

Human Health Criteria — Fish Consumption Rates

Preliminary Draft Rule

August 6, 2015

On the Agenda...

- * Welcome and Introductions
- * Updated Fish Consumption Rates & Comparison
- * Translation of Tribal Group 2 Fish to Idaho's 'Idaho Fish'
- * A Comparison of Risk
- * Preliminary Draft Rule
 - * Accounting for Bioaccumulation
 - * Update on RSC values
 - * Scope of criteria changes
 - * Preliminary PRA results
- * Discussion

Update on Tribal Surveys

**A Fish Consumption Survey
of the
[Shoshone-Bannock Tribes] [Nez Perce Tribe]
Combination Draft Final Report**

**Volume I—Heritage Rates
Volume II—Current Fish Consumption Survey
Volume III (Appendices to Volume II)**

FFQ Survey Results

Estimated Fish Consumption rates, g/day

Idaho / Group 2 Fish

Survey/Population	50%	Mean	75%	90%	95%	99%
Idaho Total	5.2	17.0	16.1	43.0	77.3	158
Idaho Angler	5.3	17.2	16.1	44.0	77.3	159
Nez Perce	61.3	104	---	231	328	764
Shoshone Bannock	48.5	111	---	266	427	793

Dietary Recall – NCI Results

Estimated Usual Fish Consumption Rates, g/day

All Fish

Survey/Population	50%	Mean	75%	90%	95%	99%
Idaho Total	14.2	22.0	29.7	51.1	67.7	118
Idaho Angler	15.9	26.5	36.9	64.6	86.4	146
Nez Perce	49.5	75.0	---	173	232	---
Shoshone Bannock	14.9	34.9	---	94.5	141	---
EPA 2014	17.6	---	32.8	52.8	68.1	105

Dietary Recall – NCI Results

Estimated Usual Fish Consumption Rates, g/day

Idaho / Group 2 / non-Marine Fish

Survey/Population	50%	Mean	75%	90%	95%	99%
Idaho Total	0.1	2.3	0.8	4.7	11.2	40.5
Idaho Angler	0.6	4.5	2.9	10.8	21.4	62.4
Nez Perce	36.0	66.5	---	159	234	---
Idaho Fish ???						
Shoshone Bannock	6.5	18.6	---	48.9	80	---
Idaho Fish ???						
EPA 2014	5.0	---	11.4	22.0	31.8	61.1

Translating Fish Groups

Table 1. FFQ Species groups.

Species Group	Description	Species and Groups Included
Group 2	Near coastal, estuarine, freshwater and anadromous	All species in Groups 3, 4 and 5 as well as lobster, crab, shrimp, marine clams or mussels, octopus* and scallops
Group 3	Salmon or steelhead	Chinook, coho, sockeye, kokanee, steelhead, other salmon and any unspecified salmon species
Group 4	Resident trout	Rainbow, cutthroat, cutbow, bull, brook, lake, brown, other trout and any unspecified trout species.
Group 5	Other freshwater finfish or shellfish	Lamprey, sturgeon, whitefish, sucker, bass, bluegill, carp, catfish, crappie, sunfish, tilapia, walleye, yellow perch, crayfish, freshwater clams or mussels, other freshwater finfish and any unspecified freshwater species

Translating Fish Groups

Includes Event
Chinook &
Steelhead

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Group 3	Salmon or steelhead	Chinook, coho, sockeye, kokanee, steelhead, other salmon and any <u>unspecified salmon species</u>
Group 4	Resident trout	Rainbow, cutthroat, cutbow, bull, brook, lake, brown, other trout and any unspecified trout species.
Group 5	Other freshwater finfish or shellfish	Lamprey, sturgeon, whitefish, sucker, bass, bluegill, carp, catfish, crappie, sunfish, tilapia, walleye, yellow perch, crayfish, freshwater clams or mussels, other freshwater finfish and any unspecified freshwater species

Dietary Recall – NCI Results

Estimated Usual Fish Consumption Rates, g/day

Idaho / Group 2 / non-Marine Fish

Survey/Population	50%	Mean	75%	90%	95%	99%
Idaho Total	0.1	2.3	0.8	4.7	11.2	40.5
Idaho Angler	0.6	4.5	2.9	10.8	21.4	62.4
Nez Perce	36.0	66.5	---	159	234	---
24.2% Idaho Fish		16.1				
Shoshone Bannock	6.5	18.6	---	48.9	80	---
30.1% Idaho Fish		5.6				
EPA 2014	5.0	---	11.4	22.0	31.8	61.1

A Comparison of Risk

- * Given quality of water and fish is a constant, fixed by criteria, risk varies with fish consumption rate
- * Now that we know the range of fish consumption rates we can look at corresponding range in risk levels

A Comparison of Risk

	Mean		95th percentile		99th percentile	
	FC	Risk	FC	Risk	FC	Risk
Idaho population	2.3	1E-07	11.2	7E-07	40.5	3E-06
Idaho anglers	4.5	3E-07	21.4	1E-06	62.4	4E-06
NPT	16.1	1E-06	56.6	4E-06	175	1E-05
ShoBan	5.6	3E-07	24.1	1E-06		

A Comparison of Risk

	Mean		95th percentile		99th percentile	
	FC	Risk	FC	Risk	FC	Risk
Idaho population	2.3	0.0000001	11.2	0.0000007	40.5	0.000003
Idaho anglers	4.5	0.0000003	21.4	0.000001	62.4	0.000004
NPT	16.1	0.000001	56.6	0.0000035	175	0.00001
ShoBan	5.6	0.0000003	24.1	0.0000015		

Preliminary Draft Rule

Accounting for Bioaccumulation

- * We are relying on EPA's recommendations / 304(a) criteria for bioaccumulation information
- * EPA's 2015 304(a) criteria provide in most cases separate BAF values for trophic levels 2, 3, and 4
- * Neither Tribal nor Idaho fish consumption is broken down by trophic levels

Trophic Level Weighting BAF

- * To derive a single BAF value to use with the available fish consumption data we need to calculate an average BAF, which we weighted by the trophic level breakdown in EPA national default FCR.

TL Weighted Average BAF =

$$\left[(8 * TL_2 \text{ BAF}) + (9 * TL_3 \text{ BAF}) + (5 * TL_4 \text{ BAF}) \right] / 22$$

BCF Where BAF Not Available

- * EPA changed course on BAF in going from 2014 draft HHC updates to 2015 final
- * Straight EPI-Suite Model in 2014 replaced with 4 method hierarchy in national TSD in 2015
- * This resulted in different BAF values, and in some cases reversion back to a BCF rather than BAF

Update on RSC

- * Spoke with Lisa Macchio & Lon Kissinger on July 16th about Idaho's proposed RSC adjustment
- * They had checked with EPA HQ
- * If Idaho went forward with our proposal they alone would be reason for EPA to disapprove our criteria updates
- * So Idaho has move forward using EPA's 2015 values – default of 0.2 except for 3 compounds.

Scope of Criteria Updates

1. Just the 88 chemicals 167 criteria disapproved in 2012, plus copper?
2. All the chemicals in Idaho's table of toxics criteria we have current criteria for (adding 17 chemicals and 23 criteria)?
3. Plus EPA's 2015 updates, includes 2 chemicals disapproved in 2012 + 9 not current in Idaho's WQS?
4. Some combination of the above?

Considerations

- * New BW, DI, and FI (FCR) apply to all criteria
- * Toxicity, BAF and RSC (sort of) are chemical specific
- * But we don't have updated values of the latter for all chemicals
- * Arsenic, asbestos and methylmercury are odd ducks

88 Chemicals Disapproved in 2012

- * Six of these chemicals were not addressed in EPA's 2015 updates:

Selenium, Thallium, Dioxin, N-Nitrosodimethylamine, N-Nitrosodi-n-Propylamine and N-Nitrosodiphenylamine

- * For these we don't have new EPA recommended inputs for Toxicity or BAF. RSC = EPA default?

All HHC in Idaho's Current WQS

- * Not every row in the table, but every criterion
- * Additional 14 chemicals:
 - Antimony, Arsenic, Methylmercury (1), Nickel, Zinc, Bromoform (1), Chloroform, 1,2-Dichloroethane (1), 1,1,2,2-Tetrachloroethane (1), 2,4-Dimethylphenol, Phenol (1), Bis(2-Chloroisopropyl) Ether (1), 2,4-Dinitrotoluene (1), Nitrobenzene
- * Would need to use old toxicity and old BCF
- * Default RSC?
- * Updated BW, DI and FI

Plus New Criteria in EPA's 2015 Update

- * EPA's 2015 HHC Update provides new criteria for 2 compounds listed in Idaho's Table of Numeric Criteria for Toxic Substances, but currently lacking criteria
- * EPA's 2015 HHC Updates also provides new criteria nine (9) compounds not even listed in Idaho's Table of Numeric Criteria for Toxic Substances.

Integrating Probabilistic Criteria

- * We now have 3 sets of criteria:
 - A. Our current criteria (CC)
 - B. 2015 Deterministic Criteria (Det)
 - C. 2015 PRA Criteria (PRA)

- * These were compared, and
 - 1) If both Det & PRA are $> CC$, we stick with CC
 - 2) If PRA is $< CC$ and Det $> CC$, we go with the PRA
 - 3) If PRA is $> CC$ and Det $< CC$, we stick with CC
 - 4) If both Det & PRA are $< CC$, we go with PRA

Technical Support Document

- * To describe all the various inputs to the update of criteria we are undertaking – and avoid a plethora of footnote – we are developing:

**Idaho's Technical Support Document for Human Health
Criteria Calculations - 2015**

TSD Map

Cover Page

Criteria
equations

Input
variable
definitions
and units

BAF/BCF
TL Weighting

Body Weight
Source of data
Distribution
Statistics, Ref

Drinking Water
Source of data
Distribution
Statistics, Ref

Fish Intake
Sources of data
Distributions
Statistics, Refs

Chemical Name

Cas No.

Carcinogen or Not

Toxicity Data/Source

RSC

BAF/BCF

Criteria values, how
determined

References

Apples & Oranges

- * At this time we do NOT have PRA results using the tribal fish consumption data
- * We plan to do so, have money in our contract with WindWard to do so
- * What we need is
 - A. a full distribution of fish consumption rates for the Nez Perce Tribe
 - B. Adjusted (or developed) for 'Idaho fish
- * SO ...

So at present the criteria in our preliminary draft rule are based on a comparison of:

Deterministic criteria calculated from 16.1 g/day, our estimated mean consumption of Idaho Fish for the Nez Perce Tribe

and

PRA based on the distribution of consumption of Idaho Fish for Idaho's total population

Overview of Preliminary Draft Rule

- * In addition to HHC criteria changes in section 210 of IDWQS we have made changes in:
 1. Added section 070.08 **Protection of Downstream Water Quality**
 2. Clarified section 210.01 **Criteria for Toxic Substances**
 3. Revised Language in section 210.03 **Applicability** of criteria
 4. Added language in 210.03.v Frequency and duration for toxics criteria
 5. Revised language in 210.05.b Human Health Criteria
 6. Corrected error in section 284.04 **Application** (of SFCDA SSC)
 7. Added section 400.06 **Intake Credits for Water Quality-Based Effluent Limitations**
 8. Various other minor changes

Discussion

We are taking comments on the
preliminary draft rule until:
August 21, 2015

The proposed rule will be published:
October 7, 2015