

Attachment 1

2014 CDFW Sea Cucumber Diver Survey: Summary of Key Results

In summary, 30 out of 86 total dive permittees (35% return rate) provided valuable feedback to questions related to fishery/market dynamics, sea cucumber biology, and current fishery management. Survey results strongly suggest a vast majority (74%, 20 of 27 responses) of fishery respondents feel that current management policies are not sufficient to maintain a sustainable fishery, with a majority of respondents (55%, 15 of 27 responses) suggesting a seasonal closure to improve sustainability.

*Note all further percentages are based off the *responses per question* unless otherwise noted

General Fishery Practices

1. What is the diver's home port? (Total responses: 26/30 (86%))

| | | | |
|---------------------------|------------------------|--------------------|-------------------------|
| Channel Islands: 11 (42%) | Santa Barbara: 5 (19%) | San Pedro: 3 (12%) | Terminal Island: 2 (8%) |
| Los Angeles: 2 (8%) | Ventura: 1 (4%) | San Diego: 1 (4%) | Marina Del Ray: 1 (4%) |

2. What percentage of time does the diver use scuba or hookah to harvest sea cucumbers

(Total responses: 30/30 (100%))

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|---------------------------------------|---------------------|-------------------------|-------------------------|
| Hookah only: 17 (57%) | Scuba only: 5 (17%) | Majority hookah: 2 (7%) | Majority scuba: 4 (13%) |
| Both scuba and hookah equally: 2 (7%) | | | |

3. Does the diver use a scooter for harvesting? (Total responses: 29/30 (97%))

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| Yes: 8 (27%) | No: 21 (73%) |
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4. Does the diver use a scooter for scouting? (Total responses: 29/30 (97%))

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| Yes: 12 (41%) | No: 17 (59%) |
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5. What percentage of total dive time does the diver use a scooter? (Total responses: 12/30 (40%))

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| The average use is 24% of total dive time. |
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6. What year did the fishery start cutting sea cucumbers? (Total responses: 23/30 (77%))

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| 14 divers said it started within 2008 – 2010 (47%) |
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*Other responses: 1985 (1), 1995 (1), 1999 (1), 2000 (2), 2005 (2), 2007 (1), 2011 (1), not known (3)

7. What year did the individual diver start cutting cucumbers? (Total responses: 28/30 (93%))

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|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| 1985 (2) | 1988 (1) | 1992 (1) | 1995 (1) | 1999 (2) | 2005 (2) | 2007 (1) | 2008 (5) | 2009 (3) | 2010 (3) | 2011 (4) | 2013 (1) | other (2) |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|

8. What percentage of an individual's landed product are sold cut? (Total responses: 28/30 (93%))

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| 100%: 19 | 91-99%: 4 | 80-90%: 4 | 75%: 1 |
|----------|-----------|-----------|--------|

9. What percentage of an individual's landed product are sold whole? (Total responses: 10/30 (33%))

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|---------|-----------|-----------|----------|
| 100%: 1 | 25-50%: 1 | 15-20%: 3 | 1-10%: 5 |
|---------|-----------|-----------|----------|

10. Does the diver cut differently for each buyer or processor? (Total responses: 28/30 (93%))

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| Yes: 14 (50%) | No: 14 (50%) |
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11. Does the diver target a specific size of sea cucumber? (Total responses: 21/30 (70%))

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| Yes: 12 (57%) | No: 9 (43%) |
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12. What size of sea cucumber does the diver target? (Total responses: 14/30 (47%))

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| 9 divers stated that they target large individuals. |
| 3 divers stated that they target smaller individuals for a live market. |

Biology

13. Sea cucumber biology: seasonal movement (Total responses: 20/30 (67%))

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| 6 divers said they move into deeper areas, spread out, or disappear (ex. go in holes/cracks) in fall |
| 7 divers said they move in to shallow areas during late winter |
| 3 divers acknowledged that they move but no specifics are given |

14. Sea cucumber biology: aggregation (Total responses: 16/30 (53%))

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| All 16 divers noted aggregation behavior |
| 10 divers said aggregations occur from March – July (late spring and summer) |
| 4 divers noted that aggregations occur on the sand at the base of/between rocks |
| Response: “Cuke sometime stand up in groups and undulate back and forth in current” |

15. Sea cucumber biology: spawning (Total responses: 13/30 (43%))

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| 10 divers said spawning happens April – July (late spring and early summer) (77% of responses) |
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*Other responses are “varies”, “hard to be specific”, and “July – Sept, contain eggs/sperm, raise bodies off bottom”

16. Sea cucumber biology: internal organs absent (Total responses: 10/30 (33%))

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| 8 divers noted that this happens in September – January (Fall/winter) (80% of responses) |
| 2 divers noted this observation, but did not provide a time period |

Perspectives on the Fishery and Fishing Behavior

17. Has the diver observed any good changes for the fishery? (Total responses: 7/30 (23%))

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| 6 divers noted the price being good (86% of responses). Other diver said “Stable market” |
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18. Has the diver observed any bad changes for the fishery? (Total responses: 21/30 (70%))

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| 21 divers indicated bad changes for the fishery. These included: “diminishing catch”, “volume is down”, “increased pressure”, “increased competition”, “less animals”, “poaching in MPA’s”, “take of small cucumbers” “start harvesting too early because of increased value” “take too long to reproduce” “nothing to ensure sustainability”, “too much year round harvest, no time for cucumbers to aggregate” |
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19. What are the advantages/disadvantages of using hookah and/or scuba to harvest?

(Total responses: 26/30 (87%))

Advantages:

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| Hookah: safer, easier to enforce closed areas, stay down longer, and can thoroughly work an area |
| Scuba: more efficient, cover more area, no anchoring, less restrictions, can dive in kelp, and can dive in current |

Disadvantages:

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| Hookah: decreased mobility and restricted in kelp |
| Scuba: more dangerous, can lose divers, and on limited time |

20. Has the diver's diving methods changed as effort has increased, yes or no?

(Total responses: 26/30 (87%))

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| Yes: 15 (58%) | No: 11 (42%) |
|---------------|--------------|

21. What has changed for the diver's diving methods? (Total responses: 26/30 (87%))

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| Working deeper: 5 (19%) |
| Staying down longer: 3 (12%) |
| More scouting time: 3 (12%) |
| Starting earlier in season: 1 (Jan. – Feb.) |
| Relocation: 1 |
| Increased effort: 1 |
| Only targeting large: 1 |
| No change: 11 (42%) |

22. Did the diver's dive effort increase, decrease, or stay the same from 2012 to 2013?

(Total responses: 26/30 (87%))

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|--------------------|------------------|------------------------|---------------|--------------|
| Decrease: 15 (58%) | Increase: 2 (8%) | Stay the same: 6 (23%) | No/NA: 2 (8%) | Yes': 1 (4%) |
|--------------------|------------------|------------------------|---------------|--------------|

23. Why did the diver's dive effort change? Total responses: 21/30 (70%)

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| Increase effort because less cucumbers: 2 (10%) |
| Increase due to the price: 3 (14%) |
| Decrease effort because less cucumbers: 6 (29%) |
| Decrease due to the price: 3 (14%) |
| Decrease for other personal reasons: 7 (33%) |
| Decrease to give resource a break: 2 (10%) |
| Same: 1 (5%) |

24. What are the advantages for being in the sea cucumber fishery over other fisheries?

(Total responses: 25/30 (83%))

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| Season for sea cucumbers (opposite from urchins/complements it): 8 (32%) |
| Price is good: 6 (24%) |
| Paid at the dock/set price: 4 (16%) |
| Change of pace/fun: 4 (16%) |
| Limited permits/transferable permits: 2 (8%) |
| Easier to harvest and transport: 1(4%) |

25. What are the disadvantages for being in the sea cucumber fishery over other fisheries? (Total responses: 9/25 (36%))

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| Unsustainable/unprofitable because bad market: 6 (67%) |
| Unethical managers, researchers, politicians: 1 (11%) |
| Need ice to transport: 1 (11%) |
| Diving deeper: 1 (11%) |

Management

26. Does the diver support regulations requiring a count of individuals landed? (Total responses: 26/30 (87%))

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| Yes: 11 (42%) (note 6 of these individuals reported “yes with a bucket count” size of the bucket varied between 2, 3, and 5 gallons) | No: 15 (58%) |
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27. Does the diver support regulations requiring individuals to report condition (cut vs. uncut)? (Total responses: 23/30 (77%))

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|-----------------|-------------|
| Yes: 14 (61%) * | No: 9 (39%) |
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28. What logbook changes does the diver support? (Total responses: 21/30 (70%))

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| Most fishermen just elaborated on their response to the previous question stating that they would support a space for cut vs. uncut (9 brought it up again) or would support a space to record a bucket count (2 brought it up again). |
| 8 stated that they want no change, not enough information to comment, etc. |

29. Are the current regulations enough to keep the fishery sustainable, yes or no? (Total responses: 27/30 (90%))

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|--------------|--------------|
| Yes: 7 (26%) | No: 20 (74%) |
|--------------|--------------|

30. What changes does the diver want to keep the fishery sustainable, if any? (Total responses: 27/30 (90%))

*Note: this is a tally of suggested methods – divers frequently said more than one of these options

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|----------------------------|------------------------|-----------------------|-------------------------------|
| Seasonal closure: 15 (55%) | Banning scuba: 7 (26%) | Size limit: 5 (19%) | Total Allowable Catch: 2 (7%) |
| Permit Buy backs: 1 (4%) | IFQ's: 1 (4%) | Area rotation: 1 (4%) | Nothing/leave alone: 5 (19%) |

Seasonal closure recommendations: what should season timing be?

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| Spring/Summer months open for harvest everything else closed: 3 responses (“Sea cucumbers are at their greatest density and peak quality from March to July”) |
| Spring/Summer months closed for harvest: 3 responses (“Close for spawning”) |
| Unspecified time: 2 responses (“2 month closure”, “later in year”) |
| Close the fishery from August-December: 1 response |