MRFSS Catch Allocation in California, 1980-1989

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Issue

- MRFSS changed the definition of CA subregions (north/south) after 1989
- 1980-1989: San Luis Obispo (SLO) County was included in southern CA
- 1990-1992: Sampling hiatus
- 1993-2003: SLO County included in northern CA
- This affects catch and effort estimates only; length data are available by county

Image: CDFW Fish Bulletin 176; Karpov et al. 1995

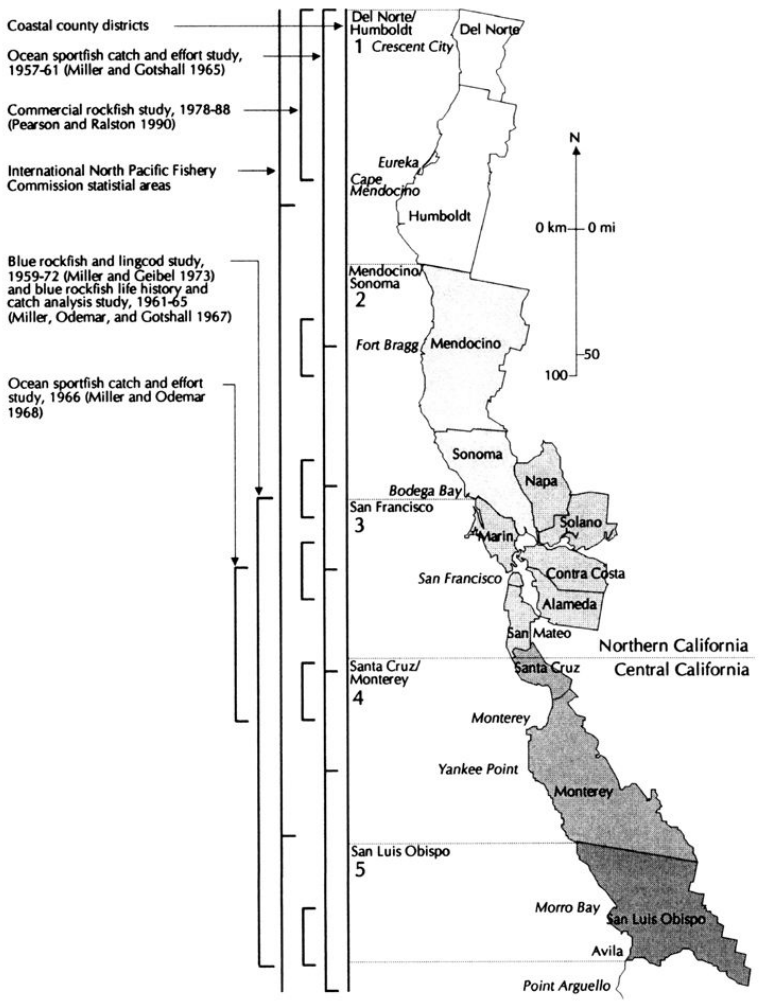

FIGURE 1. Coastal county districts and locations of other marine fishery study areas in northern and central California.

Proposed Method

- Need area definitions for CA that are spatially consistent over time

- Albin et al. (1993) estimated catch for select species by coastal county, 1981-1986, *but only for counties north of Santa Barbara County*.

- Method:
  1) Calculate ratio: SLO catch / (total Albin et al. catch - SLO catch), by year
  2) Calculate the average ratio (could use catch-weighted average)
  3) Use the average ratio to estimate the amount of MRFSS catch to re-allocate from Southern CA to Northern CA during the period 1980-1989.

TABLE 1. ESTIMATED THOUSANDS OF FISH CAUGHT (CATCH TYPE A + B) BY GROUP AND COASTAL COUNTY DISTRICT, JAN 1981---DEC 1981.

GROUP	DEL NORTE / HUMBOLDT			MENDOCINO / SONOMA			SAN FRANCISCO			SANTA CRUZ / MONTEREY			SAN LUIS OBISPO			TOTAL		
	EST.	S.E.	CV	EST.	S.E.	CV	EST.	S.E.	CV	EST.	S.E.	CV	EST.	S.E.	CV	EST.	S.E.	CV
01. LEOPARD SHARK	0	0	100	*	*	*	56	15	27	2	1	75	*	*	*	58	15	26
02. SPINY DOGFISH	0	0	100	*	*	*	1	1	59	0	0	96	1	1	56	3	1	37
03. SHARK, OTHER	3	3	94	0	0	81	204	68	33	1	1	43	1	1	61	210	68	32
04. STURGEONS	*	*	*	*	*	*	56	14	25	*	*	*	*	*	*	56	14	25
05. PACIFIC HERRING	8	13	151	20	17	87	*	*	*	*	*	*	*	*	*	28	21	76
06. NORTHERN ANCHOVY	2	1	54	*	*	*	128	62	48	*	*	*	*	*	*	130	62	47
07. SURF SMELT	1,822	890	49	552	379	69	2	2	100	*	*	*	*	*	*	2,376	967	41
10. PACIFIC TOMCOD	0	0	100	*	*	*	13	8	61	*	*	*	*	*	*	13	8	61
12. PACIFIC HAKE	0	0	90	*	*	*	*	*	*	3	2	78	*	*	*	3	2	72
13. SILVERSIDES	0	0	100	*	*	*	*	*	*	*	*	*	*	*	*	0	0	100
14. JACKSMELT	7	7	104	2	1	79	394	307	78	7	5	63	8	4	54	418	308	74
15. BLACK ROCKFISH	190	139	73	26	11	43	13	5	42	*	*	*	8	6	75	236	140	59
16. BLUE ROCKFISH	27	14	52	263	107	41	115	96	83	232	71	31	387	181	47	1,023	242	24
17. BROWN ROCKFISH	1	0	55	14	5	33	131	42	32	5	2	42	22	15	66	173	45	26
18. BOCACCIO	*	*	*	25	8	33	61	23	38	45	36	80	12	7	58	144	44	31
19. CANARY ROCKFISH	20	13	64	37	8	23	11	5	43	8	4	54	26	24	92	101	29	29
20. CHILIPEPPER ROCKFISH	*	*	*	0	0	100	5	4	91	71	72	102	*	*	*	76	72	95
21. COPPER ROCKFISH	3	2	71	42	11	26	21	7	34	6	4	72	24	16	66	96	21	22
22. GOPHER ROCKFISH	*	*	*	1	0	65	1	1	100	3	2	53	56	30	53	62	30	48
23. GREENSPOTTED ROCKFISH	*	*	*	4	1	35	37	15	40	6	3	49	4	3	72	50	15	31
24. GREENSTRIPED ROCKFISH	*	*	*	*	*	*	3	2	67	4	2	49	*	*	*	7	3	40
25. OLIVE ROCKFISH	*	*	*	3	1	46	*	*	*	12	5	38	33	24	73	48	25	51
26. QUILLBACK ROCKFISH	0	0	66	1	0	47	*	*	*	*	*	*	*	*	*	1	0	39
27. ROSY ROCKFISH	1	1	113	4	2	42	3	2	62	5	3	49	28	17	61	40	17	43
28. STARRY ROCKFISH	*	*	*	2	1	43	4	3	73	6	3	43	20	13	67	32	14	44
29. VERMILION ROCKFISH	0	0	100	3	2	47	*	*	*	5	2	48	16	9	58	25	10	39
30. WIDOW ROCKFISH	*	*	*	8	2	32	1	1	100	10	7	72	1	1	100	21	8	39

Example: 2021 Vermilion/Sunset Rockfish Assessment

Table 6: Estimated ratio of SLO catch (in numbers) to catch in California counties north of SLO from Albin et al. (1993).

Species	Year	Area	Estimate	SE	CV	SLO/(Total-SLO)
Vermilion	1981	San_Luis_Obispo	16	9	58	1.7777778
Vermilion	1981	Total	25	10	39	
Vermilion	1982	San_Luis_Obispo	12	5	46	0.6315789
Vermilion	1982	Total	31	8	27	
Vermilion	1983	San_Luis_Obispo	17	12	67	1.1333333
Vermilion	1983	Total	32	12	38	
Vermilion	1984	San_Luis_Obispo	30	27	91	1.0714286
Vermilion	1984	Total	58	28	49	
Vermilion	1985	San_Luis_Obispo	15	8	54	0.7142857
Vermilion	1985	Total	36	10	27	
Vermilion	1986	San_Luis_Obispo	23	13	56	1.0454545
Vermilion	1986	Total	45	14	30	
					Average	1.0623098
					Catch-weighted Avg.	1.0360910

Source: Dick et al. 2021

Things to consider

- Unfortunate that county-level estimates are not available for southern CA
- 1990-1992 catches
  - These are unknown, and commonly estimated using linear interpolation
  - Interpolation should be done *after* the re-allocation of catch described here
- Albin et al. catch estimates are in numbers; application to catch in weight may introduce a bias if average weights vary significantly by region
- Method may be imprecise for individual years; I suggest using an average ratio across years