Water Quality Standards Human Health Criteria

Technical Workgroup Meeting #3

Alaska Department of Environmental Conservation
Division of Water- Water Quality Standards
October 2015

Webinar instructions:

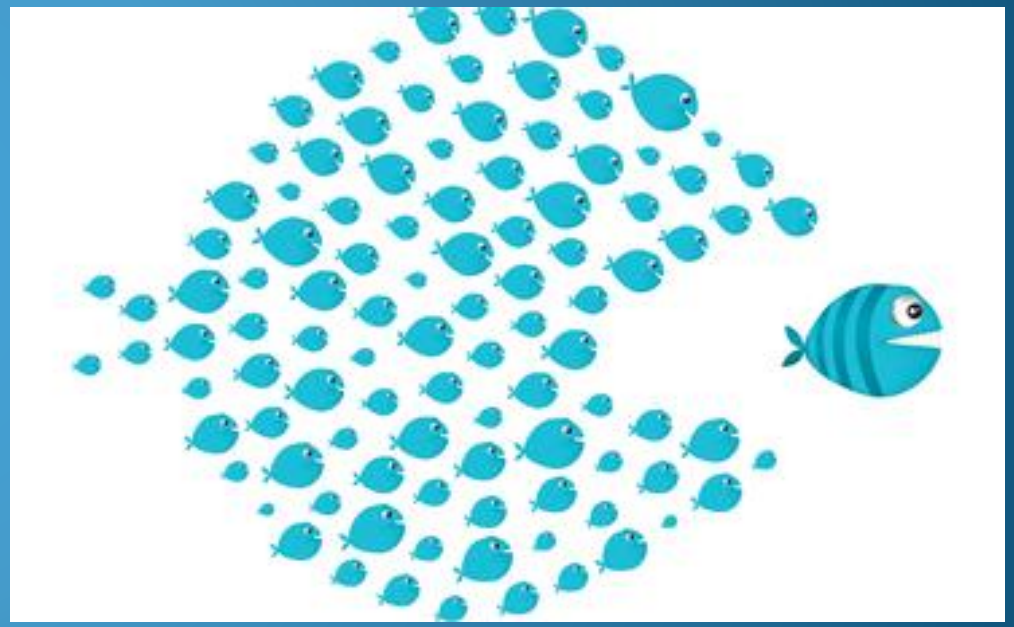
- For audio please dial: **1-800-315-6338**
- Access code: **51851**
- Note that all lines will be muted during the presentations

- Public testimony will be taken at the end of the meeting

PLEASE BE RESPECTFUL OF ALL PARTICIPANTS

Purpose of Technical Workgroup

- Provide technical feedback on issues associated with development of human health criteria (HHC) in state water quality standards
  - **Develop a Summary Report –more on this at the end of the presentation**
- Identify key sources of information that may be applicable to the process
- Ensure a variety of stakeholder voices are heard



Questions to be considered by the Workgroup

Issue #1: What information about fish consumption and fish consumption rates is available to inform the HHC process?

Issue #2: What options does DEC have for developing criteria on a statewide/regional/site specific basis?

Issue #2a: What modeling approach(es) should DEC consider (Determinstic v. Probabilistic)?

Issue #3: What is the appropriate level of protection for Alaska and its residents?

Issue #3a: How should DEC apply bioconcentration v. bioaccumulation factors?

Issue #3b: How should DEC address concerns about its carcinogenic risk value?

Questions to be considered by the Workgroup

- Issue #4a: What species should Alaska include for deriving a fish consumption rate?

- Issue #4b: What is the role of Relative Source Contribution (RSC) in relation to fish consumption rates and what are Alaska's options?

- Issue #5: What are Alaska's options for implementing the proposed criteria?
  - Existing tools (compliance schedules) and new tools (variances, intake credits)

Meeting #3 Outcomes

I. Provide DEC feedback on:

1. What is the appropriate population of concern? (Issue 3)
   1. Should Alaska use consumers only or non-consumers too?
   2. Should Alaska be focusing its resources on identification and development of an FCR for the general or a subset(s) of the general population?

II. Provide DEC feedback on:

What species should be included in Alaska's FCR (range)? (Issue 4a)

1. Inclusion of All fish versus Local fish only
2. Inclusion of Anadromous fish

HHC Equation(s)

- **RL: Risk Level**
- **CSF: Cancer Slope Factor (IRIS)**
- **RfD: Reference Dose (mg/Kg-day) (IRIS)**
- **RSC: Relative Source Contribution**
- **BW: Body Weight**
- **FCR: Fish Consumption Rate**
- **BAF: Bioaccumulation**
- **DI: Drinking Water**

	Freshwater Criteria Consumption of Organisms **and** Water	Marine Criteria Consumption of Organisms **Only**
Criteria for Carcinogens	$\frac{RL \times BW}{CSF \times [(FCR \times BAF) + DI]}$	$\frac{RL \times BW}{CSF \times FCR \times BAF}$
Criteria for Non - Carcinogens	$\frac{RfD \times RSC \times BW}{(FCR \times BAF) + DI}$	$\frac{RfD \times RSC \times BW}{FCR \times BAF}$

Mtg #2 Follow up: Issue 3

What is the appropriate level of protection for Alaska and its residents

1. Consumers only v. Consumers & Nonconsumers
2. General v. Subpopulation

Discussion: Consumers v. Consumers & Non-Consumers

1. Should DEC base its FCR on consumer only data or consider consumers and non-consumers?

- Reasons for **including** non-consumers
  - May actually be consumers mis-identified
  - may decrease "true" FCR when you trim the sample

- Reasons for **excluding** non-consumers
  - Not at risk from fish-borne contaminates
  - may increase "true" FCR when you trim the sample
  - Adds additional conservativism to formula

Draft Recommendations

A review of the Meeting #2 notes appear to say…

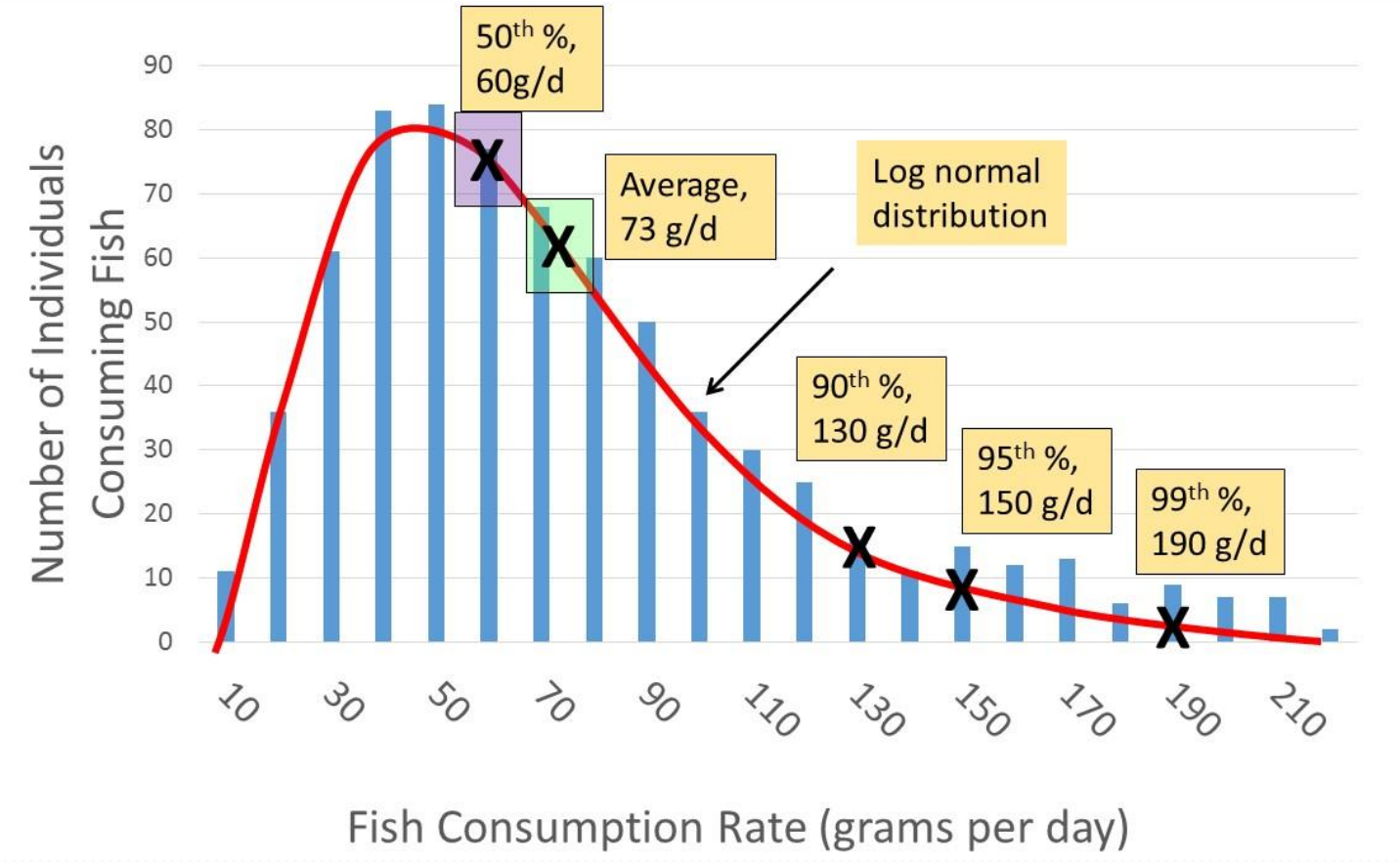
- DEC should be focused on consumers only as the population of interest, but use a methodology that accurately estimates the true percentage of non-consumers.

DISCUSSION

Discussion Population of interest: General or subset?

The fish consumption rate (FCR) in the HHC should reflect the rate of consumption by the population of concern

(Mean, 90th, 95th, 99th)



General or Subset of Population?

Should DEC concentrate its resources on establishing a

- General Population Distribution (Inc. Urban population?)
  - Pro/Con?
- Targeted Subpopulation Distribution
  - Pro/Con

Draft Recommendations

A review of the Meeting #2 notes appear to say…

- DEC should use regional fish consumption rates.
- DEC should use 90th or 95th percentile for regional fish consumption rates, particularly if a 10^{-5} cancer risk level continues to apply.
- DEC should seek out more data on urban fish consumption.
- DEC should seek out more data on urban sub-populations (e.g., Asian, Pacific Islander) fish consumption.
- DEC should use ADF&G harvest data in establishing regional FCR for rural areas
  - Potential issues may exist with differentiating between household v. individual level consumption rates

DISCUSSION

Issue #4a: What species should Alaska include for deriving a fish consumption rate?

- What fish to include?
  - Local only or all sources of fish (inc. store bought tuna)?
  - Anadromous Species?
    - How should we address anadromous species
    - What about other highly-consumed marine species (e.g., halibut, cod, crab)?
    - If we include marine species- Can we adjust RSC values

Fish Consumption- Where does it come from?

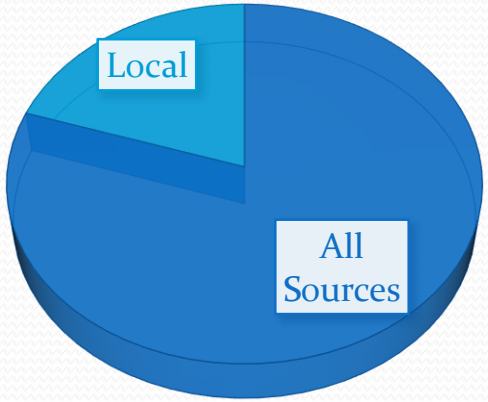
All Fish (Market and Local)

- Captures ALL fish consumption
- Accounts for exposure regardless of source

Local Only

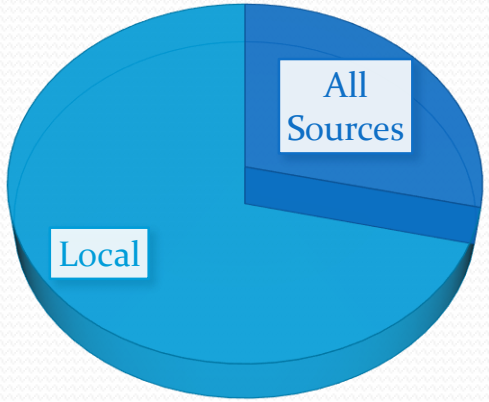
- Protective of consumption of local fish
- May be more easily traced to sources
- Less confidence in the protection FCR provides due to other routes-

FCR



Lower 48 v. Alaska?

FCR



Example

- Dick and Jane are both fish consumers
  - Dick lives in Anchorage and regularly eats tuna (sushi) and halibut that his family sends from Washington (~100 g/day)
  - Jane lives in Gustavus and regularly eats salmon and halibut she catches at the mouth of Glacier Bay (100 g/day)

- IF a FCR is determined by Overall Consumption (EPA recommendation) then both individuals are protected
- If only Alaskan (local) fish were considered, then the total FCR is reduced to 50 because both eat fish but only Jane is eating **local** fish

How big of an issue is this in Alaska where most of our fish may be localized?

May depend on the region:

The table demonstrates that the local source (i.e., Puget Sound) is going to be the highest source of fish.

The data for coastal populations may not be similar to that of interior or urban populations.

Table Courtesy of WA Ecology

Table 1. Summary of Fish Consumption Data, All Finfish and Shellfish (g/day)

Population	Source of Fish	Number of Adults Surveyed	Mean	Percentiles		
				50th	90th	95th
General population (consumers only)	All sources: EPA method	2,853	56	38	128	168
	All sources: NCI method	6,465	19	13	43	57
Columbia River Tribes	All sources	464	63	41	130	194
	Columbia River	–	56	36	114	171
Tulalip Tribes	All sources	73	82	45	193	268
	Puget Sound	71	60	30	139	237
Squaxin Island Tribe	All sources	117	84	45	206	280
	Puget Sound	–	56	30	139	189
Suquamish Tribe	All sources	92	214	132	489	797
	Puget Sound	91	165	58	397	767
Recreational Fishers (compilation of multiple studies)	Marine waters, WA State	–	11–53	1.0–21	13–246	
	Freshwater, WA State	–	6.0–22	–	42–67	

Sources: Adapted from Polissar et al., 2012, Table E-1. Data for recreational fishers is from Table 3, Technical Issue Paper: *Recreational Fish Consumption Rates* (Ecology, 2012). General population data are for consumers only, as opposed to per capita. See Chapters 4 and 6.

How this has played out in Region 10

Complicating factors:

- EPA's comments to ID on their proposed FCR suggests that the exclusion of market fish is not acceptable

- EPA tends to take a "market basket" approach under the principle that "every state does its share to protect people who consume fish and shellfish from multiple jurisdictions." (EPA Letter to Idaho. August 21, 2015)

Discussion

Potential questions

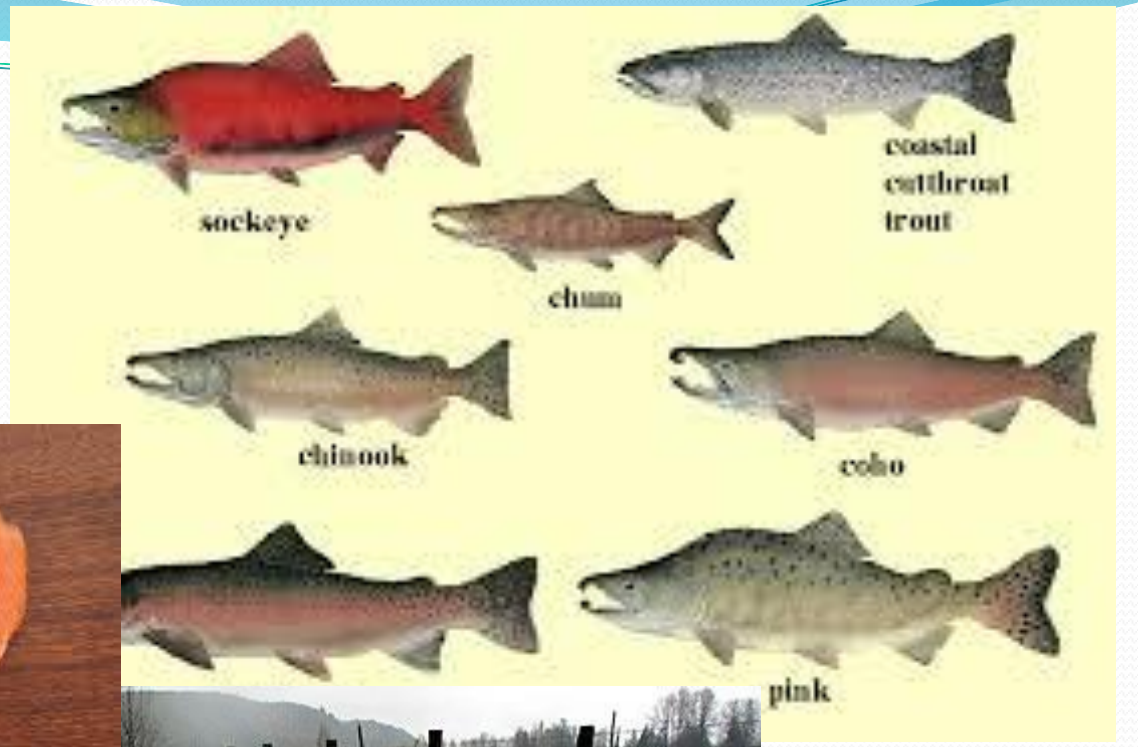
- Does enough consumption of non-Alaskan fish actually take place to make a significant difference in values?
- Is there any way Alaska can differentiate between sources of fish without conducting a statewide survey effort?
- Are there any sources of information on fish imports that could be used to inform the process?

Anadromous Species

Issue: To include or exclude anadromous fish in the calculation of a fish consumption rate (range)

Potential options:

- Include at full rate of consumption
- Include at discounted rate
- Do not include

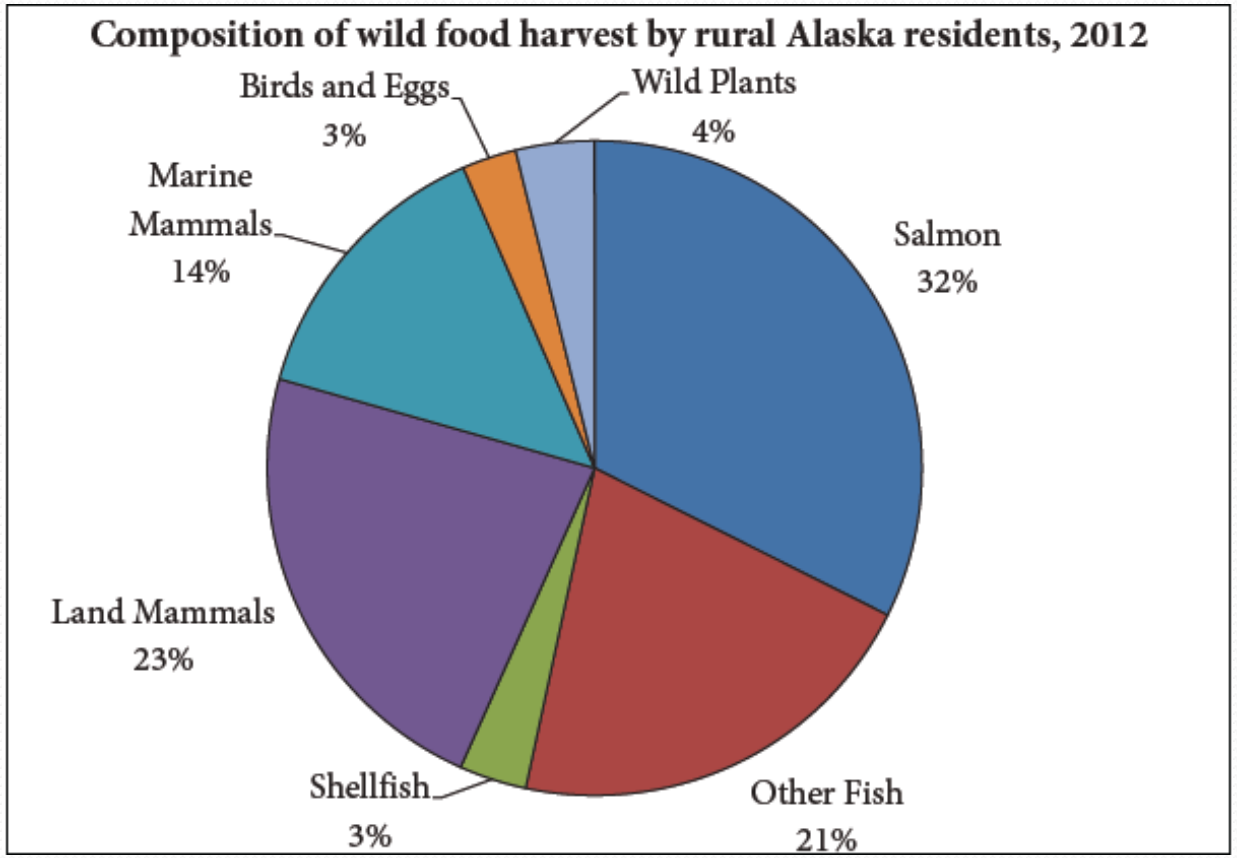


Background Information

- EPA (2015) has recommended a national FCR that is based on the consumption of freshwater and estuarine fish only
- Marine fish are considered to be part of the relative source contribution (EPA 2000)
- "[E]PA's position is that it is necessary to include market fish and appropriate to include anadromous species in the FCR used to set Idaho's AWQC." (EPA letter to Idaho on Preliminary Draft Rule)

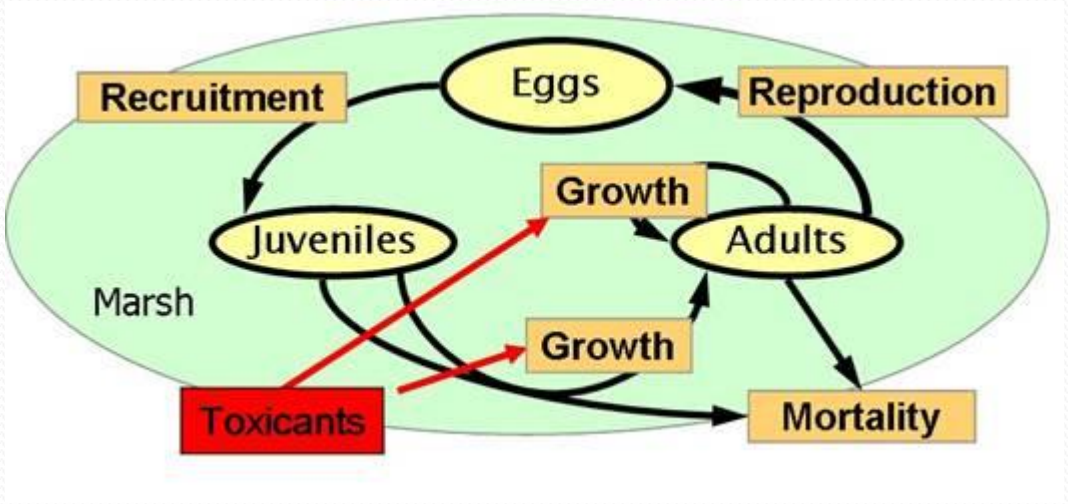
Inclusion v. Exclusion of Anadromous Species

- Reasons to include
  - Alaskans and anadromous species are closely linked
  - Inclusion would be a better estimate of *general* fish consumption
  - Consistent with other Region 10 coastal states



Inclusion v. Exclusion of Anadromous Species

- Reasons to exclude
  - Marine species are addressed in the RSC component of the HHC methodology (80/20)
  - Majority of contaminates marine fish are exposed to come from outside Alaska jurisdiction
  - Basing water quality criteria on consumption of salmon is expected to have very little effect on pollutant uptake by anadromous species



Perception

- EPA considers it appropriate to include salmon (Idaho cmts)
  - Uncertainty as to the source(s) of contaminates in body burden
  - Tribal consumption-treaty rights?
  - Market basket preferences differ

- Alaska and salmon are linked through physical, social, and economic networks

Option 1: Include at full rate

- Why?
  - Consistent with Oregon and Washington
  - Better accounting of actual consumption- regardless of source
  - Public perception
- Why not
  - Addresses sources Alaska doesn't regulate
  - More stringent criteria without substantive decrease in toxin levels
- Potential Outcomes
  - May affect how RSC is calculated

Option 2: Include at a discounted rate

- Why
  - Recognizes that marine fish are part of general diet
  - Recognizes limitations on what Alaska does and does not regulate
- Why not
  - Addresses sources Alaska doesn't regulate
  - What is the right formula to determine the reduction rate?
- Potential effects
  - May affect how RSC is calculated

Option 3: Do not include anadromous species

- Why
  - Alaska WQS cannot regulate marine waters and sources
  - Consistent with EPA's approach for national fish consumption rates
- Why not
  - Will make approval process challenging
  - Not consistent with other R10 coastal states
- Potential effects
  - Retention of RSC values

Discussion

- If Alaska was to take a regional approach and differentiate between coastal and interior communities- would that make a difference in what species we include/exclude?
- What about other marine species that see high consumption patterns (e.g., halibut, cod, crab)
- If it turned out that most of Alaska's consumption of aquatic life was marine-derived, what would that do to the Relative Source Contribution value?

Next Steps

- DEC would like to start compiling your thoughts/comments in a report format
  - Example: DEC Antidegradation Workgroup Report
  - http://dec.alaska.gov/water/wqsar/Antidegradation/docs/WorkgroupRpt_01_24_13_Final.pdf
- Please review Meeting 1 and Meeting 2 Notes and provide DEC with your feedback
- DEC will summarize your notes and report back to the group to determine whether there is/is not consensus.

Public Comment

Next Technical Workgroup Meeting

- December, 2015
- Focus on discussion to date and recommendations to DEC
- Teleconference will be available.

- Topic: **Issue 4b: What is the role of Relative Source Contribution (RSC) and what are Alaska's options?**
  - Description of RSC
  - Approaches used by other states
  - Opportunities for DEC to consider

Extra Slides: What have other states done ?

Washington

- Is basing protection on consumers-only
- Is using a 175 g/day value which is ~ mean of three tribal surveys

Idaho

- Is basing protection on consumers-only
- Considering the 90th of general population following statewide survey and the mean of higher consuming subpop (tribal). values