USDA Forest Service Clark Fork River Basin Monitoring

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I am pleased to be here to share with you Forest Service water quality monitoring activities in the Clark Fork River basin. Throughout the day, we have heard about the many and varied studies and approaches to monitoring water quality in the Clark Fork River. It is important that this information be brought together and shared so that we can understand the cumulative impacts from all ownerships and activities on the Clark Fork River. Under- standing the cumulative impacts is paramount to the management of the water resource in the Clark Fork basin.

As you may know, there are six National Forests that occupy portions of the Clark Fork basin: Flathead, Kootenai, Lolo, Bitterroot, Helena, and Deerlodge. These Forests encompass substantial acres of the watershed and contribute significantly to the flows in the river. These areas are an essential part of the headwaters of the Clark Fork.

Since we have heard a considerable amount of information regarding the results of studies and monitoring, I would like to use my limited time to give you an overview of Forest Service water quality monitoring activities. For this discussion I would like to take a moment to discuss monitoring activities as they relate to National Forest land management activities. Monitoring on National Forest lands can be categorized into three basic kinds. These are broadly described as (I) administration of on-the-ground land management activities, (2) hydrologic monitoring, and (3) aquatic monitoring. Of the three, it is extremely important that we place a high value on supervision of land management activities "on-the-ground" as essential to the protection of water resources.

The design, administration, and follow up review of our day-to-day land management activities is critical in the effort to reduce impacts to the water resource. Monitoring in this category includes timber sale administration to assure compliance with contract requirements and to confirm the implementation of best management practices. Other kinds of monitoring in this category might include administration of road construction, grazing permit administration, mining activities, and so on.

The specific "best management practices" and requirements to be applied during land management activities are developed and determined through the environmental analysis (EA) process. As you know, National Environmental Policy Act (NEPA) requires that these analyses be developed through an inter-disciplinary process. For those activities, which can potentially impact water resources, hydrologists and/or fisheries biologists serve on the teams and do the analyses.

Another key element is the gathering of input from other agencies as well as the interested public. Included is the effort we are currently undertaking with the State Water Quality Bureau, State Forester and other agencies in the design and implementation of a best management practices package that could be used statewide. All of this provides for the recognition of all the values, which could be affected by the activity.

Finally, to plan for and implement appropriate mitigating measures and other requirements set forth in the EA and contracts provides the critical ingredient in reducing and preventing unacceptable impacts to the water resources.

Hydrologic and aquatic monitoring programs provide the means to determine the effects on the water resources and the aquatic environment. These monitoring processes are especially useful where there is a site-specific proposal where we want to check a change in management direction, a new best management practice, or a highly significant project.

All Forests in the basin have implemented monitoring plans, which provide .for hydrologic and aquatic monitoring along with the administration of on-the- ground activities. The Forest Service collects data from almost 100 stations in the Clark Fork basin which are read on the average of six times per year.

Through these monitoring efforts a variety of parameters are measured depending on projected or anticipated impacts. These include stream flows, sediment--both suspended and bed load, chemical analysis--especially phosphates, and macroinvertebrates.

I think it would be worthwhile to cover in some detail a monitoring activity representing a special project undertaken by the Bonneville Power Administration (BPA). This will do several things: (1) provide an example of a monitoring technique, (2) demonstrate the importance of professional interpretation of the data, and (3) show the need for long-term review before drawing conclusions.

In 1983, two stations in Randolph Creek were monitored to assess the water quality effects of building a Bonneville Power substation and the reconstruction of an access road. During the winter of 1982-83, western Montana experienced less than average snowfall. However, a cool and moist spring and summer helped maintain stream flows throughout the year. By April 1, the watershed had much less than average levels of water accumulated in the snow- pack. By June 1, about half the season's snow accumulation had melted. The runoff during these periods produced very little flooding. Cooler temperatures occurred during June, which helped sustain the gradual runoff. The low snow packs and early season melting allowed access to monitoring stations in late March.

The average discharge of the streams monitored was actually lower than the previous year, but the peak discharges were generally within 20% of the 1982 peak.

The two stations on Randolph Creek included an upper station and a lower station. The upper station was above the BPA activity and was supposed to represent relatively undisturbed conditions and should therefore have lower concentrations than the disturbed downstream station. However, during the time of peak flow, the sediment concentrations at the upper Randolph Creek Station were higher than at the lower station. Upon investigation it was determined that the sediment recorded at the upper station was the result of drainage from the surface of a road further up the drainage. This sediment dropped out before reaching the lower station.

This technique of both before and after stations is commonly used. When analysis of the data from these kinds of stations indicates an increase in sediment, adjustments in activities have been made.

This example indicates the difficulty encountered in measuring sediment as it relates to land management activities and the need for professional review and interpretation. Data from monitoring

activities do not always represent what it seems to be. As we learn and apply state-of-the-art methods, we will be better able to interpret these effects. However, this also reinforces the importance of monitoring and inspecting land management activities for the appropriate implementation of best management practices and requirements.

All these categories of monitoring activities will be an important part of forest plan implementation. As you are aware, plans for the forests within the basin are or have been available for public review and comment. I urge you to review these plans and comment on ways they may be strengthened. Simply do not zero in on the monitoring section, rather look at the whole plan, especially the standards and guidelines. Emphasis will be given to the monitoring and supervision of on-the-ground activities. In addition, site- specific hydrologic and aquatic monitoring stations will be established to validate the assumptions used in developing forest plans as well as to measure impacts. Your participation in the review of the implemented best management practices and feedback to us of their success or failure is most important to us.

I have appreciated the opportunity of providing you an overview of Forest Service water quality monitoring activities and encourage you to contact me for specific information regarding monitoring activities in the Clark Fork basin.