Telegraph ES&R Hydrology Report
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BLM: Montana / Dakotas State Office
August 2008

PROJECT AREA

The Telegraph Fire burned 34,091 acres in the upper Merced River watershed of the Sierra Mountains. Primary tributaries are Sherlock Creek and the North Fork Merced River. The upper Merced River watershed encompasses approximately 700,000 acres from the headwaters near Triple Divide Peak to the New Exchequer Dam on Lake McClure, the main storage reservoir on the river (capacity 1 million acre-ft.). A significant part of the Merced River headwaters lies within Yosemite national Park (312,334 acres), while 271,810 acres lie within the jurisdiction of the Forest Service and Folsom Field Office, Bureau of Land Management (BLM).

EXISTING WATER QUALITY – 303(d) LISTED STREAMS

Existing water quality is generally good with no impaired streams in the project area. The nearest impaired waterbody is the located several miles downstream and below two reservoirs.

DATA COLLECTION AND TOOLS USED IN THE ANALYSIS

Mike Philbin, the team hydrologist, performed an internet search to locate information related to climate and water quality. Fieldwork consisted of five days of field visits designed to evaluate: (1) burn severity, (2) stream and riparian conditions, (3) watershed sensitivities, and (4) potential treatments. Finally, both computer modeling and GIS were used to evaluate stream flows and the distribution of burnt areas.

CUMULATIVE EFFECTS ANALYSIS AREAS

The analysis area was defined by our ability to detect the fire's effects on water quantity, water quality or stream function. Effects were modeled from where they originated (the burn area) and were then qualitatively routed to the point where it would be difficult to discern fire effects.

ANALYSIS OBJECTIVES

1. Assess watershed changes resulting from the fire.
2. Identify concerns regarding floods, sedimentation, and altered channel conditions.
3. Assess potential effects to areas downstream of moderate/high severity areas.
4. Identify potential treatments to control water, sediment, and debris movement.

ASSESSMENT

Watershed Changes / Burn Severity:

A detailed discussion of watershed changes / burn severity can be found in the soils specialist report. Burn severity was evaluated through an interdisciplinary analysis of hydrologic, soils, and vegetative indicators. Burn severity for the major watersheds is summarized in table 1.

Table 1: Telegraph Burn Severity by Watershed

	Watershed Area (ac)	% Non-Burned	% Low Severity	% Moderate Severity	% High Severely
Sherlock Creek	12,139	20	15	61	4
Drunken Gulch	1,604	26	16	56	2
Lyons Gulch	2,648	25	18	55	2
Section 24 Gulch	1,166	1	4	91	4
Halls Gulch	7,383	29	9	62	0
Good Gulch	2,972	7	11	81	1
New Culvert Gulch	101	0	9	61	30

Stream Flow / Runoff Analysis:
An analysis of stream flows was carried out for seven priority drainages (table 2).

Modeling Assumptions:

1. Pre-fire vegetative conditions were good.
2. The Burned Area Severity Map accurately represents burned conditions.
3. The Predicting Post-Wildfire Watershed Runoff Using the ArcGIS Model Builder curve number values were used to model flow http://gis.esri.com/library/userconf/feduc06/docs/predicting_wildfire_runoff.pdf.
4. One year after the burn, conditions would improve ½ a condition class due to the breaking up of the surface hydrophobicity and natural recovery.
5. Full recovery would take five years. This was based on visiting previously burned areas with similar vegetation and soils.
6. The Merced River and North Fork Merced were not modeled as they exceed the size limitations for this model. In addition, the size of unburned headwaters would make it difficult to evaluate the local effects of the fire.

Runoff Analysis:
The primary hydrologic drivers for this area are moderate to long duration rains that exceed the water storage capacity of these shallow soils and produce runoff (tables 2 and 3). While fractured bedrock can transmit water below the soil profile, large precipitation rates exceed the ability of the bedrock to take in water resulting in runoff. Where soils are exposed this runoff can then produce a network of rills that can rapidly concentrate water producing relatively large and flashy floods. This rainfall dominated hydrograph is suitable for modeling with the Soil Conservation Service (SCS) Curve Number method.

Hydrologic Modeling:
Discharges were modeled using the SCS curve number method. The model utilized a variety of six and 24-hour precipitation events, soil types, hydrologic conditions, ground cover, and burn severity to calculate potential discharges at a various recurrence intervals. These values can be compared to unburned flow estimates to evaluate the risks associated with post fire runoff. The SCS model is designed to simulate the potential and most likely responses of hydrologic systems with regard to stream flow. The values generated by this model are used, in concert with other water resource information, to interpret the potential effects to downstream "values at risk" resulting from the fire. The model's greatest value is its use in identifying potential problem areas and assisting in the design of treatments. Generated values should not be considered an absolute measure of expected stream flows; they are simply an estimate of the likely response of the hydrologic system to the fire, accounting for the systems natural resiliency and variability.

Model Inputs

Climate:
The closest climate station with a current climatic record is in Mariposa, California.
Tables 2, 3, and 4 summarize the average precipitation amounts and distribution for this site.

Table 2: Monthly Precipitation (http://www.wrcc.dri.edu/summary/Climsmcca.html)

Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	All
1.30	3.68	4.98	5.77	7.04	4.50	2.11	.80	.31	.03	.05	.65	30.61

Table 3: Frequency of Large Storms - (http://www.wrcc.dri.edu/summary/Climsmcca.html)

	>.50 inches	>1.00 inches
January	4 days	2 days
February	4 days	3 days
March	4 days	2 days
April	2 days	1 day
May	1 day	0 day
October	1 day	1 day
November	2 days	1 day
December	4 days	2 days

Table 4: Storm Frequencies – Larger Storms (NOAA Atlas 2 Volume 1) (http://www.wrcc.dri.edu/pcpnfreq.html)

Duration	Frequency	Storm Size
6 Hour	2 Year	1.5 inches
6 Hour	5 Year	1.9 inches
6 Hour	10 Year	2.1 inches
6 Hour	25 Year	2.5 inches
6 Hour	50 Year	2.7 inches
6 Hour	100 Year	3.0 inches
24 Hour	2 Year	3.2 inches
24 Hour	5 Year	4.2 inches
24 Hour	10 Year	5.3 inches
24 Hour	25 Year	6.5 inches
24 Hour	50 Year	7.0 inches
24 Hour	100 Year	8.0 inches

Results:
Table 5 presents the results of the modeling effort. The “Likelihood of Exceedence During any One Year” presents the probability of the runoff occurring in any “one year” and represents the maximum risk as no recovery has occurred and full hydrophobicity remains. The “Likelihood of Exceedence During the Recovery Period” represents the probability that an increased flow could occur prior to estimate recovery. However, the associated runoff is actually diminishing each year as recovery is progressing. To evaluate maximum risk, the single year probability should be used along with the post-fire runoff.

Table 5: Modeling Results using the SCS Curve Number Method

	Runoff Estimates Based on a 6 and 24 Hour Storm (in cfs)					
Event Size	2 year	5 year	10 year	25 year	50 year	100 year
Likelihood of Exceedence During Any One Year	50%	20%	10%	4%	2%	1%
Likelihood of Exceedence During Recovery Period[1]	82%	67%	41%	18%	10%	5%
Sherlock Creek						
Pre-Fire	1,200	2,139	3,311	4,674	5,216	6,319
Post-Fire	1,886	3,015	4,223	5,584	6,160	7,323
After one year	1,569	2,626	3,867	5,189	5,752	6,892
Drunken Gulch						
Pre-Fire	232	450	728	1064	1196	1454
Post-Fire	376	642	938	1252	1385	1656
After one year	299	541	842	1160	1290	1554
Lyon Gulch						
Pre-Fire	278	538	867	1,265	1,437	1,754
Post-Fire	413	717	1,090	1,470	1,633	1,961
After one year	357	642	998	1,396	1,555	1,878
Section 24 Gulch						
Pre-Fire	222	401	624	859	955	1,150
Post-Fire	409	602	822	1,066	1,169	1,376
After one year	320	525	735	973	1,073	1,275
Halls Gulch						
Pre-Fire	452	944	1,581	2,362	2,708	3,426
Post-Fire	867	1,502	2,281	3,124	3,474	4,186
After one year	644	1,207	1,917	2,766	3,137	3,825
Good Gulch						
Pre-Fire	568	958	1,394	1,861	2,060	2,462
Post-Fire	892	1,291	1,740	2,238	2,447	2,867
After one year	737	1,131	1,563	2,047	2,252	2,664
Culvert Gulch						
Pre-Fire	36	59	82	109	120	143
Post-Fire	56	79	105	133	145	168
After one year	50	72	97	125	136	160

1 Assumed to be 5 years. When using this row use the "after one year estimate".

Discussion: The first year runoff response will be substantially higher following the Telegraph fire as some soils are hydrophobic and transpiration has been significantly reduced. However, there would be rapid recovery following the first year as the hydrophobic conditions break down. This would occur during the first year in all moderate severity sites and after the first year in the high severity sites. Recovery would continue as vegetation becomes re-established and roots open up the soil allowing more water to infiltrate. At this time, the additional infiltration and transpiration would reduce the amount of water available to runoff.

The increase in flows would be more pronounced during relatively frequent precipitation events (2-5 year events). During the pre-fire period these soils were able to take in quite a bit of this water reducing the runoff response. However, hydrophobicity, the loss of litter storage, and a large loss of transpiration will result in a much larger percentage of precipitation becoming runoff. While there will be a large percentage increase in flows, the overall risk remains low. In fact, only "Section 24 Gulch" will see its "post fire two year event" behave like a "pre-fire 5 year event".

During larger less frequent events (50-100 year events), there would be less of a percentage change in runoff. In these shallow, rocky soils there is little capacity to take in the large amounts of water these large storms produce. Therefore, even in un-burnt areas runoff would be very high with very flashy (rapid) runoff. While more water would runoff the burnt slopes, the percentage increase would be less than for smaller storms due to the higher baseline. For these large events, the overall threat remains low as the likelihood of occurrence is low, the relative change is low, and the consequences of an event are low due to a lack of infrastructure. In fact, there are no culverts on lower Drunken, Lyons, "Section 24", or Sherlock creeks; a large culvert on Goods Gulch, and a bridge on Halls Gulch which makes the threat of flood related effects minimal.

The greatest change would occur during moderately infrequent events (10-25 year events). For example in "Section 24 Creek" an event that once had a 4% chance of occurring now has a 10% chance of occurring (in year one). Another example is that in "Culvert Gulch" an event that used to have a 10% chance of occurring now has a 20% chance in year one. This increased risk in "Culvert Gulch" poses a concern as there is a culvert that may no longer be able to process this runoff. If a failure were to occur, emergency access would be denied to a critical recreational corridor. In this situation we have a moderate risk and a high consequence and treatment is recommended.

As hydrophobic conditions break down (the first few storms) a larger amount of precipitation will infiltrate reducing runoff. This and vegetative recovery will substantially reduce potential runoff after the first year. Full recovery is expected in approximately five years.

Summary:
The shallow, rocky, steep slopes in this area naturally produced flashy runoff in even the un-burnt condition. They will continue to do so following the fire, although flows will be higher. The events that are most "different" from pre-fire conditions are those with recurrence intervals of 10-25 years. If treatments are implemented, these should be the target events. However, given the limited infrastructure I do not recommend flood control treatments at this time.

Stream and Riparian Function (as related to fire effects):

<u>Merced River</u>: The Merced River is stable bedrock and boulder controlled stream flowing through a relatively narrow canyon. The riparian area is classified as a "Valley Foothill Riparian Area", which is dominated by Cottonwood, Alder, Willow, and Ash. This riparian area was lightly burned with low to moderate severity patches extending down towards the stream. Although the riparian area within the canyon was slightly impacted by the fire, un-burnt upstream areas should allow for recovery without additional human intervention. The river experienced a large flood in 1997, which effected infrastructure, but the channel remained stable through this reach. Based on the existing channel structure and expected flow alterations, we do not expect the stability of this reach to be threatened by the effects of this fire. In addition to the Merced River several tributaries experienced moderate to high severity burn. These include Sherlock Creek, the North Fork Merced River, Halls Gulch, and Goods Gulch. These tributaries will export increased levels of sediment to the Merced River reducing water quality. These effects would be greatest in the first year following the fire and will diminish over the following five years.

<u>North Fork Merced River</u>: The North Fork is a large tributary entering the project area approximately one mile above the fire boundary. The lower five miles are intermittent with a bedrock and boulder channel. Although the riparian area within the canyon was slightly impacted by the fire, un-burnt upstream areas should allow for recovery without additional human intervention. While there are some high severity areas up the North Fork, this watershed extends well above the fire area minimizing threats from flow increases.

The floodplain, relatively intact riparian areas and long intermittent reaches should also minimize the threats to downstream water quality from this drainage.

Halls Gulch: Halls Gulch is a large tributary entering the Merced in the middle of the project area. The area burnt in a mosaic pattern with a mixture of upper moderate to unburned patches. The area had previously burnt approximately 15-20 years ago which reduced the true burn severity. While areas appeared to be high severity, soil sampling found the soils non-hydrophobic with normal infiltration (the burn looks more severe than it really is). The lower channel has been extensively mined resulting in a bedrock channel with boulder tailings. The channel is stable with little risk of instability. Sediment storage is abundant within the mined floodplain. There is a bridge over Halls Gulch just above the confluence with the Merced River which should remain

Good Gulch: Most of this watershed burned at a moderate – high severity (81%). This could result in a moderate increase in flows in this well armored drainage. There is currently a 6 foot culvert at the confluence with the Merc3ed River that should be adequate to handle expected first years flows. The upper culvert is embedded in a rock wall and would be monitored to determine if a new culvert is necessary.

Sherlock Creek: Sherlock Creek is the most sensitive stream in the project area. The stream is a B2/3 stream type (boulder/cobble) with a 25 foot width floodplain. The lower energy of this channel and the pocket pools associated with the bed material face a high likelihood of filling reducing habitat for the yellow legged frog and fish found in the channel. While areas of the riparian have burnt at moderate severity, the riparian area should recover in a few years. The greatest threat is the high severity slopes adjacent to the north side of the channel which will likely produce large quantities of sediment. Threats from tributaries (Drunken Gulch, Lyons Gulch, and Section 24 Gulch) are less of a threat then these steep slopes.

Drunken Gulch: Drunken Gulch is a primary tributary to Sherlock Creek. The area bunt in a mosaic pattern with a mixture of upper moderate to non-burnt patches. The lower channel has been extensively mined resulting in a bedrock and boulder channel with boulder tailings. The channel is stable with little risk of instability. Sediment storage is abundant within the mined floodplain.

Lyons Gulch: Lyons Gulch is a primary tributary to Sherlock Creek. The area bunt in a mosaic pattern with a mixture of upper moderate to un-burnt patches. The lower channel has been mined resulting in a bedrock and boulder channel with boulder tailings. The channel is stable with little risk of instability and there are no stream crossings. Sediment storage is abundant within the mined floodplain.

"Section 24 Gulch": Most of this drainage burned at a moderate severity (91%). However, these areas are expected to recover quickly as they are primarily in the lower end of moderate. There is no crossing at the lower end of this drainage.

TREATMENT RECOMMENDATIONS

While the risk of a damaging hydrologic event is low to moderate, the consequences of such an event is great. Therefore, treatments are recommended. The purpose of these treatments is to minimize threats in watersheds that have had a history of flooding and that could produce impacts to private property.

Fire Area Treatments: The following treatment would apply to the entire fire area.

The monitoring / patrol staff would check and clean out culverts during and following precipitation events. This would minimize the threat of drainage and road failure and associated resource damage (these individuals would also patrol for livestock trespass and patrol cultural resource locations).

Area Specific Treatments:

Merced River**:**

Culvert Gulch**:** Approximately 99% of the Culvert Gulch drainage was impacted by the Telegraph fire. Modeling suggests that flow may increase substantially threatening the culvert at the Merced River Campground Access road. This road is a critical access point to the canyon, as three high use campgrounds are located downstream the crossing. This culvert would be upgraded from two to three feet in diameter to handle the increased flow and rock that are expected to be exported from this drainage. In addition to upgrading the culvert, a 25 acre unit in the upper drainage would be mulched to minimize rilling and the rapid concentration of water. High severity burns can increase the threat of downstream flooding, as bare hill-slopes often shed water as opposed to having it infiltrate. Un-burnt areas have a vegetative cover to minimize rain splash erosion and have an organic layer which serves as a “sponge” holding water and allowing it to infiltrate. On burnt sites, “rain drops” can directly hit the ground causing rain splash erosion and eventually form a network of rills that can rapidly concentrate flows increasing down-slope discharge. Reducing rilling and runoff would also reduce the likelihood of rock fall (which could plug the culvert) and reduce erosion and subsequent sediment delivery to the Merced River from this small drainage. Modeling (ERMit) suggests that 1 ton/acre of straw would reduce sediment production (from the treatment unit) from 82 to 22 tons per acre (73% reduction). These treatments would increase the likelihood that the down slope crossing remains effective and this critical escape route would remain open.

Approximately ½ mile below this drainage is a spring that is expected to produce an increase amount of water. Other spring in this area are experiencing large increases in flow. A culvert is proposed to pass this water through the road preventing damage to the previously discussed road. Without this road access could be limited threatening a residence and three high use campgrounds.

“Burma Grade”: The slopes above the Burma grade switchbacks experienced a moderate to high severity burn. This section of road was constructed approxiamtelly 75 years ago and consists of forty culverts ranging from 12 to 36 inches in diameter. The fire has increased the likelihood of increased flow and rock movement substantially increasing the risk of culvert failure. On these very steep slopes, this would result in a “cascading failure” effectively closing this important escape route / access route to the Merced River cooridor (which includes three high use campgrounds and a year round residence). Not only is this one of only two routes into this high use area, it is also situated above the only other access route. Therefore a failure would close both escape / access routes severely threatening public safety.

Reducing the threat of failure would also protect two residences and associated infratstruture (wells, power lines, telephone, sheds, etc…). These factilities are located immediatelly below the first switchback and could be severly impacted by a road failure or rockfall.

This treament would replace/enlarge 27 culverts of the forty culverts, establish ditches at 10 sites, monitor seven culverts. This project was reviewed by the Field Office Engineer and Associate Field Manager as it is a high risk area. The treatment is necessary to ensure that the road can “pass” both increased water and rock fall associated with the burnt lands.

In addition to upgrading the culvert, two units totaling 17 acres would be mulched to minimize rilling and the rapid concentration of water. High severity burns can increase the threat of downstream flooding, as bare hill-slopes often shed water as opposed to having it infiltrate. Un-burnt areas have a vegetative cover to minimize rain splash erosion and have an organic layer which serves as a “sponge” holding water and allowing it to infiltrate. On burnt sites, “rain drops” can directly hit the ground causing rain splash erosion and eventually form a network of rills that can rapidly concentrate flows increasing down-slope discharge. Reducing rilling and runoff would also reduce the likelihood of rock fall (which could plug the culvert) and reduce erosion and subsequent sediment delivery to the Merced River from this small drainage. Modeling (ERMit) suggests that 1 ton/acre of straw would reduce sediment production (from the treatment unit) from 55 to 14 tone per acre (75% reduction). These treatments would increase the likelihood that the down slope crossing remains effective and this critical escape route would remain open.

Sherlock Creek:
Sherlock Creek had the most severly burnt slopes within the Telegraph fire with acres being high severity. Without treatment these areas are expected to produce large quantities of sediment, which could substantially impact water quality and aquatic habitat (both fish and yellow legged frogs are present in this stream). Proposed treatments could substantially reduce sediment prodiution by reducing eroison by between 70-80% off some of the highest severity slopes. These treatments include a 39 acre unit in a tributary and 112 acre unit along the main stem Sherlock Creek.

PERMITS

All work proposed under this plan fall under Permit #37 of the 2007 Nationwide Permits - Emergency Watershed Protection and Rehabilitation.

Permit 37 requires pre-construction notification as described in general condition 27. For the Telegraph Fire area the notification should include bullets 1-4 and 7 under section (b) bullets 5-6 should be identified as non-applicable.

General Condition 27. Pre-Construction Notification.

(a) Timing. Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a preconstruction notification (PCN) as early as possible. However, under Nationwide Permit 37 the activities can begin immediately upon submittal and does not have to wait for approval so long as there is an unacceptable hazard to life or there is a risk of significant loss of property or economic hardship.

(b) Contents of Pre-Construction Notification: The PCN must be in writing and include the following:
(1) Name, address and telephone numbers of the prospective permittee;
(2) Location of the proposed project;
(3) A description of the proposed project; the project's purpose; direct and indirect adverse environmental effects the project would cause; any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. The description should be sufficiently detailed to allow the district engineer to determine that the adverse effects of the project will be minimal and to determine the need for compensatory mitigation. Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the project and when provided result in a quicker decision.);
(4) The PCN must include a delineation of special aquatic sites and other waters of the United States on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters of the United States, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many waters of the United States. Furthermore, the 45 day period will not start until the delineation has been submitted to or completed by the Corps, where appropriate;
(5) If the proposed activity will result in the loss of greater than 1/10 acre of wetlands and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan.

(6) If any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, for non- Federal applicants the PCN must include the name(s) of those endangered or threatened species that might be affected by the proposed work or utilize the designated critical habitat that may be affected by the proposed work. Federal applicants must provide documentation demonstrating compliance with the Endangered Species Act; and
(7) For an activity that may affect a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, for non-Federal applicants the PCN must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic property. Federal applicants must provide documentation demonstrating compliance with Section 106 of the National Historic Preservation Act.

<u>(c) Form of Pre-Construction Notification:</u> The standard individual permit application form (Form ENG 4345) may be used, but the completed application form must clearly indicate that it is a PCN and must include all of the information required in paragraphs (b)(1) through (7) of this general condition. A letter containing the required information may also be used.

<u>(d) Agency Coordination:</u>
(1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the project's adverse environmental effects to a minimal level.
(2) For all NWP 48 activities requiring pre-construction notification and for other NWP activities requiring pre-construction notification to the district engineer that result in the loss of greater than 1/2-acre of waters of the United States, the district engineer will immediately provide (e.g., via facsimile transmission, overnight mail, or other expeditious manner) a copy of the PCN to the appropriate Federal or state offices (U.S. FWS, state natural resource or water quality agency, EPA, State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Office (THPO), and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will then have 10 calendar days from the date the material is transmitted to telephone or fax the district engineer notice that they intend to provide substantive, site-specific comments. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district engineer will fully consider agency comments received within the specified time frame, but will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.
(3) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by Section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act.
(4) Applicants are encouraged to provide the Corps multiple copies of preconstruction notifications to expedite agency coordination.
(5) For NWP 48 activities that require reporting, the district engineer will provide a copy of each report within 10 calendar days of receipt to the appropriate regional office of the NMFS

<u>(e) District Engineer's Decision:</u> In reviewing the PCN for the proposed activity, the district engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. If the proposed activity requires a PCN and will result in a loss of greater than 1/10 acre of wetlands, the prospective permittee should submit a mitigation proposal with the PCN. Applicants may also propose compensatory mitigation for projects with smaller impacts. The district engineer will consider any proposed compensatory mitigation the applicant has included in the proposal in determining whether the net adverse environmental effects to the aquatic environment of the proposed work are minimal. The compensatory mitigation proposal may be either

conceptual or detailed. If the district engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse effects on the aquatic environment are minimal, after considering mitigation, the district engineer will notify the permittee and include any conditions the district engineer deems necessary. The district engineer must approve any compensatory mitigation proposal before the permittee commences work. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the district engineer will expeditiously review the proposed compensatory mitigation plan. The district engineer must review the plan within 45 calendar days of receiving a complete PCN and determine whether the proposed mitigation would ensure no more than minimal adverse effects on the aquatic environment. If the net adverse effects of the project on the aquatic environment (after consideration of the compensatory mitigation proposal) are determined by the district engineer to be minimal, the district engineer will provide a timely written response to the applicant. The response will state that the project can proceed under the terms and conditions of the NWP. If the district engineer determines that the adverse effects of the proposed work are more than minimal, then the district engineer will notify the applicant either:
(1) That the project does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit;
(2) that the project is authorized under the NWP subject to the applicant's submission of a mitigation plan that would reduce the adverse effects on the aquatic environment to the minimal level; or
(3) that the project is authorized under the NWP with specific modifications or conditions. Where the district engineer determines that mitigation is required to ensure no more than minimal adverse effects occur to the aquatic environment, the activity will be authorized within the 45-day PCN period. The authorization will include the necessary conceptual or specific mitigation or a requirement that the applicant submit a mitigation plan that would reduce the adverse effects on the aquatic environment to the minimal level. When mitigation is required, no work in waters of the United States may occur until the district engineer has approved a specific mitigation plan.