AN EVALUATION OF CURRENT PROTECTIONS & PROPOSED CHANGES TO THE AQUATIC CONSERVATION STRATEGY OF THE NORTHWEST FOREST PLAN

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July 2003

This paper examines and compares two alternatives for implementing the Northwest Forest Plan (NWFP) for their effectiveness in protecting and restoring aquatic resources. These two approaches are:

1) the existing approach, which requires that all activities must be consistent with the attainment of the Aquatic Conservation Strategy Objectives (ACSOs) at all spatial and temporal, scales. This approach is referred to as the "No Action Alternative"

2) the Action Alternative in the DSEIS which assumes, by fiat, that the standards and guidelines in Chapter C of the NWFP Record of Decision (ROD) alone meet the Aquatic Conservation Strategy of the NWFP. This approach completely dissolves the ACSOs as requirements. From a land management perspective, it also dissolves the rest of the requirements in the ROD outside of Chapter C. For brevity, this approach is referred to as the "Action Alternative."

As part of this assessment, this paper evaluates the efficacy of the riparian protection measures and associated standards and guidelines under both alternatives for the NWFP in protecting and restoring aquatic resources, including watershed conditions, water quality, stream structure, riparian areas, aquatic habitat, and aquatic biota, including salmonids. For both alternatives, the NWFP standards for the following elements are examined, with respect to their efficacy in protecting and restoring aquatic resources:

- Riparian protections
- Key Watersheds
- Roads
- Grazing management
- Mining
- Logging

The efficacy of riparian reserves

Adequate riparian protection is vital to protecting aquatic resources, as numerous assessments have concluded (Meehan, 1991; USFS et al., 1993; Rhodes et al., 1994; Henjum et al., 1994; CWWR, 1996; USFS and USBLM, 1995; 1997a; b). The failure to adequately protect these areas results increases in the extent, intensity, and duration of aquatic degradation.

Riparian areas provide a variety of functions essential to protecting water quality, channel form, aquatic habitat conditions, and the survival and production of salmonids and other sensitive aquatic biota. Among the most vital riparian functions are the recruitment of LWD, thermal regulation, bank stability, hydrologic regulation, and sediment detention and storage (Meehan, 1991; USFS et al., 1993; Rhodes et al., 1994; Henjum et al., 1994; CWWR, 1996; USFS and USBLM, 1997a; b). These functions are especially critical in watersheds subjected to grazing, mining, and logging and associated activities, because these activities damage riparian conditions, if not adequately restricted. These activities also increase aquatic damage when they occur outside of riparian areas, although adequate riparian protection can ameliorate some of damage caused by upslope impacts. Water quality and fish habitat cannot be protected without protecting riparian areas. Although upland ecosystems must also be protected, there are no measures that can serve as a surrogate for adequate riparian protection, in the protection and restoration of aquatic resources.

There are four primary factors that determine the efficacy of riparian reserves in protecting aquatic resources from continuing damage. First, the riparian reserves must be wide enough to provide the functions essential to the protection of aquatic resources. Second, protections within these reserve widths must be adequate to protect against damage to riparian processes within the reserves and to aquatic resources.

Third, the degree of protection provided by reserve widths and protection over the entire channel network is a critical concern. The failure to adequately protect the entire channel network, and especially headwaters, will result in continued degradation due to channel linkages. Damage to headwater channels ultimately translates into cumulative damage to downstream channels.

Fourth, the condition of riparian areas within reserves is also a major element in their function. Riparian areas that have been damaged by activities such as roads and logging do not provide the same level of aquatic resource protection as fully functional, undamaged areas. Damaged areas within reserves also serve as sources of on-going degradation.

Interim riparian reserve widths

The NWFP ROD establishes interim riparian reserve widths that can be changed once watershed analysis is conducted. Because these widths are subject to change, the efficacy of interim widths and the provisions for width adjustment are evaluated separately.

The interim riparian widths for riparian reserves along streams set by the ROD are summarized as follows:

1) Fish- bearing streams: slope distance of 300 ft, 2 site potential tree heights, or outer edge of

100-yr floodplain or riparian vegetation, whichever is greatest.

2) Permanently flowing nonfish-bearing streams: slope distance of 150 ft, 1 site potential tree ht, or outer edge of 100-yr floodplain or riparian vegetation, whichever is greatest.

3) channelized intermittent streams; slope distance of 100 ft or 1 site-potential tree height, or outer edge of riparian vegetation; edge of riparian vegetation, whichever is greatest; these areas must include unstable and potentially unstable areas.

The widths of **undamaged** riparian reserves, from the edges of floodplains, needed to provide essential stream protection functions are shown in Figure 1, based on a compilation of studies and information reviewed in USFS et al. (1993), Rhodes et al. (1994), USFS and USBLM (1995; 1997a; c), (CWWR, 1996), and Reeves (2003).[1] The widths needed to supply undamaged levels of microclimate regulation, stream shading, and bank stability are based on the information in USFS et al. (1993).

The width of riparian reserves needed to reduce the frequency and extent of blowdown is derived from Franklin and Forman, (1987) which found that blowdown extent and frequency was increased by effects of edges caused by roads and logging. Since the introduction of such edges increase the blowdown of remaining trees regardless of reserve width, the vulnerability of riparian reserves to blowdown does not decrease with increased width. Therefore, any edge diminishes the resistance of riparian reserves to degradation by blowdown, even if the reserve width is greater than 300 ft from the edge of the stream, as shown in Figure 1.

USFS et al. (p. V-38, 1993) noted that based on the lithology of parent material and slope, up to 200 feet from each side of ephemeral streams was needed to protect against downstream degradation from sedimentation **in the absence of mass wasting**, based on professional judgment and experience (rather than any formal analysis of data). However, with mass wasting, these widths would need to be increased to protect intermittent streams. Much of the area within the NWFP is prone to mass wasting (Reeves, 2003). It is a dominant mechanism for increased sedimentation from logging and roads within the NWFP area. Mass failures from roads and logged areas within the forests of the NWFP are more frequent, larger, travel farther, contain less wood, and damage a far greater percentage of stream channels in a watershed than do those from mature forests (Ketcheson and Froelich, 1978; May, 2002). This indicates that riparian reserve widths must be larger than the up to 200 ft estimated by USFS et al. (1993) to be needed in the absence of mass wasting in order to protect against increased sediment delivery and channel damage caused by mass wasting. Riparian reserves would also need to be expanded to buffer some of the impacts from mass failures upslope of the riparian reserves, which can be triggered by existing impacts such as roads and logged areas.

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[1] The second y-axis in Figure 1 is based on the assumption of an average site potential tree height of 150 ft. For simplicity, this assumption is made throughout this paper.