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Forest
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File Code: 2500

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Route To:

Subject: Best Management Practices: Evaluation Program and Concurrent Monitoring Reports

To:

Results of the 2000 BMP Evaluation Program monitoring and 1999-2000 Concurrent Monitoring of timber sales, roads, recreation, grazing, prescribed fire, mining and tractor piling on the Klamath National Forest are enclosed with this letter. Evaluation of BMPs was conducted by District and Forest personnel using Regional procedures from October 1999 through November 2000. The purpose of this monitoring is to validate implementation and effectiveness of BMPs associated with these activities. Best Management Practices are procedures intended to protect water quality and insure statutory requirements are met with the State. Monitoring results are used to adapt future management actions where improvements in meeting water quality objectives are indicated.

The BMP monitoring report includes an executive summary of findings, summary by project type, problems, effects and management recommendations.

We are hopeful that these reports provide useful information concerning Northwest Forest Plan implementation and demonstrate that most activities are being performed in a manner that meets water quality and aquatic habitat objectives. If you have questions or suggestions which make this report more useful, please contact Al Olson, Aquatics Program Coordinator, 530 841-4417. Technical questions regarding site evaluations should be directed to Tom Laurent, 530 841-4416. The report can be accessed on the Forest's Web page at the following Internet address:
www.r5.fs.fed.us/klamath/mgmt/analysis.html

Sincerely,

/s/ MARGARET J. BOLAND

MARGARET J. BOLAND
Forest Supervisor

Enclosures



Klamath National Forest

Best Management Practices

**REGION 5
EVALUATION PROGRAM
WATER QUALITY
MONITORING REPORT**

Evaluation of
Forest Service Administered Projects
Including, Timber Sales, Roads,
Prescribed Fire, Mining Activities
and Revegetation Activities During
2000

www.r5.fs.fed.us/klamath/mgmt/analysis.html

Natural Resources Staff
1312 Fairlane Road
Yreka, CA 96097

**KLAMATH NATIONAL FOREST
2000
BEST MANAGEMENT PRACTICES (BMP)
EXECUTIVE SUMMARY**

This year (2000) represents the ninth year of the Best Management Practices Evaluation Program (BMPEP) on the Klamath National Forest. This program is designed to evaluate how well the Forest implements BMPs and how effective the BMPs are in keeping sediment out of watercourses. On site evaluations have been divided into 28 categories that reflect timber, engineering, recreation, grazing, fire, mining, and vegetative activities and programs.

In 2000, 45 projects or sites were drawn at random from Forest activity pools based upon Regional activity assignments. Each project or site was reviewed for BMP implementation and effectiveness. The category and types of projects monitored were: timber (15 sites), roads (23 sites), recreation (2 sites), grazing (3 site), fire (1 sites), and tractor piling (1 sites). Monitored activities occurred on Happy Camp, Salmon River, Scott River, and Goosenest Districts

Evaluation of BMP Implementation compliance involved (1) doing what we said we were going to do to protect water quality and (2) determining project document sufficiency regarding watershed objectives. BMP Effectiveness compliance involved determining if water quality protection measures were effective in meeting management objectives. The table below summarizes the results of the BMP Evaluation Program for 2000, as well as from previous years.

Monitoring Years	Total # of Sites Monitored	Sites Meeting BMP Monitoring Criteria			
		Implementation		Effectiveness	
		# of Sites	% of Total Successful	# of Sites	% of Total successful
1992	53	29	55%	43	81%
1993	77	61	79%	72	94%
1994	52	39	75%	46	89%
1995	77	64	83%	74	96%
1996	57	48	84%	56	98%
1997	60	60	100%	59	98%
1998	61	38	62%	30/35	86%
1999	38	25	66%	34	89%
2000	45	40	89%	43	96%

Implementation standards for BMPs were fully compliant on 89% of the sites evaluated. BMP effectiveness requirements were met on 96% of the sites evaluated. This represents a significant improvement in BMP implementation and effectiveness compared to 1999. Areas in need of improved BMP implementation are SMZ widths, road decommissioning and grazing. Areas in need of improved BMP effectiveness are grazing, road decommissioning practices.

BMP MONITORING REPORT

INTRODUCTION

On-site evaluations are the core of the BMP Evaluation Program. There are 30 different evaluation procedures designed to assess a specific practice or set of closely related practices. Evaluation procedures vary greatly based upon the management activity evaluated, but the overall evaluation process is similar. The type and number of management activities evaluated each year on the Forest are assigned by the Regional Office. The specific management activity sites evaluated are randomly selected from project pools. The criteria for sample pool development have been standardized by the Region for each activity type and are described in the BMP User's Guide (1999).

One of the goals of BMP monitoring is to strive for interdisciplinary evaluation of projects including the project proponents and watershed personnel. This gives direct feedback to the project proponent on how well the BMP was implemented and provides for adaptive management, if necessary, on future project development.

No concurrent BMP monitoring is included in this report.

SAMPLING

Data collection methods are specific for each BMP and are described in the 1999 BMP User's Guide. BMP evaluations that require monitoring soil cover use the Forest's soil cover monitoring procedures developed by the Forest in 1998. The types of data gathered are identified for each BMP and is used to answer specific evaluation questions on each BMP evaluation form. Management activities, such as timber projects, roads, prescribed fire, tractor piling require: 1) a prepared EA or EIS; 2) all contract requirements be met; and 3) at last one winter (but not more than 3 winters) has passed since contract requirements have been met.

The timber and roads project sample pool was developed from a list of closed timber sales. The prescribed fire sample pool was developed from a list of completed burn projects. The recreation sample pool was the list of all known developed sites on the Forest. The range sample pool was a list of active grazing allotments on the Forest by district.

BMP evaluations were coordinated and conducted by Tom Laurent, Sharon Koorda, Robbie Van de Water (with District assistance), Don Elder (with District assistance).

SUMMARY BY PROJECT TYPE

T01 Streamside Management Zones

Five harvest units were reviewed from the Canon Timber Sale on the Scott River District. Four of the reviewed harvest units did not use EA recommended SMZ widths . The SMZs as located on the ground varied from 50 to 200 feet wide. The recommended minimum width was 150 feet. Only 1 (20%) of the sampled SMZs met BMP implementation evaluation requirements and all of the sampled SMZs (100%) met BMP effectiveness evaluation requirements.

T02 Skid Trails

Three skid trails were evaluated from the Canon Timber Sale on the Scott River District. The three randomly selected skid trails met all evaluation criteria for BMP implementation and effectiveness requirements. The water bar failure rate varied from 0 to 4%. Sediment from the failed water bar did not reach a stream course.

T03 Suspended Yarding

Three harvest units from the Canon Timber Sale on the Scott River District were evaluated. These three harvest units met all evaluation criteria for implementation and effectiveness. Soil cover within these SMZs was >80%. There was no visible ground disturbance within the SMZ from yarding activities.

T04 Landings

Four timber sale landings were reviewed from the Canon and Upper South Fork Timber Sales on the Scott River and Salmon River Districts.

All four landings met BMP implementation and effectiveness requirements

E08 Road Surface, Drainage and Slope Protection

Four road construction (1) and reconstruction (3) projects from Canon Timber Sale (roads 44N59YA, 44N41, 44N59Y, 44N45A) on the Scott River District were reviewed. All four of the projects met BMP implementation and effectiveness requirements.

E09 Stream Crossing

Four stream crossings were evaluated associated with each of the roads identified under E08. Stream crossing types were a rocked ford, culvert on an intermittent stream, a spring crossing

and a dry draw. All four of the projects met BMP implementation and effectiveness requirements.

E10 Road Decommissioning

Three road-decommissioning projects (roads 45N86, 16N28, 18N13 and 18N13B) on the Happy Camp District were evaluated. All three projects successfully met all BMP implementation requirements. Roads 18N13 and 18N13B were ongoing projects and BMP effectiveness was not evaluated. Road 16N28 successfully met BMP effectiveness requirements. Road 45N86 did not successfully meet BMP effectiveness requirements. Fifty percent of the evaluated sites met BMP requirements. Of the two monitored sites that did not meet BMP requirements, one was a minor failure and the other was a major failure. The problems were the result of an off-forest engineering inspector (on a detail) making contract modifications (poor judgment) that did not remove all of the fill material within the floodplain. The contract specifications called for the removal of the entire fill located in the floodplain.

E11 Control of Sidecast Material

Sidecasting associated with the four roads identified under E08 was evaluated. All four sites met BMP implementation and effectiveness requirements.

E13 In-Channel Construction Practices

Four in-channel projects on the Happy Camp, Salmon River and Oak Knoll Districts were evaluated. The projects were associated with roads 17N16 and 18N17 on Happy Camp District, road 40N54G on the Salmon River District and road 40S16 on the Oak Knoll District. These projects (ERFO projects) were repairs to storm damaged stream crossings from the 1997 flood. All four projects met all BMP requirements for implementation and effectiveness.

E17 Snow Removal

Road 46N51 on the Scott River District was monitored for snow removal activities. All BMP requirements for implementation and effectiveness were met.

E19 Restoration of Borrow Pits and Quarries

A rock source quarry along road 44N55A on the Scott River District was reviewed. This site is located on a ridge top. These types of quarries are not usually restored but put into a self-maintaining condition since they will be reused in the future. This site met all the BMP requirements for implementation and effectiveness.

E20 Management of Roads During Wet Periods

Roads 38N26, 38N16 and 37N28 on the Salmon River District and road 44N45 on the Scott River District were reviewed. These roads met all the requirements for BMP implementation and effectiveness.

R22 Developed Recreation Sites

The Indian Scotty Campground on the Scott River District was reviewed for BMP compliance. The campground did not meet BMP implementation for the sanitation facilities. The current toilet design is outdated and will be replaced in 2001. The rest of the campground operations met BMP implementation and effectiveness requirements.

R30 Dispersed Recreation Sites

The Grouse Gap shelter on the Oak Knoll District was reviewed for BMP compliance. The site met all requirements for BMP implementation and effectiveness.

G24 Range Management

The new draft BMP procedure was used in evaluating three range allotments on the Oak Knoll (Horse Creek Allotment), Scott River (South Fork Saloon Allotment) and Gooseneck (Bray Allotment) Districts.

Bray and Horse Creek Allotments met all BMP requirements for implementation and effectiveness. The South Fork Saloon allotment met BMP implementation requirements but did not meet BMP effectiveness requirements due to not meeting allotment utilization standards that resulted in overgrazed riparian areas exceeding the allowable soil erosion rate. The allowable soil erosion rate is exceeded when >5% of riparian areas show signs of erosion and/or when >10% of upslope riparian areas show signs of erosion. Twenty-two to 53% of the transect points showed signs of accelerated erosion from grazing.

F25 Prescribed Fire

One prescribed burn unit was monitored on the Scott River District (unit 16, Canon Timber Sale). Measured post-burn soil cover was 90%. The soil cover objective was 50% as identified in the Forest's LRMP. This burn met all BMP requirements for implementation and effectiveness.

V28 Vegetation Manipulation

One tractor pile unit (unit 25) was monitored from the Canon Timber Sale on the Scott River District. This unit was piled in 1999. Measured soil cover was 79%. The soil cover objective was 70% as identified in the Forest's LRMP. This tractor pile unit met all BMP requirements for implementation and effectiveness.

SUMMARY

Overall, 89% of the BMP evaluated sites met all implementation requirements and 96% of the sites met all effectiveness requirements. This is a significant improvement over the 1999 rate. There was no evidence of significant water quality impairment from the 4 noncompliant sites.

Summary Table of BMP Implementation and Effectiveness Success Rate by Individual BMPs.

BMP	Total # of Sites	IMPLEMENTATION		EFFECTIVENESS	
		# of Sites Meeting BMP Criteria	% of Total	# of Sites Meeting BMP Criteria	% of Total
T01	5	1	20	5	100
T02	3	3	100	3	100
T03	3	3	100	3	100
T04	4	4	100	4	100
E08	4	4	100	4	100
E09	4	4	100	4	100
E10	3	3	100	2	67
E11	4	4	100	4	100
E13	4	4	100	4	100
E17	1	1	100	1	100
E19	1	1	100	1	100
E20	2	2	100	2	100
R22	1	0	0	1	100
R30	1	1	100	1	100
G24	3	3	100	2	67
F25	1	1	100	1	100
V28	1	1	100	1	100
TOTALS	45	40	89	43	96

PROBLEMS, EFFECTS AND MANAGEMENT RECOMMENDATIONS

Problem: Poor implementation of recommended SMZ widths (T01).

Solution: The problem seems to be in the unit layout phase. It is recommended that District watershed specialists work more closely with the layout/marketing crew to ensure that proper SMZ widths are being used on the ground. It is recommended that a sample of timber sale projects be reviewed on the ground during and after layout and marking as part of the FY2001 Integrated Forest-level Monitoring Schedule.

Problem: Problems with road decommissioning contract inspection (E10).

Solution: The following steps are recommended: 1) review and familiarization with Klamath National Forest road decommissioning policy by project IDT and project inspector; 2) initiate a multi-disciplinary project review prior to awarding contract; and 3) increase in-field project inspection/review by zone and/or Forest engineer.

Problem: Outdated campground sanitation facilities (R22).

Solution: Replacement of outdated toilets in 2001. Utilize BMPEP program results as criteria in development of out-year Capital Investments Program (CIP).

Problem: Grazing over utilization of riparian areas (G24).

Solution: The District will develop and implement a new management strategy for the South Fork Saloon allotment prior to animal turnout in 2001. Additional concurrent monitoring of identified over utilized riparian areas and earlier intervention with permittee, if necessary, to prevent over utilization of riparian vegetation.

Klamath National Forest

Best Management Practices
***Concurrent* Monitoring Report**

Evaluation of Forest Service Administered Projects
Including timber sales, road improvement/decommissioning,
road material waste areas, and grazing practices
For water quality protection

October 1, 1999 – May 31, 2000

Natural Resources Staff
1312 Fairlane Road
Yreka, CA 96097

Executive Summary

Concurrent Best Management Practice (BMP) monitoring and evaluation results are reported for October 1, 1999 to May 31, 2000. Monitoring was done as part of an ongoing effort by the Klamath National Forest resources staff in cooperation with other departments to determine how well BMPs were applied to Forest management activities. Concurrent monitoring, conducted during project implementation, is complementary to the Best Management Practice Evaluation Program. BMPEP looks at effectiveness a season after project completion. Due to its timing, concurrent monitoring and evaluation can facilitate immediate correction of mistakes found and apply any learning to similar actions.

The focus of this report was on 4 types of projects: timber sales, erosion control on road improvement and decommissioning projects, designation of road material waste areas, and grazing. The number of site visits, or samples, in each type ranged from two (grazing) to 55 (timber sale) site visits. The samples are rated in categories of meeting or not meeting BMPs, or undetermined as to whether they met BMPs. The report lists results by project under the four management areas. The sampling results are discussed project by project and as a group. Conclusions on BMP success for the 67 samples are given and programmatic recommendations offered for each type of activity. Recommendations range from design improvements, to administrative procedures that will improve water quality protection, to development of meaningful monitoring protocols.

Some of the conclusions are:

- Wet weather operations standards are working, due in large part to the diligence of sale administrators and cooperation of purchasers. The standards package should be revised to be appropriate for most of Goosenest District.
- Road decommissioning and storm proofing efforts on Ukonom had generally successful erosion control BMPs, with the exception of challenges on Steinacher Road. These included over wintering of unstable land that had partially completed work, repeated contract specification lapses by the contractor. Data on decommissioning projects on other Districts was not available for this report.
- The grazing site visits illustrated more about the need for interpretations of standards and guides in a way that's meaningful for water quality, and can be easily measured, than about whether BMPs were met. An interdisciplinary team has been working on this problem for several seasons. Finalizing their efforts needs to be a Forest priority to be able to gauge our success with grazing BMPs.
- Road waste area designation included 2 campground sites. One in particular was a clear BMP violation. The problem was fully rectified by moving the material at considerable expense. Some areas where

administrative procedures can be improved to avoid a similar problem in the future include updating or at least following the R5 MOU with CalTrans, and getting appropriate interdisciplinary skills involved early in project inception and planning.

Table below is an overall summary showing the percent of samples in each rating category by type of activity. The percentages of samples “not meeting”, or “undecided as to whether BMP intent was met are high relative to the randomly-selected BMPEP samples. This is because the site selection is biased toward sites that have either had BMP questions raised, or where activities are considered relatively risky for water quality. A more complete explanation of evaluation results can be found in the body of the report.

**Summary of percent BMPs compliance by management type, 1999-2000
Concurrent Monitoring**

Activity type	Sample size	Percent meeting BMPs	Percent not meeting BMPs	Percent undecided
Timber Sales	55	76	24	0
Road decommissioning and reconstruction	7	43	57	0
Road material waste disposal	3	67	33	0
Grazing	2	0	0	100
Total	67			

Introduction

The Klamath National Forest is in its ninth year of monitoring Best Management Practice implementation and effectiveness to evaluate the effects of Forest activities on water quality. The larger of 2 parts of this monitoring program is the **Best Management Practice Evaluation Program** or BMPEP. BMPEP is part of the Pacific Southwest Region (R5's) effort to determine both compliance with and effectiveness of 24 groups of related practices. Each group encompasses from 1-6 BMPs with a single protocol. **Concurrent Monitoring (CM)**, the complementary smaller piece of the monitoring program, is voluntary and was initiated at the Forest level in 1997 to focus on a few practices each year. Both single practices and groups or activity types have been scrutinized. In 1997-8, the focus was on emergency road repair practices. In 1998-1999, the focus was on wet weather operations. In 1999-2000, CM included road decommissioning and storm proofing, road material waste disposal, range and wet weather operations BMPs.

An important distinction between the two parts of the monitoring program are that while BMPEP is based on a random sample of sites that have over wintered, CM is done on an opportunity basis concurrently with project operations. While the purpose of BMPEP is to primarily evaluate practice effectiveness along with implementation in protecting water quality, CM mainly assesses implementation or compliance with BMPs. Its key advantage is that the timing allows for immediate adjustments in design, both on the project being assessed, and on similar projects being planned. The results of the '99-00 CM efforts will be shared externally with interested agencies, groups and individuals, as well as internally, in order to disclose how well we did what we said we would do.

The monitoring period reported here was October 1, 1999 to May 31, 2000. A report detailing the results of BMPEP monitoring during the 1999 calendar year was released March 20, 2000.

Data Collection Methods

The selection of sites was non-random. Sampling was not intended to be representative of all activities. It was done where projects were perceived to be of high risk to water quality, or because there was a complaint or question raised about compliance. In addition, a goal was set at a Forest wide Wet Weather Operations (WWO) workshop in March 1999 by timber administration, engineering and aquatic resources staff to formally monitor future WWO projects. This was accomplished for the monitoring period.

In each case the assessment was done during project operations, or immediately following. The protocols that were used sometimes followed the

1992 BMPEP User's Guide, and the '99 draft update was used on at least one occasion. In most cases however, field observation and assessment with documentation in the form of short memos or contract daily diaries was done in place of a BMPEP form. Monitoring was accomplished by contract administrators and resource specialists. Attachment 1 is the list of contributors.

The primary information utilized here is 1) whether BMPs were met, not met, or if the outcome is undecided, 2) where BMPs weren't met, what the nature of the problem was, and 3) what corrective action, if any, was taken.

Where outcome is "undetermined" it is not evident how well BMP intent is met. For example, for wet weather timber operations, conditions may have been wet, but other indicators do not clearly demonstrate a water quality problem. The indicators used include whether sediment has migrated more than 20' off the road surface, or to the nearest stream. In the "undetermined" and "not met" cases, corrective or preventative actions were generally taken, and are documented in project files.

Summary of Results by Project Type

This section lists which projects were monitored, by management type, and how many of the samples met BMPs.

A sample consists of a single visit to a single site.

See Discussion section for details of results and a brief history, project by project.

Timber sale operations - 8 projects from 4 Districts were monitored. Two of these did not operate outside the normal operating period (NOP), while six did. For those operating outside the NOP, visits were made regularly throughout the wet weather season.

Table 1. Timber sale operation BMP compliance summary

Sale name	WWO	# samples	#samples meeting BMPs	#samples undetermined whether meeting BMPs	#samples not meeting BMPs
Upper South Fork	yes	13	13	0	0
Jack Heli	yes	5	5	0	0
Cub Heli	yes	13	9	4	0
Jack Trac	no	1	1	0	0
Canon	yes	18	9	9	0
Happy Thin	no	1	1	0	0
Snowpark	yes	2	2	0	0
Blue Canyon	yes	2	2	0	0
Total		55	42	13	0

Several BMPs are grouped together under Wet Weather Operations. In all of the undetermined sites, there was a combined status of “meets-undetermined” which were almost all shown in the “undetermined” category. See Discussion.

Road decommissioning and reconstruction to storm proof - three projects were sampled: two were road decommissioning and one had both storm proofing and decommissioning. All projects were initiated on Ukonom District during the time it was part of the Klamath Forest.

Table 2. Road decommissioning and reconstruction BMP implementation summary

Project name	#samples	#samples meeting BMPs	#samples not meeting BMPs
Steinacher Rd. Decommission	3	0	3
Rogers Creek Culvert Removal	2	1	1
Cub-McCash Rd. Decomm./ stormproof	2	2	0
Total	7	3	4

Road material waste disposal - two projects were assessed: one on Happy Camp Ranger District and one on Oak Knoll District. The Oak Knoll project (Tree of Heaven) was considerably larger than the Happy Camp one.

Table 3. Road material waste disposal BMP implementation summary

Project name	#samples	#samples meeting BMPs	#samples not meeting BMPs
Sarah Totten Campground disposal area	1	1	0
Tree of Heaven Campground disposal area	2	1	1
Total	3	2	1

Grazing Practices - one allotment on Scott River District had two sites assessed, each for a single BMP. Multiple indicators were used, so the “undetermined” sample was actually a partial “meets”. See Discussion.

Table 4. Grazing Bmp implementation summary

Project name	#samples	#samples meeting BMPs	#samples undetermined	#samples not meeting BMPs
Long Gulch Lake (meadow+stream)	2	0	1	1
Total	2	0	2	0

Discussion of Results

Timber Sale Wet Weather Operations

Most of the sales during the reporting period either were shut down during wet weather or had documented that no BMP problems occurred.

Jack Heli Timber Sale on Scott River District was monitored 5 times from 9-23-99 through 6-5-00. The purchaser did not operate between 4/21 and 4-24, except to plow snow, and did not operate after 6-5.

Jack Trac, also on Scott River, was monitored on 10-6-99, when operations were completed.

Upper South Fork, on Salmon River District had 10 samples taken between 9-28-99 and 10-28-99, after which there were no further operations. There were no BMP problems during the reporting period.

Note: previous visits to Upper South Fork in August of 1999 following a summer thunderstorm resulted in 1 of 2 sampled sites needing remedial action (a skid road which needed to have water barring kept current). Findings of the 2 review trips taken to the sale area after the thunderstorm can be found in District and SO files. (Memos by Ed Matthews, Oscar Munson, and Robbie Van de Water).

Happy Thin Timber Sale on Happy Camp District had no ground-disturbing activities after 10-31-99. As of that date all "winterizing" of the two landings was done as well as blading and ditch pulling of roads.

Canon Timber Sale on Scott River District was monitored from 3/1/00 through 5/25/00. Almost half the samples were of the status "meets/undetermined" regarding BMPs. Of the sites which were either "undetermined" or "meeting-undetermined", one had a slide on 3/1. The sale administrator ordered the

material to be removed and spread on the roadway without sidecasting. On 3/9, there slide material was being rutted. Water barring above and below the site were required. Also on 3/9 a drainage ditch problem required placement of filter cloth. On 4/6 there was a problem with operations in snow on three roads, mostly in drifts. The purchaser was required to plow snow, leaving a 2-4" cushion, per WWO standards. During removal, the plow left the roadway a short distance, but this was determined by the District Hydrologist to be not a water quality problem. On 4/11 the purchaser was ordered not to use one road because of moisture conditions. On 4/27, units were considered too wet for tractor skidding operations, and the purchaser was ordered to shut down operations in all units until late spring/ early summer. On 5/1 minor ruts were observed on an approximately 6 mile sample of road, however, these were determined to be in compliance with WWO BMPs. On 5/9 there was minor rutting and wet conditions on haul roads, so operations were suspended "throughout storms". On 5/18 roads were again dry enough to use without violating BMPs. Documentation of the above can be found in District TS contract and Supervisor's Office WWO BMP files.

Cub Timber Sale was monitored from 10-25-99 through 12-23-99, when the purchaser completed the sale except for final road maintenance scheduled for spring or summer of 2000. The following roads totaling 11.25 miles were actively monitored during this period: 43N45, 44N43, 44N44, 44N45 and 44N52. Two landings (#1 and #2) were also continually assessed. Almost a third of the samples were of the status "meets/ undetermined" regarding BMPs. On 10-25, three roads had minor problems over the 5 miles checked. These were corrected by blading for winter maintenance. As a preventative measure, straw bale sediment traps were placed on the drainage ditches at both landings on 10-28. The landings and roads met BMPs at that time. However, on 11-18 landing #1 was found to be wet and therefore the Sale Administrator closed it down to use until the surface froze hard or dried out. Follow-up monitoring on 12-20 showed that the landing had developed minor ruts. Corrective actions taken included blading, repair of silt filters in the drainage ditch, and construction of a berm around the landing. On 12-23 the landing was smoothed out and the access road water barred. Landing #2 also had preventative measures in place, including paving of the access road and rocking of the landing surface as well as the straw bale filters which were maintained as needed. Monitoring showed that this landing and associated road met BMPs throughout the season.

A review was made of winter operations on Snowpark Timber Sale, Goosenest District on 3/29/00 by the District Sale Administrator, Sale Preparation Forester and Culturist, and the Forest Hydrologist and Soil Scientist. A question had been raised regarding the applicability of Forest WWO standards to sales on portions of the Goosenest District where there are no stream channels. It was determined that soil resource standards and road maintenance standards, as well as visual quality could potentially be issues,

but that water quality was not. Even though the incidence of rutting on one sample approached a BMPEP T-02 yellow flag indicator, the bottom line for BMP compliance was determined by no sediment migration toward streams. There were no streams in the vicinity. The two sites visited on 3/29 were therefore determined to meet BMPs.

The conclusions apply to all of Snowpark Sale Area. The non-applicability of WWO standards as currently written would be similar to Blue Canyon Timber Sale area as well, according to the Forest Sale Representative (FSR). The two sites visited on Blue Canyon were sampled on days when corrective actions were taken due to wet road conditions to protect the road investment. Although water quality was not at risk, the spirit of WWO implementation was met. Documentation of the East Side Wet Weather Ops review including subsequent soil standard sampling by the Forest Soil Scientist is contained in a draft memo dated May 4, 2000 (File 2520) by Tom Laurent and Robbie Van de Water. Blue Canyon sample documentation is contained in the contract folder at the District.

In conclusion, WWO across the Forest were largely in compliance with BMPs, with the minor exceptions on Cub and Canon sales. These problems were corrected in a timely manor by the Sale Administrator and FSR working with the purchaser. There were several shutdowns, both voluntary (e.g. Jack Heli from Oct. through April and June-July) and ordered (e.g. on Canon on 4-11 and 5-9). Various preventative and remedial measures were used, including rocking/ paving, early blading, water barring, sediment filtration, and snow plowing in accordance WWO standards.

Erosion Control on Road Decommissioning and Reconstruction Projects

As noted, the three projects monitored were on Ukonom District.

Reviews of the Steinacher project took place in October 1999, and in February and March of 2000. Steinacher Phase II, a cooperative venture by the Forest Service and the Karuk Tribe, covers the last 5 miles of the Steinacher Road. It was begun in the spring of 1999 and terminated in October due to wet weather. Three-fourths of a mile had been completed, but work was done affecting approximately two miles of road. One concern with BMP compliance was sidestepping throughout the project segment, as documented in the contract daily diaries. A large (75,000 cubic yard) fill had been partially removed, needing stringent erosion control from top to bottom of the fill. Two hay bale berms were partially successful for controlling rill and gully erosion as the site over wintered, but the bales were no longer operating by early spring as they had rolled down the slope. Straw mulch placement was very light and absent in a couple of small spots. The oversteepened face of the fill showed gullying, and the higher degree of outslope than on Phase I segment (to 55%) led to some rilling and gullying, and some slumping near the toe of the fill where

compaction did not occur. This has led to a concern by Forest Service geologists over debris flow risk, as occurred in Phase I.

Note: Phase I, which was completed in 1995, and underwent some 1997 flood damage, also had follow-up effectiveness monitoring done during this past winter and spring. Results showed good vegetative recovery on debris flow scars on the project. Some lessons learned include need for location of springs at least by the design phase, and the need to strictly adhere to compaction standards during contract administration. It is the intent of the Forest Service that knowledge from Phase I and other projects be incorporated into Phase II.

A July 10, 2000 letter (file 2510) from the Klamath and Six Rivers National Forest Supervisors to the District Rangers of both Forests lined out their joint expectations for Phase II winterization and erosion control work needed prior to next winter.

The Cub-McCash decommissioning/ reconstruction for stormproof work also ended in October 1999 due to weather. Reviews were done in October 1999 and April 2000. Decommissioned segments include the lower Black Mountain Road and the last segment of McCash Road. The roads were outsloped to greater than the 20-25% called for, however, this was not an erosion problem due to the very heavy application of straw mulch that provided adequate soil cover. Grass seeding was also adequate, possibly helped by the mulch that increased the moisture retention. Dewatering of the one stream crossing was successful, with no sediment entering the stream course. The channel was riprap-lined over a fabric membrane. Machine compaction was adequate to retard slumping of the outer edge of the decommissioned prism, as had resulted on the Steinacher project. Aside from the rilling mentioned, some minor sidecasting was the only problem associated with the project.

The Cub Road from its takeoff to McCash Creek crossing is being reconstructed for improved drainage and reduced sedimentation, entailing the installation of rolling dips. The face of some dips underwent minor rilling, but not enough to have sediment travel beyond the outslope of the dips. Rilling in a heavier winter might have been a problem for the dips in this erodible soil except that riprap energy dissipaters were placed at the outlet of the dips. These structures should capture material from the road in all but the most extreme weather. Aggregate rock was not used due to funding limitations. Aggregate is often placed on higher use roads, especially on highly erodible native surfaces. The finished slope of the new prism was 20-25%, as called for. Although this was slightly steeper than the typical 15%, the design called for a uniform slope that eliminated the oversteepened existing cut surface. All fill material caught on the original prism, and the fillslope was heavily mulched (3000 pounds/ acre). Both Steinacher and Cub-McCash projects are detailed in a May 22, 2000 memo to the files by Bill Snavely, District Hydrologist/ Geologist.

Rogers Creek culvert removal project entailed removal of a large culvert crossing and associated fill on the old Highway 96 alignment. The objective was to open up fish passage from the Klamath River up into Rogers Creek. The work required building an approximately 0.3 mile access to the crossing fill, removal of around 8500 cubic yards of fill, wasting of the fill in a suitable location, and obliteration of the temporary access. The project was accomplished in September and October of 1999. Minor to moderate sidecast occurred in unstable areas traversed by the temp road. The first monitoring visit in December of 1999 revealed minor sidecast. At this time scattered slash, straw mulch, and water barring were prescribed as remedial erosion control treatments. They were all deemed effective during the March 2000 review. Winter peak flows had caused some undercutting of the fresh stream bank with associated failures into the creek, totaling 25-30 cubic yards. The access route to the waste area had 2 small rills forming, which added an estimated 3 cubic yards to Rogers Creek. Lessons learned are that the remaining fill should have been laid back to a gentler angle. Water bars and log erosion barriers should be designed to have the same angle as the slope of the road. Bill Snavely's 3-9-00 memo to project files and BMP forms E13 and E14 are on file at Orleans Ranger District.

Road Material Waste Areas

In May 2000 the Forest entered into agreements with CalTrans to permanently waste some of their stockpiled material in two campground areas, Tree of Heaven and Sarah Totten Campgrounds. Both sites failed to meet the intent of several BMPs (7.2, 7.3, 2.1, 2.13 in particular) since material was wasted in the active channel, and well within the 100-year floodplain without documentation of alternate potential waste area assessment (FSM 2527). A small wetland was associated with one site. However, this site had a relatively minor apparent impact as it was in an existing campground and the small amount of material was carefully placed. Material composition was suited to its use for controlling campground erosion, surfacing finer existing soil with courser-grained material. The impact needs to be reassessed, however, following a larger event: at least a bankfull-magnitude peak flow.

The second site had a large amount of material, an estimated 1500 cubic yards, hauled in which was unsuitable in its composition. Besides the high percentage of fines there was a substantial amount of debris. The material was wasted in an area that was in a recovery stage after multi-year efforts by the Forest Service in cooperation with students from Yreka. This project underscored the need for timely involvement of appropriate resource specialists, i.e. an earth scientist or aquatic specialist when disturbance of riparian zones is planned. FSM 2527 calls for public review of proposed actions in floodplains. Following administrative procedures, such as FSM 1588, which deals with MOUs is essential for protecting public property and values. In this case, portions of the MOU between the FS and Cal Trans were not followed,

leaving a gentleman's agreement in lieu of the required special use permit. When the amount of material exceeded that which was agreed to by the ranger, there was no recourse except to remove the material at FS expense. A well-crafted special use permit might have enabled other remedy.

Corrective actions were timely, well planned and executed. The Deputy Forest Supervisor notified the chairman of the California NCWQCB immediately of the breach of BMPs, SO and District staff coordinated their evaluations on how to remedy, and a suitable alternate site was designated. That site, a quarry planned for reclamation, was left in an improved state. The original site waste site underwent no apparent damage.

Grazing Allotment

The grazing allotment that was monitored was the Carter Meadows Allotment in the southeast corner of Scott River District. Two sites were visited by the District Range Conservationist and Forest Hydrologist 10-4-00 to determine whether BMPs were met in the Long Gulch area of the allotment. The visit was a follow-up to an August visit by the Range Conservationist after a complaint from a member of the public.

The cows had been moved out of the drainage in August, so one purpose of the visit was to assess how much, if any recovery had taken place in the month between visits. The first site, the meadow adjacent to Long Gulch Lake was evaluated for compliance with BMP 8.1, 8.2, and 8.3. A secondary purpose this sample was used to test the draft R5 revision of BMPEP G-24, the protocol used to assess implementation and effectiveness of the above-mentioned BMPs. The second sample was a 100' length of stream approximately a mile downstream from the lake.

The meadow sample was assessed for utilization that served as a vegetation indicator, since overlapping use by recreationists and pack stock made it difficult to assess riparian impacts from range cattle. Trampling of the meadow and stream bank here were concentrated near a trail bisecting the meadow and an adjacent campsite. It was determined that utilization varied from 40-60%, ranging from Use Class III to Class IV. The maximum allowable in the Forest Plan standards and guides is 46-60%, or Use Class IV. The site was determined to "meet" utilization, and "undetermined" re. stream bank disturbance.

In order to better assess the affects on water quality, the second sample was assessed using stream bank damage as an indicator. The new G-24 protocol was not found to be useful to answer these questions. A simple stream bank alteration assessment method determination developed on the Forest was done instead as a single indicator of compliance with grazing BMPs. Regularly-spaced points on the 100' transect running parallel to the stream were evaluated to find the proportion of points where disturbance from trampling

and chiseling (hoof action which displaces soil or plant roots) was evident. Forty percent of the 50 points had evidence of bank alteration from cattle. This sample was suggested the site did “not meet” at least BMP 8.3; Controlling Livestock Distribution within Allotments, based on the stream bank indicator. Because other indicators that may have met the criteria were not measured at that time, this sample was also “undecided”. The transect was also shorter than the suggested 1000’, calling for additional monitoring to determine a more realistic bank damage rating.

Follow-up action was accomplished by the Range Conservationist in the form of pre-2001 season discussions with the range permittee. The objective was to reduce concentrations of cattle for periods of time that result in utilization higher than seen at Site 1, or bank alteration approaching that seen at site 2. The permittee was notified during the pre-season meeting of the complaint, and was instructed to continue to meet Forest Plan standards and guides as per the terms of the grazing permit. Follow-up monitoring was done during the summer of 2000. In July a permanent monitoring transect was located in the key area in the meadow below the lake to establish baseline data and to monitor ecological trend over time. The data (using the R5 green line vegetation composition method) indicates that the vegetative condition of the meadow is in mid to late seral stage, and meets desired conditions for Forest Plan standards and guidelines 23-1, -10, -12, and -15. A mid-season use check at the lake on August 17, 2000 indicated that cattle use was within allowable standards. Use at the lake was light. Cattle were not in the area around the lake, and three head were in the meadow below the lake.

During the mid-season field visit it was learned that a backcountry horse trip was planned in the area for the following weekend. It was anticipated that around forty horses and riders would be using the area, presumably based out of the Carter Meadows campgrounds and using the trail and lake areas for day rides. This highlights the need to coordinate use between recreational stock and permitted livestock to prevent the overuse of riparian areas, and to account for impacts from both sources when evaluating either BMP group: grazing or recreational stock use.

Conclusions and Recommendations

The following section synthesizes the results and proposes adaptive management actions in the four activity types.

1. Timber operations: Compared with past seasons, there were few sales operating outside the normal operating period. The Forest’s performance as well as documentation has greatly improved in Wet Weather Operations, both in and out of the NOP. Scott-Salmon-Oak Knoll Zone’s documentation, using daily diaries and the spreadsheet summary (Attachment 2) is a model that has utility for the Region as

well as across the Forest. On the West side sales, there was evident payoff from pre-season road and landing hardening and installation of sediment filtration devices. Maintenance of all these design measures, and diligence on the part of purchasers and sale administrators in watching for changes in weather and ground conditions paid off. Several samples were deemed "meeting-undetermined" when conditions were wet, to flag them for close monitoring and possible action in the near future. BMP violations were successfully avoided. The East side sales were closely monitored every day or two and described in daily diaries, although only a couple of samples were assessed for this report. Two of the samples came from the review done by the Forest Hydrologist and Forest Soil Scientist where skid trail rutting was measured. They determined that there was no applicability of WWO standards, including skid trail and road rutting to BMPs in areas where there are no stream channels. It was decided that the applicability of WWO (and LRMP) standards were to soil and road resource protection, rather than for water quality protection. Such protection is the mandated purpose for BMPs.

It is recommended that the Forest have a small interdisciplinary ad hoc team go through the WWO standard package and make adjustments that will make the package applicable to the East Side. The makeup of the team should be a road engineer, earth scientist specializing in BMPs, and soil scientist. Attached to the May 5, 2000 draft memo documenting the Snowpark T.S. field review discussed above are sections of the WWO package which the team could begin examining.

2. Road decommissioning and reconstruction for stormproofing: All projects were all on Ukonom district, where the District earth scientist was diligent in his monitoring efforts, and utilized others to conduct reviews. These efforts, detailed in memos, ranged from relatively simple (Rogers Ck. Culvert removal) to complex (Steinacher road decommission coop project). The assessments show a range of success in terms of BMP implementation and effectiveness.

Phase II Steinacher had repeated problems with sidecasting and compaction. The District Earth Scientist assessed risks after evaluating Phase I performance during the several wet seasons, including the '97 flood, and worked with the Phase II cooperator to over winter and monitor a large fill that was partially removed prior to winter shut down. The erosion control at that site was by-and-large successful, however, steps are being taken by the Forest Service to ensure that the project is not left in a similar state during the upcoming winter.

The problems associated with the equipment access route to the Rogers Ck. Project were largely remedied prior to the worst of winter. Sedimentation from the residual fill material on the newly uncovered stream banks could not be feasibly corrected. Recommendations for future projects were documented, and are available. These include laying the fillslope back to ½:1 slope.

The Cub-McCash project met BMPs, even though minor rilling occurred on dip faces, since sediment did not leave the roadbed owing to several factors: heavier mulch rate (3000 lb./ acre) applied on steep granitics, the fill caught on the original road prism, and that the fill was placed to cover up an oversteepened cut slope, leaving a uniform sideslope. For reduced risk of eroding during a wetter-than-average season, surface protection, ideally the addition of rock surfacing would further protect water quality.

3. Road material waste area: Both sites evaluated failed to meet the intent of several BMPs as well as direction pertaining to floodplain and wetland management consistency. One site probably will have negligible impact due to its design and placement. The other site had a large amount of unsuitable material hauled in to a sensitive riparian area. Portions of the MOU between the FS and Cal Trans were not followed, particularly a special use permit governing the terms of the agreement.

On the positive side, corrective actions were timely, well planned and executed. Appropriate resource specialists, including engineering examined an alternate waste site and all material was removed with no lasting effects.

The Forest needs to evaluate its environmental review process and documentation for recreation projects located in riparian reserves. Strategic planning for such review could happen during annual program planning and when Capitol Improvement Program grant proposals are developed.

A final conclusion and recommendation specifically about waste sites for Cal Trans use is that the 1971 MOU should be revisited. The objective of a review would be to ensure that protection measures are consistent with current FS mandates. These include protection of listed water bodies (Clean Water Act Sec. 303d) and listed fishes (Endangered Species Act) as well as consistent with our Forest LRMP guidelines, especially those that implement the Aquatic Conservation Strategy. Even BMPs post-date this agreement. CalTrans Regional and Forest liaisons, in consultation with an aquatic resources specialist would be the best people to work with the State on this review.

4. Grazing: the small amount of monitoring documented here was not enough to say anything conclusive about BMP compliance on the particular allotment reviewed. However, some process recommendations are offered. First, the need for working closely with the permittee, ideally during field visits where self-monitoring techniques as well potential resource conflicts are discussed. The best time to do this on all allotments is in the fall at the end of the grazing season.

Second, the Forest needs to review, validate and interpret its standards and guides for watershed and water quality protection on grazing projects. The Region has apparently finalized a revised BMPEP protocol that has no meaning for Klamath LRMP direction. Whether current standards and guides are upheld, or whether they are proposed to be amended during a review, meaningful indices to measure compliance with standards is needed. The R5 monitoring protocol is a tool, and as such should not be mistaken for a standard. It may not be the best tool; for example bank disturbance indicators may be more meaningful to assess riparian impacts than detailed vegetative surveys. The cadre of aquatic and range specialists from several units have already looked at various indicators and provided feedback to the Region. The feedback was apparently not incorporated, so this cadre now needs to verify the standards and come up with a Forest-level protocol, or be willing to use the new R5 method and defacto standards.

Finally, the Long Gulch meadow site underscored the need for recreation and grazing specialists to come together in order to ensure consistency of standards required by recreational stock and livestock. Along with earth scientists, such an interdisciplinary group can 1) examine the validity of the perceived conflict between the two kinds of stock use in the wilderness, and 2) help craft Forest direction to resolve any conflict for the betterment of water quality.

A generic last observation has to do with documentation. The WWO Seasonal Report form developed by Don Elder works well for concurrent monitoring report compilation. This spreadsheet blank form is in Attachment 2. Embedded in the form (other sheets) are a sample and the key. The form should be backed up by memos to the file whenever problems arise. The memos should recommend corrective actions and then document when/ what action(s) were taken. A further suggestion was made by one unit that the Contract Daily Diary (R5-2400-181 form) be amended for use on the Forest by adding blocks to check for "BMP compliance" or "BMP non-compliance". There could be a reminder to make a note under "Comments" section if non-compliance is checked. Individuals who are currently using daily diaries and other tools to

optimize communication of monitoring efforts are also more effectively contributing to the corporate knowledge base of BMPs and hence improved water quality protection. Consistent use of these tools and improved monitoring protocols needs to be encouraged to facilitate excellence in BMP implementation and reporting alike.

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