

Administrative Record

An analysis of sea turtle take rates in the high- seas longline fishery in the eastern Pacific ocean.

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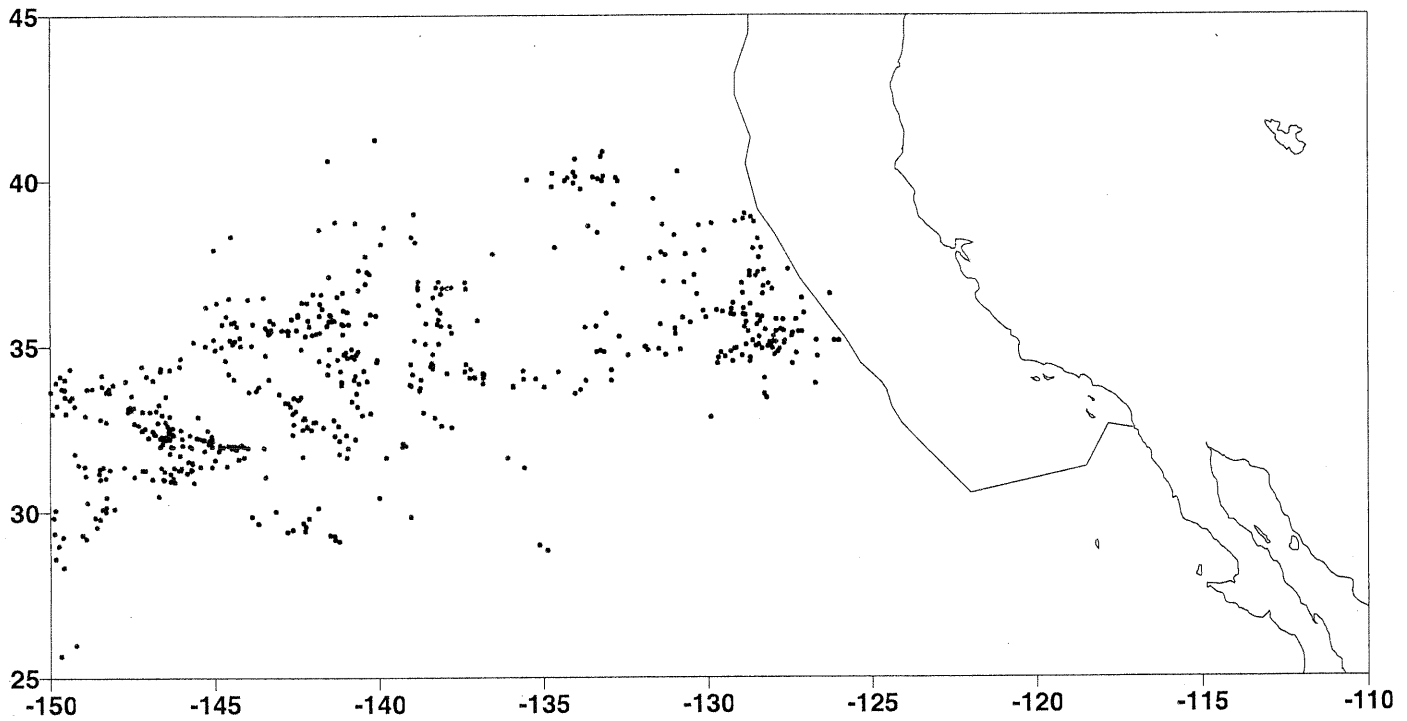
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Distribution of HI/CA sets

Hawaii (1997-2001) and California (2001-2003) observed longline sets. n = 586 sets



The Data

	West of W150 1994-2002 <i>Bill Walsh (Honolulu)</i>	East of W150 1997-2003 <i>Lyle Enriquez (Long Beach)</i> <i>plus Honolulu Data</i>
Leatherback Entanglements	32	15
Loggerhead Entanglements	129	50
Hooks Observed	1,513,596	444,833
Sets Observed	1,875	586
California Sets / Trips	0 / 0	198 / 9
Hawaii Sets / Trips	1875 / 149	388 / 29
California / Hawaii Vessels	0 / 50	10 / 35
Mean Hooks per Set	807	759
Leatherbacks per 1000 hooks	0.021	0.034
Loggerheads per 1000 hooks	0.085	0.112
Sets with Leatherbacks	32	15
Sets without Leatherbacks	1843	571
Sets with Loggerheads	129	50
Sets without Loggerheads	1746	536

Set, trip, and vessel summary for all data (West vs East of W150)

SETS

	West	East	All sets
CA sets	0	198	198
HI sets	1875	388	2263
All sets	1875	586	2461

TRIPS

	West	East	All trips
CA trips	0	9	9
HI trips	149	29	178
All trips	149	38	187

VESSELS

	West	East	All vessels
CA vessels	0	10	10
HI vessels	50	35	85
All vessels	50	45	95

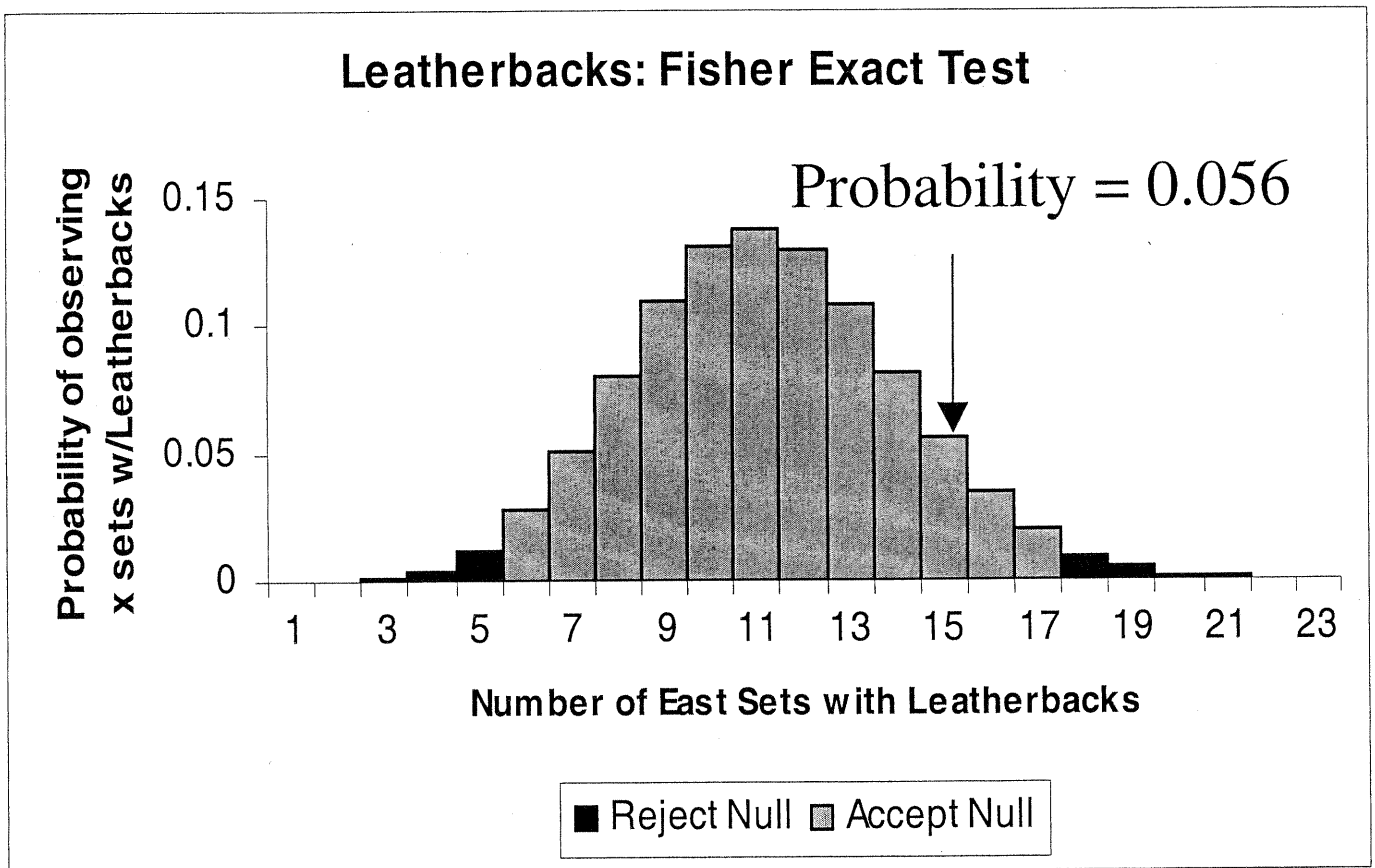
Leatherback Fisher test

Leatherback 2x2 Contingency Table

	West	East	All sets
Sets with Leatherbacks	32	15	47
Sets without Leatherbacks	1843	571	2414
All sets	1875	586	2461

$$P = \left(\frac{R_1! R_2! C_1! C_2!}{n!} \right) / f_{11}! f_{12}! f_{21}! f_{22}!$$

Leatherback probabilities given true null hypothesis of West = East

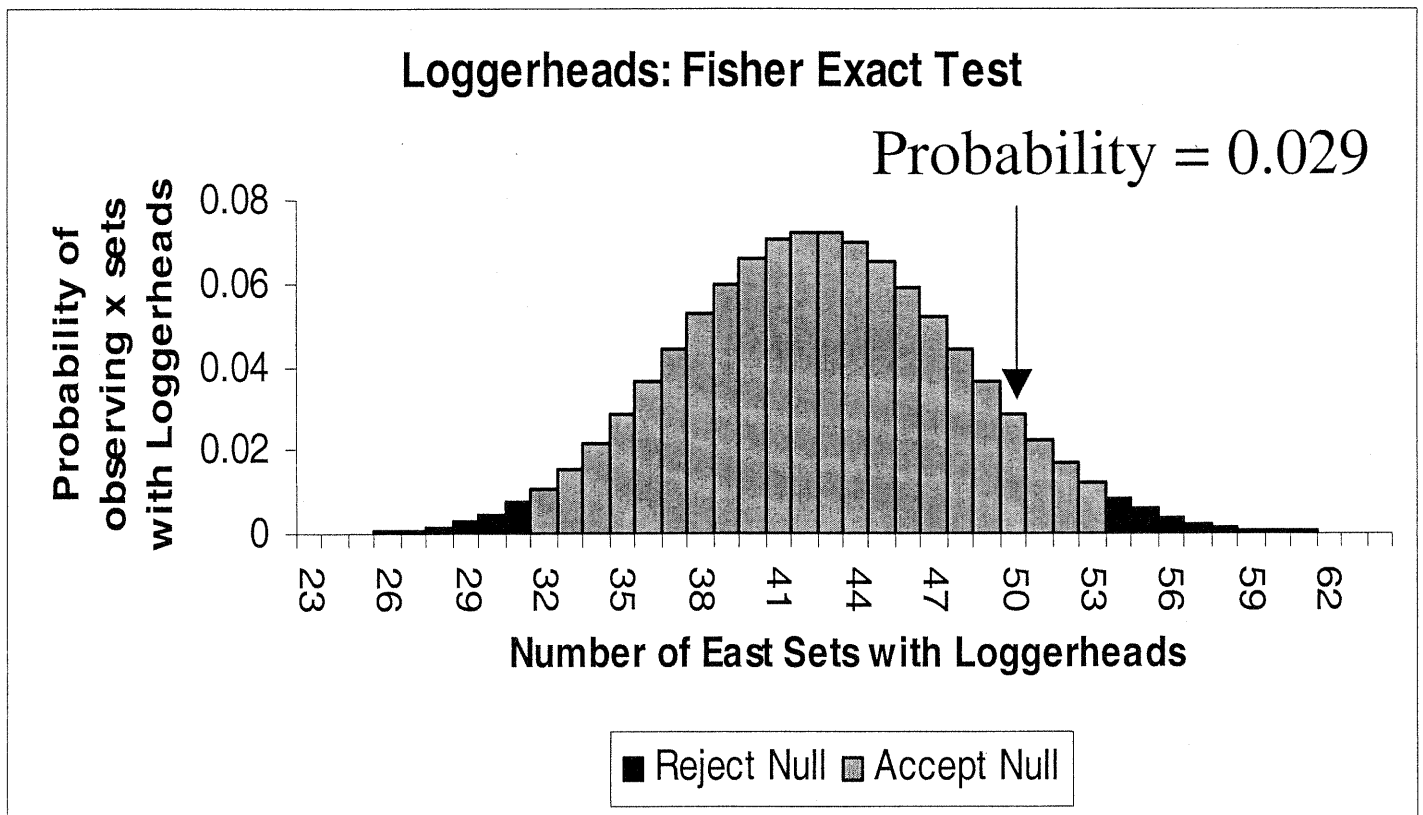


Accept Null hypothesis, $p = 0.226$ (sum of values as or more extreme than observed)

Loggerhead Fisher test

Loggerhead 2x2 Contingency Table

	West	East	All sets
Sets with Loggerheads	129	50	179
Sets without Loggerheads	1746	536	2282
All sets	1875	586	2461



Accept Null hypothesis, $p = 0.202$ (sum of values as or more extreme than observed)

Summary

	Proportion of Sets with Turtles		
	West of W150	East of W150	p-value
Loggerhead	6.8%	8.5%	0.202
Leatherback	1.7%	2.5%	0.226
	Turtles per 1000 hooks		
Loggerhead	0.085	0.112	
Leatherback	0.021	0.033	
	East of W150: Proportion of Sets with Turtles		p-value
	1st Quarter	4th Quarter	
Loggerhead	17.0%	3.5%	0.0002
Leatherback	0.0%	4.5%	0.000

Observed sets/takes east of W150

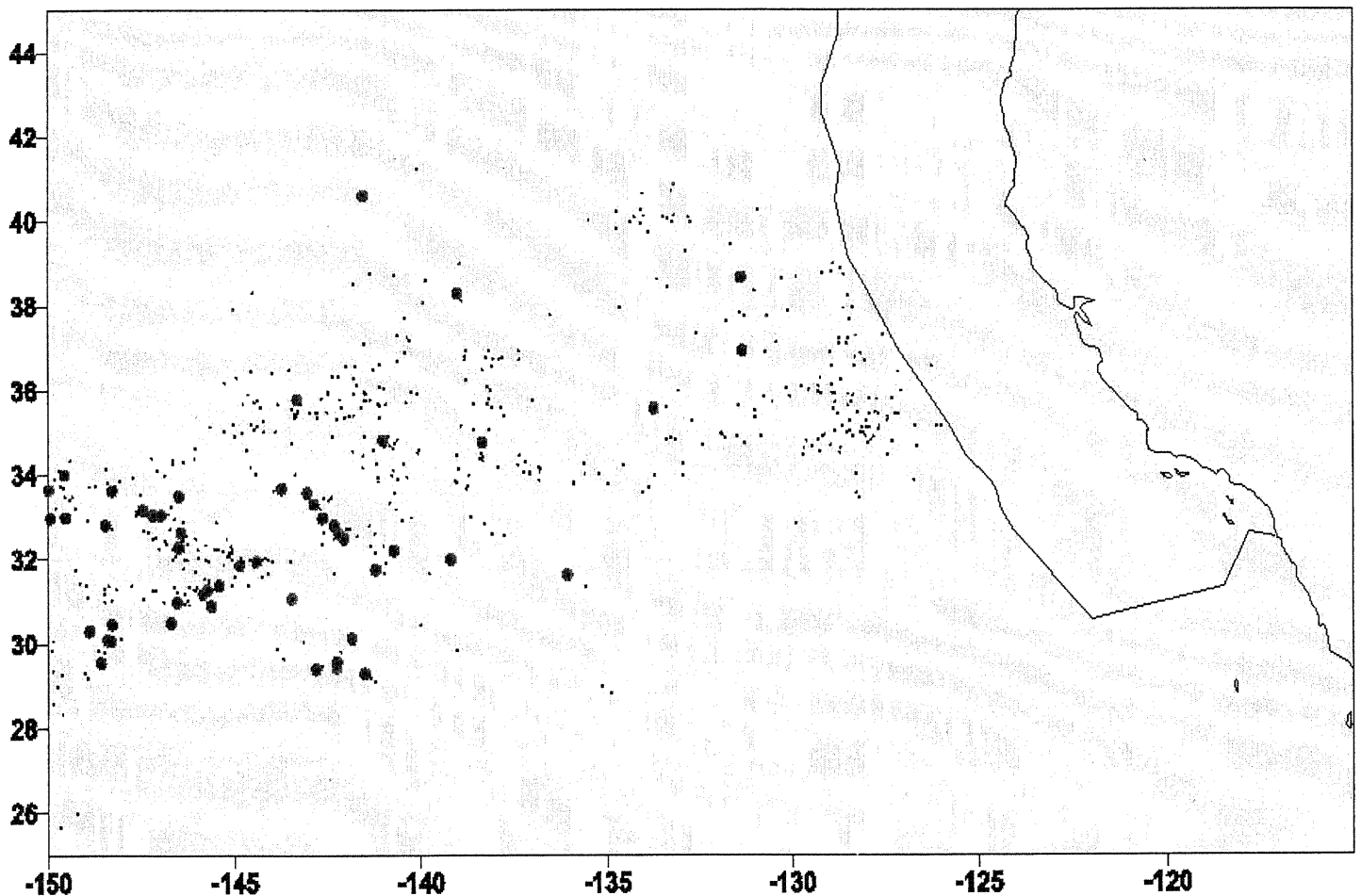
Turtle Takes 1997-2001 (Hawaii fishery) and 2001-2003 (CA fishery). 586 sets

Red = 56 Loggerhead

Yellow = 15 Leatherback

Pink = 2 Olive Ridley

Black (sets)



210 of 586 sets in 1st quarter (193 west of W140)

310 of 586 sets in 4th quarter (142 west of W140)

East of W150: Higher take rates of loggerheads west of each line, 'statistically equal' take rates of leatherbacks either side of line.

	W130	Fisher 2-tailed p
Loggerhead		0.00
Leatherback		0.97
	W135	Fisher 2-tailed p
Loggerhead		0.00
Leatherback		1.00
	W140	Fisher 2-tailed p
Loggerhead		0.00
Leatherback		1.00
	W145	Fisher 2-tailed p
Loggerhead		0.009
Leatherback		0.58

Leatherbacks: East of W150, 1st vs 4th quarter

Leatherback 2x2 Contingency Table

Area East of W150 only

	1st Qtr	4th Qtr	All sets
Sets with Turtles	0	14	14
Sets without Turtles	210	296	506
All sets	210	310	520

Loggerheads: East of W150, 1st vs 4th quarter

Loggerhead 2x2 Contingency Table

Area East of W150 only

	1st Qtr	4th Qtr	All sets
Sets with Turtles	36	11	47
Sets without Turtles	174	299	473
All sets	210	310	520

