COUNTY OF HUMBOLDT EXTRACTION REVIEW TEAM (CHERT)

2018 POST-EXTRACTION REPORT

DISCUSSION DRAFT

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For the:

Humboldt County Board of Supervisors

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This report is being issued as a Discussion Draft.

Comments can be submitted during the 60-day public review period of
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to the Director of Humboldt County Planning and Building Department.

Comments received will be summarized with responses in Final Draft
which will be available by July 1, 2019

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INTRODUCTION

This report presents an overview of the Humboldt County gravel extraction for the 2017 mining season. Information on mining volumes, methods, and success of mine operators in meeting approved plans is reported herein. Representing Humboldt County, 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, including: 1) US Army Corps of Engineers (Corps), 2) National Marine Fisheries Service (NMFS), 3) California North Coast Regional Water Quality Control Board (NCRWQCB) and 4) California Department of Fish and Wildlife (CDFW). Recommendations were based on field reviews at each site, aerial photos, biological surveys, and topographic and hydrologic information provided by the operators as required by the US Army Corps of Engineers 2015 Letter of Permission (LOP 2015) and individual permits obtained by several operators. The LOP and associated documents are the primary federal instruments regulating gravel mining operations in Humboldt County. LOP 2015 can be accessed at: https://www.spn.usace.army.mil/Portals/68/docs/regulatory/LOP_2015-1.pdf. The NMFS Biological Opinion provides the basis for many of the LOP's standards and requirements; it can be accessed at: https://www.spn.usace.army.mil/Portals/68/docs/regulatory/Biological%20Opinions/HumboldtGravelLOPBO.pdf

The Humboldt County Board of Supervisors created CHERT in 1992 to provide scientific oversight on Mad River gravel extraction, which had arrived at an impasse over environmental concerns. Four CHERT members were appointed by the Board with expertise in hydrology, fluvial geomorphology, and river ecology; three of those same four original members continue to serve through the present. In 1996, the scope of CHERT services 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 found, along with other County gravel mining documents, at: http://humboldtgov.org/252/Surface-Mining-Reclamation-Act-SMARA-Doc

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 upcoming extraction season. Later, operators submit air photos, topographic and hydrologic information, and a mining proposal, occasionally followed by a second field review. CHERT then issues a written recommendation, which may suggest changes to reflect either CHERT's or an agency's concerns. Once all parties accept a final version of the mining plan, and it is approved by the Corps, NMFS, NCRWQCB and CDFW, mining can begin provided all other agency permits have been obtained. Additional field reviews may be done while mining is taking place due to unexpected circumstances that might require alteration to 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, CDFW, Corps, and NMFS.

CHERT develops recommendations based on two primary goals: 1) minimizing potential cumulative effects by ensuring that reach-scale mining volumes do not exceed sustainable levels, 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). Ensuring that annual mined gravel volumes are less than mean annual recruitment is an important management criterion for avoiding channel excessive bed degradation and habitat damage. Site-specific measures are also recommended by CHERT to reduce both cumulative and localized potential mining effects on riparian and aquatic habitat. These may include, for example, ensuring that skim floor elevations are sufficiently high to maintain low flow channel confinement so that small rises in river stage do not inundate skim surfaces too readily.

With 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 being refined. This feedback process, termed 'adaptive management', helps ensure that gravel mining and management improves resource protection, the quality of information provided by mine operators, and program efficiency. Problems 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. Any such problems are described in the performance issues section of this report.

In addition to annually recurring activities (e.g., mining site reviews, extraction recommendations, annual post-extraction report preparation), CHERT occasionally participates in other activities. For example, CHERT prepared a technical analysis of Mad River physical channel conditions, riparian vegetation, and fish habitat in 2009 to support physical and biological assessments required for renewal of federal and state permits. Such analyses occur when requested by the County, the operators, or other stakeholders and with direction from the Humboldt County Board of Supervisors. CHERT also provides comments on drafts of various other documents, such as the Corps' updated letters of permission (LOP), NMFS biological opinions, etc.

A relatively 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 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 since 2011 has been greater than that reported by CHERT.

Although Eel River cross sections (covering mining reaches in the Lower Eel and Van Duzen rivers, the Middle Reach Eel above Scotia, and the South Fork Eel) have been surveyed since about 1997 and have been used in the annual mining review process, a quantitative, longer-term cross section analysis had not been done until early 2009. As part of the renewal of federal and state permits, a multi-year analysis of cross sections was prepared by CHERT to support impact evaluation and refine protection/mitigation strategies. The Eel River cross section report also provides essential information for updating environmental analyses of Eel River gravel mining. As mentioned above, CHERT reports, including the Eel River cross section analysis, can be found at and downloaded from the Humboldt County Community Development Service's website: http://humboldtgov.org/252/Surface-Mining-Reclamation-Act-SMARA-Doc

Humboldt County Instream Gravel Extraction Sites and Extraction Terminology

Table 1 describes the geographic breakdown of Humboldt County mining reaches. CHERT classifies extraction techniques into 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 Humboldt County extraction sites are more or less isolated from the reaches described above. 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. Located in trinity County, Dinsmore Bar, operated by Mercer Fraser Co., is not part of the CHERT program but their volumes are reported in this report.

Table 2. - CHERT extraction methodology terminology and descriptions.

Narrow Shoreline Skim	A skim with one edge 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 wider.
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 wider. Some may refer to this as a 'horseshoe' skim.
Dry Trench	A relatively long, linear shallow skim that remains above the water table at the time of excavation. When located in a secondary channel that normally dries up during the low flow season, it may be called an overflow channel skim.
Wet Trench	A trench sufficiently deep to intersect the water table at the time of excavation, designed for high water to flow through the trench.
Alcove	An excavation designed to simulate naturally occurring shoreline pools, typically located on the backside of meanders, that can provide deep, cool water during summer months and/or winter high velocity refuge.
Dry Alcove	Same as above, but to a depth above the water table at the time of excavation.
Fish Access Channel	A channel excavation that may include pools and incorporate large wood designed to temporarily improve fish migration access.
Wetland Pit - Discontinued	A strategically located and designed pit simulating a remnant channel feature, such as an oxbow pond; this method has been discontinued because by having standing water year-round, it can provide habitat favoring bullfrogs (see below).
Moist Pit	A relatively new extraction method that limits extraction depth to no lower than the elevation where moist gravel is encountered. It designed to go dry each year to prevent non-native bullfrogs from successfully reproducing, and may create conditions favorable for the native (and candidate-listed) Foothill Yellow-legged Frog.
Terrace Skim	A free-draining skim located on a low terrace above typical high water.
Terrace Pit	A pit excavated on a low terrace above typical high water and isolated by remnant topography from the active channel or provided with an outlet to allow water to freely enter and exit the pit with changes in river stage.

2018 EXTRACTION SUMMARIES

River Reach Extraction Volumes

In 2018, CHERT reviewed 32 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, Trinity River, and isolated sites added). As shown in Table 3, the total volume of gravel approved for extraction in 2018 was 456,236 cubic yards (cy). The total volume actually extracted was 368,681 cy, or about 81% of that approved for extraction. As mentioned above, any gravel extraction done by Blue Lake Rancheria from the Mad River is not included in this report.

Tables 4-10 list site-specific 2018 extraction information for each extraction area grouped by river reach. Sites are listed from downstream to upstream in each table. Table 10 lists extraction information for isolated sites. There was no gravel extraction from Humboldt County isolated sites in 2018, but the Dinsmore Bar, operated by Mercer Fraser Co. and located in Trinity County and thus not part of the CHERT program, submitted pre- and post-extraction reports to CHERT. Humboldt County extraction volumes and surface areas by extraction method for 2018 are shown in Table 11.

Mined areas that extracted 10% or more above (or 110% of) their approved volumes are shown in red font in the following tables. The 10% 'threshold' (i.e., extraction exceeding 110% of approved volume) has been used for years as an informal trigger for distinguishing over-extraction from unavoidable inaccuracies in pre- and post-extraction surveys and volume computations. The level of disagreement between pre- and post-extraction surveys, depending on the type of mining, may indicate over-extraction when in fact there was none, or the opposite.

Table 3. Humboldt County 2018 gravel extraction summary by river reach.

River Reach	No. of mined sites	No. of mined areas	Approved Volume (cu. yd.)	Extracted Volume (cu. yd.)	Percent of Approved Volume	Extracted Area (acres)
Lower Mad River	9	12	83,945	80,270	96%	20.4
Lower Eel River	2	7	163,775	145,540	89%	11.9
Middle Eel River	1	2	27,853	24,570	88%	4.3
Van Duzen River	2	6	108,276	79,609	74%	14.7
South Fork Eel River	1	2	34,751	20,306	58%	3.5
Trinity River	2	3	17,109	0	0%	0.0
Isolated Sites	0	0	20,527	18,386	90%	2.3
Humboldt County Total =	**17**	**32**	**456,236**	**368,681**	**81%**	**57.1**

Table 4. Mad River gravel extractions in the 2018 extraction season. The volumes listed in this table do not include any taken by the Blue Lake Rancheria.

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	4,406	5,045	115%	2.0
Eureka Ready Mix	Miller-Almquist Bar	1	wide shoreline skim	4,858	5,061	104%	0.7
Eureka Ready Mix	Johnson-Spini Bar	1	wide shoreline skim	9,410	10,260	109%	6.1
Mercer Fraser Co.	Essex Bar	1	wide shoreline skim	1,271	1,275	100%	0.5
Eureka Ready Mix	Christie Bar	1	narrow offset skim	7,946	7,934	100%	2.0
Eureka Ready Mix	Christie Bar	2	narrow shoreline skim	5,129	4,896	95%	1.0
Eureka Ready Mix	Christie Bar	3	narrow shoreline skim	10,010	10,576	106%	2.6
GLJ Construction	Blue Lake Bar	1	moist pit	7,988	7,891	99%	0.7
GLJ Construction	Blue Lake Bar	2	narrow shoreline skim	4,367	4,488	103%	1.5
GLJ Construction	Blue Lake Bar	3	narrow shoreline skim	2,712	2,768	102%	0.5
Eureka Ready Mix	Emmerson Bar	1	moist pit	8,148	6,598	81%	1.2
Mad River Sand and Gravel	Guynup Bar	1	moist pit	17,700	13,478	76%	1.6
River Reach Totals =		**12**	---	**83,945**	**80,270**	**96%**	**20.4**

Table 5. Lower Eel River gravel extractions in the 2018 extraction season.

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 extr. proposed	n/a	n/a	n/a	n/a
County of Humboldt	Worswick Bar	n/a	no extr. proposed	n/a	n/a	n/a	n/a
Eureka Ready Mix	Drake Bar	n/a	no extr. proposed	n/a	n/a	n/a	n/a
Mercer Fraser Co.	Sandy Prairie: Plant A	A1	wet trench	17,206	17,949	104%	0.4
Mercer Fraser Co.	Sandy Prairie: Plant A	A2	moist pit	62,696	69,346	111%	4.3
Mercer Fraser Co.	Sandy Prairie: Plant B	B1	wet trench	15,248	13,971	92%	1.5
Mercer Fraser Co.	Sandy Prairie: Plant B	B2	alcove	25,133	0	0%	0.0
Hansen Truck Shop	Hansen Bar	n/a	no extr. proposed	n/a	n/a	n/a	n/a
Eureka Ready Mix	Hauck Bar	1	offset skim	15,573	16560	106%	1.4
Eureka Ready Mix	Hauck Bar	2	wet trench	8,795	7,758	88%	1.0
Eureka Ready Mix	Hauck Bar	3	offset skim	19,124	19,956	104%	3.3
River Reach Totals =		**7**	**---**	**163,775**	**145,540**	**89%**	**11.9**

* Hauck Area 1 is contiguous with Rock Area 4, Table 7; the Hauck volume for Area 1 is that portion on the Hauck site.

Table 6. Middle Eel River gravel extractions, 2018.

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	n/a	no extr. proposed	n/a	n/a	n/a	n/a
Humboldt Redwoods Co.	Lower Truck Shop Bar	n/a	no extr. proposed	n/a	n/a	n/a	n/a
Humboldt Redwoods Co.	Upper Truck Shop Bar	n/a	no extr. proposed	n/a	n/a	n/a	n/a
Humboldt Redwoods Co.	Three Mile Bridge Bar	1	narrow shoreline skim	25,298	22,162	88%	3.3
Humboldt Redwoods Co.	Three Mile Bridge Bar	2	narrow shoreline skim	2,555	2,408	94%	1.0
Humboldt Redwoods Co.	Dinner Creek Bar	n/a	no extr. proposed	n/a	n/a	n/a	n/a
Humboldt Redwoods Co.	Elinor Bar	n/a	no extr. proposed	n/a	n/a	n/a	n/a
Humboldt Redwoods Co.	Larabee Bar	n/a	no extr. proposed	n/a	n/a	n/a	n/a
Humboldt Redwoods Co.	South Fork Bar	n/a	no extr. proposed	n/a	n/a	n/a	n/a
Humboldt Redwoods Co.	Bowley Bar	n/a	no extr. proposed	n/a	n/a	n/a	n/a
Humboldt Redwoods Co.	Maynard Bar	n/a	no extr. proposed	n/a	n/a	n/a	n/a
Humboldt Redwoods Co.	Vroman Bar	n/a	no extr. proposed	n/a	n/a	n/a	n/a
River Reach Totals =		**2**	**---**	**27,853**	**24,570**	**88%**	**4.3**

Table 7. Van Duzen River gravel extractions, 2018.

Operator	Site	Area No.	Method	Approved Volume (cu. yds.)	Extracted Volume (cu. yds.)	Percent of Approved Volume	Extracted Area (acres)
Leland Rock	A	1	offset skim	35,255	35,332	100%	5.4
Leland Rock	B	2	narrow shoreline skim	8,819	7,130	81%	1.5
Leland Rock	C	3	offset skim	14,500	14,500	100%	1.9
Leland Rock	D	4	skim	30,000	5,829	19%	2.2
Van Duzen River Ranch	n/a	n/a	no extr. proposed	n/a	n/a	n/a	n/a
Tom Bess	West Site	1	narrow offset skim	511	787	154%	0.3
Tom Bess	West Site	2	narrow offset skim	19,191	16,031	84%	3.4
River Reach Totals =		**6**	**---**	**108,276**	**79,609**	**74%**	**14.7**

* Rock Area C is contiguous with Hauck Area 1, Table 5; the Rock volume for Area 1 is that portion on the Rock site.

Table 8. South Fork Eel River gravel extractions, 2018.

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 extr. proposed	n/a	n/a	n/a	n/a
Randall Sand and Gravel	Home Bar	1	wide shoreline skim	26,100	20,306	78%	3.5
Randall Sand and Gravel	County Bar	2	wide shoreline skim	8,651	0	0%	0.0
Mercer Fraser Co.	Cooks Valley: MEN *	n/a	no extr. proposed	n/a	n/a	n/a	n/a
Mercer Fraser Co.	Cooks Valley: HUM *	n/a	no extr. proposed	n/a	n/a	n/a	n/a
River Reach Totals =		**2**	---	**34,751**	**20,306**	**58%**	**3.5**
* "HUM" is in Humboldt County, "MEN" is in Mendocino County							

Table 9. Trinity River gravel extractions, 2018.

Operator	Sites	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	2,213	0	0%	0.0
Mercer Fraser Co.	Willow Creek Site	2	overflow channel skim	7,295	0	0%	0.0
Mercer Fraser Co.	Willow Creek Site	3	wide shoreline skim	7,601	0	0%	0.0
Mercer Fraser Co.	McKnight Bar	n/a	no extr. proposed	n/a	n/a	n/a	n/a
Klamath Trinity Aggregates	Rowland Bar	n/a	no extr. proposed	n/a	n/a	n/a	n/a
River Reach Totals =		**3**	---	**17,109**	**0**	**0%**	**0.0**

Table 10. Gravel extraction from isolated sites, 2018.

Operator	River	Site	Method	Approved Volume (cu. yds.)	Extracted Volume (cu. yds.)	Percent of Approved Volume	Extracted Area (acres)
County of Humboldt	North Fork Mattole	Cook Bar	no extr. proposed	n/a	n/a	n/a	n/a
County of Humboldt	Larabee Creek	Charles Bar	no extr. proposed	n/a	n/a	n/a	n/a
County of Humboldt	Bear River	Branstetter Bar	no extr. proposed	n/a	n/a	n/a	n/a
Humboldt County	PL-Van Duzen Bar	Van Duzen Bar	no extr. proposed	n/a	n/a	n/a	n/a
Mercer Fraser Co.	Dinsmore Bar	Dinsmore Bar	wet trench	20,527	18,386	90%	2.3
County of Humboldt	Middle Eel River	Dyerville Bar	no extr. proposed	n/a	n/a	n/a	n/a
Fort Seward Ranch	Eel River	Satterlee Bar	no extr. proposed	n/a	n/a	n/a	n/a
Isolated Sites Totals =	---	---	---	**20,527**	**18,386**	**90%**	**2.3**

Table 11. Humboldt County gravel extraction volumes and areas by extraction method, 2018.

Extraction Method	No. of Areas	Extracted Volume (cy)	Percent of Total Volume	Area (acres)	Percent of Total Area
moist pit	4	97,313	28%	7.8	14%
narrow offset skim	3	24,752	7%	5.7	10%
narrow shoreline skim	7	54,428	16%	11.4	21%
wet trench	3	39,678	11%	2.9	5%
wide offset skim	5	92,177	26%	14.2	26%
wide shoreline skim	5	41,947	12%	12.8	23%
Humboldt County Totals =	**23**	**350,295**	**100.0%**	**54.8**	**100%**

PERFORMANCE ISSUES: 2018

To evaluate operator performance and compliance, CHERT and regulatory agency staff conduct field reviews in the fall after completion of operations and review post-extraction documentation (cross sections, air photos, and other materials) to ensure approved mining plan design specifications were met. Overall, operator performance in conducting their 2018 operations consistent with approved mining plans was very successful, and few problematic conditions were noted this past year during post-extraction field reviews. Although most extractions were below their approved volumes, several sites exceeded approved volumes, but only by relatively minor amounts. Given the calculation methods used (double-end-area), the large scale of most operations and the large heavy equipment used for extraction, some level of volume deviations are to be expected and are not considered significant in most cases.

We highlighted sites that extracted more than 10% ***above*** approved volume (or 110% ***of*** approved volume) in Tables 4-10. It should be noted that while the percent over-extracted can be useful for evaluating performance, 10% of a large extraction volume can be of more significance than 10% of a small volume. For example, if an approved extraction of 30,000 cy is over-extracted by, say, 3,300 cy (an extraction of 111% of that approved), this could very well lead to impacts, depending on how the over-extraction was configured on the ground. Conversely, an over-extraction of 10% at a small volume extraction area may amount to only a few hundred cubic yards, in which case there would likely be no impacts.

At several mined areas, the actual extraction volume was much less than that approved. This does not present a problem as long as the extracted area is left in a condition that meets design objectives and mitigations (see Introduction above, and LOP 2015). Any adverse field conditions encountered during post-extraction field visits are noted below.

Problems noted in 2018

- Eureka Sand and Gravel Hauck/Rock Bar (Lower Eel River): A temporary access road to one extraction area at this site cut through part of the unmined gravel bar surface. Concerns were expressed during the post-extraction field review that the condition would create unfavorable hydraulics during subsequent river rises. This was not an issue treated in the operator's approved plans, but only came up during the post-extraction review. The operator corrected the potential problem by filling in the through cut before any river rises.

- Eureka Sand and Gravel O'Neill Bar (Mad River): The extracted volume exceeded the approved volume by 15% (see Table 4). Because this was a relatively small extraction, the over-extraction composed a volume of only 639 cubic yards. CHERT does not consider this a significant issue, and the post-extraction field visit did not indicate any potential problems.

- Gary Johnston Site, Blue Lake Bar (Mad River): During the post-extraction field visit, it was observed that the two skims, Areas #2 and #3, appeared excavated too low with ponded water in the lowest most areas. Surveys later confirmed this. The operator was required to replace the over-extracted gravel onto the affected river bars to raise the skim floors to the approved elevations (the 35% flow elevation). This was completed before a rise in river stage inundated the areas.

- Tom Bess Site (Van Duzen River): At Area 1, a narrow offset skim in Mr. Bess' West Area, was over-extracted by 54% (Table 7), amounting to 276 cubic yards above the approved volume. Because this was a relatively small extraction, the over-extraction was a small volume and the post-extraction field visit did not indicate any potential problems. CHERT does not consider this a significant issue,

- Leland Rock Site (Van Duzen River): At Area D, originally designed as a wet trench, as done in years past, the incomplete replenishment from past trenching resulted in a remnant pond with the proposed trench for 2018 adjacent to the remnant pond. A survey for FYLF found the pond occupied, leading the operator to request a design change from a trench to a skim, with a resulting large decrease in volume.

CHERT was not involved in subsequent field reviews or discussions between the operator and representatives of the NMFS. During the post-extraction field review, comments were made to the effect that the skim floor appeared to be too low (below the 35% flow elevation) in some areas. However, the post-extraction cross section surveys indicate that this was not the case.

- Mercer Fraser Co., Sandy Prairie Site (Lower Eel River): Over-extraction to 11% of approved volume, just over the unofficial threshold mentioned above, occurred at Area A2, a moist pit. However, the volume that amounted to, because this was a large extraction area, was considerable at 6,650 cy. This was an innovative extraction, designed to create FYLF habitat, or at least as an alternative to extracting that same volume in another area that could have impacts. The photograph below shows the pit after extraction during the Nov. 8, 2018, field review, during which time no concerns were voiced about the field conditions observed. Given that the pit was offset some distance from the active channel, habitat impacts are unlikely from the over-extraction.

Late Post-Extraction Submittals: The post-extraction submittals for the following sites were submitted later than December 15, 2018, the deadline set forth in the US Army Corps of Engineer's LOP 2015, Appendix C:

- Mad River Sand and Gravel, Guynup Bar (Mad River).
- Randall Site (South Fork Eel River).

The delays in receiving these materials, some not submitted until late January, caused a delay in the preparation of this report.

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%
2012	553,704	384,514	69%
2013	362,222	226,362	62%
2014	376,467	285,527	76%
2015	400,919	272,240	68%
2016	545,275	463,382	85%
2017	563,540	363,297	64%
2018	456,236	368,681	81%
Totals	**14,639,462**	**10,311,316**	**70%**
Averages	**697,117**	**491,015**	**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%
2012	111,317	100,329	90%
2013	80,525	76,919	96%
2014	69,322	66,743	96%
2015	70,230	69,719	99%
2016	145,769	142,510	98%
2017	153,778	113,841	74%
2018	83,945	80,270	96%
Totals	**4,011,024**	**3,630,827**	**91%**
Averages	**148,556**	**134,475**	**91%**

APPENDIX A (continued)

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%
2012	226,520	188,994	83%
2013	176,477	80,918	46%
2014	127,671	97,232	76%
2015	168,581	94,954	56%
2016	179,659	151,456	84%
2017	183,063	102,683	56%
2018	163,775	145,540	89%
Totals	**5,888,712**	**3,861,423**	**66%**
Averages	**267,669**	**175,519**	**66%**

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%
2012	29,569	25,880	88%
2013	0	0	n/a
2014	59,298	45,394	**77%**
2015	48,146	39,350	82%
2016	82,276	78,731	96%
2017	59,409	44,316	75%
2018	27,853	24,570	88%
Totals	**1,396,353**	**1,038,151**	**74%**
Averages	**63,471**	**47,189**	**74%**

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%
2012	19,039	0	0%
2013	27,588	17,212	62%
2014	32,341	24,754	77%
2015	20,610	15,129	73%
2016	34,863	23,657	68%
2017	36,679	17,010	46%
2018	34,751	20,306	58%
Totals	**1,218,986**	**826,401**	**68%**
Averages	**55,408**	**37,564**	**68%**

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%
2012	142,191	47,760	34%
2013	63,111	41,713	66%
2014	74,701	51,404	69%
2015	85,978	53,088	62%
2016	92,995	67,028	**72%**
2017	108,686	76,526	70%
2018	108,276	79,609	74%
Totals	**3,163,929**	**1,995,148**	**63%**
Averages	**143,815**	**90,689**	**63%**

APPENDIX A (continued)

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%
2012	25,068	21,551	86%
2013	5,521	723	13%
2014	13,134	0	0%
2015	7,374	0	0%
2016	9,713	0	0%
2017	21,925	8,921	41%
2018	17,109	0	0%
Totals	**738,117**	**456,437**	**62%**
Averages	**33,551**	**20,747**	**62%**

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
2012	0	0	n/a
2013	20,527	18,386	n/a
2014	0	0	n/a
2015	0	0	n/a
2016	0	0	n/a
2017	0	0	n/a
2018	0	0	n/a
Totals	**196,702**	**116,808**	**59%**
Averages	**9,367**	**5,562**	**59%**