Watershed Condition Indicators - South Fork Clearwater

Watershed Condition Analysis

In 1992, a coarse filter watershed condition analysis was completed for the Nez Perce National Forest (Gloss and Gerhardt, 1992). This assessment considered watershed sensitivity (erosion potential and channel type), disturbance indicators (road density, timber harvest, fire, grazing, and mining), and the condition of streams relative to Forest Plan objective to derive a low-moderate-high rating for each watershed. Watershed sensitivity, as defined in that analysis, is shown on Map 16. It was derived from a generalized Forestwide soil erosivity map and generalized channel type groups within each watershed. Some small watersheds, such as the face drainages along the South Fork Clearwater were excluded from the analysis. Private lands were considered only if they were internal to predominately National Forest watersheds.

The results of the 1992 analysis are shown on Map 30, expressed as high, moderate, and low integrity. The analysis found that, across the Nez Perce National Forest, 53% of area analyzed rated high integrity, 25% rated moderate, and 22% rated low. Within the South Fork Clearwater Subbasin, 33% rated high integrity, 10% rated moderate, and 53% rated low.

In the 1992 report, the watershed condition results were expressed in terms of high, moderate, and low *concern* for watershed condition. For this assessment, those results have been expressed as high, moderate and low *integrity*. The terms *concern* and *integrity* are essentially opposites as used in this context. The results are the same, but the scales have been reversed.

For the current analysis, watershed condition is discussed in terms of disturbance indicators (road density, % timber harvest, % equivalent clearcut area), estimates of sediment yield (% over natural), and narratively for other impacts. This section provides a watershed-wide overview. More detailed discussions of stream channel and fish habitat conditions are found in following chapters by ERU.

Disturbance indicators are used to index watershed condition based on their effects on runoff or erosional processes. For example, roads affect runoff processes through creation of impervious surfaces and disruption of subsurface flow paths. Roads also expose soil and change slope conditions, which nearly always results in increased surface erosion and can result in accelerated rates of mass erosion, relative to natural conditions. Timber harvest effects are generally not as severe on a per unit area basis as roads, but generally result in increased runoff and erosion. The magnitude of timber harvest effects (aside from roads) are similar to fire, although substantial differences exists between timber harvest and fire effects.

Other human impacts that are significant in the South Fork Clearwater, such as grazing and mining, will be discussed narratively. Quantitative disturbance indicators are not readily available nor commonly used for these activities. The following table summarizes current watershed condition indicators for watersheds within the South Fork Clearwater Subbasin:

Table 3.16 Watershed Condition Indicators

Watershed	Area (acres)	Roads (miles)	Road Density (mi/mi^2)	Timber Harvest (acres)	Timber Harvest (%)	ECA (%)	Sed Yield (%)
Mill Creek	23,249	94	2.6	4,586	20	8	8
Johns Creek	72,150	60	0.5	1,198	3	<1	1
Twentymile Creek	14,545	17	0.7	153	1	1	4
Tenmile Creek	34,410	24	0.4	336	1	1	1
Crooked River	45,659	137	2.0	4,616	10	6	8
Red River	103,348	588	3.6	22,939	22	12	24
American River	58,612	213	2.3	8,129	14	10	14
Newsome Creek	42,576	220	3.3	8,010	19	7	13
Silver Creek	16,509	27	1.1	1,097	7	5	3
Peasley Creek	9,112	55	3.8	2,016	22	13	20
Cougar Creek	7,731	48	4.0	1,750	23	12	15
Meadow Creek	24,115	164	4.4	7,684	32	11	16

- Watershed Area, Timber Harvest - From Watershed Database as of 12/11/97
- Roads, Road Density - From RMS (filename INFRA) GIS Overlay as of 10/21/97
- ECA - Projected 1997 % equivalent clearcut area from Watershed Database as of 1/13/98
- Sed Yield - Projected 1998 % sediment yield over base from NEZSED runs as of 8/20/96

Road densities relative to watershed condition have been rated on various scales, depending on the study and its assumptions. In the 1992 Nez Perce National Forest coarse filter analysis, road density less than 1 mile per square mile was rated "low", 1-3 miles per square mile was rated "moderate", and greater than 3 miles per square mile was rated "high". In the ICRB Science Assessment, less than 0.7 was "low", 0.7-1.7 was "moderate", 1.7-4.7 was "high", and greater than 4.7 was "very high".

ECA thresholds of concern have varied considerably, but typically range between 15% and 30% of third to fifth order watershed areas. Current criteria resulting from Endangered Species Act consultation have focused on 15% ECA as a trigger for further analysis in high priority anadromous watersheds.

Table 3.16 gives an indication of how impacts, primarily from roads and timber harvest, are distributed throughout the South Fork Subbasin. This is also illustrated spatially on Maps 12, 13, 14, and 21. Relatively, impacts from these two activities are heaviest in Red River, Newsome Creek, Peasley, Creek, Cougar Creek, and Meadow Creek. Intermediate levels of impact are found in Mill Creek, Crooked River, and American River. The lowest levels of impact are found in Johns Creek, Twentymile Creek, Tenmile Creek, and Silver Creek. More specific discussions of the effects of these activities are found in the ERU descriptions.