



# Fish Consumption Issues

# Fish Consumption - Outline

- Overview of fish consumption questions and recommendations
  - Background
  - Status of Board's Review
  - Activities Since the March Meeting
  - Concerns Raised Since the March Meeting
  - Next Steps
- Presentation on Salmon Issue
- Opportunity for audience comment
- Board review/discussion
- Next Steps



# Reasonable Maximum Exposure (RME)

## Who are we trying to protect?

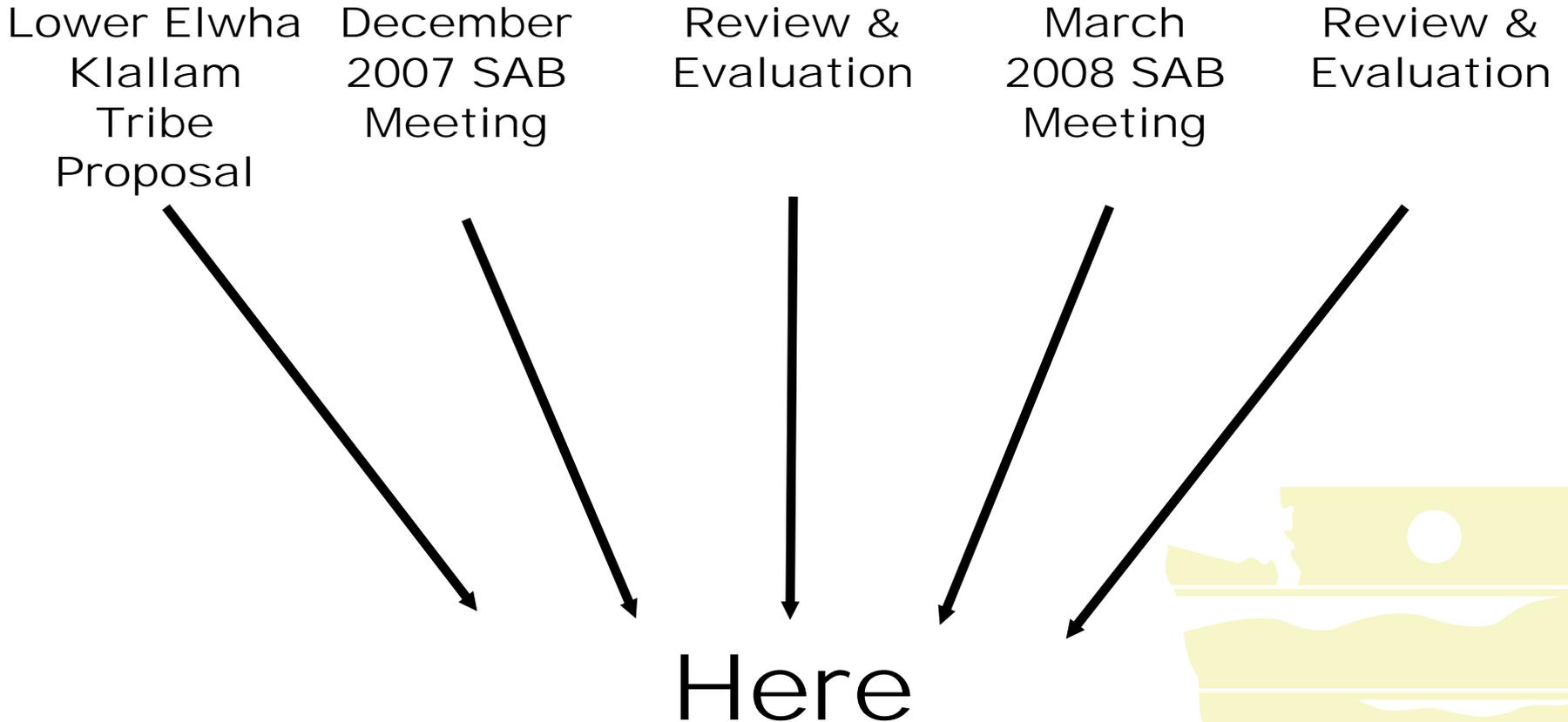
- MTCA Definition: “...the highest exposure that can be reasonably expected to occur for a human or other living organisms at a site under current and potential future site use.”
- CERCLA Definition: “...the highest exposure that is reasonably expected to occur at a Superfund site...”
- Common Features
  - 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 90<sup>th</sup> and 99.9<sup>th</sup> 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



# How Did We Get Here?



# 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

# Ecology's Initial Conclusions

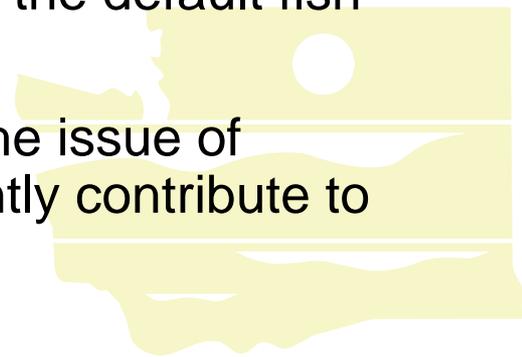
- Ecology believes that the MTCA exposure parameters do not provide a reasonable basis for estimating fish consumption exposures for members of the Lower Elwha Klallam Tribe (LEKT).
- Ecology believes that the Suquamish survey provides a sound basis for estimating the shellfish consumption for LEK Tribal 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.

# Board Review and Discussion

- Ecology brought the issue to the Board in December 2007.
- Ecology discussed 10 questions at the March Meeting.
- 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 in the overall consumption rate.
  - 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.

# Results From the March 2008 Meeting

- Areas of General Agreement (with some qualifications)
  - The need to look beyond the recreational exposure scenario
  - Use of consumption studies to estimate consumption rates and factors to consider when evaluating whether such an approach is appropriate
  - Use of the Suquamish consumption survey to estimate fish/shellfish exposure for members of the LEKT
  - Factors to consider when estimating fish diet fraction
  - Justification for modifying the MTCA default values for exposure duration and body weight
- The Board did not reach a conclusion on whether to agree or disagree with Ecology's conclusion on modifying the default fish diet fraction.
- The Board requested additional information on the issue of whether localized releases are likely to significantly contribute to contaminant body burdens in adult salmonids.



# Activities Since the March 2008 Meeting

- Ecology met with and/or obtained additional information on the salmon issue from other state agencies, EPA, DOH, LEKT and several Board members.
- Ecology (SWRO) continued work on the scope of work for additional investigations in the Port Angeles area and preparation of the baseline risk assessment.
- Ecology (SWRO) met with several interested parties from the Port Angeles area to discuss Ecology's plans for investigation and cleanup and the relationship to the Board's review.

# Concerns/Questions

- Role of the Science Advisory Board
- Transparency on scientific vs policy determinations
- Level playing field on modifying default exposure parameters
- Level of conservatism/Interplay between multiple factors
- Completing Board's review and/or reaching final decisions in advance of additional studies



# Role of the Science Advisory Board

- RCW 70.105D.030(5) directs Ecology to establish a scientific advisory board to provide advice on a wide range of topics including cleanup standards and remedial actions.
  - Ecology consults with the Board on statewide issues.
  - The MTCA rule defines a role for the Board when Ecology is considering how to use new scientific information when defining cleanup requirements for individual sites.
- The Board's conclusions and recommendations are advisory in nature.
- Ecology is responsible for establishing cleanup standards and cleanup requirements for specific sites.
  - The Ecology site manager assigned to a specific site makes those determinations when preparing the cleanup action plan.
  - Ecology must consider a wide range of technical and policy factors that extend beyond the scientific issues addressed by the Board.

# Transparency on Scientific & Policy Issues

Regulatory Dilemma = What exposure parameters should be used to characterize health risks for tribal members and establish cleanup requirements?

## Risk Management Issues

- Reasonable maximum exposure (RME)
  - Reasonably expected future site use
  - Combination of parameters used to estimate RME.
  - Use of 95<sup>th</sup> percentile
- Establishing cleanup standards
- Selecting cleanup actions.

## Risk Assessment Issues

- Scientific basis for fish consumption rates:
  - Use of fish consumption surveys from different tribes;
  - Use of Suquamish consumption survey.
- Scientific basis for modifying default exposure parameters
  - Fish diet fraction
  - Average body weight
  - Exposure duration

# Level Playing Field on Scientific Review

- Theory and technique with widespread acceptance in relevant scientific community.
- Standard testing methods or widely accepted scientific methods
- Review of relevant information (support and non-support) and rationale for proposed modifications
- Valid assumptions that err on side of protecting human health and the environment
- Highly-exposed populations
- Quality assurance/quality control, anomalies, limitations of information, known or potential rate of error.

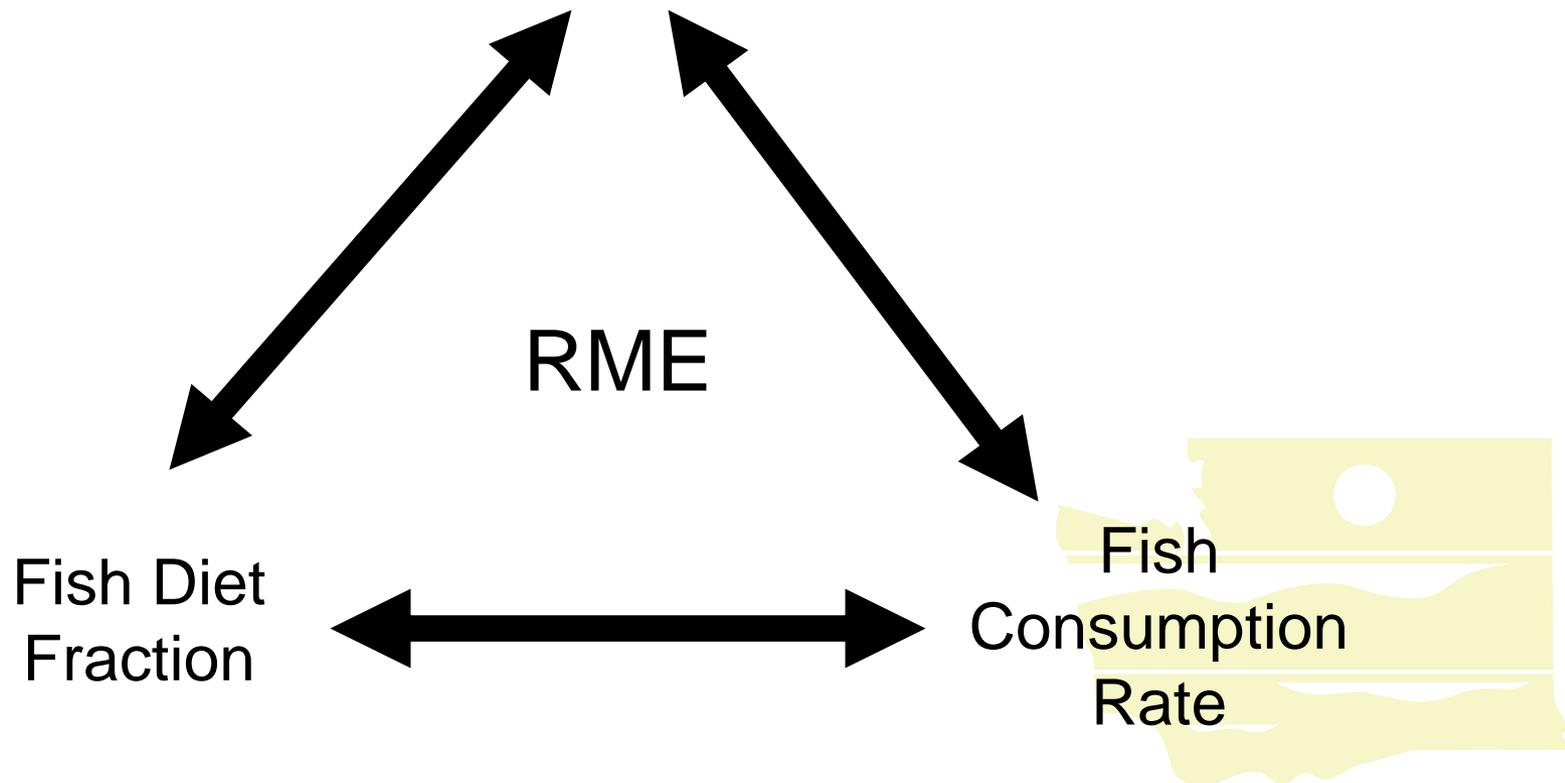


# Level of Conservatism/Interplay Between Factors

- MTCA cleanup levels based on reasonable maximum exposure (RME)
  - RME is considered to be a high end – but not worst case – estimate of individual exposures within a population group.
  - A key policy determination in the original MTCA cleanup rule.
  - Exposure estimate is considered reasonable because it is a product of several factors that are a mix of average and upper-bound estimates
  - High end – between the 90<sup>th</sup> and 99.9<sup>th</sup> percentile of the exposure distribution.
- Key policy question when establishing cleanup standards
  - Do the combination of exposure factors provide a reasonable estimate of the RME?

# Further Studies and Evaluation

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



# Next Steps

- Finish Discussion on Salmon Issues
- Ecology will work with Rayonier LLC, LEKT and others to complete additional studies
  - Evaluations prepared by City, Port and Nippon
  - Sediment investigation
  - Human health risk assessment
- Ecology site manager will review the results from additional studies and evaluations
- Ecology will determine whether to bring site-specific issues back to the Board for further discussion
- Ecology will also be considering this issue during MTCA rule amendment process