



Pacific Halibut Bycatch in the 2008 Groundfish Fisheries

H.2.b: Supplemental NMFS Reports 1 and 2

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Pacific halibut bycatch in 2008 groundfish fisheries

- Analysis of fishery and observer data from the 2008 bottom-trawl fishery
 - Application of last year's method
 - Sensitivity of results to alternative approaches to stratifying the fish viability data (as suggested by the SSC last year)
- Analysis of fishery and observer data from the 2008 non-nearshore, fixed-gear fisheries
 - Application of general method described in June 2009, for 2002-2007 data
 - Additional stratification of the primary sablefish fishery, North and South of Pt. Chehalis

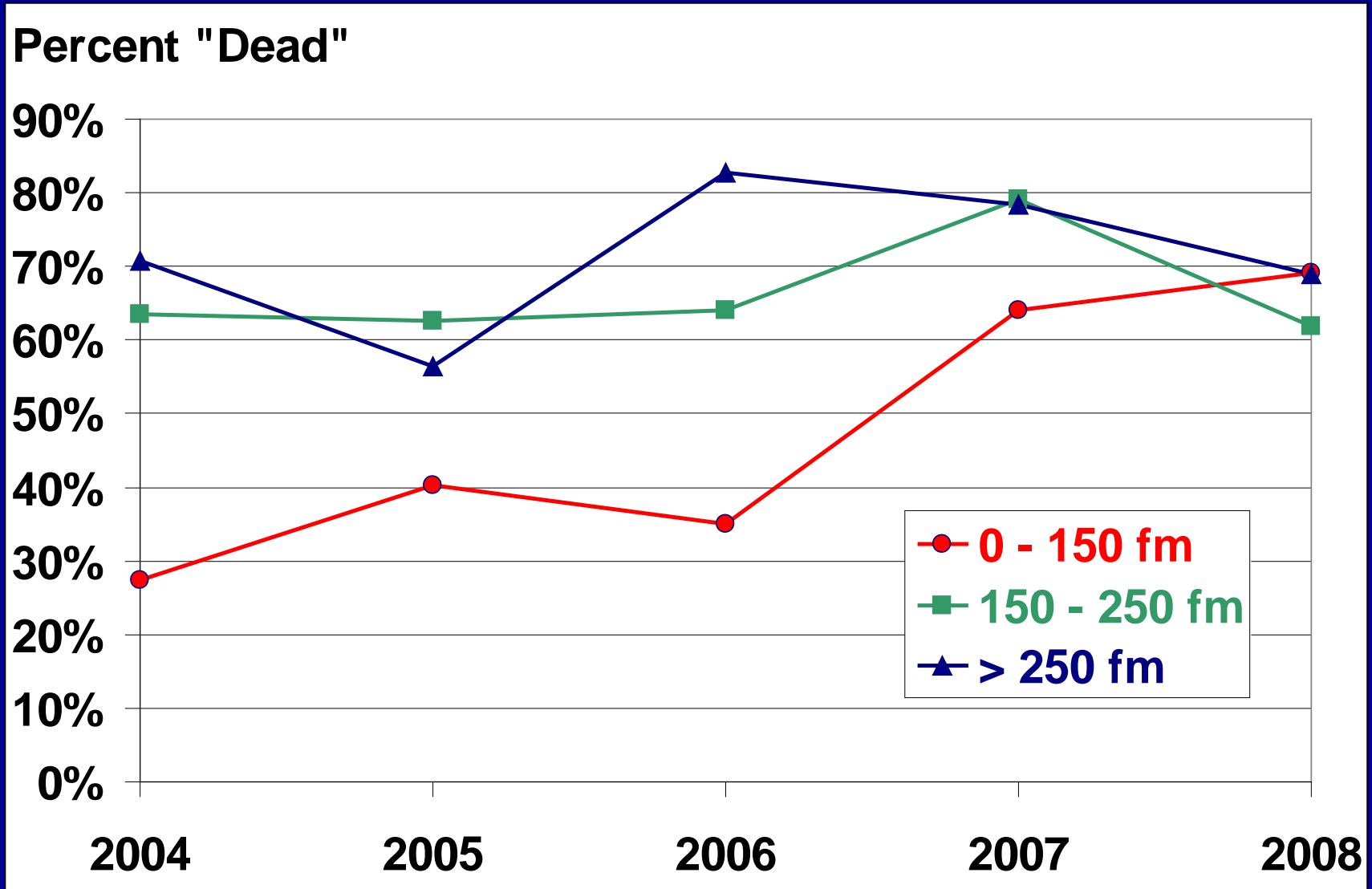
Changes in trawl effort

Latitude range ° N. lat.	Depth range (fm)	% change from	
		2006 to 2008	2007 to 2008
40.667 - 46.667	0 - 150	-71%	-47%
	150 - 700	92%	39%
46.667 - 47.667	0 - 150	-51%	-39%
	150 - 700	182%	70%
47.667 - 48.667	0 - 150	-88%	-49%
	150 - 700	99%	80%
Total	0 - 150	-70%	-45%
	150 - 700	100%	47%
	All depths	21%	23%

Changes in observed halibut condition over time

	% of viabilities = "Dead"			Average mortality rate		
	0 - 150 fm	150 - 250 fm	> 250 fm	0 - 150 fm	150 - 250 fm	> 250 fm
2004	27%	63%	71%	48%	72%	72%
2005	40%	63%	57%	58%	70%	69%
2006	35%	64%	83%	51%	69%	81%
2007	64%	79%	78%	68%	78%	79%
2008	69%	62%	69%	75%	69%	73%

Percentages of fish evaluated for viability that were categorized as "Dead"

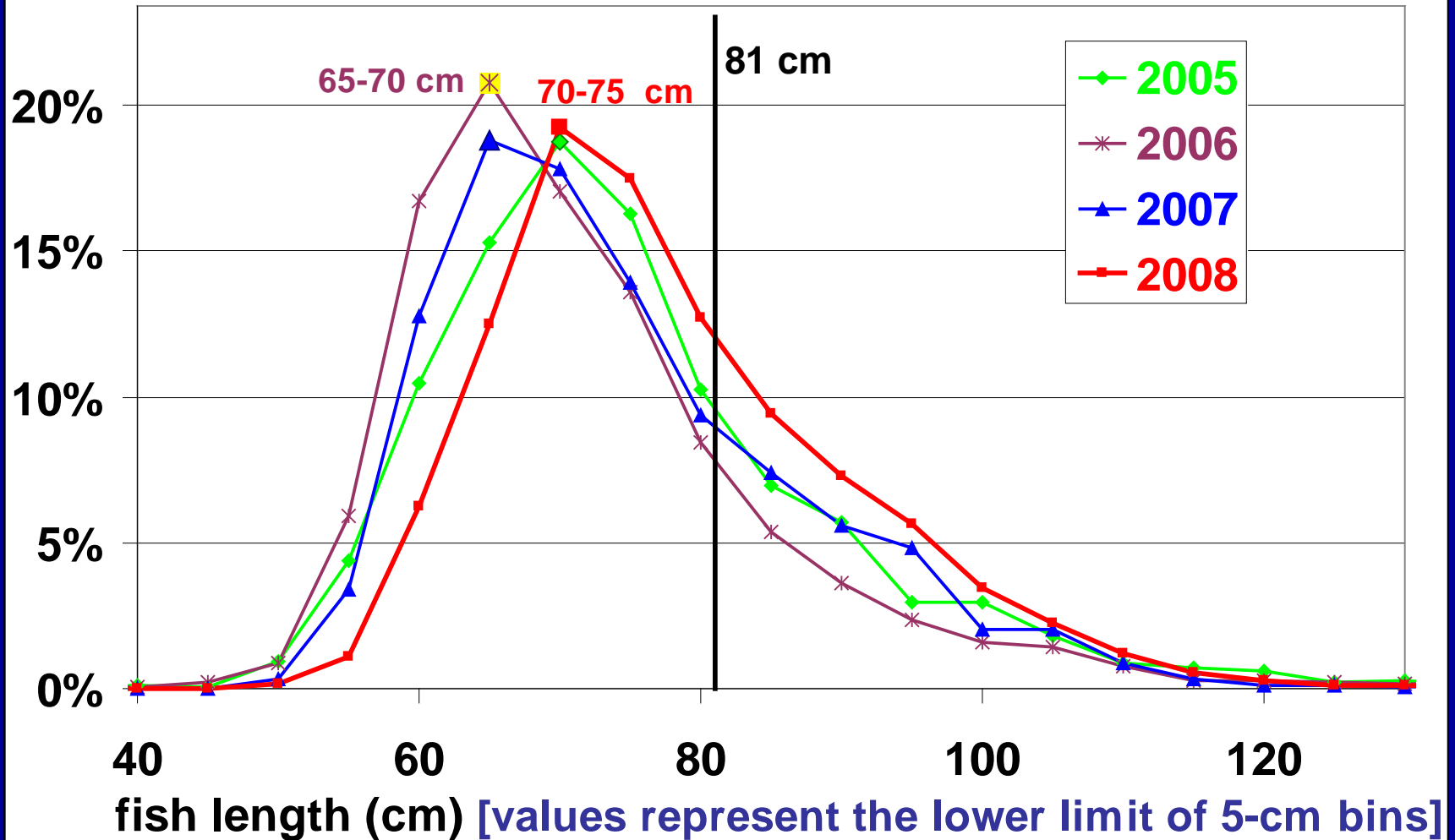


Estimates of bottom-trawl bycatch of Pacific Halibut

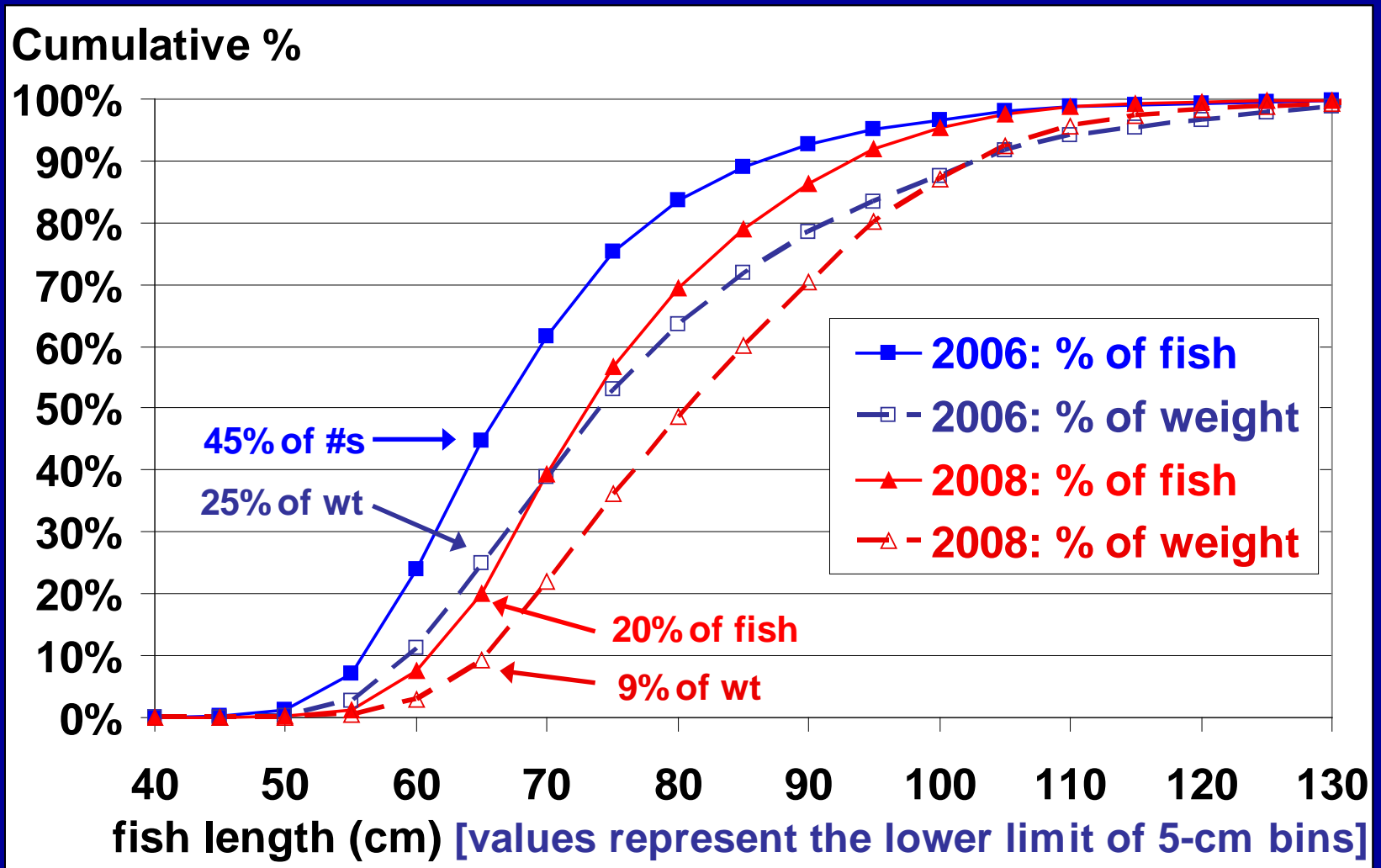
Year	Trawl Effort (hours)	Estimated Halibut Bycatch (lb, net)	Estimated Total Halibut Mortality (lb, net)	Mortality (lb) per Trawl Hour	Mortality % of Bycatch	Est. Legal-sized Halibut Mortality (lb, net)	% of Mortality that is legal-sized
2004	37,495	489,882	260,590	6.9	53%	153,804	59%
2005	39,377	715,752	417,863	10.6	58%	178,218	43%
2006	42,602	666,782	345,648	8.1	52%	158,570	46%
2007	41,874	350,266	257,338	6.1	73%	127,677	50%
2008	51,434	437,689	280,515	5.5	64%	182,857	65%
% chg '07 -> '08	23%	25%	9%	-10%	-13%	43%	31%

Length distributions of measured trawl-caught halibut, 2005-2008

% of measured fish



Cumulative distributions of the percentages of numbers and weight of measured halibut, by length bin, in 2006 & 2008



Sensitivity testing of alternative stratification of viability data

Bycatch and Fishery data from year:	Halibut viability data from:	Stratification of Halibut Mortality Rates	Halibut Bycatch (lb, net)	Halibut Mortality (lb, net)	Legal-sized Mortality (lb, net)
2007	2007-08	3 depth zones (DZ)	367,892	263,555	125,489
		3 DZs + 3 lat zones	367,892	266,184	127,094
		3 DZs + 2 seasons	367,892	262,418	125,091
2008	2007-08	3 depth zones (DZ)	434,027	315,270	205,985
		3 DZs + 3 lat zones	434,027	316,028	206,752
		3 DZs + 2 seasons	434,027	318,628	208,317

Bottom Trawl Summary

- Trawl hours increased by 23% in 2008, mainly off Oregon, and seaward of the RCA
- Total 2008 halibut mortality (218,515 lb) was just 9% higher than in 2007
- However, mortality of legal-sized halibut rose by 43%, as larger fish are found seaward of RCA
- The observed condition of halibut caught shoreward of the RCA has declined since 2004
- Additional stratification of viability data beyond depth zones has little affect on estimates

Estimates of non-nearshore, fixed-gear bycatch of Pacific Halibut

	No area stratification			Area strat.
	Estimated total (mt)	Discard Mortality		Mortality
		25% mort. rate	16% mort. rate	16% mort. rate
2002	139	35	22	23
2003	225	56	36	33
2004	185	46	30	40
2005	228	57	36	37
2006	679 (796*)	170 (199*)	109	107
2007	170	43	27	24
2008				46

- Area stratification is North and South of Pt. Chehalis

Halibut bycatch in the primary longline sablefish fishery

	2002	2003	2004	2005	2006	2007	2008
North of Pt Chehalis							
Gross discard (mt, rnd. wt.)	129	176	165	213	536	107	143
Discard mortality (mt, rnd. wt.)	21	28	26	34	86	17	23
% of fixed-gear total	89%	87%	67%	93%	80%	71%	49%
South of Pt Chehalis							
Gross discard (mt, rnd. wt.)	12	27	49	14	116	20	96
Discard mortality (mt, rnd. wt.)	2	4	8	2	19	3	15
Coast-wide							
Gross discard (mt, rnd. wt.)	140	203	214	226	651	127	239
Discard mortality (mt, rnd. wt.)	22	32	34	36	104	20	38
% of fixed-gear total	97%	100%	87%	99%	98%	85%	83%

Amounts of discard mortality calculated using a 16% rate of mortality for discarded halibut

Distribution of observed lengths of discarded halibut

	N. of Pt Chehalis		S. of Pt Chehalis	
	Number	% of area	Number	% of area
Visual estimate				
0 - 74 cm	2,064	50.3%	989	25.7%
75 - 84 cm	821	20.0%	985	25.6%
85 - 150 cm	1,219	29.7%	1,875	48.7%
Total	4,104		3,849	

The IPHC defines halibut of at least 81 cm in length as legal-sized. Most halibut are not brought aboard fixed-gear vessels, and so most lengths are from visual estimates, and not measurements; only 84 measured lengths.

Fixed-gear summary

- Discard mortalities for 2002-07 are very similar to reported to the Council in June
 - Additional area stratification at Pt. Chehalis, WA
- High 2006 discard mortality driven by higher encounter rates of Pacific halibut, particularly in primary fishery north of Pt. Chehalis, WA
- The discard mortality in 2008 is roughly twice that in 2007, but less than half that in 2006.
- Precision of legal-sized estimates is affected by the reliance on visual length estimates

Observation of the fixed-gear fishery

	LE Sablefish Primary			Other LE Sablefish	OA Fixed Gear	
	Longline		Pot	Longline	Hook-and-line Gears	Pot
	N. of Pt. Chehalis	S. of Pt. Chehalis				
	Number of observed trips					
2002	23	47	23	11	-	-
2003	25	25	35	130	41	16
2004	13	35	13	62	43	96
2005	31	73	39	35	34	43
2006	31	34	39	121	11	38
2007	36	40	30	158	50	45
2008	17	60	24	122	58	55
	Number of observed vessels					
2002	9	18	6	4	-	-
2003	8	8	6	17	13	7
2004	6	13	3	14	15	17
2005	10	18	7	11	10	14
2006	9	10	7	21	8	15
2007	9	14	4	36	25	20
2008	6	13	6	32	33	20

Fixed-gear halibut bycatch rates

	LE Sablefish Primary			Other LE Sablefish	OA Fixed Gear	
	Longline		Pot	Longline	Hook-and-line Gears	Pot
	N. of Pt. Chehalis	S. of Pt. Chehalis				
	% of observed trips that caught Pacific halibut					
2002	96%	47%	17%	0%	--	--
2003	100%	52%	9%	1%	0%	0%
2004	100%	71%	38%	0%	0%	0%
2005	97%	59%	33%	0%	0%	0%
2006	100%	76%	56%	0%	9%	0%
2007	94%	48%	33%	2%	26%	7%
2008	100%	78%	83%	3%	34%	5%
	Observed Pacific halibut discard ratios					
2002	0.330	0.028	0.011	0.000	*	*
2003	0.353	0.047	0.000	0.000	*	*
2004	0.237	0.075	0.053	0.000	*	*
2005	0.332	0.020	0.004	0.000	*	*
2006	0.783	0.164	0.027	0.000	*	*
2007	0.218	0.033	0.009	0.003	0.084	0.003
2008	0.372	0.145	0.015	0.004	0.126	0.001