



# Idaho Fish Consumption Survey 2013

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IDEQ Fish Consumption Survey Sample and  
Questionnaire Design

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# Agenda

Recap of July 10 meeting

Bounding the Sample Population

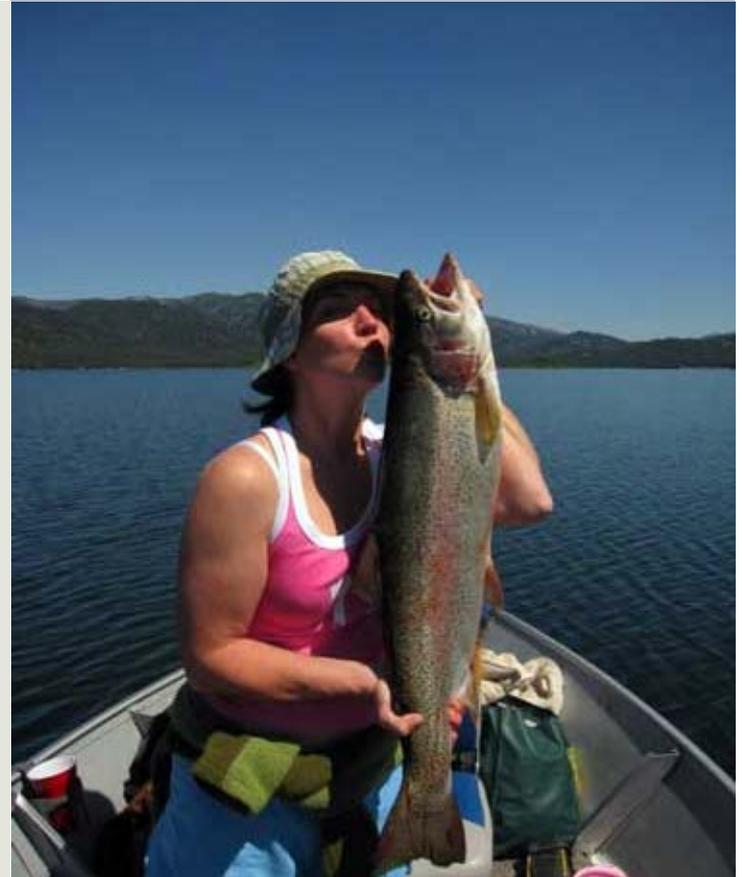
Sampling

The Survey Instrument

Coordination with the Tribes

Next Steps

Questions



# RECAP of July 10 Meeting

- Goals for Survey were presented and adopted.
  - To survey the general population's fish consumption rate
  - To survey the angling population fish consumption rate
  - Measure fish consumption from all sources of fish
  - Identify the consumption variance within-person and between-person
  - Baseline for unusual or long term intake rates
  
- Operational definitions were presented
  
- Statistical issues of precision and accuracy were discussed
  
- Alternative methodologies and sample design strengths and limitations were discussed
  
- Common Core Questions were discussed
  
- Perception of suppressed consumption was discussed
  
- Update on the coordination with tribal surveys





# Bounding the sample population

- Households or Individuals as the survey unit?
  - Proposal is to use Households as the survey unit
    - The correlation of within-family consumption will be adjusted.
  
- Include Poachers?
  - IDF&G asserts repeat poachers are a very small population. They are usually caught, and it is cheaper to buy a license.
    - Proposal is that this will not be an issue.
  
- Include out of state license holders?
  - Proposal is that there is no evidence that out-of-state license holders are any different than in-state license holders, and so need not be included.
    - 2011, 449,963 licenses of which 121,470 were out of state (27%)



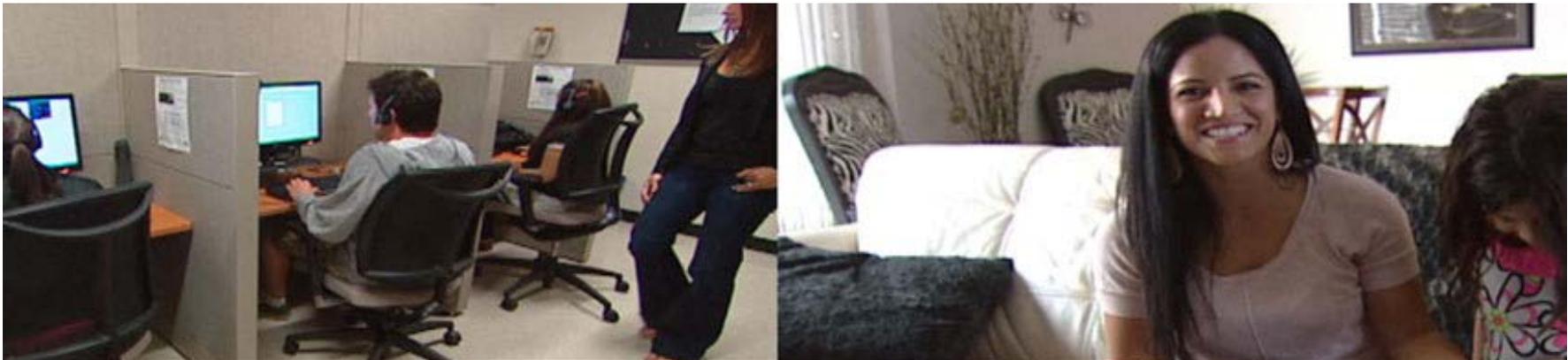
# Bounding the sample population continued

- Additional sampling for minority populations?
  - The proposal is that the stratified sample may be able to identify if there are unique within strata variability.
    - Angler population will capture the minorities who eat Idaho fish.
- Youth anglers ?
  - Youth will not be surveyed directly.
    - Should they be surveyed indirectly?
- Perception of consumption suppression?
  - The survey will collect information but will be unable to draw conclusions. Slide 23 will discuss this further.



# Bounding the sample population continued

- Total dietary intake?
  - Proposal is that the survey will be limited to fish intake.
    - Purpose of surveys must be made clear to respondents, reduces recall bias, keeps the survey short and less expensive (allowing larger samples).
- Definition of non-consumers of fish?
  - Those who have not eaten fish within the last 12 months
    - If use NCI only never eaters need to be identified.
- Definition of an Idaho Angler?
  - Holds an in-state Idaho Adult license



## The Survey Sample

- ❑ There are a number of methods that can be used to calculate confidence level for a specific percentile.
- ❑ Without the data set, and lacking previous research on Idaho, it is difficult to offer a meaningful estimate of the observed range.
- ❑ The NCI method requires the largest sample to obtain the sufficient responses to meet the methods requirement.
- ❑ If set sample to NCI requirements other analysis methods requirements will be satisfied.



## The Survey Sample

- According to the 2007 Behavioral Risk Factor Surveillance System, BRFSS, survey:
  - The CDC estimates 91% of Idahoans consume fish at least once a year and 56 % consume fish caught in Idaho N = 5,000 sample
  - The CDC estimates that 83% of Idahoans consume fish at least once a month and 22% consume fish caught in Idaho at least once a month.
- This data will be used to estimate the sample size for FFQ and NCI



## The Survey Sample – The Frequency of Consuming Fish

- National Cancer Institute method demands some of the sample will have eaten fish on 2 or more of the 24 hour recall surveys.
- Food Frequency Survey runs the risk of serious respondent recall bias, reducing the validity and reliability of the survey.
- Mixed 24hr and FFQ methodology tries to solve the limitations of the two approaches.



## The Survey Sample and Questionnaire Delivery

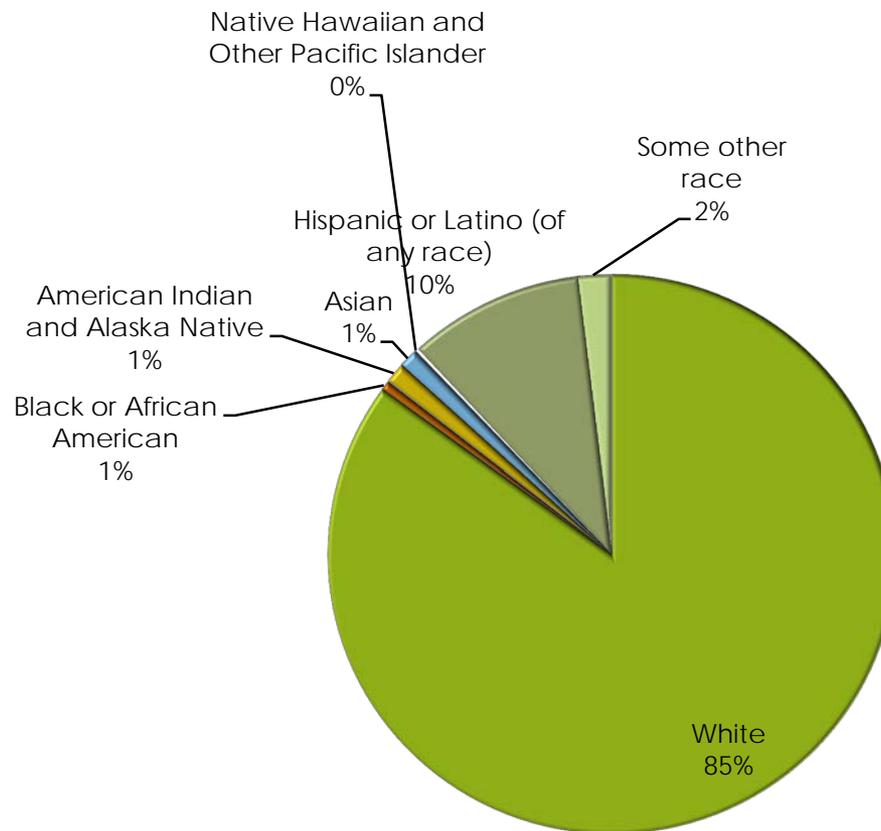
- ❑ Whether telephone, mail, internet or in person, the number of successful surveys remains the same.
- ❑ Collecting survey responses by multiple methods (phone, internet, etc.) is a valid and increasingly common approach with the advent of cell phones.
- ❑ The issue becomes the response rate of the different methods and the quality of the responses.
- ❑ There are methods of post-survey resampling to test for bias.



## The Survey Sample – But what about small populations, like minorities and frequent fish consumers?

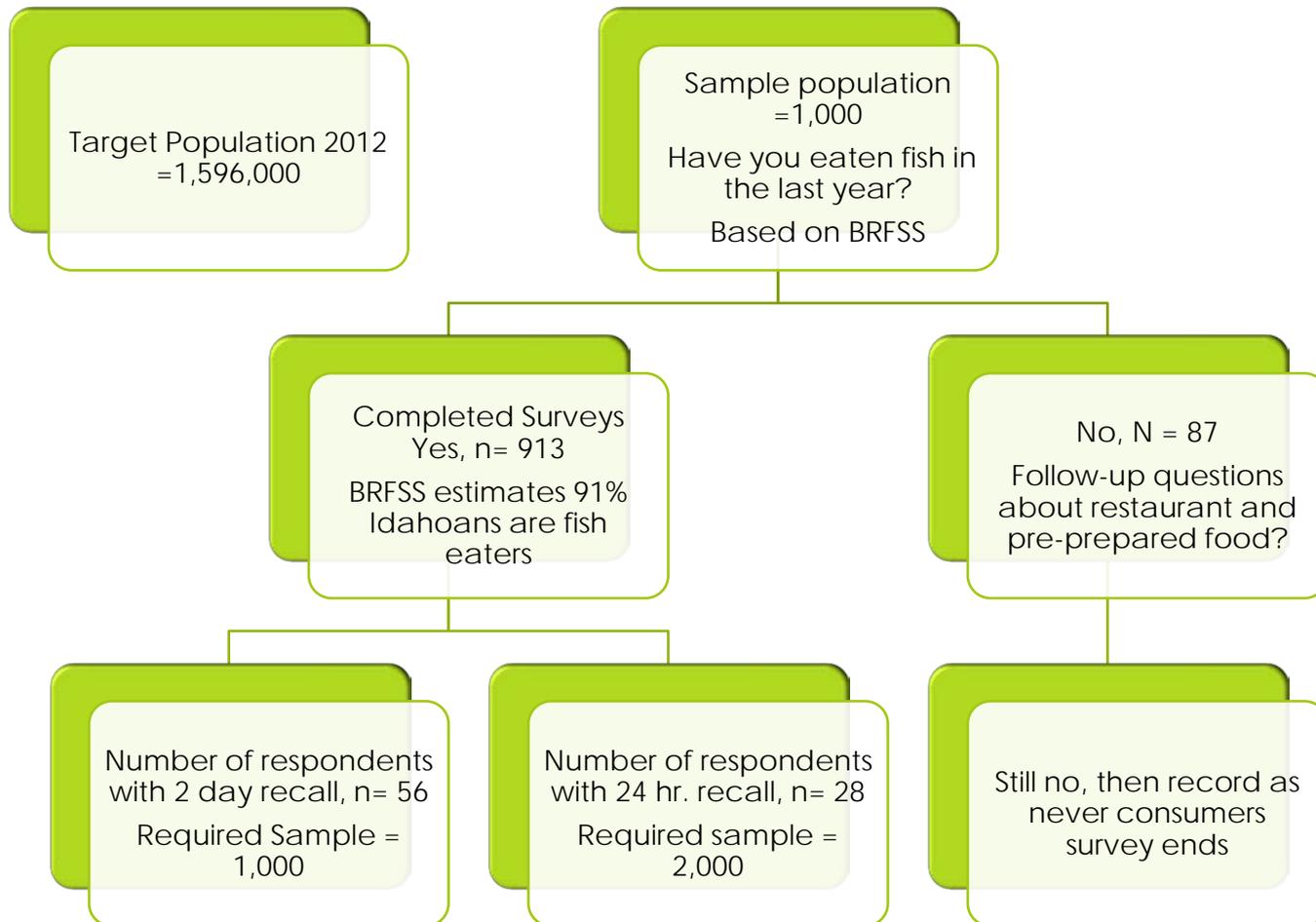
- These issues can be handled with a stratified or quota sample.
- The goal of the survey is to measure fish consumption of the total Idaho population and angler population.
- The goals of the survey determine the variables that the sample should accommodate.
- The concern over under/over reporting SES and/or high fish consumers is a sensitivity issue of the robustness of the model's assumptions.

# Distribution of Ethnicity in Idaho Reported as one race except Hispanic

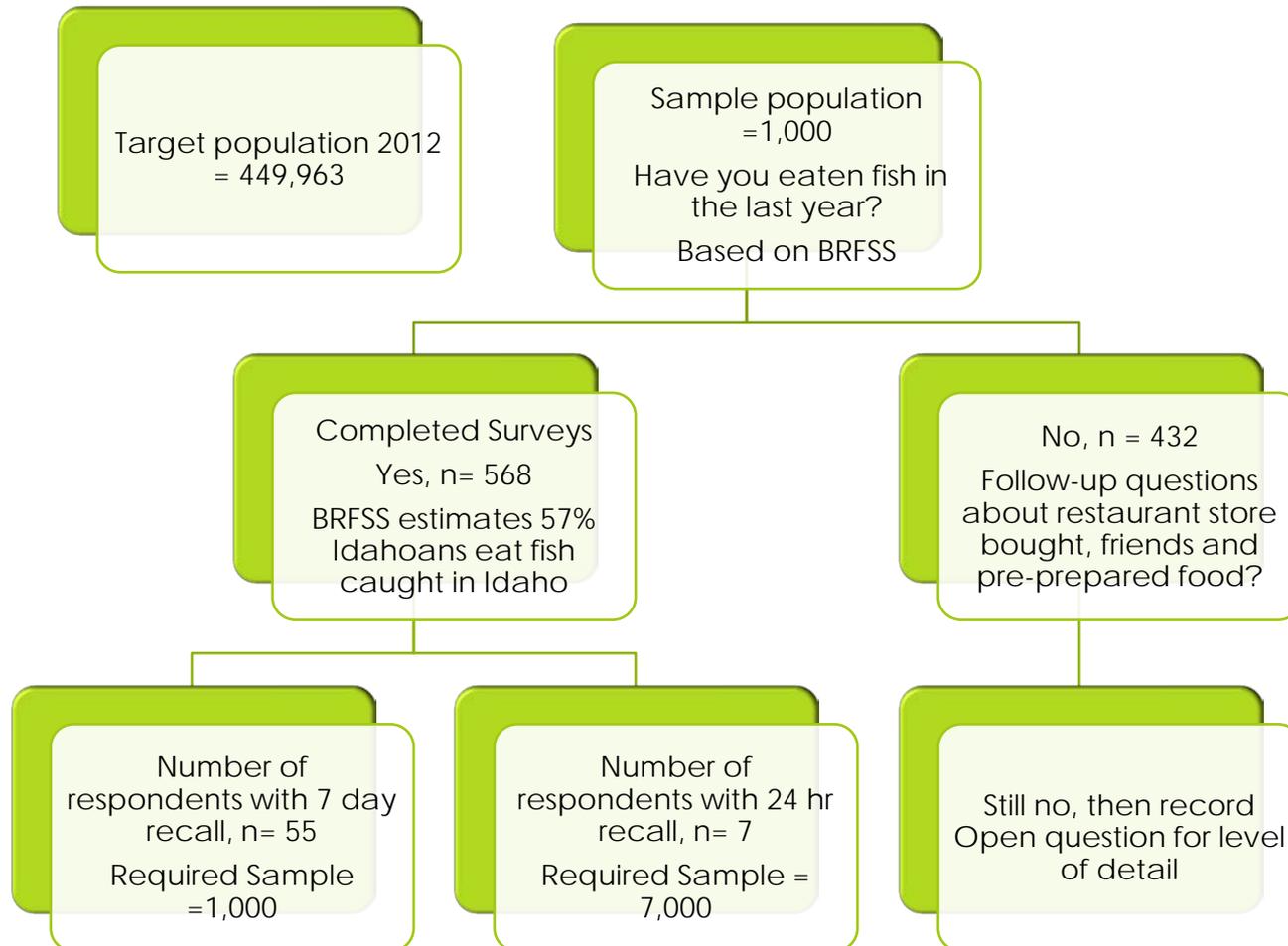


## Idaho Demographic Profile US Census 2010

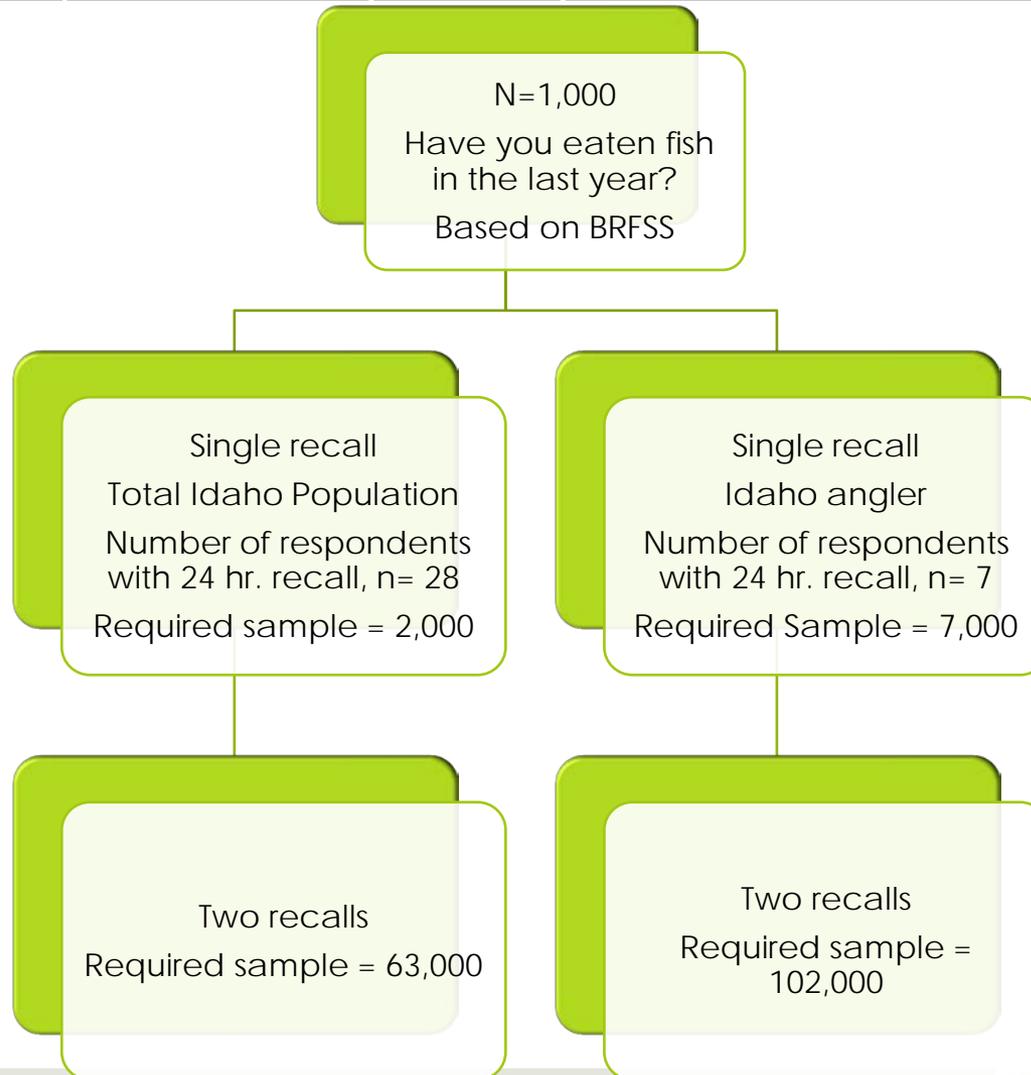
# Analysis – The NCI requirements for **all** fish/shellfish Total Idaho Population **Hypothetical** for a 1,000 sample size **single** Recall



# Analysis – The NCI requirements for Idaho fish/shellfish Total Idaho Population **Hypothetical** for a 1,000 sample size **single** recall



# Analysis – The NCI requirements for **all and Idaho** fish/shellfish for **Total Idaho** population and **anglers** **Hypothetical** required sample size on 2 recall based on **simple** probability analysis





# Sample design – Art of determining sample size

The analytic model will drive the number of required completed surveys

IDEOQ budget will determine the number of completed surveys acquired

BSU is charged to provide a sample design that will provide sufficient number of surveys for analytic modeling

End of the day reduction of ideal number of surveys results in loss of robustness of results

Loss of robustness does not mean loss of valid results only wider confidence intervals.

- ▣ Log normal distribution
- ▣ Bi modal distribution
- ▣ Within-person variation
- ▣ Between-person variation
- ▣ 24 hour recall
- ▣ Recall bias
- ▣ Small subpopulations
- ▣ Variation tolerance





## Strategies for reducing sample size - Hypothetical examples

- Only use frequent fish consumers for call back for second 24 hour recall survey.
  - “Have you eaten fish within the last seven days?”
    - Those answering yes may change the probability from  $1/30^{\text{th}}$  chance of eating fish to  $1/7^{\text{th}}$ , potentially doubling the probability of 2 recalls from 1.1% to 2%.
      - The assumption that the within-person variance is stable will not reduce the validity of results when paneling the respondents
- Increase the recall period from 24 hr. to 48 hr. or even longer.
  - This increases recall bias. However, the variable of interest is the daily rate of intake.
    - Example, using a 7 day recall, if a respondent miss reports their consumption by 50 percent on the first recall but is accurate on the second recall. The within variance will increase by 7%. This means that the variance will increase by 3 ounces on a standard salmon steak of 9 ounces but the daily increase would only be 0.3 ounces.
  - This may the potential of reducing the required sample by seven times.

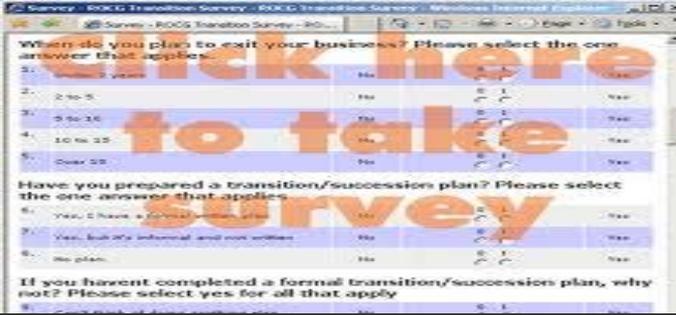


# Minimizing the number of surveys

- To provide greatest flexibility to IDEQ
- Implementing consultant will be able to generate 4 panels of samples
  - To be implemented seasonally across the year
- After first panel recommend conducting basic statistics to determine
  - Number of non consumers
  - Shape within person variation
  - Shape of between person variation – percentile
  - Number of Idaho fish consumers
  - Number of 24 hour recall hits
- Depending upon analytic method chosen, run additional panels until target of successfully completed surveys reached

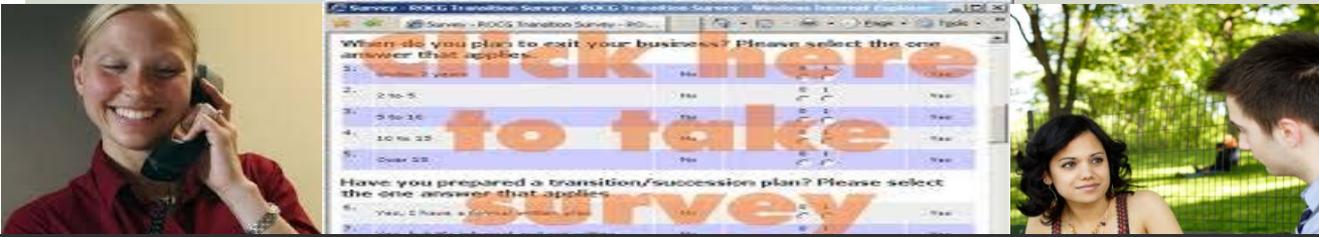
# Fish Consumption Rates

Two sampling issues examined



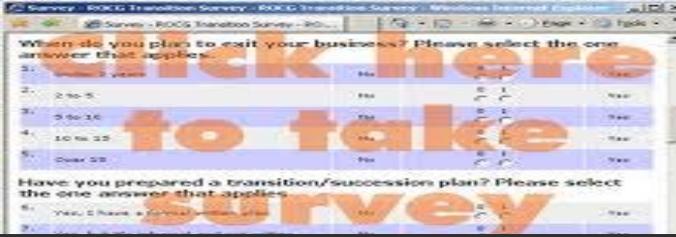
# The Survey Instrument – The Common Core Questions

- Demographic profile
  - Age
  - Gender
  - Ethnicity
  - Income
- Consumption of fish by source
  - Perception of consumption suppression
- Type of fish consumed classification
- Frequency of fish consumption
- Quantity of fish consumed
- How fish was prepared
  - Flesh, skin, whole



# Survey length an issue

- Depending upon the number of completed surveys required, the length of the questionnaire is one way to adjust the total cost of the project.
- There is empirical evidence on the national level, some of it dated, that indicates some of the covariates can be collapsed.
  - For example the 2007 BRFSS survey found little variation between below poverty rate and above poverty rate fish consumption with a positive correlation with income.
- The demographic stratifications may change as the questionnaire is tested for length



# 1. The Survey Instrument – Demographic Stratification of General Population

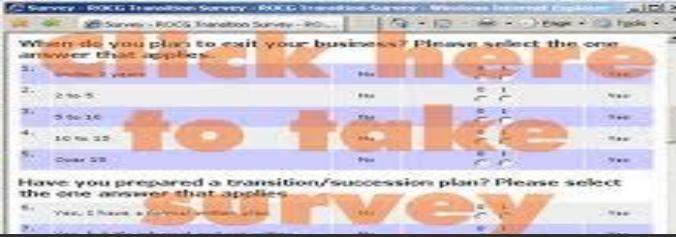
## Demographic profile Gender and Age

## Tables for Respondent and family members

- **Who are you?** The gender randomness occurs with the first question of the survey.
- Are you the oldest female (male) member of the household?
  - IF YES CONTINUE IF NO ASK IF THE OLDEST MEMBER WHO IS HOME AND COULD COME TO THE PHONE.
  - THE INTERVIEWERS ASK FOR THE NEXT GENDER ON EACH SUCCESSIVE CALL

Age	Question Two Category that Best represents your age?		Question Three Number of people living in your house ( <u>not</u> including yourself)	
	Female	Female	Male	Female
<b>Question One</b>				
18-24 years old				
25-44 years old				
45-64 years old				
65 and over				
Total				





## 2. The Survey Instrument – Demographic Stratification of General Population

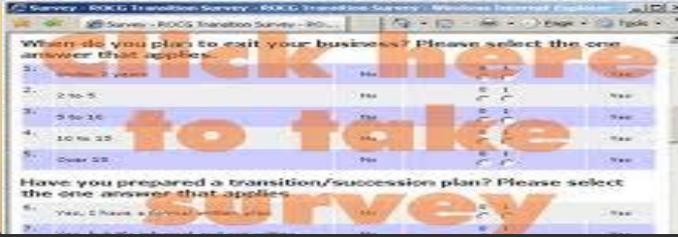
Demographic profile  
Income

- Concern for poverty
- Breaks on US Census Classifications
- Interested in the lowest income brackets – possible subsistence fishers.
- Large enough to reduce respondent fabrication

Table for Respondent

	Less than \$15,000
	\$15,000 to \$24,000
	\$25,000 to \$44,000
	\$45,000 to \$69,000
	\$70,000 to \$99,000
	Over \$100,000





# The Survey Instrument – Demographic Stratification of General Population

## Demographic profile

### Ethnicity

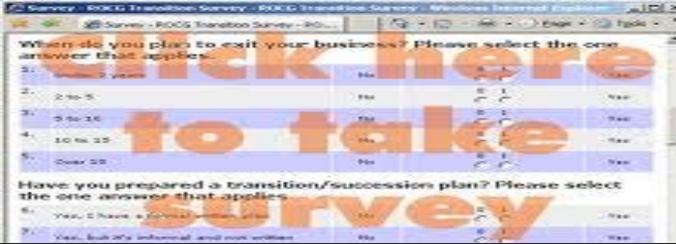
- Concern for minority population
- Breaks on US Census Classifications
- Interested White 85% Hispanic 10%, Asian/Pacific Islander 1.2% Black 0.6% and Tribes 1.3% Note this is > 100% because people are allowed to multiple identify
- A second question to identify the Idaho Tribe

### Table for Respondent

	White Caucasians
	Hispanic
	Asian or Pacific Islander
	Black or African American
	Native American Alaskan Native

	Kootenai Tribe
	Coeur d'Alene Tribe
	Nez Perce Tribe
	Shoshone-Bannock Tribe
	Shoshone-Paiute Tribe
	Other Tribe





# The Survey Instrument – Type of Fish

## Proposed Categories For Wild Caught Idaho Fish

Fish Category	Fish species	Characteristics
Trout	Rainbow, west slope cutthroat, Yellowstone cutthroat, brown, brook, kokanee and lake Trout	Short lived cold water cooked whole
Salmon & Steelhead	Chinook, Steelhead, Coho There may be confusion with rainbow trout hybrids	Short lived, part of life cycle out of state cooked whole, filleted
Crawfish	Any shell fish identified as consumed	
Other	Includes: walleye, tiger Muskie channel catfish, bullhead catfish white fish, small and large mouth bass, black crappie, white crappie, blue gill pumpkin seed, yellow perch pike minnow, carp, chisel mouths etc..	Game and non game species may be cooked whole or fileted, and a number are long lived others short lived



# Survey Instrument - Consumption Suppression

- IDEQ continues to consider suppression, and the financial and design constraints that may limit investigation of this issue.
- Cross sectional survey inappropriate vehicle beyond perception
  - Significant risk of self explication
- Further work needed on influence of
  - Population growth
  - Cultural evolution
  - Urbanization
  - Limited shorelines
  - News media
  - Fish advisories
  - water quality
  - Actual fish availability
  - etc.

# Tribal Collaboration

7/25 conference call

8/7 conference call with  
NCI, Subar and Dodd

8/13 conference call

BSU sharing preliminary  
designs



# Next Steps

- Finalize sample design
- Finalize covariates of interest
- Draft the questions and survey instrument





# Questions

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