Environmental Monitoring and Assessment Program – Western Surface Waters Pilot

"Demonstrating the monitoring tools to assess the ecological condition of streams across the West"

The EMAP Western Surface Water Pilot is...	A five-year research and monitoring project to assess the ecological condition of streams and rivers throughout the Western U.S. Primary objectives of EMAP-West are to: (1) develop the monitoring tools (biological indicators, stream survey design, estimates of reference condition) necessary to produce unbiased estimates of the ecological condition of surface waters across a large geographic area of the West; (2) demonstrate those tools in a large-scale assessment; and (3) determine the relative risk to surface waters from a comprehensive list of potential stressors.
The geographic scope of EMAP-West is...	EMAP-West will utilize a probability design to measure ecological indicators in streams across the West (the conterminous portions of EPA Regions VIII, IX and X); in addition, a more spatially-intensive design will be utilized to assess ecological condition within one special focus area in each Region (the John Day/Deschutes River Basins in Region X, the Northern California Coast Range in Region IX, and the Upper Missouri River Basin in Region VIII).
Monitoring will be conducted by...	EMAP-West is a partnership between EPA's Office of Research and Development, EPA Regions VIII, IX and X, and the states and tribes that make up the 3 Western EPA Regions. Responsibilities for sampling and assessment will be shared by these groups.
Key elements of EMAP-West include…	*Ecological indicators* – A key goal of EMAP-West is to develop local experience with a broad range of ecological indicators (fish, macroinvertebrate and periphyton assemblages; riparian and in-stream physical habitat; water chemistry) in the West. These make up the list of "core" indicators likely to be utilized both in the region-wide surveys and in the Regional focus areas. An additional list of research indicators is being discussed among ORD, the Regions and their stakeholders; this list includes toxic contaminants, microbiological indicators and riparian birds. *Reference condition* – To use ecological indicator information effectively, we need to be able to compare current indicator status to some measure of reference condition (e.g., derived from historical information, or from the best-attainable current condition). We view the establishment of reference conditions as one of the highest priorities for EMAP-West, and as the first step in the eventual development of biological criteria to complement current state-level criteria for chemical and physical stressors (e.g., nutrients, temperature, etc.). *Accurate estimates of resource* – EMAP uses the EPA River Reach File (RF3, the digital form of USGS 1:100,000 maps) as a frame from which to select a probability sample of streams and rivers. RF3 error rates can be very high in arid areas (particularly for errors of inclusion, where digital maps show a stream trace, but no stream actually exists). A major first goal will be the making of accurate estimates of these error rates, through extensive reconnaissance effort in 1999. *Comprehensive assessments* – One of the strengths of a probability design is that results from a sample survey can be extrapolated to the entire population of resources being examined. For EMAP-West, we are adjusting sample sizes to permit state-level estimates of condition for wadeable streams, and Regional-level estimates for rivers.

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