



**pacific northwest aquatic monitoring partnership**  
supporting aquatic habitat and salmonid monitoring programs

# **Integrated Status and Trend Monitoring (ISTM) Workgroup: Developing Tools to Assist In the Regional Development and Coordination of Large-Scale Aquatic Monitoring Programs**



## Integrated Status and Trend Monitoring Workgroup (ISTM)

Goal: Improve integration of existing and new efforts that are intended to address status and trend questions.

### Lower Columbia River Pilot Project

- Processes and tools that aid development & management of monitoring plans for status and trend of ESA listed fish populations and their ecosystems.





## Five basic objectives of ISTM

1. Identify & prioritize decisions, questions, and objectives
2. Review existing programs and designs
3. Identify monitoring designs, sampling frames, protocols, and analytical tools
4. Use trade-off analyses to develop recommendations for monitoring
5. Recommend implementation and reporting mechanisms

Salmon and steelhead monitoring

Decisions  
and  
questions

Review  
existing  
programs

Identify  
potential  
designs

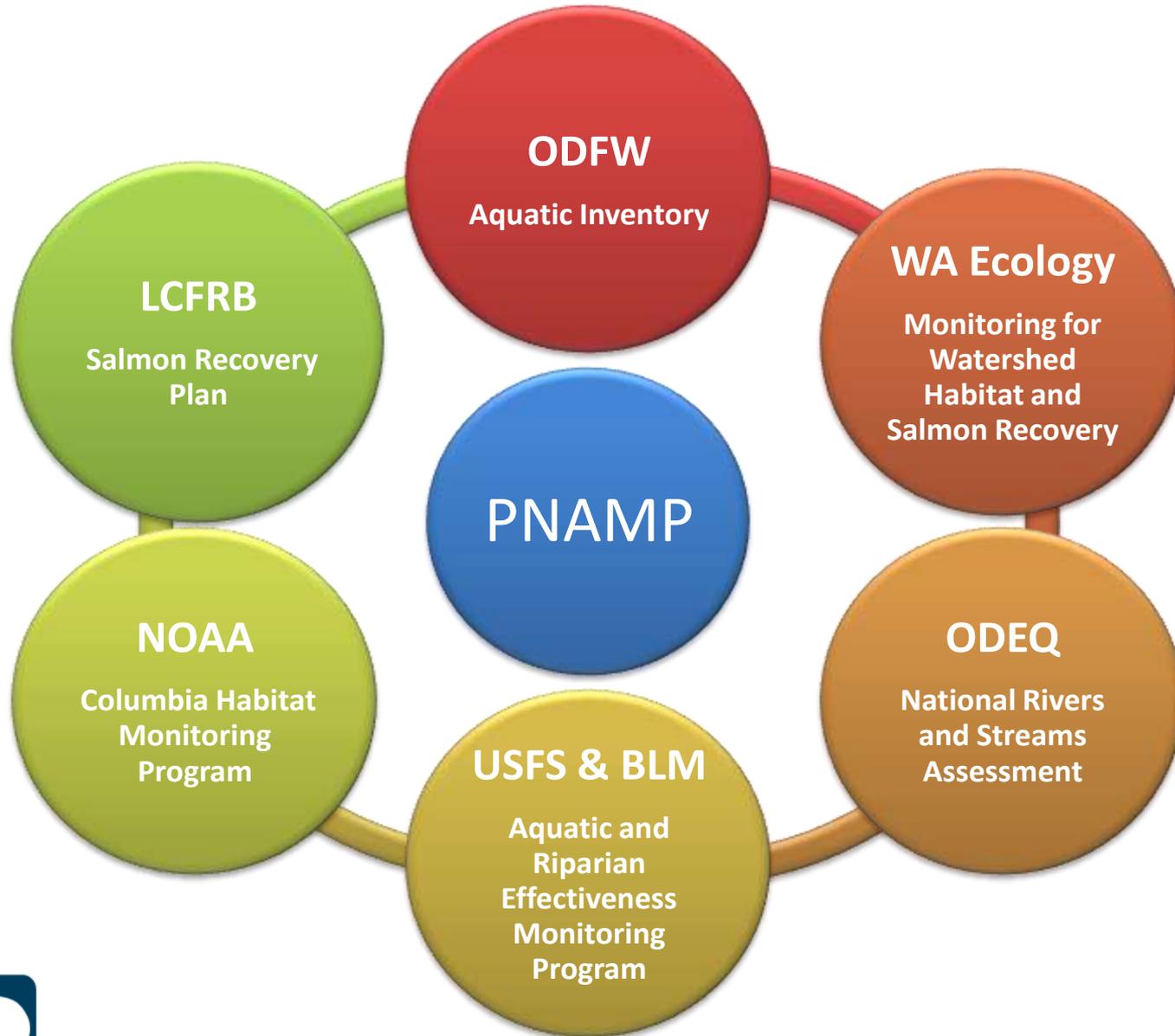
Trade-off  
analyses

Implementation  
recommendations

Habitat & watershed condition monitoring



# ISTM Habitat Partners



To evaluate ability of habitat monitoring programs to share data need to look at entire protocol and use same terminology

- STRIDE

- Spatial design (how we select monitoring sites)
- Temporal design (how we select when we monitor)
- Response design (what and how we measure)
- Inference Design (how we analyze the data)

<https://salmonmonitoringadvisor.org/>



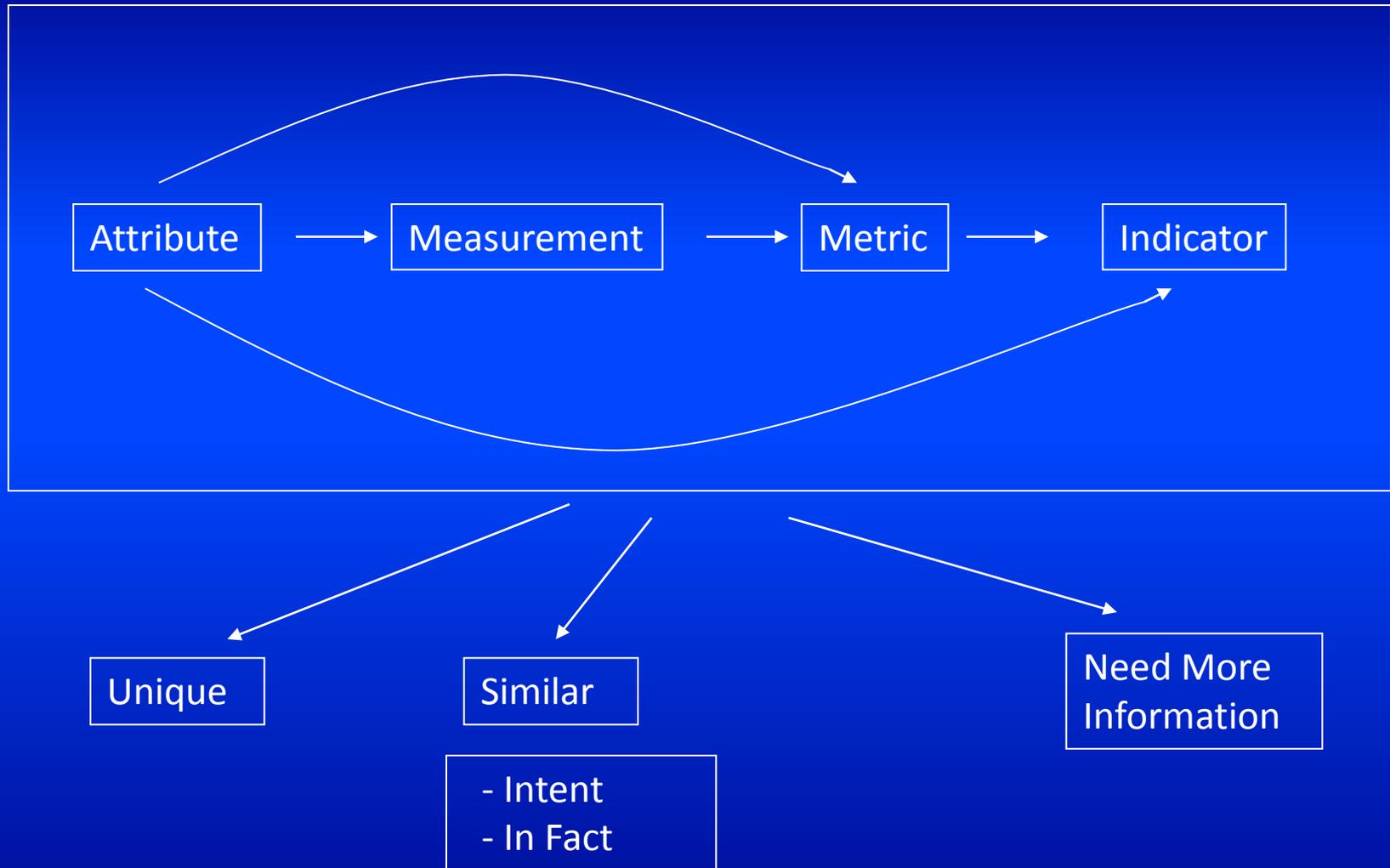


# Key Terms

- Attribute: A habitat characteristic (e.g. wetted channel width).
- Measurement: A field data collection event (e.g. the wetted channel width is measured to the nearest cm with a measuring tape at 10 transects perpendicular to the channel thalweg located equidistant along the survey reach).
- Metric: The reduction or processing of measurements to describe an attribute for a sample site (e.g. average wetted channel width).
- Indicator: The reduction or processing of site metrics to describe an attribute for the area of inference (e.g. cumulative distribution function of wetted channel widths for a river basin).



# Data Elements



# ISTM Habitat Workgroup Attribute Spreadsheet

MONITORING ENTITY	PROGRAM ATTRIBUTE CODE	MEASUREMENT METHOD (i.e field sampling procedure)	METRIC METHOD (i.e. site summary calculations)	INDICATOR METHOD (i.e. analysis that converts site metrics to inference domain characterization)
ODFW	PCTCASC	NA	$((\text{CABAREA} + \text{CABDAREA}) / \text{PRICHNAREA}) * 100$	Mean and cumulative distribution function of site metric from which median, quartiles, or attribute occurrence at any established benchmark can be determined
ODFW	ACH	Measured at start and end of each 1000 meter survey and at three equally spaced transects within the survey reach. Determined by averaging 3 cross-section measurements taken at 25%, 50%, and 75% of the Active Channel Width of the water depth of fast water units or at pool tail crest of pools and adding it to the distance from water surface to the top of the active channel. Changes in vegetation, slope breaks, or high water marks are used as indicators of bankfull height.	Avg: ACH >0	Mean and cumulative distribution function of site metric from which median, quartiles, or attribute occurrence at any established benchmark can be determined
ODFW	PCTBEDROCK	Ocular estimate of the percentage of total substrate area in wetted stream channel that is bedrock in each channel unit	Avg: (PCTBEDROCK)	Mean and cumulative distribution function of site metric from which median, quartiles, or attribute occurrence at any established benchmark can be determined



# Other Information Gathered by ISTM Habitat Workgroup

- Year Started
- Season
- Primary Objective
- Attributes
- Site Length
- Indicator Inference Base Spatial Scale
- Spatial Design Category
- Target Number of Sites/Year/Base Spatial Scale
- Base Temporal Scale
- Temporal Panel Design
- Quality Control
- How Are Data Managed?



# ISTM Habitat Attribute Category Summary

Category	Total number of attributes	Unique	Similar	Need more information
Amphibians	3	1	2	0
Aquatic or Floodplain Geomorphology	137	21	62	54
Disturbance/Restoration	48	21	22	5
Ecological or Geological Classification	5	5	0	0
Environmental Condition	93	11	29	53
Fish	14	5	6	3
Hydrology/Water Quantity	7	4	3	0
Light	7	2	5	0
Macroinvertebrates	7	1	4	2
Mammals	1	1	0	0
Multi-Species	10	4	0	6
Sediment/Substrate/Soils	111	68	23	20
Vegetation/Plants	53	12	14	27
Water Quality	41	11	25	5
Totals	537	167	195	175





## Next Steps

- Once we have a “complete” list of unique and similar attributes we can begin asking:
  - Are the unique attributes needed?
  - At what (if any) spatial scale can information on “similar” attributes be shared?
  - What is the preferred protocol for “similar” attributes that are collected by different protocols? (or, can a variety of protocols be used?)