COUNTY OF HUMBOLDT EXTRACTION REVIEW TEAM (CHERT)

2011 POST-EXTRACTION REPORT

DISCUSSION DRAFT

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For the:

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TABLE OF CONTENTS

INTRODUCTION

This report presents an overview of the Humboldt County gravel extraction for the 2011 season. Information on mining volumes, methods, and success of mine operators in meeting approved plans are reported herein. The County of Humboldt Extraction Review Team (CHERT) provided site-specific recommendations on extraction designs submitted by the operators and their consultants, as did agencies with regulatory and oversight responsibilities (US Army Corps of Engineers (Corps), National Marine Fisheries Service (NMFS), California Department of Fish and Game(CDFG)). Recommendations were based on field reviews at each site including reviews of aerial photos and topographic and hydrologic information provided by the operators as required by the US Army Corps of Engineers 2010 Letter of Permission (LOP), and individual permits obtained by several operators. The LOP can be found at: http://www.spn.usace.army.mil/regulatory/PN/2010/2007-00857LOP.pdf

For background, The Humboldt County Board of Supervisors appointed CHERT in 1992 to provide scientific oversight to Mad River gravel extraction, which had arrived at an impasse over environmental concerns. In 1996, the CHERT role was expanded to include most riverine extraction sites throughout Humboldt County. Additional details on CHERT's role have been presented in earlier post-extraction reports, that can be found at: http://co.humboldt.ca.us/planning/smara/default.asp?inc=slm

The annual review process consists of visiting sites in the spring with operators and agency staff to observe post-winter conditions, note undesirable effects from the previous season's extraction (if any), and discuss a possible mining plan for the current season. Later, operators submit air photos, topographic and hydrologic information, and

a mining proposal, which is typically followed by a second field review. CHERT then issues a written recommendation, which may or may not include suggested changes to reflect either CHERT's or an agency's concerns. When all parties accept a final iteration of the mining plan, it is approved by the Corps and CDFG and mining can begin, providing all other agency permits have been obtained. In rare occasions, a field review may be done while mining is taking place due to unexpected circumstances that might require an alteration in an approved plan. Post-extraction field reviews are conducted after mining is completed in late summer or fall. Each operator then compiles a post-extraction data set, including pre and post-extraction topographic data, volume calculations, aerial photographs and other pertinent data. These data are submitted to CHERT, CDFG, Corps, and NMFS.

CHERT bases recommendations on two areas of concern: 1) minimizing potential cumulative effects by ensuring that reach-scale mining volumes do not exceed that which is sustainable, and 2) ensuring that site-specific methods of extraction (skimming, trenching, etc.) are appropriate for protecting local habitat. The concept of 'sustained yield' gravel extraction requires that gravel extraction volumes not exceed mean annual recruitment (an estimate of the long-term average annual supply of gravel to a specific reach of a river). Actual mined gravel volumes are typically well below mean annual recruitment. Site-specific measures are also recommended by CHERT to reduce both cumulative and localized potential effects of mining on riparian and aquatic habitat. These may include, for example, ensuring that skim floor elevations are high enough to maintain low flow channel confinement so that small rises in river stage do not inundate skim surfaces too readily.

Through time, experience on the rivers, and interaction with regulatory agencies, mine operators, and other stakeholders, the measures taken to protect river habitat and to improve program functioning are continually refined. This feedback process, termed 'adaptive management', is essential to help ensure that gravel mining and management improves with respect to resource protection, the quality of information provided by mine operators, and program efficiency. Problems can occasionally arise, however, when either the river's response to previous mining results in undesirable river habitat conditions, or an operator deviated from an approved mining plan.

In addition to recurring activities (mining site reviews, extraction recommendations, annual post-extraction report preparation), CHERT participated in preparing a Mad River supplemental programmatic environmental impact report (SPEIR) that will be circulated in draft form in 2012. Technical analyses of Mad River physical channel conditions, riparian vegetation, and fish habitat were completed in 2008-2009 to support both the SPEIR update and biological assessments required for renewal of federal and state permits. CHERT also attended meetings to discuss Mad River gravel mining and effects on river resources and prepared mitigations aimed at responding to concerns expressed by NMFS and CDFG. NMFS decided that the mitigations proposed by CHERT, with the support of the Mad River gravel operators, were inadequate to avoid a jeopardy opinion in their Biological Opinion. CHERT did not concur with the jeopardy opinion, but the decision to comply with the NMFS conditions was up to the gravel operators. To avoid a second consecutive season of no mining, the operators agreed to conditions that both they and CHERT believe are ill-conceived and, in some cases, less protective of river resources than the former strategies. Those conditions were incorporated into the Corps' LOP and will remain in effect through 2015.

Although Eel River cross section data (covering mining reaches in the Lower Eel and Van Duzen rivers, the Middle Reach Eel above Scotia, and the South Fork Eel) have accumulated since about 1997 and have been used in the annual mining review process, a quantitative, longer-term analysis of them had not taken place until early 2009. As part of the renewal of federal and state permits, this longer-term analysis of cross sections was prepared to support impact evaluation and protection/mitigation strategies. The Eel River cross section report also provides the essential foundation for updating environmental documentation for Eel River gravel mining. As mentioned above, as CHERT reports are completed, they can be found at, and downloaded from, the Humboldt County Community Development Service's website: http://co.humboldt.ca.us/planning/smara/default.asp?inc=slm

A new gravel mine site was recently permitted by federal regulatory agencies and extracted gravel from the Mad River for the first time in 2011. The operator of this site, the Blue Lake Rancheria, was not required to obtain permits from the State of California or Humboldt County, and consequently, operates outside of the CHERT program. Their mining plans are reviewed by the US Army Corps of Engineers and National Marine Fisheries Service. They receive no CHERT review, nor do they provide any mining information to CHERT, so this report

contains no information from the Rancheria's mining operations. Consequently, the volume of gravel mined from the Mad River in 2011 was greater than presented here by an amount unknown to CHERT.

Humboldt County Instream Mine Sites and Extraction Terminology

Table 1 describes the geographic breakdown of Humboldt County mining reaches used in this report. CHERT classifies extraction techniques into the twelve descriptive categories in Table 2.

Table 1 - Description of river reaches used to sort and report extraction data.

Approximate Length (miles)	River Reaches
7	**Mad River:** The Mad River Reach extends approximately seven miles downstream from the Blue Lake Fish Hatchery to just below the Highway 299 Bridge near Arcata.
6	**Lower Eel River:** The Lower Eel River Reach extends approximately six miles downstream from the mouth of the Van Duzen River to near Fernbridge.
5	**Lower Van Duzen River:** The Lower Van Duzen River Reach extends upstream approximately five miles from the mouth of the Van Duzen River.
26	**Middle Reach of Eel River:** The Middle Reach of the Eel River extends upstream from Scotia (River mile 20) for approximately 26 miles to River Mile 46.
17	**South Fork Eel River:** The South Fork Reach extends from Garberville (River mile 33) upstream to Cooks Valley near the Mendocino County line (River mile 50).
15	**Trinity River Reach:** The Trinity River Reach extends downstream about 15 miles from near Willow Creek into the Hoopa Valley.
	Isolated Sites: Five extraction sites are more or less isolated from the rest of project. These are the *Satterlee Bar* on the main stem of the Eel river at Fort Seward, the *PL Bar* on the Van Duzen River, the *Branstetter Bar* on Bear River, the *Charles Bar* on Larabee Creek, and the *Cook Bar* on the North Fork of the Mattole River.

Table 2. - CHERT extraction methodology terminology and descriptions.

Narrow Shoreline Skim	A skim where one edge is close to the low flow channel at or above the 35% flow elevation with a width no greater than 1/3 that of the unvegetated bar surface.
Wide Shoreline Skim	Same as above but with a width greater than 1/3 that of the unvegetated bar surface.
Narrow Offset Skim	A skim that has a substantial vertical or horizontal offset from the low flow channel and a width no greater than 1/3 that of the unvegetated bar surface.
Wide Offset Skim	Same as above, but has a width greater than 1/3 that of the unvegetated bar surface. Sometimes referred to as a 'horseshoe' skim in the past.
Dry Trench	A relatively long, linear shallow skim that does not intercept the water table at the time of excavation.
Overflow Channel Skim	Same as above, but one that is located within a high flow overflow channel
Wet Trench	A trench that is deep enough to intercept the water table at the time of excavation
Wetland Pit	A strategically located and designed pit simulating a remnant channel feature, such as an oxbow pond (see Fig. 2); sometimes provided with a small outlet channel.
Deep Alcove	A relatively deep excavation designed to simulate naturally occurring shoreline pools that can provide deep cool water during summer months

	and/or winter high velocity refuge.
Shallow Alcove	A relatively shallow excavation designed to simulate naturally occurring shoreline pools that can provide winter high velocity refuge and summer rearing habitat for juvenile salmonids (see Fig. 1).
Fish Access Channel	A channel excavation that may include pools designed to temporarily improve fish access.
Terrace Pit	A pit excavated on a low terrace to a depth above groundwater level with an outlet provided to allow water to freely enter and exit the pit with changes in river stage.

Habitat Enhancement Activities

The primary purpose of gravel mining in Humboldt County is to supply local markets with construction aggregate, and most extractions are designed to do this as efficiently as possible within the constraints of the rules and regulations aimed at minimizing effects on riverine habitat. But increasingly, more extractions forego some profitability for habitat improvement. Figure 1 is a photo of a shallow alcove excavated in 2011 by Eureka Ready Mix at their Christie Bar mining site. Some years ago, we began recommending, and the operators began excavating, what we termed "alcoves", mimicking what we observed the river creating on its own. Alcoves are trenches (deep or shallow as in Figure 1) that typically connect with the main low flow channel at the downstream end of a point bar. Juvenile and adult salmon and steelhead use these features for holding to escape high velocities in the main channel. Juvenile salmonids in particular benefit from cooler summer water temperatures typically found in alcoves.

Figure 1. Shallow alcove excavated at Christie Bar, Mad River, in 2011. This was a re-excavation of a 2010 alcove skim that removed newly replenished gravel. Surrounding riparian vegetation was undisturbed. This area provides rearing habitat for juvenile salmonids and off-channel habitat for other species such as Western pond turtles and red-legged frogs.

Beginning in about 1993 (the second year of CHERT, known then as the Mad River Scientific Design and Review Committee), CHERT recommended extraction features termed "wetland pits" with design elements that optimized habitat for plants and animals that typically occupy off-channel oxbow ponds formed by the river's lateral migration. Gently sloping shorelines that readily allow wetland plants to colonize, and perimeters conforming to existing riparian vegetation are the two main design elements for wetland pits. Large wood may also be placed in these features to add habitat complexity. Over time the wetland pits became lush with wetland plants and aquatic animals such as Western Pond turtles, salamanders, etc. Most eventually disappeared through channel migration or gravel replenishment during floods as expected (and as desired). Figure 2 shows a ground-level photo of a wetland pit excavated in 2001 on Emmerson Bar, Mad River. The design of the channel incorporated a shallow shoreline deepening toward the interior of the pit. Mining designs with habitat improvement elements such as those described above play an increasing role in Humboldt County gravel extraction. This is one of only two wetland pits that

persist today (the other is at Christie Bar, Mad River). As noted below, bullfrogs, an invasive species, have invaded this feature. Because bullfrogs may feed on other native species that are threatened or endangered (such as red legged frogs), use of wetland pits as a mining technique is on hold for the time being. The overall effect of wetland pits on sensitive species is unknown: the pits create new habitat for sensitive species, possibly increasing their numbers, but bullfrogs take some unknown percentage. Consequently, wetland pits may or may not be a net benefit to sensitive species. Lack of funds prevents the ecological analysis needed to sort out these complexities.

Figure 2. Off channel wetland pit extraction area on Emmerson Bar, Mad River, excavated in 2001. Riparian and aquatic plants are thriving and providing much-needed habitat for native aquatic species and migratory birds. However, bullfrogs have invaded this area and may harm red-legged frogs by predation. Use of wetland pits such as this is on hold until the effect of bullfrogs is better understood. Unfortunately, no research is currently underway.

2011 EXTRACTION SUMMARIES

River Reach Extraction Volumes

In 2011, CHERT reviewed 44 extraction areas (some multiple times) distributed among 17 mining sites in Humboldt County (many sites had more than one extraction area). Appendix A provides historical gravel extraction volumes from the beginning of the CHERT program in 1992 (Mad River) and the expansion in 1997 (Eel River and isolated sites added). As shown in Table 3, the total volume of gravel approved for extraction in 2011 was 774,582 cubic yards (cy). The total volume actually extracted was 505,805 cy, or about 65% of that approved for extraction.

Table 3. Humboldt County 2011 gravel extraction summary by river reach.

River Reach	No. of mined areas	No. of mined sites	Approved Volume (cubic yards)	Extracted Volume (cubic yards)	Percent of Approved Volume	Extracted Area (acres)
Lower Mad River	20	8	147,380	143,124	97%	35.5
Lower Eel River	4	3	301,537	214,730	71%	28.7
Middle Eel River	3	3	76,715	35,618	46%	6.3
Van Duzen River	9	3	175,724	71,903	41%	11.2
South Fork Eel River	4	1	36,063	14,244	39%	3.0
Trinity River	4	2	37,163	26,186	70%	5.6
Isolated Sites	0	0	0	0	n/a	n/a
Humboldt County Total =	**44**	**20**	**774,582**	**505,805**	**65%**	**90.3**

Tables 4-9 list site-specific 2011 extraction information for each extraction area grouped by river reach. Sites are listed from downstream to upstream in each table. There was no gravel extraction from isolated sites in 2011. Over-extraction is a primary concern for CHERT and regulatory agencies. The following criteria were used to designate sites that were over-extracted: 1) extracted volume exceeded approved volume by 10% or more (110% of approved volume), and 2) the volume of over-extraction exceeded 1,000 cy (for small volume extractions, a relatively small amount of over-extraction may meet the 110% criterion without causing any real damage to river resources, thus the additional 1,000 cy criterion). Areas that had over-extraction are shown in red font in Tables 4-9. The characteristics of each over-extraction are discussed in the next section (performance issues).

Table 4. Mad River gravel extractions, 2011.

Operator	Site	Area No.	Method	Approved Volume (cu. yds.)	Extracted Volume (cu. yds.)	Percent of Approved Volume	Extracted Area (acres)
Eureka Ready Mix	O'Neill Bar	1	wide shoreline skim	9,682	8,578	89%	2.7
Miller Family Trust	Miller Bar	n/a	no extraction proposed	n/a	n/a	n/a	n/a
Eureka Ready Mix	Johnson-Spini Bar	1	wide shoreline skim	24,079	26,602	110%	9.5
Eureka Ready Mix	Johnson-Spini Bar	2	alcove	5,129	5,714	111%	0.5
Mercer Fraser Co.	Essex Bar	1	wide shoreline skim	3,320	0	0%	0.0
Eureka Ready Mix	Christie Bar	1	narrow shoreline skim	8,877	8,858	100%	3.2
Eureka Ready Mix	Christie Bar	2	alcove	6,064	6,513	107%	1.1
Eureka Ready Mix	Christie Bar	3	narrow shoreline skim	365	444	122%	2.9
Eureka Ready Mix	Christie Bar	4	alcove	809	1,378	170%	0.5
Eureka Ready Mix	Christie Bar	5	terrace skim	2,287	2,233	98%	0.7
Eureka Ready Mix	Johnson Bar *	3	narrow shoreline skim	10,020	9,610	96%	---
Eureka Ready Mix	Johnson Bar *	4	alcove	681	555	81%	---
Eureka Ready Mix	Johnson Bar *	5	terrace skim	814	833	102%	---
GLJ Construction	Blue Lake Bar	1	narrow offset skim	17,576	18,311	104%	3.5
GLJ Construction	Blue Lake Bar	2	narrow shoreline skim	5,310	5,615	106%	2.4
GLJ Construction	Blue Lake Bar	3	narrow shoreline skim	540	498	92%	0.2
GLJ Construction	Blue Lake Bar	4	narrow offset skim	2,979	3,145	106%	1.0
Eureka Ready Mix	Emmerson Bar	1	narrow shoreline skim	5,104	6,063	119%	1.3
Eureka Ready Mix	Emmerson Bar	2	alcove	10,143	9,442	93%	1.2
Mad River Sand and Gravel	Guynup Bar	1	narrow shoreline skim	5,871	6,677	114%	1.0
Mad River Sand and Gravel	Guynup Bar	2	terrace skim	10,436	6,577	63%	1.2
Mad River Sand and Gravel	Guynup Bar	3A	dry alcove	5,285	2,903	55%	0.8
Mad River Sand and Gravel	Guynup Bar	3B	alcove	7,231	7,607	105%	0.6
Mad River Sand and Gravel	Guynup Bar	4A	narrow offset skim	1,985	2,455	124%	0.3
Mad River Sand and Gravel	Guynup Bar	4B	dry alcove	2,793	2,513	90%	0.9
River Reach Totals =	---	---	---	**147,380**	**143,124**	**97%**	**35.5**

* extraction contiguous with Christie Bar area with same number; extracted areas included with Christie areas

Table 5. Lower Eel River gravel extractions, 2011.

Operator	Site	Area No.	Method	Approved Volume (cu. yds.)	Extracted Volume (cu. yds.)	Percent of Approved Volume	Extracted Area (acres)
Eureka Ready Mix	Singley Bar	n/a	no extraction proposed	n/a	n/a	n/a	n/a
County of Humboldt	Worswick Bar	n/a	no extraction proposed	n/a	n/a	n/a	n/a
Mallard Pond	Drake Bar	n/a	no extraction proposed	n/a	n/a	n/a	n/a
Mercer Fraser Co.	Sandy Prairie: Plant B	B1	wet trench	77,349	28,013	36%	4.2
Mercer Fraser Co.	Sandy Prairie: Plant B	B2	wet trench	25,171	15,804	63%	1.7
Mercer Fraser Co.	Sandy Prairie: Plant B	B3	wet trench	45,598	50,097	110%	3.0
Mercer Fraser Co.	Sandy Prairie: Plant B	B4	narrow offset skim	6,777	3,481	51%	2.0
Mercer Fraser Co.	Sandy Prairie: Plant A	A1	dry trench	37,807	35,680	94%	6.4
Mercer Fraser Co.	Sandy Prairie: Plant A	A2	wet trench	32,186	29,623	92%	2.3
Hansen Truck Shop	Hansen Bar*	1	secondary channel skim	49,221	25,400	52%	4.5
Eureka Ready Mix	Hauck Bar	1	narrow offset skim	6,690	6,909	103%	1.9
Eureka Ready Mix	Hauck Bar	2	dry trench	8,145	8,765	108%	1.7
Eureka Ready Mix	Hauck Bar**	3	wet trench	12,593	10,958	87%	1.0
River Reach Totals =	---	---	---	**301,537**	**214,730**	**71%**	**28.7**

* actual extraction area estimated; ** extracted by Leland Rock

Table 6. Van Duzen River gravel extractions, 2011.

Operator	Site	Area No.	Method	Approved Volume (cu. yds.)	Extracted Volume (cu. yds.)	Percent of Approved Volume	Extracted Area (acres)
Leland Rock	above 101 bridge	1	narrow shoreline skim	5,678	5,370	95%	1.0
Leland Rock	below 101 bridge	2	wet trench	19,162	11,426	60%	1.0
Leland Rock	below 101 bridge	3	wet trench	40,958	9,913	24%	2.0
Leland Rock	below 101 bridge*	4*	wet trench	*	*	*	*
Van Duzen River Ranch	Bar #8	1	narrow offset skim	41,980	17,965	43%	0.1
Van Duzen River Ranch	Bar #10	2	wide offset skim	52,178	15,429	30%	5.3
Tom Bess	East Side A	1	narrow shoreline skim	2,905	2,481	85%	0.5
Tom Bess	East Side B	2	narrow shoreline skim	4,470	5,027	112%	1.0
Tom Bess	East Side C	3	wet trench	2,900	4,292	148%	0.3
Tom Bess	West Side	4	wet trench	5,493	0	0%	0.0
River Reach Totals =	---	---	---	**175,724**	**71,903**	**41%**	**11.2**

* located on Hauck Bar, ERM site; volumes listed in Table 5.

Table 7. Middle Reach Eel River gravel extractions, 2011.

Operator	Site	Area No.	Method	Approved Volume (cu. yds.)	Extracted Volume (cu. yds.)	Percent of Approved Volume	Extracted Area (acres)
Humboldt Redwoods Co.	Scotia Dam Bar	1	shoreline skim	16,767	0	0%	0.0
Humboldt Redwoods Co.	Lower Truck Shop Bar	n/a	no extraction proposed	n/a	n/a	n/a	n/a
Humboldt Redwoods Co.	Upper Truck Shop Bar *	2	wet trench	29,959	11,473	38%	1.0
Humboldt Redwoods Co.	Three Mile Bridge Bar	3	narrow shoreline skim	29,989	24,145	81%	5.3
Humboldt Redwoods Co.	Dinner Creek Bar	n/a	no extraction proposed	n/a	n/a	n/a	n/a
Humboldt Redwoods Co.	Elinor Bar	n/a	no extraction proposed	n/a	n/a	n/a	n/a
Humboldt Redwoods Co.	Larabee Bar	n/a	no extraction proposed	n/a	n/a	n/a	n/a
Humboldt Redwoods Co.	South Fork Bar	n/a	no extraction proposed	n/a	n/a	n/a	n/a
Humboldt Redwoods Co.	Bowley Bar	n/a	no extraction proposed	n/a	n/a	n/a	n/a
Humboldt Redwoods Co.	Maynard Bar	n/a	no extraction proposed	n/a	n/a	n/a	n/a
Humboldt Redwoods Co.	Vroman Bar	n/a	no extraction proposed	n/a	n/a	n/a	n/a
River Reach Totals =	---	---	---	**76,715**	**35,618**	**46%**	**6.3**

Table 8. South Fork Eel River gravel extractions, 2011.

Operator	Site	Area No.	Method	Approved Volume (cu. yds.)	Extracted Volume (cu. yds.)	Percent of Approved Volume	Extracted Area (acres)
Wallan and Johnson	Wallan and Johnson Bar	n/a	no extraction proposed	n/a	n/a	n/a	n/a
Randall Sand and Gravel *	Home Bar	1	wide shoreline skim	20,299	14,244	70%	3.0
Randall Sand and Gravel	Home Bar	2	dry alcove	1,416	0	0%	0.0
Randall Sand and Gravel	County Bar	3	narrow shoreline skim	8,996	0	0%	0.0
Randall Sand and Gravel	Park Bar	4	wide shoreline skim	5,352	0	0%	0.0
Mercer Fraser Co.	Cooks Valley: MEN **	n/a	no extraction proposed	n/a	n/a	n/a	n/a
Mercer Fraser Co.	Cooks Valley: HUM **	n/a	no extraction proposed	n/a	n/a	n/a	n/a
River Reach Totals =	---	---	---	**36,063**	**14,244**	**39%**	**3.0**

* estimated area; ** "HUM" is in Humboldt County, "MEN" is in Mendocino County

Table 9. Trinity River gravel extractions, 2011.

Operator	Site	Area No.	Method	Approved Volume (cu. yds.)	Extracted Volume (cu. yds.)	Percent of Approved Volume	Extracted Area (acres)
Mercer Fraser Co.	Willow Creek Site*	1	wide shoreline skim	5,285	3,286	62%	1.2
Mercer Fraser Co.	Willow Creek Site	2	wide shoreline skim	12,823	12,954	101%	2.4
Mercer Fraser Co.	Willow Creek Site	3	terrace skim	9,162	9,946	109%	2.0
Mercer Fraser Co.	McKnight Bar	1	wide shoreline skim	9,893	0	0%	0.0
Klamath Trinity Aggregates	Rowland Bar	n/a	no extraction proposed	n/a	n/a	n/a	n/a
River Reach Totals =	---	---	---	**37,163**	**26,186**	**70%**	**5.6**

* actual extraction area estimated.

Humboldt County extraction volumes by method for 2011 are shown in Table 10. In recent years there has been increasing reliance on trenching in the active channel to depths below groundwater (wet trench category, below), which in 2011 accounted for about one-third of the total extraction volume. Narrow skims (offset from the channel or along the channel) account for about another one-third. Concurrently, the formerly common method of wide shoreline extraction has diminished to only about 13%. This shift in methods results from both the adaptive management process inherent in the Humboldt County mining program as well as from the increasingly detailed and forceful role of National Marine Fisheries Service (NMFS) staff, particularly with regard to increased trenching. While CHERT recognizes there are instances where trenching may be the least harmful method, or even beneficial in rare cases, it is not a panacea. In other instances where trenching has been insisted upon by NMFS

despite CHERT reservations, we have observed worsening of habitat (e.g., channel braiding and decreased water depths over riffles), as noted in the next section. We believe a more conservative use of wet trenching than has been employed lately will better protect river habitat.

Table 10. Humboldt County gravel extraction volumes and areas by mining method, 2011.

Extraction Method	No. of Areas	Extracted Volume (cy)	Percent of total volume	Area (acres)
alcove	5	31,209	6%	3.9
dry alcove	2	49,861	10%	9.8
narrow offset skim	5	77,666	15%	13.3
narrow shoreline skim	12	74,788	15%	18.9
terrace skim	4	19,589	4%	3.9
wet trench	6	160,173	32%	15.5
wide offset skim	1	15,429	3%	5.3
wide shoreline skim	7	65,664	13%	15.8

The CHERT program has been integral to the Corps' Humboldt County mining permits since 1997. Since then, NMFS has taken an increasingly dominant role in mining plan reviews and recommendations. CHERT is concerned that when our recommendations differ from those of NMFS (as they often do), the Corps defers to the NMFS recommendations in every case, in effect supplanting CHERT as the entity providing direct and detailed technical guidance in the County's mining program. In 2011, this occurred at the Sandy Prairie site. NMFS did not show for the pre-arranged field review at which all other participants (Mercer Fraser Co, the operator, the Corps, CHERT and CDFG) came to a consensus on a mining plan. A special second review had to be arranged, during which NMFS wanted changes to virtually every proposed and previously agreed on extraction area. Only with insistence from CDFG was there any reconsideration by NMFS, and only at one area. In our opinion, this unnecessarily increases review costs to the operators and delays the start of operations. We would hope that the Corps, with whom the ultimate federal authority lies, would make a decision based on the merits of the competing proposals rather than simply deferring to NMFS, and develop a mechanism for expeditiously resolving differences among the parties involved.

Performance Issues: 2011

To evaluate operator performance and compliance, CHERT conducts field reviews in the fall after completion of operations and reviews post-extraction documentation (cross sections, air photos, and other materials) to ensure approved mining plan design specifications were met. By and large, operator performance in conducting their 2011 operations consistent with approved mining plans was very successful. The most common deviation of actual extraction from approved plans was mining a greater volume than that approved. Although the majority of extractions were below their approved volumes, several sites exceeded approved volumes, as indicated below.

At several mined areas the actual extraction volume was much less than that approved. This does not present a problem as long as the area is left in a condition that meets design objectives (the area will drain effectively after inundation by river flows and so does not have depressions that may trap fish). Other instances may occur where the approved volume is met, but the extraction boundaries deviated from approved designs. We note below where deviations in the form of excessive volume and/or substantive deviation from approved plans occurred in 2011.

Johnson-Spini Bar, Mad River (Eureka Ready Mix, operator): The skim depth at Area 1 was slightly too deep (by about 0.5 feet) in some areas. Because of the relatively large surface area, this resulted in over extraction by about 2,500 cy (see Table 4). This was a minor deviation from approved plans. We note that the difficulties in maintaining precise grade control during extraction operations often result in deviations of this magnitude.

Sandy Prairie Site, Lower Eel River (Mercer Fraser Co., operator): Area B3 was over extracted by about 4,500 cy (see Table 5). This was caused by the extraction area being too wide at the downstream half (at XS 10.2, 11 11,1, 11.2). Because the area was within a large overflow channel located well away from the flowing channel, we doubt this had any negative effects on habitat, as indicated by field observations during the post-extraction site review.

In addition, the trench at Area A2 caused braiding of a major riffle in this reach of the Eel River, as shown in Figure 3. By capturing some percentage of the river's flow, the trench may have caused the depth of water in the natural riffle to decrease. Shallow depths at riffles in the Lower Eel River are known to impede upstream migration of adult salmon. Trench locations and designs must be more carefully evaluated to prevent worsening of habitat conditions as occurred here.

Figure 3. Sandy Prairie trench at Area A2 (center channel) caused braiding (multiple channels) at the riffle and captured a substantial percentage of the flow of the river. This reduced flows and water depths at the natural riffle to the right.

Hansen Bar, Lower Eel River (Hansen Truck Shop, operator): Although the site was under-extracted because of time constraints by a narrower width than approved, the extraction extended farther downstream than indicated in the approved plans. Because the area was adjacent to an overflow channel located well away from the flowing channel, we doubt this had any negative effects on habitat, as indicated by field observations during the post-extraction site review.

Bess Site, Van Duzen River (Tom Bess, operator): The trench at the east site (Area C) was wider and longer (by about 100 feet) than approved, resulting in an extracted volume about 1,400 cy over that approved. The extension tapered the downstream end of extraction to a more logical end-point. CHERT notes that trench widths, and thus volumes, are sometimes difficult to manage due to collapsing sidewalls.

Van Duzen River Ranch, Van Duzen River (Jack Noble, operator): The post-extraction review of the Bar #10 cross sections indicated that the extraction at cross section 4+00 extended about 140 feet too far to the right. Thus, about half of the extraction at this cross section came from outside (to the right of) the approved extraction area. Only about 30% of the approved volume was actually extracted at this area (see Table 6). Because this area is above the Corps-designated ordinary high water (OHW) elevation, it lies outside the Corps' area of jurisdiction, and most likely had no effect on river habitat.

APPENDIX A: HISTORICAL EXTRACTION VOLUME SUMMARIES

Humboldt County Totals ("---" means unknown)

Year	Approved Volume (cubic yards)	Extracted Volume (cubic yards)	Percent
1992	---	---	---
1993	---	---	---
1994	---	---	---
1995	---	---	---
1996	---	---	---
1997	---	---	---
1998	1,075,095	820,952	76%
1999	1,142,212	860,974	75%
2000	987,848	706,234	71%
2001	979,515	494,819	51%
2002	1,023,866	748,461	73%
2003	881,090	581,800	66%
2004	692,020	440,710	64%
2005	664,565	493,240	74%
2006	700,660	561,845	80%
2007	784,108	612,132	78%
2008	659,022	534,821	81%
2009	454,213	211,207	46%
2010	562,303	374,313	67%
2011	774,582	505,805	65%
Totals	**9,590,001**	**6,855,988**	**71%**
Averages	**815,886**	**572,424**	**70%**

Mad River ("---" means unknown)

Year	Approved Volume (cubic yards)	Extracted Volume (cubic yards)	Percent
1992	115,000	115,000	100%
1993	122,100	138,400	113%
1994	134,500	134,898	100%
1995	210,637	226,265	107%
1996	203,998	189,517	93%
1997	252,926	210,976	83%
1998	265,795	223,352	84%
1999	196,212	174,974	89%
2000	204,748	146,534	72%
2001	199,215	167,719	84%
2002	204,991	171,937	84%
2003	150,390	136,790	91%
2004	156,540	141,250	90%
2005	138,475	127,200	92%
2006	174,245	162,360	93%
2007	165,504	153,341	93%
2008	142,043	130,613	92%
2009	0	0	n/a
2010	111,439	86,246	77%
2011	147,380	143,124	97%
Totals	**3,037,319**	**2,751,126**	**91%**
Averages	**165,724**	**149,335**	**90%**

Lower Eel River ("---" means unknown)

Year	Approved Volume (cubic yards)	Extracted Volume (cubic yards)	Percent
1992	---	---	---
1993	---	---	---
1994	---	---	---
1995	---	---	---
1996	---	---	---
1997	561,700	326,500	58%
1998	399,100	273,000	68%
1999	471,400	290,500	62%
2000	291,300	208,600	72%
2001	389,900	119,300	31%
2002	387,300	220,000	57%
2003	318,300	163,900	51%
2004	188,840	120,305	64%
2005	199,370	166,280	83%
2006	235,495	208,240	88%
2007	243,097	177,334	73%
2008	237,955	215,760	91%
2009	229,386	106,467	46%
2010	208,286	188,730	91%
2011	301,537	214,730	71%
Totals	**3,923,757**	**2,489,719**	**63%**
Averages	**311,531**	**198,923**	**64%**

Middle Eel River ("---" means unknown)

Year	Approved Volume (cubic yards)	Extracted Volume (cubic yards)	Percent
1992	---	---	---
1993	---	---	---
1994	---	---	---
1995	---	---	---
1996	---	---	---
1997	147,300	84,900	58%
1998	157,900	99,400	63%
1999	134,900	124,900	93%
2000	160,100	131,000	82%
2001	116,100	64,000	55%
2002	132,767	121,608	92%
2003	74,030	54,060	73%
2004	0	0	n/a
2005	0	0	n/a
2006	0	0	n/a
2007	89,990	64,424	72%
2008	0	0	n/a
2009	0	0	n/a
2010	0	0	n/a
2011	76,715	35,618	46%
Totals	**1,013,087**	**744,292**	**73%**
Averages	**72,363**	**53,164**	**73%**

APPENDIX A (continued)

South Fork Eel River ("---" means unknown)

Year	Approved Volume (cubic yards)	Extracted Volume (cubic yards)	Percent
1992	---	---	---
1993	---	---	---
1994	---	---	---
1995	---	---	---
1996	---	---	---
1997	67,700	74,700	110%
1998	75,400	70,100	93%
1999	85,400	75,900	89%
2000	75,700	53,700	71%
2001	66,000	43,100	65%
2002	58,163	48,122	83%
2003	87,060	54,660	63%
2004	80,730	50,745	63%
2005	82,770	36,480	44%
2006	92,000	35,075	38%
2007	90,737	73,956	82%
2008	32,358	24,833	77%
2009	40,170	24,986	62%
2010	42,864	27,732	65%
2011	36,063	14,244	39%
Totals	**894,018**	**641,371**	**72%**
Averages	**69,789**	**49,578**	**71%**

Van Duzen River ("---" means unknown)

Year	Approved Volume (cubic yards)	Extracted Volume (cubic yards)	Percent
1992	---	---	---
1993	---	---	---
1994	---	---	---
1995	---	---	---
1996	---	---	---
1997	120,000	81,600	68%
1998	119,100	103,700	87%
1999	159,900	108,800	68%
2000	194,800	121,300	62%
2001	161,700	85,600	53%
2002	202,500	167,400	83%
2003	175,100	123,000	70%
2004	179,045	92,610	52%
2005	159,090	123,170	77%
2006	134,910	104,750	78%
2007	152,773	113,184	74%
2008	209,176	137,850	66%
2009	175,132	73,236	42%
2010	169,041	69,917	41%
2011	175,724	71,903	41%
Totals	**1,968,094**	**1,362,964**	**69%**
Averages	**165,162**	**107,580**	**65%**

Trinity River ("---" means unknown)

Year	Approved Volume (cubic yards)	Extracted Volume (cubic yards)	Percent
1992	---	---	---
1993	---	---	---
1994	---	---	---
1995	---	---	---
1996	---	---	---
1997	47,500	40,000	84%
1998	35,000	28,100	80%
1999	64,300	66,900	104%
2000	18,000	22,200	123%
2001	46,600	15,100	32%
2002	38,145	19,394	51%
2003	76,210	49,390	65%
2004	62,075	32,700	53%
2005	64,100	30,570	48%
2006	64,010	51,420	80%
2007	42,007	29,893	71%
2008	12,490	11,701	94%
2009	0	0	n/a
2010	30,673	1,688	6%
2011	37,163	26,186	70%
Totals	**570,437**	**397,368**	**70%**
Averages	**42,936**	**28,504**	**66%**

Isolated Sites ("---" means unknown)

Year	Approved Volume (cubic yards)	Extracted Volume (cubic yards)	Percent
1992	---	---	---
1993	---	---	---
1994	---	---	---
1995	---	---	---
1996	---	---	---
1997	---	---	---
1998	22,800	23,300	102%
1999	30,100	19,000	63%
2000	43,200	22,900	53%
2001	0	0	n/a
2002	0	0	n/a
2003	0	0	n/a
2004	24,790	3,100	13%
2005	20,760	9,540	46%
2006	0	0	n/a
2007	0	0	n/a
2008	25,000	14,064	56%
2009	9,525	6,518	68%
2010	0	0	n/a
2011	0	0	n/a
Totals	**166,650**	**91,904**	**55%**
Averages	**13,552**	**7,571**	**56%**