

Washington Forum on Monitoring Watershed Health and Salmon Recovery

Approved Protocols List

March 25, 2008

The following protocols have been approved by the FORUM as standard protocols to be used by FORUM members in order to create greater uniformity and sharing of data across the agencies, tribes, and individuals. The list was generated to begin the process of adopting standard protocols for Washington for habitat, water quality, and fish abundance monitoring. This is a daunting task because everyone agrees in principle with the need for standards, but it often means that procedures adopted and implemented by some agencies may no longer be considered the best approach. The protocols in this list have been chosen because they have demonstrated under field testing that they have low variance, high signal to noise ratios, and consistent precision. It is anticipated that over time other protocols will be added as they demonstrate that they can meet or exceed the listed protocols.

This list should be considered as the “green list” in that they are accepted as providing high quality data and that agencies should be comfortable in appending the listed protocols to contracts issued by the participating agencies for field work, and for required “in house” monitoring programs. Those protocols offered by consultants and others should be able to demonstrate that their methodology can produce data of equal precision, variance, and signal to noise ratios. It is expected that this list will expand and change as more information about protocols is obtained.

PROTOCOL CATEGORY	PROTOCOL	REFERENCE
Watershed Health Conditions for wadeable streams	These protocols measure instream physical conditions, riparian conditions, and basic fauna relative abundance and taxa. They are useful for determining through probabilistic sampling overall watershed health over large geographic areas.	
	US EPA EMAP Protocols for wadeable streams	Peck, D., J.M. Lazorchak, and D.J. Klemm (editors), 2003. Environmental Monitoring and Assessment Program – Surface Waters: Western Pilot Study Field Operations Manual for Wadeable Streams. U.S. Environmental Protection Agency, Western Division, Corvallis, OR. www.epa.gov/r10earth/offices/oea/ieu/WADEABLE_MANUAL_APR_2003.PDF Kauffman, P.R., P. Levine, E.G. Robinson, C. Seeliger, and D.V. Peck (1999). Quantifying physical

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		habitat in wadeable streams. EPA/620/R-99/003. U.S. Environmental Protection Agency, Washington, D.C.
	US Forest Service AREMP	AREMP, 2006. Field protocols Manual, Aquatic and Riparian Effectiveness Monitoring Program. Regional Interagency Monitoring for the Pacific Northwest Forest Plan, 2006 field season. http://www.reo.gov/monitoring/watershed/AREMP/2004/aremp.htm .
	US Forest Service PIBO	Heitke, J.D., E.J. Archer, D.D. Dugaw, B.A. Bouwes, E.A. Archer; R.C. Henderson, J.L. Kershner. 2006. Effectiveness monitoring for streams and riparian areas: sampling protocol for stream channel attributes. Unpublished paper on file: http://www.fs.fed.us/biology/fishecology/emp .
	Upper Columbia River Protocols	Hillman, T.W., 2006 (August). Draft Monitoring Strategy For the Upper Columbia Basin, Prepared for the Upper Columbia Basin Regional Technical Team and the Upper Columbia Salmon Recovery Board. BioAnalysts, Inc. Eagle Idaho.
Salmonid Abundance Estimates	These protocols are used to estimate instream juvenile abundance, juvenile migrant abundance, and adult spawner abundance	
<ul style="list-style-type: none"> Adult salmon spawner abundance 	Carcass counts of anadromous salmonids	Johnson. D.H., B.M. Shrier, J.S. O'Neal, J.A. Knutzen, X. Augerot, T.A. O'Neil, and T.N. Pearson. 2006. The Salmonid Field Protocol Handbook, Techniques for assessing status and trends in salmon and trout populations. American Fisheries Society ISBN-13: 978-1-888569-92-6. 478 pages.
<ul style="list-style-type: none"> Juvenile Instream Abundance 	Electrofishing backpack and boat	Johnson. D.H., B.M. Shrier, J.S. O'Neal, J.A. Knutzen, X. Augerot, T.A. O'Neil, and T.N. Pearson. 2006. The Salmonid Field Protocol Handbook, Techniques for assessing status and trends in salmon and trout populations. American Fisheries Society ISBN-13: 978-1-888569-92-6. 478 pages.
<ul style="list-style-type: none"> Adult salmon spawner abundance 	Redd Counts	Johnson. D.H., B.M. Shrier, J.S. O'Neal, J.A. Knutzen, X. Augerot, T.A. O'Neil, and T.N. Pearson. 2006. The Salmonid Field Protocol Handbook, Techniques for assessing status and trends in salmon and trout populations. American Fisheries Society ISBN-13: 978-1-888569-92-6. 478 pages.
<ul style="list-style-type: none"> Juvenile Migrant Abundance 	Traps; Rotary Plane and Screw	Johnson. D.H., B.M. Shrier, J.S. O'Neal, J.A. Knutzen, X. Augerot, T.A. O'Neil, and T.N. Pearson. 2006. The Salmonid Field Protocol Handbook, Techniques for assessing status and trends in salmon and trout populations. American Fisheries Society ISBN-13: 978-1-888569-92-6. 478 pages.
<ul style="list-style-type: none"> Adult salmon 	Beach Seining	Johnson. D.H., B.M. Shrier, J.S. O'Neal, J.A. Knutzen, X. Augerot, T.A. O'Neil, and T.N. Pearson. 2006.

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spawner abundance		The Salmonid Field Protocol Handbook, Techniques for assessing status and trends in salmon and trout populations. American Fisheries Society ISBN-13: 978-1-888569-92-6. 478 pages.
<ul style="list-style-type: none"> Juvenile and adult abundance 	Snorkel Surveys	Johnson. D.H., B.M. Shrier, J.S. O'Neal, J.A. Knutzen, X. Augerot, T.A. O'Neil, and T.N. Pearson. 2006. The Salmonid Field Protocol Handbook, Techniques for assessing status and trends in salmon and trout populations. American Fisheries Society ISBN-13: 978-1-888569-92-6. 478 pages.
<ul style="list-style-type: none"> Adult salmon spawner abundance 	Tangle Nets	Johnson. D.H., B.M. Shrier, J.S. O'Neal, J.A. Knutzen, X. Augerot, T.A. O'Neil, and T.N. Pearson. 2006. The Salmonid Field Protocol Handbook, Techniques for assessing status and trends in salmon and trout populations. American Fisheries Society ISBN-13: 978-1-888569-92-6. 478 pages.
<ul style="list-style-type: none"> Adult salmon spawner abundance 	Weirs	Johnson. D.H., B.M. Shrier, J.S. O'Neal, J.A. Knutzen, X. Augerot, T.A. O'Neil, and T.N. Pearson. 2006. The Salmonid Field Protocol Handbook, Techniques for assessing status and trends in salmon and trout populations. American Fisheries Society ISBN-13: 978-1-888569-92-6. 478 pages.
<ul style="list-style-type: none"> Adult salmon spawner abundance 	Tower Counts	Johnson. D.H., B.M. Shrier, J.S. O'Neal, J.A. Knutzen, X. Augerot, T.A. O'Neil, and T.N. Pearson. 2006. The Salmonid Field Protocol Handbook, Techniques for assessing status and trends in salmon and trout populations. American Fisheries Society ISBN-13: 978-1-888569-92-6. 478 pages.
<ul style="list-style-type: none"> Adult salmon spawner abundance 	Fish Counting at Hydroelectric projects	Johnson. D.H., B.M. Shrier, J.S. O'Neal, J.A. Knutzen, X. Augerot, T.A. O'Neil, and T.N. Pearson. 2006. The Salmonid Field Protocol Handbook, Techniques for assessing status and trends in salmon and trout populations. American Fisheries Society ISBN-13: 978-1-888569-92-6. 478 pages.
Data and Metadata Standards	The use of common field protocols is of marginal value if common data standards are not used including a common data dictionary. Following data dictionary and metadata standards are a work in progress but are the standard.	
<ul style="list-style-type: none"> Habitat Restoration Data Dictionary 	Pacific Coastal Salmon Recovery Fund Data Dictionary	National Marine Fisheries Service, Pacific Coastal Salmon Recovery Fund Northwest Fisheries Science Center PCSRF Data System.
<ul style="list-style-type: none"> Reporting time and location data for GIS use 	GIS Location information Approved by PNAMP	Northwest Environmental Data Network (NED). 2007. Best Practices for Reporting Location and Time Related Data, Vers 3.3. 28p. http://www.pnamp.org/web/workgroups/DM/documents/General/2007_0312Location%20&Time_v3.3.pdf
<ul style="list-style-type: none"> Standard formats 	Data Exchange Format Guidelines	State of Washington. SWIMTAC. Data Management and Sharing Guidelines. 5 pages. http://www.swim.wa.gov/documents/DataManagementGuidelines4-04.pdf
<ul style="list-style-type: none"> Metadata 	Data Exchange Format Guidelines	State of Washington. SWIMTAC. Data Management and Sharing Guidelines. 5 pages. http://www.swim.wa.gov/documents/DataManagementGuidelines4-04.pdf
<ul style="list-style-type: none"> Data and 	Data Exchange	State of Washington. SWIMTAC. Data Management and Sharing Guidelines. 5 pages.

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coordinate system standard	Format Guidelines	http://www.swim.wa.gov/documents/DataManagementGuidelines4-04.pdf
Stream macro-invertebrates	Macroinvertebrate Assemblages Approved by PNAMP	Hayslip, Gretchen, editor. 2007. Methods for the collection and analysis of benthic macroinvertebrate assemblages in wadeable streams of the Pacific Northwest. Pacific Northwest Aquatic Monitoring Partnership, Cook, Washington. 27 pages. http://www.pnamp.org/web/workgroups/SC/meetings/2007_0821/2007_0612PNAMP_macroinvert_protocol_final.pdf
Water Quality	Protocols for accredited laboratory analysis of water	<p>WAC 173-50-010 Establishes a state program for accreditation of environmental laboratories which conduct tests and submit data to the department of ecology, the department of health, and other entities which require the use of accredited laboratories.</p> <p>WAC 173-50-030 Objectives. Objectives of the accreditation program are to:</p> <ul style="list-style-type: none"> • Assure accredited laboratories have a demonstrated capability to accurately and defensibly analyze environmental samples; • Assist environmental laboratories in improving their quality assurance/quality control procedures; and • Foster cooperation between the state departments of ecology and health, local agencies, other users of environmental data, and operators of environmental laboratories.