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Redwood National Park Document



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Detail Description	The guidelines detailed here concern land use practices in the Park Protection Zone, a sensitive area in the Redwood Creek basin just above the Redwood National Park boundary. As logging in this area can threaten resources within the park, a process had been set up involving park review and comments on timber harvest plans, encouraging cooperation with timber companies to help improve forest practices. In addition to specific guidelines, the document includes a table of statistics on timber harvest reviews conducted by the National Park

L30

~~April~~ April 14, 1986

Memorandum

To: Regional Director, Western Region

From: Superintendent, Redwood

Subject: Land Use Guidelines for the Park Protection Zone

One of the issues raised by the General Accounting Office staff during their recent field trip was the land management practices occurring upstream of the park in the Redwood Creek drainage. We discussed at some length with them our activities (and our inability to provide more effective oversight) in both the Park Protection Zone and the area upstream from it! During the discussion it was indicated the park staff had developed written Land Use Guidelines for the Park Protection Zone in response to U.S. Senate Report 95-528, October 21, 1977.

These guidelines are being used as the source document for our comments to proposed Timber Harvest Plans filed for timber harvesting in the Park Protection Zone. It occurred to us, however, we have not received any acknowledgement, suggestions and/or corrections from either the Regional or Washington Office on the guidelines which were initially submitted (approximately a year ago) at the same time as the 1984 Report to Congress.

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LANDUSE GUIDELINES FOR THE PARK PROTECTION ZONE

BACKGROUND

Concern for protecting downstream resources of Redwood National Park has existed since the initial establishment of Redwood National Park. Public Law 90-545, signed into law on October 2, 1968, authorized the Secretary *"to enter into contracts and cooperative agreements with, the owners of land on the periphery of the park and on watersheds tributary to streams within the park designed to assure that the consequences of forestry management, timbering, landuse, and soil conservation practices conducted thereon, or of the lack of such practices, will not adversely affect the timber, soil, and streams within the park"*.

In January, 1976, the California State Board of Forestry asked the National Park Service to work closely with timber operators in order to protect the buffer zone surrounding Redwood National Park. In March, 1976, Arcata Redwood Company, Louisiana-Pacific Corporation and Simpson Timber Company agreed to voluntarily abide by a logging program that would minimize erosion on lands around the periphery of Redwood National Park. As a result of this, on November 18, 1976, the Justice Department, acting for the National Park Service, signed the two-year Redwoods Agreement with the major timber companies which outlined land use guidelines, allowed detailed review of proposed timber cutting operations by a park service team, and permitted the inspection group to request modification of timber harvesting plans (THP) as needed for park protection.

On March 27, 1978, P.L. 95-250, which expanded the park, was signed into law and established a 30,000 acre Park Protection Zone (PPZ) upstream from Redwood National Park. The act and accompanying legislative history state specifically that the Secretary is to undertake and publish studies on erosion and sedimentation originating within the hydrographic basin of Redwood Creek, as well as develop clear landuse guidelines. The guidelines are to be used as a basis for reasonable cooperative management of the PPZ. In May, 1978, the Deputy Regional Director, Western Region of the National Park Service negotiated a mutual agreement with the California Department of Forestry whereby the park service would 1) be notified of all THP's in the Redwood Creek watershed, and 2) Redwood National Park would participate in the State THP review process by attending and providing recommended mitigation measures on all preharvest inspections within the PPZ and on selected preharvest inspections outside the PPZ.

From January, 1978 to August, 1984, a total of 158 THP's totalling 14,605 acres have been submitted to the California Department of Forestry to harvest timber and build roads in the Redwood Creek watershed (Table 1). Of these, 108 THP's totalling 9,945 acres were inspected by National Park Service professionals.

However, since the passage of P.L. 95-250, in 1978, there has been a considerable reduction in the National Park Service's ability to 1) field review and provide recommendations on commercial THP's, 2) conduct follow-up reviews during and upon the completion of timber harvesting operations and 3) secure access to conduct erosion and sedimentation studies. These processes have formed the backbone of effective erosion monitoring and park protection, since the 1978 act. The threats to downstream park resources, which partly result from continued road construction and harvesting of timber upstream from the park, are as real now as they were when the park was expanded in 1978.

TABLE 1. Summary of annual National Park Service timber harvest reviews conducted on lands upstream from Redwood National Park.

	1978*	1979	1980	1981	1982	1983	1984**	TOTAL
Plans Submitted	22	40	27	12	15	27	15	158
Park Protection Zone (PPZ)	13	26	14	4	11	15	4	87
Upper Basin	9	14	13	8	4	12	11	71
Total Acreage	2,213	2,759	3,510	977	750	2,777	1,619	14,605
Plans Inspected by National Park Service PPZ/UPPER BASIN	12/2	25/5	14/5	4/4	11/3	15/3	4/1	108
Acreage Inspected by National Park Service	1,365	2,292	3,084	625	630	1,614	335	9,945

* - Does not include 24 timber harvesting plans covering 837 acres located on private lands in the 1978 expansion area which were field inspected but never harvested.

** - As of September, 1984

In mid-1983, and without prior notification to the National Park Service, a change in administrative procedure within the California Department of Forestry effectively precluded National Park Service participation in the field review of timber harvesting and road construction plans on lands upstream from the Park Protection Zone. Participation is now allowed only when land and timber owner permission can be secured before the field review. Currently, CDF regularly notifies the National Park of all THP proposals for the PPZ only. Many THP's for lands upstream from the PPZ have been submitted, field reviewed and approved by the State in 1984 without notification to the National Park Service.

Nothing precludes CDF from also requiring the National Park Service to secure landowner permission to inspect harvest plans in the PPZ. Likewise, it is unlikely the NPS could secure permission from private landowners for access to review landuse proposals in the PPZ. These possibilities were envisioned in the legislative history of H.R. 3813 (the Burton expansion bill) where it is stated, *"a significant portion of the legislation is concerned with the problem of protecting both the lands acquired on October 2, 1968, and the additional lands proposed to be acquired by this bill within the Redwood Creek basin."* On April 22, 1977, The Secretary of the Interior testified that the 48,000 acre acquisition proposal (i.e. park lands as of March, 1978) is not self protective: *"It is our best judgment that acreage in excess of 48,000 acres is not necessary to protect the park as long as timbering activities throughout the remainder of the watershed remain regulated by the State of California in concern with the National Park Service"* (emphasis added).

On October 13, 1977, the Senate Committee on Energy and Natural Resources also realized the need to protect park resources from potentially damaging landuse activities being carried out upstream from the park. In passing the Senate version of the Bill (S1976), they stated, *"it is the sense of the committee that there will be a continued need to protect the expanded Park from actions on private lands located within the same ecological unit as the park. In part, this need can be met by the exercise of the authorities provided by existing section 3(e) of the 1968 Act."*

The Committee recognized that the National Park Service had been provided the opportunity to pre-inspect company timber harvest plans according to an agreement between the concerned companies and the Department of Justice. (As of 1979, this is no longer the case). According to the committee, *"this process appears to be working successfully and should be continued."* The committee recognized, however, that neither section 3(e) nor legal action have been totally successful in protecting park resources in the past. To this end, they required the National Park Service to formulate rules and regulations for adoption by the Congress to protect and preserve Redwood National Park resources. *The Secretary is instructed to develop clear guidelines...the Secretary is also expected to report decisions to the committee and to the House committee on Interior and Insular Affairs concerning the guidelines that are developed and the progress that is made in implementing the provisions of this park protection zone.*

Successful implementation will depend on a number of factors. The principal among these are mutual cooperation between landowners and the N.P.S. as well as timely access privileges needed to review landuse proposals and operations. For example, access will be needed for the review of proposed, ongoing and completed landuse operations such as, logging, road construction or reconstruction, site preparation, commercial thinning, log hauling, quarrying, erosion control work, road maintenance, and other related tasks. Access will also be needed to perform tasks related to the design, implementation and verification of studies concerning the causes, prevention and control of man-caused erosion, as well as, studies intended to understand and quantify natural, background erosion levels.

As a result of the park's involvement in THP field reviews and erosion and sedimentation studies carried out in the Redwood Creek watershed since 1978, the National Park Service has acquired a sound professional basis for promulgating landuse guidelines intended to assure long term protection of the downstream riparian and aquatic resources of Redwood National Park. The guidelines which follow were developed, in part, to fulfill the Service's statutory and fiduciary duties with respect to the protection of irreplaceable park resources from the individual and cumulative impacts of land use operations conducted upstream from the park.

LANDUSE GUIDELINES FOR THE PARK PROTECTION ZONE (PPZ)

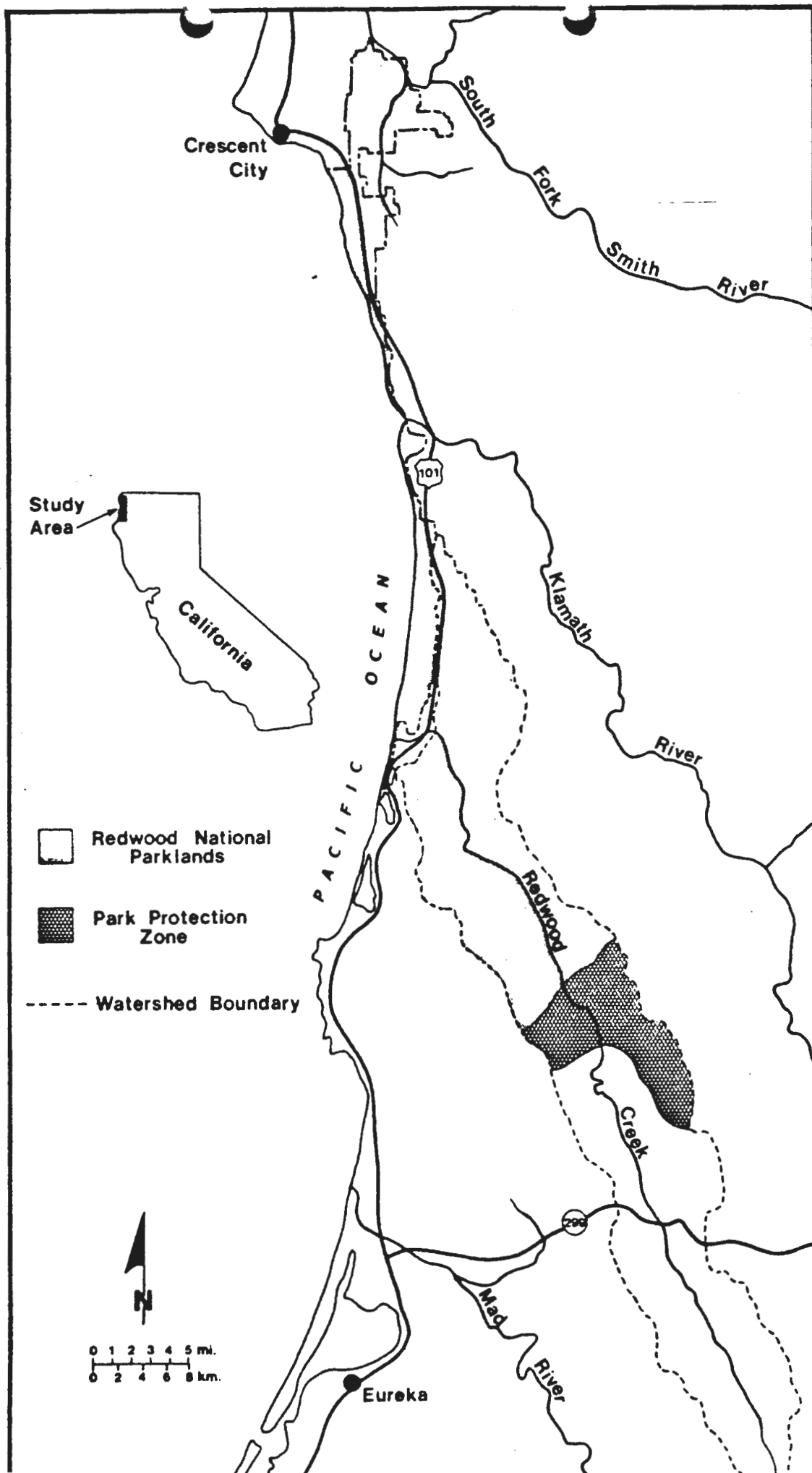
The following landuse guidelines were developed, as directed by Congress (95th Congress, Senate Report 95-528, October 21, 1977), to serve as the basis for reasonable cooperative management of the 30,000-acre Park Protection Zone, upstream from Redwood National Park. They are specifically applicable to areas of the Redwood Creek watershed shown on the attached map (Figure 1). These guidelines apply to all landuse practices that significantly disturb soil or vegetative cover. When timber harvesting is proposed, they are to be used in conjunction with requirements of the State of California forest practice regulations. The guidelines have been developed to provide as full protection as reasonably possible for National Park resources in Redwood Creek while at the same time permitting the orderly harvesting of timber and use of surrounding private land.

I. Submission, Review and Inspection of Landuse Plans

- A. Submit a copy of proposed Timber Harvest Plans (THP) to the National Park Service, Redwood National Park, 791 8th St., Arcata, CA, 95521 two (2) weeks prior to filing with the California Department of Forestry.
- B. At the option of the N.P.S., a field inspection separate from and earlier than the C.D.F. pre-harvest inspection may be needed for harvest plans which:
 - a) involve more than 100 acres of timberland,
 - b) involve over two miles of new road construction or reconstruction,
 - c) contain or are adjacent to any landslide over 0.5 acres in size,
 - d) contain areas with a high or extreme mass-erosion hazard rating (as described in attachment) or
 - e) contain or abut a Class I perennial watercourse.
- C. Submit for review by the National Park Service plans for all other proposed earth moving activities not requiring a timber harvest plan (e.g. road construction, road reconstruction, stream clearance, quarrying) four weeks prior to the commencement of operations. The National Park Service may need to field review proposed operations.
- D. Submit to Redwood National Park, copies of all California Department of Fish and Game 1603 permit applications and C.D.F. Timber Harvest Plan exemptions, amendments, and fire plans concurrent with their submission to the State of California. Proposed work sites may need field inspection by the N.P.S.

II. Road Construction, Reconstruction and Maintenance

- A. Define logging roads on lands within the P.P.Z. as either permanent, active-temporary, or inactive-temporary. Inactive-temporary logging roads are those dead-end road segments which are not now being used for log hauling, which will not or cannot be extended into areas of commercial timber and along which no viable quantities of commercial timber exists.



- B. Regularly maintain all permanent roads and all active-temporary roads (those temporary routes which are part of an active THP) by performing preventive summer maintenance and winter storm maintenance (this includes cleaning culvert inlets, correcting or repairing slip-outs, constructing or repairing waterbars and accomplishing other erosion control work).
- C. Install cross-road drains and entirely excavate stream crossings on temporary roads upon completion of timber operations. Extend excavation down to the original channel bed and shape stream banks to a stable angle. Place all excavated fill where neither storm runoff nor mass movement will cause it to enter the stream.
- D. Currently unused, unmaintained roads (those which have not been used during the preceeding three years) need to be either brought up to maintained standards, as described above, or designated as inactive-temporary roads. Inactive-temporary roads should be brought up to specifications as outlined in II.C. above (i.e. stream crossings excavated; cross-road drains constructed, etc.), within two years.
- E. When gullies and landslides that will add sediment to any stream are identified, initiate stabilization measures within one (1) month of the detection.
- F. In proposed timber harvesting plans, culvert sizes for stream crossings on permanent and active-temporary logging roads should include:
 - 1) All calculations used to predict peak flood flows,
 - 2) All factors and numerical coefficients used to make stream discharge estimates based on vegetative and ground conditions expected immediately after logging; and
 - 3) Computations utilizing Redwood Creek rainfall intensity data available from Redwood National Park.
- G. Use bridges to cross all streams which are shown to require the equivalent of a 60-inch or larger culvert. A permanent or temporary bridge structure (depending on the road classification) could be used unless a written feasibility analysis shows that a culverted crossing would be both economically and environmentally preferable. In order to ensure such culverted crossings remain intact, both upstream and downstream fill faces should be rip-rapped with coarse rock armor.
- H. Construct or reconstruct stream crossings so they have a low potential for future stream diversion. That is, either dip the road grade into the crossing from both approaches, or construct a large berm (cross road drain) across the lower approach to direct diverted stream-flow immediately back into its channel.
- I. Within the active life of a THP (generally three (3) years from its submittal) upgrade, where necessary, all logging roads which are under the ownership of the timberland owners and which are used for log hauling from the plan area. "Upgrading" consists of re-fitting underdesigned stream crossings with culverts capable of passing the

50-year flood discharge, installing trash racks and downspouts where necessary, building large berms or cross-road drains to prevent large gullies from developing at stream crossings with high diversion potentials and cleaning away loose organic debris for approximately 50 feet above the culvert inlets.

- J. Provide a written feasibility analysis as part of the THP in situations where any new road construction is proposed to access timber already accessible from existing roads, regardless of ownership.
- K. Harvesting operations under excessively wet conditions occurs when mud flows from ruts in a landing or roadbed and when a muddy slurry enters any designated Class I, II or III watercourse (see California forest practice rules for watercourse definitions). When such conditions occur, halt operations until sufficient drying has occurred to undertake activities to protect the road surface (e.g., adding rock, etc.).
- L. Build full-bench roads, with all spoil being endhauled to a stable site, when roads to be constructed or reconstructed cross steep ($\geq 50\%$) slopes which extend continuously to a stream channel.
- M. Excavate and place in a stable location all unstable, uncompacted landing and road fill (including organic debris) resting on steep ($\geq 50\%$) slopes which extend continuously to a stream channel.

III. Timber Harvesting

- A. Land and timber owners should prepare and have available for review a five-year road construction, re-construction and timber harvesting schedule for their holdings in the PPZ. Revise plans every three (3) years.
- B. To address potential cumulative effects in basins over 1000 acres in size, limit harvesting to 25% of the crown area over a minimum period of 25 years.
- C. Utilize alternatives to clear-cut harvesting (e.g., light-selection or light-shelterwood cuts where no more than 50% of the existing basal area is removed with reentry in not less than 10 years, or, alternatively, utilize no-cut buffers,) on steep, potentially unstable and unstable inner gorge slopes, as well as on and above large landslides and unstable areas (>1 acre in size) where failure material has clear access to stream channels. Inner gorge areas include the steep slopes ($\geq 65\%$) between the stream channel and the first major break-in-slope above the stream. Potentially unstable and unstable slopes are defined as having a mass Erosion Hazard Rating (EHR) of moderate or greater (see attached rating system). Select alternative harvesting methods to minimize risk of initiating or accelerating landsliding.
- D. Strictly limit or defer all cutting on unstable or potentially unstable (mass EHR is moderate or greater) inner gorge slopes along class I and class II watercourses.

- E. Limit clear-cut harvesting units to a 40 acre maximum size where the mass-E.H.R. is moderate. Where the mass-E.H.R. is high, limit clear cuts to 20 acres, or less, and intervening 300-foot leave strips should not be harvested until 5 years following completion of stocking of adjacent areas. Conduct no clear cutting on plan areas where the mass-EHR is extreme.
- F. Limit tractor yarding to slope areas which average no steeper than 50%, except where stable, existing skid trails can be re-used, or where an acceptable justification is included with the timber harvest plan.
- G. Do not construct skid trails or tractor firebreaks on steep ($\geq 50\%$) slopes which lead without break to a stream channel or where the mass-E.H.R. is high. Limit the use of tractors to unbroken streamside slopes less than 35% in gradient where the mass-E.H.R. is high.
- H. Flag proposed skid trails prior to the National Park Service field inspection:
 - 1. on landslides and unstable areas,
 - 2. on slopes over 35% where the mass-E.H.R. is high or extreme,
 - 3. in stream protection zones; and
 - 4. on steep ($\geq 50\%$) slopes which lead without break to a stream.

IV. Stream Protection

- A. Do not broadcast burn:
 - 1. stream protection zones (SPZ) on any watercourses capable of transporting significant quantities of bedload sediment, or
 - 2. inner gorge slopes or slopes where the mass-E.H.R is moderate or extreme.
- B. Extend stream protection zones which cross landslides or unstable slopes to above the upper limit of observed instability.
- C. Leave in place or bucked off above the ground surface, logs and root-wads which are keyed into the bed or banks of a stream channel. Remove to a stable location loose rootwads which could roll downslope into a stream channel.

INSTRUCTIONS FOR USE OF MASS-MOVEMENT CHECKLIST
AND MASS EROSION HAZARD RATING

The susceptibility of many hillslopes to mass erosion (landsliding) following landuse is dependent on a number of factors. The Mass-Movement Checklist and Mass Erosion Hazard Rating systems have been developed to help anticipate problem areas. Based on the assigned rating, certain types of standard forest land use practices need to be modified when activities are planned for unstable and potentially unstable hillslopes. These modifications have been built into the landuse guidelines.

1. Complete Step 1 (MASS-MOVEMENT CHECKLIST) by carefully reviewing site conditions present within the proposed THP area.
 - a. If no categories are checked during Step 1 (MASS-MOVEMENT CHECKLIST) as a result of the inspection of the THP area, then the plan area is considered to have a low mass-movement potential, and the completion of Step 2 is not necessary.
 - b. If any of the conditions exist (i.e., any of items 1 through 4 are checked), then a potential for mass movement of soil and rock exists and a calculation of Step 2 (MASS MOVEMENT HAZARD RATING) is needed.
2. If any item was checked in Step 1, complete Step 2 (MASS EROSION HAZARD RATING) for the proposed THP area by circling the appropriate field description which best describes each category. Sum the points and determine what the MASS EROSION HAZARD RATING is (i.e., less than 11 points = moderate; 11 to 22 points = high; and over 22 points = extreme).

STEP 1: MASS MOVEMENT CHECKLIST

Factors Indicating Existing or Potential Mass Movement

EXISTING MASS MOVEMENT FEATURES (see following page for fuller description)

1. _____ Existing Landslide (area of recent soil movement over an area which is a half acre or more in size).

OR

POTENTIAL MASS MOVEMENT FEATURES (see following page for fuller description)

2. _____ Shallow Landsliding Potential: Slope gradient 65% or more and soil mantle depth less than ten feet to unfractured bedrock and soil texture is noncohesive. Slope located in inner gorge or at head of ephemeral stream.

OR

3. _____ Deep Landsliding Potential: Slope gradient 65% or more and hummocky terrain or surface cracks or hydrophytes or leaning trees are present, over an area of an acre or more.

OR

4. _____ Deep Landsliding Potential: Slope gradient is less than 65% and hummocky terrain or surface cracks or hydrophytes or leaning trees are present, over an area of five acres or more. (See following page for fuller description.)

* If any one of the above conditions exist, a potential for mass movement *
* of soil exists and a calculation of the MASS EROSION HAZARD RATING is *
* required. Go to Step 2. *

Factors Indicating Existing or Potential Mass Movement

I. Shallow-Seated Landslide

A. existing

An area where surficial material (unconsolidated rock, colluvium, and soil) has moved downslope along a relatively steep, shallow failure surface. The failure surface is generally greater than 65% in steepness and less than 5 feet in depth. It is usually characterized by: (1) a scarp at the top; (2) a concave scar below the scarp, where surficial material has been removed; and sometimes (3) a convex area at the bottom where slide material is deposited. Vegetation is usually disturbed (tilted trees), anomolous (younger, even-aged stand), or absent (bare soil). Minor bank slumps are excluded from this definition.

B. potential

The slope gradient is greater than 65 percent with a soil mantle depth less than 10 feet, including fractured rock lying on hard rock or another comparatively impermeable substrate. West of Redwood Creek the soil is poorly drained, unconsolidated and has a mottled g-horizon within 3 feet of the surface. East of the Creek it may be characterized by non-cohesive colluvial soils consisting of sands, gravels or abundant rock fragments. Susceptible areas are found less than 100 feet downslope from convex slope breaks located in stream side gorges or in minor swales at the heads of ephemeral streams.

II. Deep-Seated Landslide

A. existing

An area where landslide material has moved downslope either as a relatively cohesive mass (rotational slides and translational block glides) or as an irregular, hummocky mass (earthflows). The failure surface is generally deeper than five feet and is usually well-exposed at the head scarp. Complex failures with rotational movement at the head and translational movement or earthflows downslope are common. Vegetation on rotational and translational slides is relatively undisturbed, although trees and shrubs may be pistol-butted or tilted. Earthflows are common in grassland areas. Deep-seated landslides may have intermediate tension cracks, scarps, and shallow slides superimposed throughout the slide mass.

B. potential

The area characterized by all or some of the following: hummocky topography consisting of rolling, bumpy ground, frequent benches, and depressions; short irregular surface drainages begin and end on the slope; tension cracks and head wall scarps indicating slumping are visible; slopes are irregular and may be slightly concave in upper half and convex in lower half as a result of previous slope failure; there may be evidence of impaired ground water movement resulting in local zones of saturation within the soil mass, which is indicated at the surface by sag ponds with standing water, springs, or patches of wet ground. One or more of the following are present: hydrophytic (wet site) vegetation prevalent; leaning, jackstrawed, or split trees are common; pistol-butted trees with excessive sweep may occur in areas of hummocky topography.

Step 2. Evaluation of the MASS EROSION HAZARD RATING for a Timber Harvest Plan Area, Park Protection Zone

- - - - - Points to be Allocated for each Category - - - - -
1 2 3

CATEGORY	PICK APPROPRIATE DESCRIPTIONS		
1. Size of largest existing landslide in plan area (ac)	under 1/2	1/2 to 1	over 1
2. Time since last movement (yrs)	over 100	50 to 100	under 50
3. Mean slope gradient of plan area (percent)	under 50	50 to 65	over 65
4. Slope position of plan area	ridge or convex slope	straight or broken, benchy slope	swale or concave slope, or below major slope break
5. Does plan area contain inner gorge slopes	No	yes, on Class II	yes, on Class I
6. Proximity of plan area to designated stream channels	over 500' to nearest Class I or II	less than 500' to Class I or II	abuts a Class I or Class II stream
7. Vegetation (conifers)	some tilted or swayed trees	many tilted or swayed, some fallen trees	many tilted, swayed and/or fallen; old growth absent, young even age stand locally present
8. Ground water conditions	few seasonal springs	springs and hydrophytes locally abundant	widespread alder regrowth springs and hydrophytes locally abundant
9. Ground rupture in plan area	small head or lateral scarps locally visible, may be moss covered, dis-	ancient scarps common; fresh scarps locally visible but discontinuous	scarps fresh and sen- continuous or continuous; may be 5 feet or higher
10. Stability of adjacent,	occasional, small landslides	numerous small slides or occasional large landslides over 1 acre	numerous small slides earthflows or large slides along stream channels

*
* Calculation of MASS EROSION HAZARD RATING: Point Totals for less than 11 = MODERATE *
* Categories 1 & 2 & 3 &...& 10 11 to 22 = HIGH *
* over 22 = EXTREME *
*
