Guidelines for Developing Protocols in monitoringmethods.org and Pisces Statements of Work for Adult and Juvenile Fish Data Collection and Analysis; and Other Indicators

1. In FY 13 Protocols should be proposed or published prior to start of contracts for SOW initiation with complete list of metrics and indicators with the associated methods identified for Work Elements Collect Data (157) and Analyze Data (162). Protocols should be submitted as proposed by. The protocols should be published prior to implementation. The use of implementation notes will allow for variation in annual implementation to be documented. Implementation notes are only available once a protocol is published.
2. For WE 156 (Develop methods or designs) Protocols or methods should be proposed or completed by close of the contract. If you are working on specific methods or designs not in a protocol you may leave the protocol blank in RM&E Metadata tab.
3. Protocols may cover multiple species, but describe different survey times in the study designs (*Separate work elements would be required, if locations of monitoring are different for species.)*
4. Protocols for data collection on fish species should be life stage specific, unless all data are collected at each site. (Adult Sampling; Juvenile Sampling)
5. Multiple protocols are necessary if data collected at sites varies among the sites. *Example weir sites and spawning ground survey sites are used to assess adult abundance, but because different information is collected at weirs and on spawning grounds and they may have different spatial and temporal sample designs it is better to have them as distinct protocols.*
6. Protocols for data collection and analysis of life stages can be combined. *(Habitat Data collection and analysis of indicators see: Scientific Protocol for Salmonid Habitat Surveys within the Columbia Habitat Monitoring Program (CHaMP) or Adult Data Collection Spawning Ground Survey and Adult VSP Assessment (Abundance, Distribution, Diversity). However, see guideline 3: If different metrics/indicators or data collection methods are applied at sites you are advised to create different protocols.*
7. If separate protocols are created to describe Data Collection and Analysis, please reference the Protocol ID (IDs can be determined by looking at the web address or looking at the left sidebar on the Protocol details page) of the Data Collection protocol in the Background section of the Analysis protocol to indicate how data for the analysis was collected. Analysis protocols may also reference other Analysis protocols in the same manner. *(For Example Adult Abundance Assessment and Juvenile Abundance Assessment Protocols could be referenced in a separate protocol for cross-life stage survival assessments in Salmonid Smolt to Adult return Estimates.)*
8. Methods should be developed in collaboration:
    - Where feasible methods should be documented to be the basic information documenting the step by step processes excluding species or location information, unless species information is an essential variable (e.g. a method used in the Methow may be appropriate in the John Day; Or Spawner abundance or Juvenile production estimates from redd extrapolations may vary by species.)
    - Rather than creating new methods people may customize methods if they omit steps or use alternative equipment in a manner that does not radically change the methodology or comparability of data.
    - Become a collaborator or subscribe to a methods but make sure you talk to the method owner to make sure the method developed is what you do.
    - Assign an agency lead to document methods for all sponsors who may work with other agencies as well. E.g.
    - BPA has endorsed methods for use across the program and if your method is published and you want it to be endorsed by BPA send an email to RMESupport@bpa.gov with the subject "Method Endorsement" e.g. Measuring Fish Length: Fork length (ID: 1550) (Published) or Genetic Sex Marker for O. mykiss and O. tshawytscha (ID: 1340) (Published); CHaMP - Locating the Site (ID: 831) (Published) CHaMP - Site Layout (ID: 832) (Published) CHaMP - Topographic Point Collection Methods (ID: 836) (Published), CHaMP - Site Map (ID: 842) (Published) etc.

9. If you recognize that your protocol needs to be split into multiple protocols for Work Elemetns and is not accurate for the work being conducted sponsors should create new protocols. New protocols can be a version of the protocol or clone of the protocol. New protocols should accurately reflect the work being conducted at the all work sites. If you recognize this prior to publication of a protocol you should reference the new protocol in the actual introduction. Alternatively if you retire the protocol you should provide a reference to the new protocol in the notes after protocol retirement.

The following table represents examples of approaches to creating protocols based on the monitoringmethods.org guidance and the salmon monitoring advisor, which also line up with BPA's SOW requirements based on the guidance above. (Note these example protocols are not complete with all metrics and methods, but may be used as guidance to document your protocols.)

Protocol Name	BPA Work Element	Metrics	Methods (Example Methods)
Adult Monitoring Weirs	157 Collect Data	• Origin • Abundance • Age • Length • Sex • Date/time • Mark-detection • Mark-application • Tissue collection • Condition • etc.	• Adult steelhead abundance from weir data • Hydroacoustics - Rivers - DIDSON (Dual-frequency IDentification SONar) • Use of Instream PIT tag Arrays to Monitor Migration • PIT Tag Marking • Hatchery Marks/Tags • Fish sex • Etc.
Adult Spawning Ground Surveys	157 Collect Data	• Abundance • Redds • Carcasses • Live • Tissue Collected • Origin etc.	• Hatchery Marks/Tags • Fish sex • Length: Adult • Obtaining length measurements from adult steelhead and Chinook salmon • Etc.
Adult Salmonid Analysis	162 Analyze Data	• Abundance • Returns • Spawners • Age Composition • Hatchery Fraction • Strays • Distribution • Run Timing etc.	• Age Structure • Length: Juveniles • adult migration timing • adult sex ratio • Length: Adult • DIDSON escapement estimation • Etc.
Juvenile Trapping (collection)	157 Collect Data	• Origin • Abundance • Age • Length • Sex • Date/time • Mark-detection • Mark-application • Tissue collection • Condition	• Rotary Screw Trap • Scales - Juvenile Salmonid • trap tissue collection for DNA analysis • Obtaining length measurements from juvenile steelhead and Chinook salmon

		• Flow etc.	
Juvenile Sampling (collection)	157 Collect Data	• Origin • Abundance • Age • Length • Sex • Date/time • Mark-detection • Mark-application • Tissue collection • Condition	• Basic Snorkel Survey Procedures • Electro-fishing - Backpack - Mark • Electro-fishing - Backpack - Recapture • Beach Seine - Perpendicular Set • Fish sex
Juvenile Salmonid Analysis	162 Analyze Data	• Juvenile Productivity • Juvenile Abundance	• Estimating Instream Juvenile Salmonid Abundance Using Snorkeling • Salmonid abundance metric derived from stream electro-fishing surveys
Life Stage Specific Survival (analysis)	162 Analyze Data	• Egg to Parr Survival • Smolt to Adult Return • Adult to Adult Return	• Smolt-to-adult return estimate • Out-migration Survival • Adult-to-Adult Productivity
Possible habitat protocol; radio telem	157 Collect Data	• Temperature • Flow	• Flows and Hydrology • CHaMP - Water Temperature

Example for Documenting Locations in Pisces

Please note BPA is looking at improving the ability to document locations through importing existing GIS data or though use of other tools. However until that technology is available please follow these guidelines to document location for monitoring sites. Figure 1. Represents an example of how people may document locations in Pisces. *Please send comments and questions to RMEsupport@bpa.gov.*

1. Sample site locations in Pisces need to labeled clearly and have descriptive names. *(15 mile/8 mile PIT Tag Array, or 1000 meter Spawning Survey Transect Start, **not** Monitoring Site)*

2. For sites with fixed structures or annual sample sites (Weirs, Traps Tag arrays, Creel Survey locations, etc.)

   Place points

3. For Transects (Spawner Surveys, Snorkel Surveys vegetation transects etc.)

   - Use a point to document location
     - Document if the point identified is the Start or End point or midpoint of a transect.
   - Forks or branches in transect should be documented as a start of separate transect on the non mainstem stream.
   - Note that in some transects daily segments may be a portion of the total transect and you should only document one transect. For example one spawning ground survey has 4 continuous 1 mile length segments in Bear Creek, which could be documented as "*Bear Creek spawning ground 4 Mile transect Start*" or " Bear Creek Mainstem Snorkel Survey 10 mile transect end point
   - Using your judgment also consider if there are significant spatial or temporal breaks in the survey (e.g. 200 meters or 1/8 mile or greater) you should consider documenting those as separate transects. Consider separate points if the gap results in tracking separate summary data sets for the transect.

4. For Area Survey (Vegetation Plots, Lidar or remote sensing)

   Place point at the Center (Centroid of a polygon or representative location)

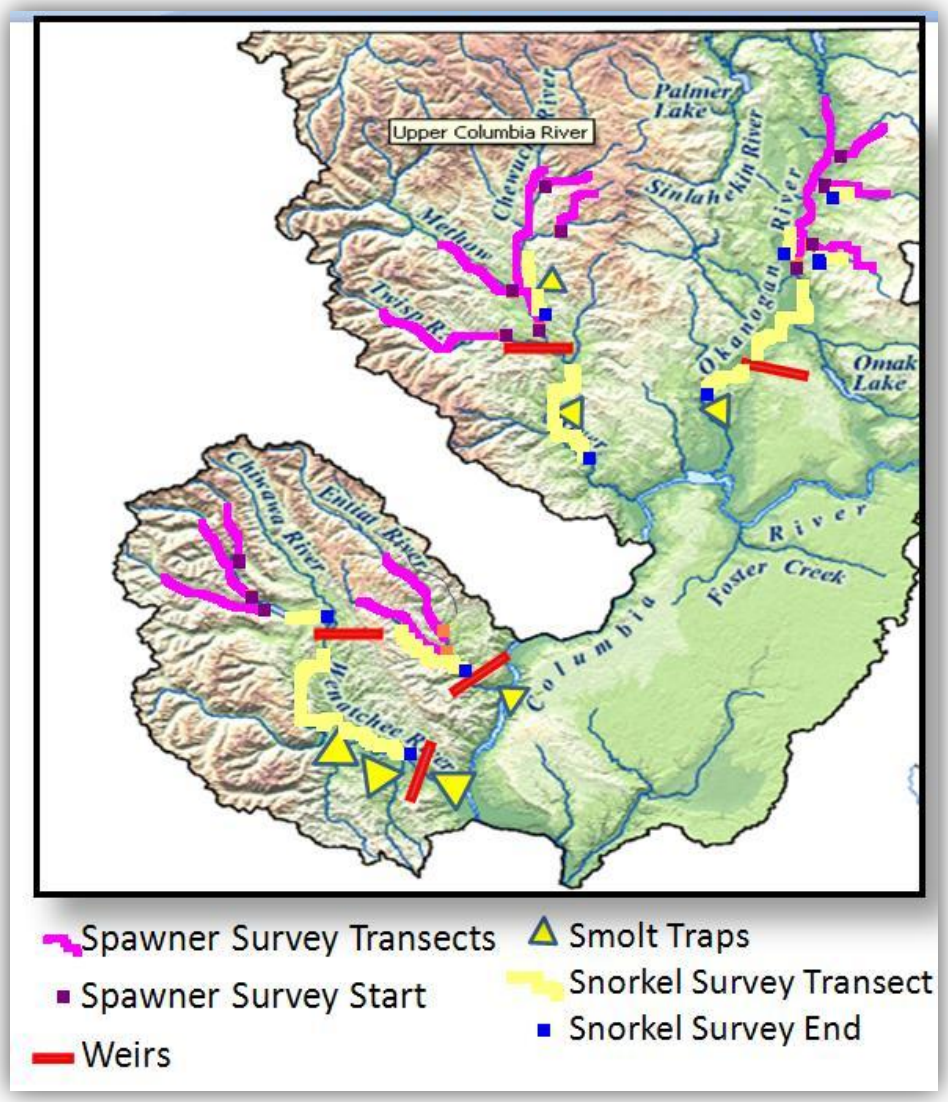

Figure 1. Example of monitoring locations that are tracked as Points in Pisces.