default value (50%) falls within the range of scientific defensible values and current information is insufficient to change the default fish diet fraction.
- Ecology agrees with the following LEK Tribal recommendations:
 - Use of exposure duration of 70 years;
 - Use of body weight of 79 kg;
- Ecology agrees with the LEK Tribal conclusions that contaminants from the Site are unlikely to significantly contribute to the contaminant body burden for salmon that are harvested from local waters.
- Ecology recognizes that there are a number of uncertainties that complicate efforts to estimate fish/shellfish consumption exposures.

Quality of Information Analysis

- Theory and technique with widespread acceptance in relevant scientific community
 - ❑ Numerous studies have shown that tribal consumption rates are higher than recreational exposure rates.
 - ❑ EPA guidance materials are based on this theory/technique.
 - ❑ Site-specific cleanup decisions are based on this theory/technique.
- Standard testing methods or widely accepted scientific methods
 - ❑ Suquamish study was well designed and implemented using standard survey techniques.
 - ❑ Shellfish habitat has been characterized using standard evaluation and mapping techniques.
 - ❑ Limited details on survey of LEKT dietary habits and patterns.

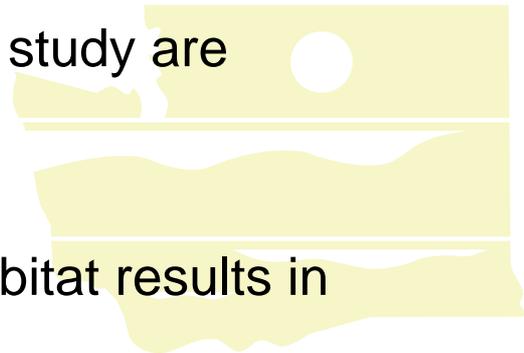


Quality of Information Analysis

- Review of relevant information (support and non-support) and rationale for proposed modifications
 - ❑ Suquamish consumption survey (with and w/o salmon)
 - ❑ Tulalip consumption survey (with and w/o salmon)
- Valid assumptions that err on side of protecting human health and the environment
 - ❑ Sufficient shellfish habitat at the Site to support a sustainable level of shellfish consumption similar to the Suquamish rates.
 - ❑ LEKT members have diet habits similar to Suquamish Tribe.
 - ❑ Contaminants from the Site are unlikely to significantly contribute to the contaminant body burden for salmon that are harvested from local waters.
 - ❑ Combination of assumptions result in exposure estimates that fall at the upper end of exposure distributions.

Quality of Information Analysis

- Highly-exposed populations
 - ❑ Proposal adequately addresses the highly exposed populations likely to be present at the site.
 - ❑ The site is located within the Usual and Accustomed fishing area for the Lower Elwha Klallam Tribe.
 - ❑ Proposal is based on studies from tribes in the Pacific Northwest.
- Quality assurance/quality control, anomalies, limitations of information, known or potential rate of error.
 - ❑ Suquamish study is well conducted/well-designed study.
 - ❑ Shellfish consumption rates from Suquamish study are significantly higher than other studies.
 - ❑ Limited documentation for some information.
 - ❑ Uncertainty on current and future shellfish habitat results in unquantifiable rate of error.



Audience Comments



Board Review and Discussion

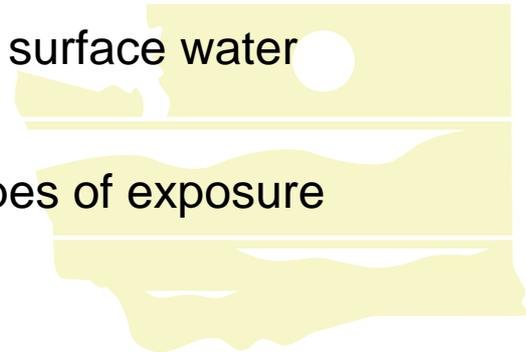
- Ecology has identified 10 questions for Board review.
- Central Issues:
 - Use of the Suquamish Tribal Survey to estimate fish/shellfish exposure for members of the LEKT.
 - Dietary habits and patterns
 - Shellfish habitat
 - Whether to include salmon consumption in overall consumption rates.
 - Whether there is sufficient information to justify modifying the MTCA default values for fish diet fraction, exposure duration and body weight.
- Ecology is not asking the Board for advice on cleanup requirements for site.

MTCA Default Exposure Parameters

- **Question #1:** Ecology has concluded that the MTCA exposure parameters do not provide a reasonable basis for estimating fish consumption exposures for members of the Lower Elwha Klallam Tribe (LEKT). Does the Board believe this conclusion is consistent with current scientific information?
- Ecology has concluded that the MTCA exposure parameters do not provide a reasonable basis for estimating fish consumption exposures for members of the LEKT.
 - ❑ Ecology does not believe that recreational scenario representative of LEK Tribal fish consuming habits
 - ❑ Differences between MTCA default recreational fish consumption rate & LEKT proposal
 - ❑ Differences between MTCA default recreational fish consumption rate & EPA exposure guidance
 - ❑ Northwest Tribal fish consumption rates used to develop Tribal Water Quality Standards
 - ❑ Different fish consumption rates used to develop cleanup standards at different sites and revisions to Oregon's water quality standards

Use of Consumption Surveys from Other Tribes

- **Question #2: Is it scientifically defensible to use consumption surveys from other tribes with similar dietary habits to estimate fish and shellfish consumption exposures for members of the LEKT?**
- Ecology believes it is scientifically defensible to use information from other tribes to estimate fish and shellfish consumption exposures for members of the LEKT.
 - ❑ Consistent with EPA data hierarchy of fish consumption data
 - ❑ Consistent with approaches used to develop Tribal surface water standards (included Oregon DEQ)
 - ❑ Consistent with approach used to prepare other types of exposure assessments



Factors to Consider When Using Surveys from Other Tribes

- **Question #3**: What factors should Ecology consider when evaluating whether it is appropriate to use consumption surveys from other tribes to estimate exposures for members of the LEKT?
- Ecology believes that several factors should be considered when evaluating whether to use a Tribal survey from one tribe to estimate exposure for other tribes.
 - Data hierarchy
 - Study design
 - Similarities in Tribal dietary habits and customs
 - Similarities in harvesting techniques
 - Similarities in watersheds



Use of the Suquamish Fish Consumption Survey

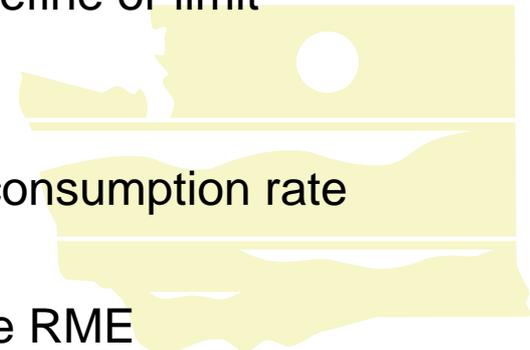
- **Question #4: Does the SAB believe it is scientifically defensible to use the fish consumption survey completed by the Suquamish Tribe to estimate fish and shellfish consumption exposures for members of the LEKT?**
- Ecology believes that the Suquamish survey provides a sound basis for estimating the shellfish consumption for LEK Tribal members.
 - Study design of Suquamish survey
 - Similarities in dietary habits
 - Similarities in harvesting techniques
 - Similarities in watershed characteristics
 - Quantity and quality of shellfish habitat
 - Harvesting potential



Fish Diet Fraction

General Considerations

- **Question #5: What factors should Ecology consider when selecting a fish diet fraction that will be used to estimate fish consumption exposures for Tribal populations?**
- Ecology believes that several factors should be considered when selecting a fish diet fraction for Tribal populations
 - ❑ Current Tribal fish/shellfish harvesting and consumption habits/patterns
 - ❑ Future Tribal fish/shellfish harvesting and consumption habits/patterns
 - ❑ Legal agreement, advisories, or restrictions that define or limit fish/shellfish harvesting
 - ❑ Nature & extent of fish and shellfish habitat
 - ❑ Sustainable levels of fish/shellfish relative to the consumption rate
 - ❑ Federal and state regulations and guidance
 - ❑ Combination of exposure parameters to define the RME



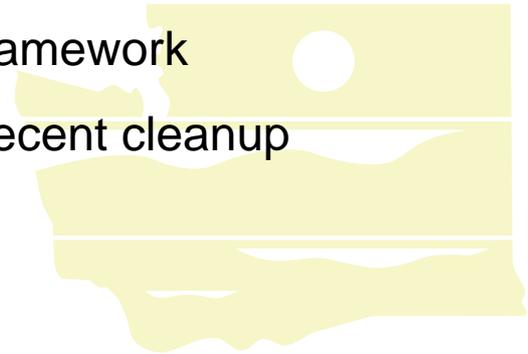
Fish Diet Fraction

- **Question #6: Does the MTCA default fish diet fraction provide a reasonable basis for estimating fish consumption exposures for the Lower Elwha Klallam Tribe? If not, what value or range of values is consistent with current scientific information?**
- Ecology believes that the current MTCA default value (50%) falls within the range of scientific defensible values and current information is insufficient to change the default fish diet fraction.
 - ❑ MTCA decision-making framework
 - ❑ Shellfish harvesting patterns
 - ❑ Range of fish diet fraction values used at cleanup sites
 - ❑ Practical considerations
 - ❑ Definition of reasonable maximum exposure



Duration of Exposure

- **Question #7: Does the MTCA default duration of exposure provide a reasonable basis for estimating fish consumption exposures for the Lower Elwha Klallam Tribe? If not, what value or range of values is consistent with current scientific information?**
- Ecology agrees with the LEK Tribal recommendation to use an exposure duration of 70 years when preparing exposure estimates and establishing cleanup levels.
 - ❑ LEK Tribal-specific census and demographic information
 - ❑ Consistent with EPA Region X decision-making framework
 - ❑ Consistent with exposure assumption applied at recent cleanup projects



Body Weight

- **Question #8: Does the MTCA default body weight provide a reasonable basis for estimating fish consumption exposures for the Lower Elwha Klallam Tribe? If not, what value or range of values is consistent with current scientific information?**
- Ecology agrees with the LEK Tribal recommendation of 79 kg average body weight for Tribal members when estimating fish consumption exposures.
 - ❑ Basis for Suquamish fish consumption rates
 - ❑ Information on body weights for LEK Tribal members
 - ❑ EPA guidance materials
 - ❑ Approaches used at other Puget Sound cleanup sites



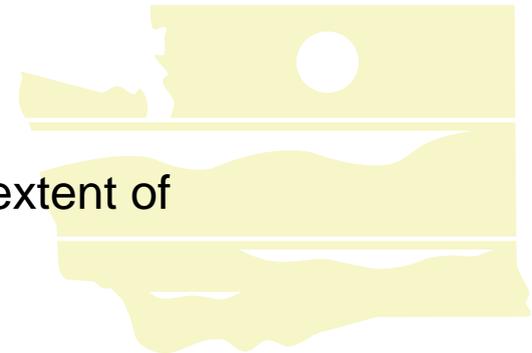
Salmon

- **Question #9: Ecology and the LEKT have concluded that contaminants from the Site are unlikely to significantly contribute to the contaminant body burden for salmon and other anadromous species that are harvested from local waters. Does the Board agree that this conclusion is consistent with current scientific information?**
- Ecology and the LEKT have concluded that contaminants from the Site are unlikely to significantly contribute to the contaminant body burden for salmon and other anadromous species that are harvested from local waters.
 - ❑ Consistent with current scientific information on Pacific salmonid lifecycle and contaminant body burdens
 - ❑ Consistent with EPA Region 10 Framework
 - ❑ Consistent with approaches used at other Puget Sound cleanup sites



Additional Information to Reduce Uncertainties

- **Question #10: What additional information could be collected during the baseline risk assessment to reduce the uncertainty surrounding current estimates of fish consumption exposures?**
- Ecology recognizes that there are several uncertainties that complicate efforts to estimate fish consumption exposures. Ecology seeks ideas about ways to reduce those uncertainties.
 - Additional survey information related to LEK Tribal areas to harvest fish & shellfish
 - Survey of inter-tidal and sub-tidal habitats
 - Sampling and analysis to help define nature and extent of contamination



Next Steps

- Compile Board's Response in Meeting Summary
- Site-Specific Decision-Making
 - Rayonier Cleanup Activities
 - Other Areas Being Addressed by the Toxics Cleanup Program Through the Puget Sound Initiative
- Consider Whether to Develop Interim Guidance on This Issue
- Consider MTCA Rule Revisions to Support Site-Specific Decision-Making

