

Review of California Halibut Trawl Fishery in the California Halibut Trawl Grounds

**Draft Supplemental Report to the
California Fish and Game Commission**



**California Department of Fish and Game
Marine Region
State Fisheries Evaluation Project
(02/20/2008)**

Introduction

In 2004, the Legislature approved SB 1459 (Bill) which amended Fish and Game Code (FGC) §8495 and §8842, and added §8494 and §8841 pertaining to California's bottom trawl fisheries. The Bill granted the Fish and Game Commission (Commission) authority over all state managed bottom trawl fisheries not managed under a federal or state fishery management plan, created a California halibut bottom trawl permit, established qualifying criteria to obtain permits, and required that every bottom trawl vessel issued a state permit be subject to the requirements and policies of the federal West Coast Groundfish Observer Program. The Bill also prohibited the use of trawl gear in four small areas within the California Halibut Trawl Grounds (CHTG) as of 2005 that were previously open to California halibut trawling (Figure 1) (FGC §8495). The CHTG were established in 1971 and currently encompass 201 square nautical miles (nm) of state waters not less than one nm from mainland shore between Point Arguello (Santa Barbara County) and Point Mugu (Ventura County) (Figure 1). The 2005 area closures amounted to 13 percent of the previously existing CHTG. Commencing April 1, 2008, four additional closures, comprising 42 percent of the remaining CHTG, will be implemented. The four areas are shown in Figure 1 and can be described generally as waters lying from one and three nm from mainland shore approximately between the following points:

- Area A: Rocky Point to Point Conception
- Area B: Point Conception to Gaviota
- Area C: Santa Barbara Point to Pitas Point
- Area D: Hueneme Canyon to Laguna Point

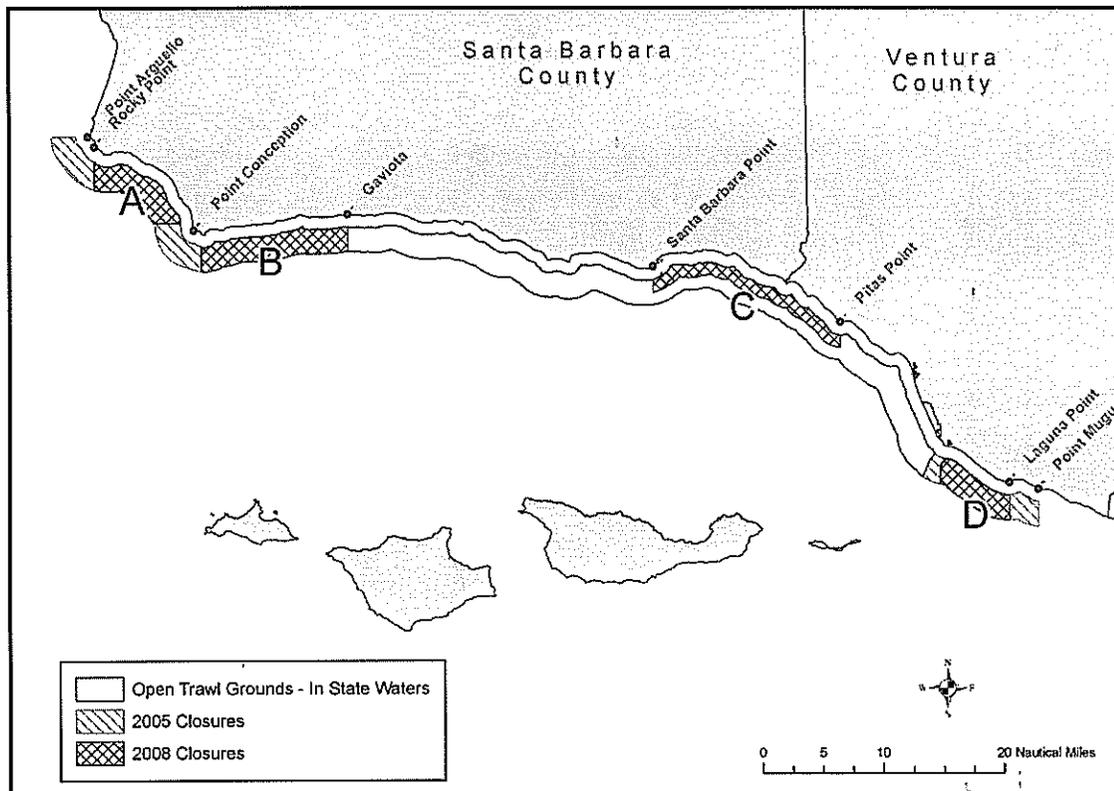


Figure 1. Map of the California Halibut Trawl Grounds and closures.

The Commission may choose to reverse the pending 2008 area closures if performance criteria listed in FGC §8495 for the fishery are deemed to have been met. The performance criteria require that the use of trawl gear: 1) minimizes bycatch; 2) is likely not damaging seafloor habitat; 3) is not adversely affecting ecosystem health; and 4) is not impeding reasonable restoration of kelp, coral, or other biogenic habitats.

At the February 7, 2008, Commission meeting in San Diego, the Department of Fish and Game (Department) summarized its draft report submitted to the Commission entitled "Information Concerning the California Halibut Trawl Fishery off Southern California" (CDFG 2008). The report provided the Commission with the best available information about the California halibut trawl fishery operating within the CHTG, including underwater footage of the trawl gear performance under tow and habitat footage to validate the presence or absence of hard bottom habitat in proposed closure Area C. Following the presentation, the Commission requested that the Department produce detailed maps and habitat characteristics of the seafloor for each of the individual proposed area closures. The purpose of this supplemental report is to provide the Commission with the best available information concerning key habitat attributes and fishery performance information for each of the aforementioned closures.

Summary for Proposed Closure Areas

Key attributes and information are summarized for each individual 2008 closure area in Table 1. Each of these areas has different physical characteristics and each has not been utilized by the California halibut trawl fleet equally. The factors discussed in CDFG (2008) regarding performance criteria for the implementation of the Trawl Bill differ significantly in each of the proposed closures. The economic impact of the closures on the fishing fleet also differs by each area. A comparison of these factors is provided in Table 1. The individual proposed closure areas have been labeled A through D and are shown on maps in Figures 2, 3, 4, and 5.

The area trawled within the four proposed closure areas was compared to both the total area trawled inside the CHTG and the area trawled statewide, by plotting all trawl log effort from 1997 to 2006 using Geographic Information System software. This information indicates that the actual area trawled for California halibut within the four proposed closure areas was 35 percent of the CHTG and five percent of the total area of bottom habitat trawled statewide. The actual area trawled was highest in Area C of the four areas, comprising 17 percent of the CHTG and three percent of the total area of bottom habitat trawled statewide (Table 1). The actual bottom habitat trawled in Areas A and D each comprised nine percent of the CHTG and one percent of the overall area of bottom habitat trawled statewide. Fishing activity is negligible in Area B.

Bycatch discard rates from the collaborative bycatch study were lowest in Area B at 11.5 pounds-per-tow (38.2 percent discarded dead), and highest in Area A at 53.6 pounds-per-tow (2.3 percent discarded dead) with an overall average of 23.5 pounds-per-tow (Table 1). No rocky reef associated hard corals, sponges, or live kelp were caught during the bycatch study. Bycatch data were collected using the same methods in each of the areas and are comparable across the four areas, however, the 30-minute sample tows used in the bycatch study were shorter than the 1 to 1.5 hour tows typical of the fishery.

The greatest ex-vessel revenue was generated in Area C, which is also where the highest concentration of trawl effort occurred (Table 1). For the Santa Barbara and Ventura Counties region, the total contribution to local economic output is about 2.3 times the direct ex-vessel revenue. This total output contribution is derived from input-output multipliers which capture how direct output contributes to local economic activity; in terms of total direct, indirect, and induced output, total wages, and employment (Appendix A and Appendix B).

Table 1. Descriptive attributes of the California Halibut Trawl Grounds with individual summaries for each of the four proposed 2008 area closures.

Descriptive attributes	2008 area closures				Total
	A	B	C	D	
Area (square nm)	17	25	18	13	73
Percent area of CHTG (open in 2007)	10%	14%	10%	8%	42%
Percent soft bottom	90%	72%	97%	100%	86%
Percent area trawled within the CHTG	9%	< 1%	17%	9%	35%
Average discarded (pounds-per-tow)	54	12	13	33	24
Percent discarded dead	2%	38%	1%	8%	6%
Average annual ex-vessel revenue for California halibut landings ^{1,2}	\$13,949	\$21	\$86,206	\$45,574	\$145,750
Average annual ex-vessel revenue for other species landed with California halibut ^{1,2}	\$1,013	\$1	\$5,510	\$2,378	\$8,902

Data source: CFIS (2008)

¹Ex-vessel revenue based on ten year averages of fishing seasons from 1997/98 to 2005/2006.

²Ex-vessel revenue adjusted for inflation to year 2006\$ prices.

Summary for Closure Area A

General Physical Description

Area A is located in the northwestern portion of the Santa Barbara Channel (SBC) (Figure 1). It encompasses an area of 17 square nm between one nm and three nm from mainland shore from Rocky Point to Point Conception (Figure 2), and represents approximately 10 percent of the open CHTG, with an average bottom depth of 30 fathoms (fm) (Table 1). The seafloor of Area A has been surveyed using sidescan sonar. Four areas of rocky reef are inside the closure boundaries making up approximately 10 percent of its area. *Macrocystis* kelp grows about 0.5 nm inshore of this closure (Figure 2).

Discard Information

The four study tows conducted inside Area A had a bycatch discard rate of 53.6 pounds-per-tow, of which 2.3 percent was discarded dead. Discards in this area consisted of both fish and invertebrates, with California bat rays and sheep crabs accounting for 80 percent (by weight) of the discarded catch.

Revenue and Economic Impact

Trawl harvests taken from Area A represent about four percent of the regional revenue (region includes Santa Barbara and Ventura Counties) derived from the harvest of California halibut and other marketable species taken incidentally with the California halibut (Table 1). In terms of dollar value generated, Area A has a relatively small revenue generating potential compared to Areas C and D, averaging annual ex-vessel revenue of about \$14,000, with a range of \$0 (most recently) to \$40,000 (five to ten years ago). The direct ex-vessel revenue from Area A represents a total economic output contribution of about \$34,000 on average, and a potential economic output contribution of as much as \$91,000 annually.

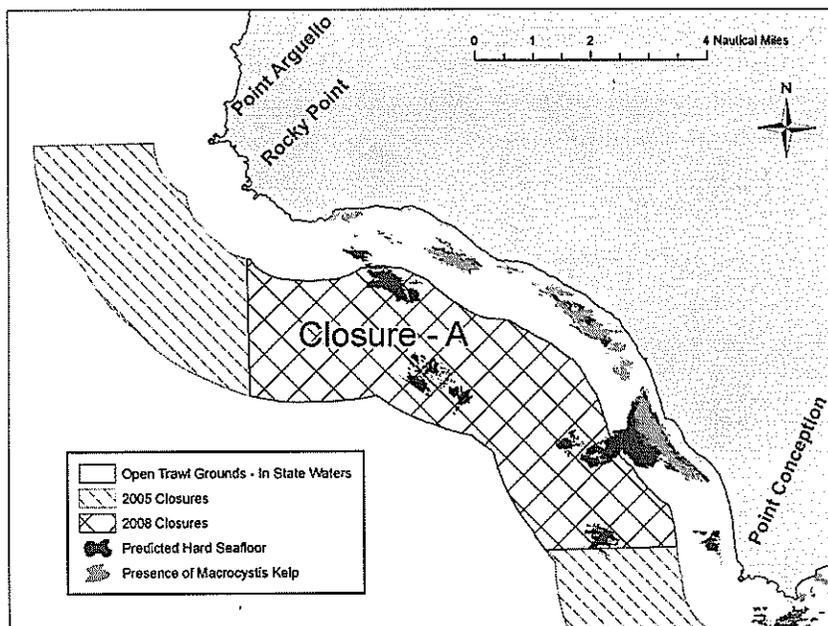


Figure 2. Map of closure Area A located between Rocky Point and Point Conception.

Summary for Closure Area B

General Physical Description

Area B is located in the western portion of the SBC (Figure 1). It is the largest of the four areas, encompassing an area of 25 square nm between one nm and three nm from mainland shore from Point Conception to Gaviota (Table 1). Area B represents approximately 14 percent of the open CHTG, with an average bottom depth of 39 fm (Table 1). Sidescan sonar surveys have mapped the seafloor within this closure. This closure contains two areas of rocky reef that make up 28 percent of its area (Figure 3). Most of the rocky reef encompasses one large area that extends from shore to near the outer boundary of the closure. *Macrocystis* kelp beds are found within 0.1 nm of the nearshore boundary (Figure 3).

Discard Information

The four study tows conducted inside Area B had a bycatch discard rate of 11.5 pounds-per-tow, of which 38.2 percent was discarded dead. Discards in Area B consisted mostly (by number) of brittle stars, crab species, and sea pens. Sea pens, which are considered "soft corals", are not reef forming corals and were only encountered in Area B during the bycatch study.

Revenue and Economic Impact

Trawl harvests taken from Area B represent less than one percent of the regional revenue derived from the harvest of California halibut and other marketable species taken incidentally with the California halibut (Table 1). Area B is not a significant revenue producing area for California halibut trawl fishermen in the region of Santa Barbara and Ventura Counties. Likewise, the contributions of Area B to California halibut trawl fishermen and total regional economic output is not significant.

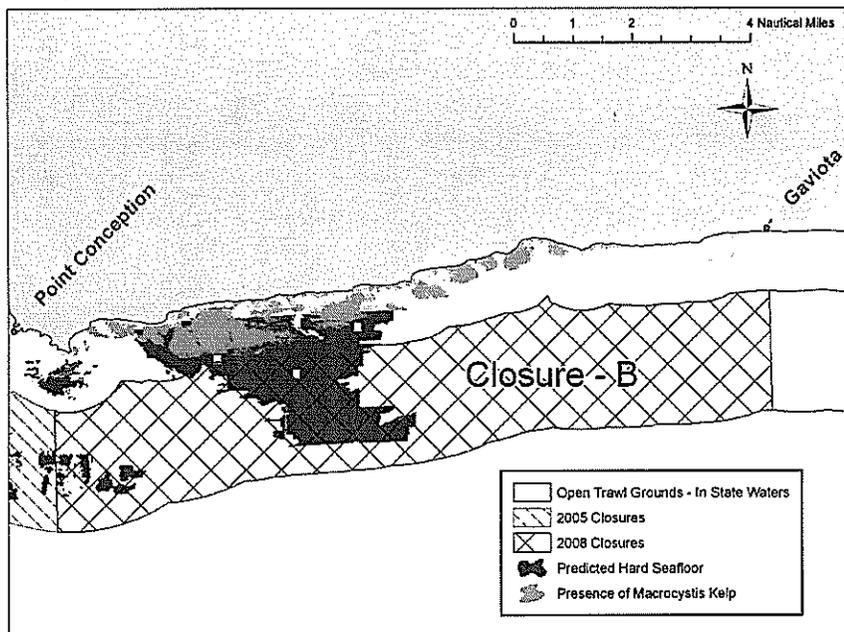


Figure 3. Map of closure Area B located between Point Conception and Rocky Point.

Summary for Closure Area C

General Physical Description

Area C is located in the eastern portion of the SBC (Figure 1). It encompasses an area of 18 square nm between one nm and two nm from mainland shore from Santa Barbara Point to Pitas Point, and represents approximately 10 percent of the open CHTG, with an average bottom depth of 17 fm (Table 1). High resolution multibeam and sidescan sonar bathymetry mapping has recently been completed in this area by California State University Monterey Bay (CSUMB) and the United States Geological Survey (USGS). Previous course scale mapping of rocky seafloor indicated that 9 percent of the seafloor was rocky reef. The new high resolution mapping and observations by the Department's Remote Operated Vehicle (ROV) indicate that the actual percentage of rocky seafloor in closure Area C is between three percent and five percent (Figure 4). *Macrocystis* kelp grows within 0.1 nm of the nearshore boundary of the closure.

Discard Information

The sixteen study tows conducted inside Area C had a bycatch discard rate of 12.9 pounds-per-tow, of which one percent was discarded dead. Discards in this area consisted of both fish and invertebrates with shark and ray species accounting for 60 percent (by weight) of the discarded catch in this area.

Revenue and Economic Impact

Trawl harvests taken from Area C represent over 22 percent of the regional ex-vessel revenue derived from the harvest of California halibut and other marketable species taken incidentally with the California halibut (Table 1). In terms of dollar value generated, Area C has the highest revenue generating potential of all the sub-areas, averaging about \$86,000 annually in ex-vessel revenue, with a range of \$55,000 to \$159,000. The direct ex-vessel revenue from Area C represents a total output contribution of about \$208,000 on average, and a potential regional economic output contribution of as much as \$360,000 annually to Santa Barbara and Ventura Counties.

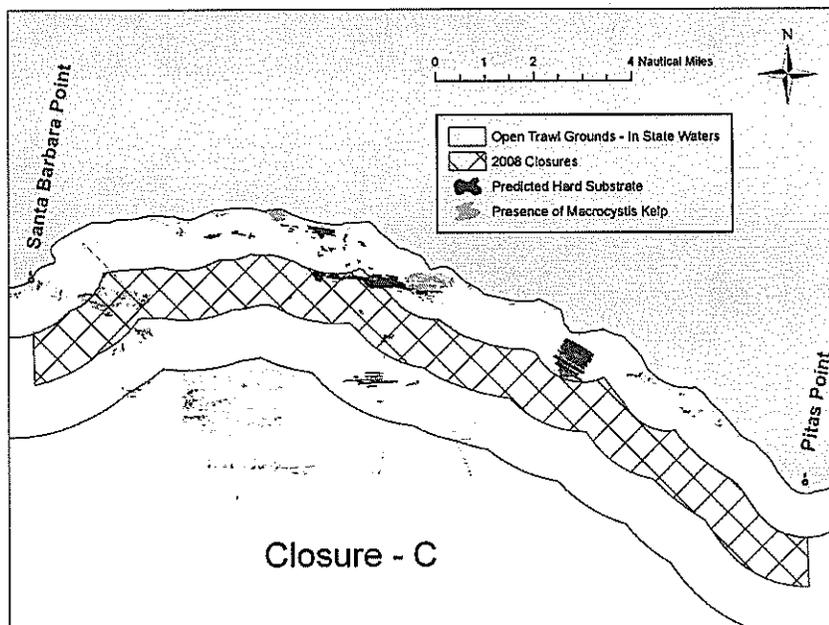


Figure 4. Map of closure Area C located between Rocky Point and Point Conception.

Summary for Closure Area D

General Physical Description

Area D is located in the southeastern portion of the SBC (Figure 1). It is the smallest of the four areas, encompassing an area of 13 nm between one nm and three nm from mainland shore from Hueneme Canyon to Laguna Point (Figure 5). Area D represents approximately eight percent of the open CHTG, with an average bottom depth of 34 fm (Table 1). Area D was also mapped in high resolution using multibeam sonar by CSUMB (Figure 5). This mapping has clearly identified the extensive submarine canyon system within and near the area. Several patches of hard substrate have been mapped in Area D, although they are negligible, combining to represent less than one percent of the area (Table 1) (Figure 5). Determination of rocky seafloor within the canyon areas of this closure has not been completed. The canyon areas within the closure cover 2.5 square nm and make up approximately 19 percent of the closure area. No canopy forming *Macrocystis* kelp grows in or near this closure (Figure 5).

Discard Information

The eight study tows conducted inside Area D had a bycatch discard rate of 32.6 pounds-per-tow, of which 8.3 percent was discarded dead. Discards in Area D consisted of both fish and invertebrates with shark and ray species accounting for 60 percent of the discards by weight and gray sand stars 68 percent by count.

Revenue and Economic Impact

Trawl harvests taken from Area D represent about 12 percent of the regional revenue derived from the harvest of California halibut and other marketable species taken incidentally with the California halibut (See Table 1). In terms of dollar value generated, Area D is second only to the revenue generated in Area C, averaging an annual revenue of about \$48,000, with a range of \$7,600 to \$107,000. The direct ex-vessel revenue from Area D represents a total economic output contribution of about \$109,000 on average, with a potential contribution of as much as \$243,000 annually to the regional economies of Santa Barbara and Ventura Counties.

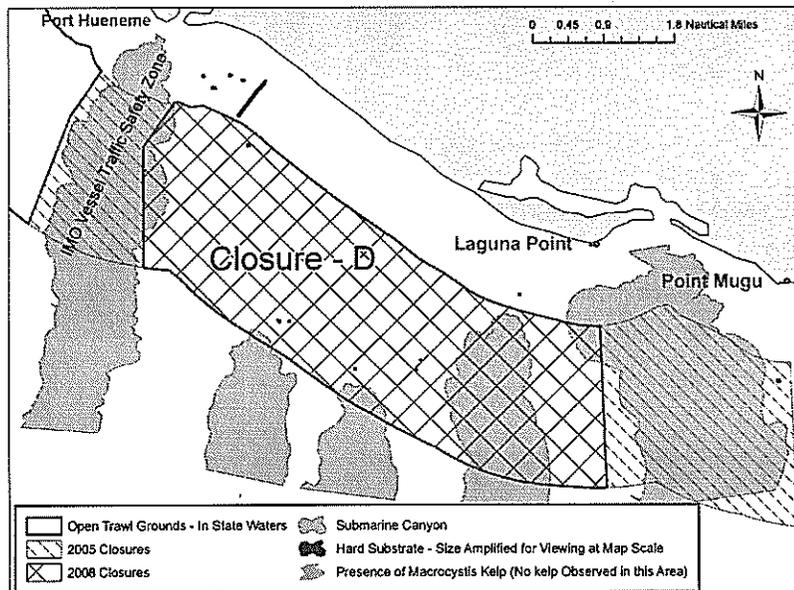


Figure 5. Map of Closure Area D located between Hueneme Canyon and Point Laguna.

Literature Cited

CDFG. 2008. Information concerning the California halibut trawl fishery off southern California. Draft report to the California Fish and Game Commission, California Department of Fish and Game, Marine Region, State Fisheries Evaluation Project.

CFIS. 2008. California Fisheries Information System. California Department of Fish and Game.

NMFS. 2005. Final Environmental Impact Statement: Pacific coast groundfish fishery management plan, essential fish habitat designation and minimization of adverse impacts. National Marine Fisheries Service, Seattle, Washington. December, 2005.

Data Sources

Presence of kelp data plotted in maps came from CDFG aerial flight surveys conducted in 1989, 1999, and 2002 through 2005. Seafloor substrate data came from a variety of sources, such as Channel Islands National Marine Sanctuary, National Marine Fisheries Service (2005), and in 2006, a collaborative effort to map the nearshore seafloor from Goleta to Point Mugu was undertaken by the California Coastal Conservancy. Partners performing the mapping were California State University, Monterey Bay, the United States Geological Survey, the United States Mineral Management Service, the Beach Erosion Authority for Clean Oceans and Nourishment, and the City of Carpinteria. As of February 2008, most of the mapping has been completed and made available for use. Using multi-beam and side-scan sonar techniques, the mapping provides high resolution (6.5 ft) information for depth and substrate type. cursory analysis of the data made available so far has provided more detailed information about hard substrate inside the CHTG. After the remaining mapping is completed, similar maps can be made for the CHTG from Ventura west to Goleta. This will provide high resolution information that is presently unavailable on the presence of rocky habitat within the 2008 closure area near Santa Barbara (i.e., Area C).

Appendix A. Ex-vessel revenue (2006\$) from California halibut and marketable species harvested incidentally with California halibut in the region and in the California Halibut Trawl Grounds sub-areas.

Fishing season	California halibut	Other marketable species harvested with California halibut	All California halibut and other marketable species combined ¹	Ex-vessel revenue (2006\$) for California halibut and other marketable species by sub-area			
				Area A	Area B	Area C	Area D
97/98	\$257,551	\$13,677	\$271,228	\$38,828	\$0	\$54,686	\$56,389
98/99	\$318,390	\$37,849	\$356,239	\$30,447	\$0	\$133,342	\$15,110
99/00	\$241,372	\$28,900	\$270,272	\$19,972	\$0	\$81,441	\$14,309
00/01	\$376,531	\$33,587	\$410,118	\$2,756	\$0	\$72,541	\$23,766
01/02	\$726,890	\$51,796	\$778,686	\$17,369	\$0	\$120,642	\$107,275
02/03	\$615,756	\$22,456	\$638,212	\$40,245	\$214	\$158,873	\$79,709
03/04	\$358,200	\$12,105	\$370,305	\$0	\$0	\$57,170	\$65,625
04/05	\$374,276	\$11,212	\$385,488	\$0	\$0	\$88,671	\$88,792
05/06	\$337,333	\$17,462	\$354,795	\$0	\$0	\$82,279	\$20,909
06/07	\$298,156	\$6,379	\$304,536	\$0	\$0	\$67,515	\$7,638
Totals	\$3,904,455	\$235,423	\$4,139,878	\$149,615	\$214	\$917,159	\$479,521
Ten Season Average	\$390,446	\$23,542	\$413,988	\$14,962	\$21	\$91,716	\$47,952

¹Landing revenues do not include sea cucumber, ridgeback prawn or white croaker.

Appendix B. Economic contribution to the Santa Barbara and Ventura Counties from trawl caught California halibut over ten fishing seasons from 1997 to 2006. The ex-vessel revenue is adjusted for inflation to 2006\$ prices.

Economic contribution	Regional	Area A	Area B	Area C	Area D
Direct output ¹	\$413,988	\$14,962	\$21	\$91,716	\$47,952
Economic output ²	\$938,043	\$33,901	\$49	\$207,816	\$108,653
Wages	\$445,696	\$16,107	\$23	\$98,741	\$51,625
Jobs	18.5	0.7	0.0	4.1	2.1
Output multiplier ³	2.26587				
Wage multiplier	1.076593				
Jobs multiplier (per \$1,000,000)	44.7				

¹Landing revenues do not include sea cucumber, ridgeback prawn or white croaker.

²Economic output contribution includes direct, indirect, and induced effects of commercial fishing output on the regional economies of Santa Barbara County and Ventura County.

³Economic multipliers are taken from IMPLAN for the regions of Santa Barbara County and Ventura County combined.