APPENDIX G: CRUISE REPORT: Investigation into the Feasibility of Use and Seafloor Interaction of Light-Touch Trawl Gear in the Former Trawl Grounds of Monterey Bay

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
20 Lower Ragsdale Dr. suite 100
Monterey, CA 93940
www.wildlife.ca.gov

EDMUND G. BROWN JR., Governor
CHARLTON H. BONHAM, Director

CRUISE REPORT

Investigation into the Feasibility of Use and Seafloor Interaction of Light-Touch Trawl Gear in the Former Trawl Grounds of Monterey Bay

Prepared by

Travis Tanaka
CDFW-Marine Region
20 Lower Ragsdale Dr. Ste. 100
Monterey, CA 93940
Travis.Tanaka@wildlife.ca.gov

Lyle Enriquez
NOAA Fisheries
501 West Ocean Blvd.
Long Beach, CA 90802
Lyle.Enriquez@NOAA.gov

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Vessel: F/V Cecelia

Dates: August 10-13, 2013

Purpose: Conduct a fishery-independent survey to document seafloor interactions and species catch composition by use of "light-touch" trawl gear and to investigate the economic feasibility of using this gear in the former California halibut (halibut) trawl grounds of Monterey Bay:

1. Attach remote cameras to the trawl doors and headrope to document seafloor interactions and degree of contact.

2. Measure, weigh when possible, and assess condition of catch.

3. Measure, tag and release all live legal-sized fish of the target species California halibut (*Paralichtys californicus*).

4. Retain sublegal-sized halibut for life history studies.

5. Obtain economic information from the captain of the F/V Cecelia on fishing operations during the survey.

6. Monitor and record any protected species interactions.

Procedure:

This survey was a research partnership among the California Department of Fish and Wildlife (CDFW), the National Marine Fisheries Service, Southwest Region, Sustainable Fisheries Division (NOAA Fisheries), and commercial halibut trawl fishermen. The survey was conducted

in Monterey Bay, within the boundaries of the National Oceanic and Atmospheric Administration's, Monterey Bay National Marine Sanctuary (MBNMS). The MBNMS required issuance of a permit in order for the CDFW and NOAA Fisheries to conduct the survey within its boundaries. The lead action agency for the survey was NOAA Fisheries, and the CDFW was considered a non-Federal representative which conducted the at-sea research and carried out many aspects of the survey. Further, since the NOAA Fisheries contributed equipment and had an at-sea biologist performing duties on-board the survey vessel, this was considered a major Federal action requiring both National Environmental Policy Act (NEPA) and Endangered Species Act (ESA) consultations.

The section 7 ESA consultation was finalized on May 28, 2013, the Categorical Exclusion Memo and Checklist to satisfy NEPA requirements were approved on May 30, 2013, and the MBNMS Permit (#MBNMS-2013-015) was approved on June 4, 2013, allowing the survey to take place. The F/V Cecelia was contracted to run the survey and operated out of Moss Landing Harbor, adjacent to Monterey Bay. Using the contracted fisherman's knowledge and data from previous CDFW trawl surveys, the F/V Cecelia conducted 30-minute tows using "light-touch" trawl gear as defined in CCR Title 14 §124. All tows followed a pre-determined bottom contour or followed the best possible course given tide and current direction. Prior to each tow, NOAA Fisheries staff would scan the immediate area for signs of threatened, endangered and other protected species in the fishing area.

Legal-sized (legal) halibut collected in the trawl were measured, sexed by gently squeezing the abdomen and looking for milt or hydrated eggs, tagged, and released. Sublegal-sized (sublegal) halibut were to be retained for life history studies. All associated species were measured and weighed in aggregate when possible. All halibut and any other finfish species not weighed at sea had weights estimated from CDFW data and/or established length/weight estimates for that species. All finfish and invertebrates were placed into separate bins with fresh seawater to keep them alive before assessment and release. All live specimens were released upon completion of data collection.

Results:

Twenty tows at 30 minutes per tow were completed over 4 days (Figure 1). Typically commercial halibut trawlers will tow for 1-3 hours, depending upon whether they are fishing for the live or fresh market. The purpose of the shorter tow time for this survey was to document via video gear interaction with the seafloor, to ensure that captured species would have an increased chance of survival upon release, and to reduce the chance of interactions with threatened, endangered, or other protected species. Average tow speed was approximately 2.3 to 2.7 knots. Most of the tows were performed in the northern part of the bay due to better water clarity for filming and to avoid the larger quantities of sea nettles (phylum Cnidaria) that were present elsewhere in the bay. Weather for the cruise was excellent with little wind or swell.

The survey used GoPro Hero 2 cameras mounted on the trawl doors and/or headrope to document fishing gear contact with the seafloor. NOAA Fisheries personnel collected video clips on 15 of the 20 tows performed during the survey. The quality of the video was dependant on light and depth of the tow. Of the 18 videos collected, six are considered good quality video and will be analyzed for seafloor contact and net performance by a NOAA fisheries biologist.

There were 55 legal halibut caught, all of which were tagged and released in good condition. No sublegal halibut were caught. All released halibut had some degree of split caudal fins and minor bruising on the blind side. Many of the released halibut, despite minor bruising and split

fins, were very lively and swam away immediately upon release. The total estimated weight was 761.3 pounds (345.3 kilograms) with a length range of 578-975 mm.

In addition to halibut, there were 33 incidentally caught species (Table 1). The top three vertebrate species by count were California skate (*Raja inornata*, 302), shortbelly rockfish (*Sebastes jordani*, 287), and Pacific sanddab (*Citharichthys sordidus*, 241). The most abundant invertebrate species was Dungeness crab (*Metacarcinus magister*, 656). Sea nettle jellyfish (*Chrysaora fuscescens)* were present in small amounts in 16 of the tows. All rockfish captured were juvenile and averaged 89 mm fork length. No groundfish that are designated as overfished by the federal government were captured.

For all finfish, regardless of species, 85.9 percent by count were considered to be in good or excellent condition prior to release. For the invertebrates, all jellyfish were assessed to be in poor or dead condition after capture. For the remaining individual invertebrates (739), except for two market squid and one octopus, all were released in good or excellent condition.

In order to satisfy the requirements of the ESA consultation, NOAA Fisheries provided one dedicated scientific crew member to perform all the ESA monitoring and mitigating protocol at-sea duties. No ESA threatened or endangered species, or other protected species were encountered while transiting to the fishing grounds, fishing, or during any other part of the survey.

Economic data were gathered by NOAA Fisheries personnel using an economic survey form given to the captain of the F/V Cecelia. Data were collected on vessel characteristics, trip and catch information, fixed and variable expenses, quantities of catches, expected prices and revenues if the fish would have been landed by the vessel. Data were also collected on monthly distribution of trips, potential expected number of trips in Monterey Bay if the fishery were to re-open, potential expected revenue, and potential fleet size. The data collected are only intended to be used for the purpose of determining the practicality of using light-touch trawl gear to catch halibut in the former trawl grounds of Monterey Bay. A final/full report of the survey results (including both economic and video analysis) is in preparation and will be available by December 2013.

Personnel: Travis Tanaka, Co-principle investigator, CDFW
Lyle Enriquez, Co-principle investigator, NOAA Fisheries
Morgan Castagnola, Vessel captain
Daniel Castagnola, Deckhand
Cheryl Barnes, Moss Landing Marine Labs, August 10-11, 2013
Kristine Lesyna, CDFW, August 12-13, 2013
Michael McCorkle, Southern California Trawlers Association
Tonya Wick, NOAA Fisheries-ESA Biological Assessment

Figure1. Trawl area, including tow track lines.

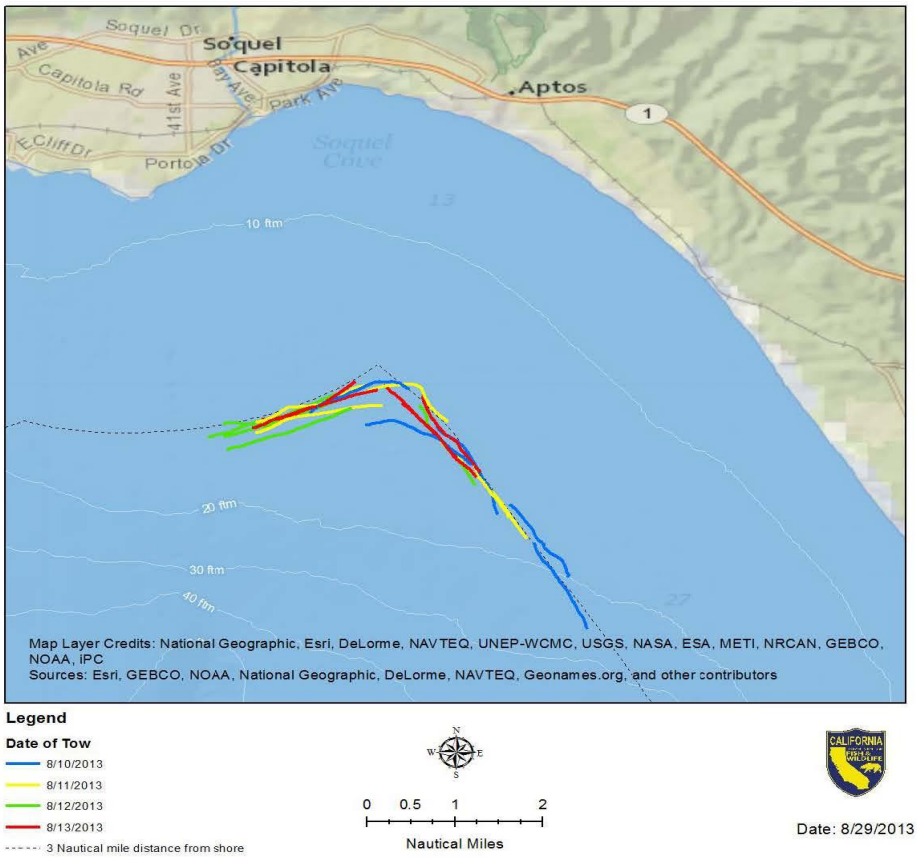

Table 1. Total catch from light touch trawl survey in Monterey Bay, August 2013, including individual numbers and total weight.

Scientific Name	Common Name	Number	Weight (lb)
Metacarcinus magister	Dungeness crab	656	659.0
Raja inornata	California skate	302	557.25
Sebastes jordani	shortbelly rockfish	287	4.75**
Citharichthys sordidus	Pacific sanddab	241	56.3
Sebastes goodei	chilipepper rockfish (juvenile)	179	3.25**
Genyonemus lineatus	white croaker	163	24.25
Parophrys vetulus	English sole	152	34.8
Zaniolepis latipinnis	longspine combfish	141	11.0**
Raja binoculata	big skate	112	966.25
Chrysaora fuscescens	brown sea nettle	91	499.5**
Peprilus simillimus	Pacific butterfish	84	7.0**
Eopsetta jordani	petrale sole	79	88.75
Platichthys stellatus	starry flounder	72	240.5
Paralichtys californicus (legal-size))	California halibut	55	761.3*
Doryteuthis opalescens	California market squid	45	5.0
Pleuronichthys decurrens	curlfin turbot	35	11.45
Psettichthys melanostictus	sand sole	34	31.5
Ophiodon elongates	lingcod (juv)	33	0
Octopus spp.	Octopus	23	0
Leptocottus armatus	staghorn sculpin	15	6.75
Squalus acanthias	spiny dogfish	9	60.5**
Chitonotus pugetensis	roughback sculpin	8	0
Lunatia lewisii	moon snail	6	0
Pisaster brevispinus	giant pink seastar	4	0
	sea star spp.	4	
Pycnopodia helianthoides	sunflower star	4	4
Metacarcinus gracilis	slender crab	3	
Hyperprosopon anale	spotfin surfperch	3	
Synodus lucioceps	California lizardfish	2	0
Zalembius rosaceus	pink sea perch	2	0
Myliobatis californica	bat ray	1	11.5
Pleuronichthys verticalis	hornyhead turbot	1	0.5
Clupea pallasi	Pacific herring	1	0
Cancer productus	red rock crab	1	0

*= calculated weights based on Department sample data
**=Total weight calculated from on-board weights and established length/weight relationship data

0=No weight due to small size, lack of length/weight relationship data, or unable to calculate average weight due to low catch