

Fishery management and SPR@size estimate

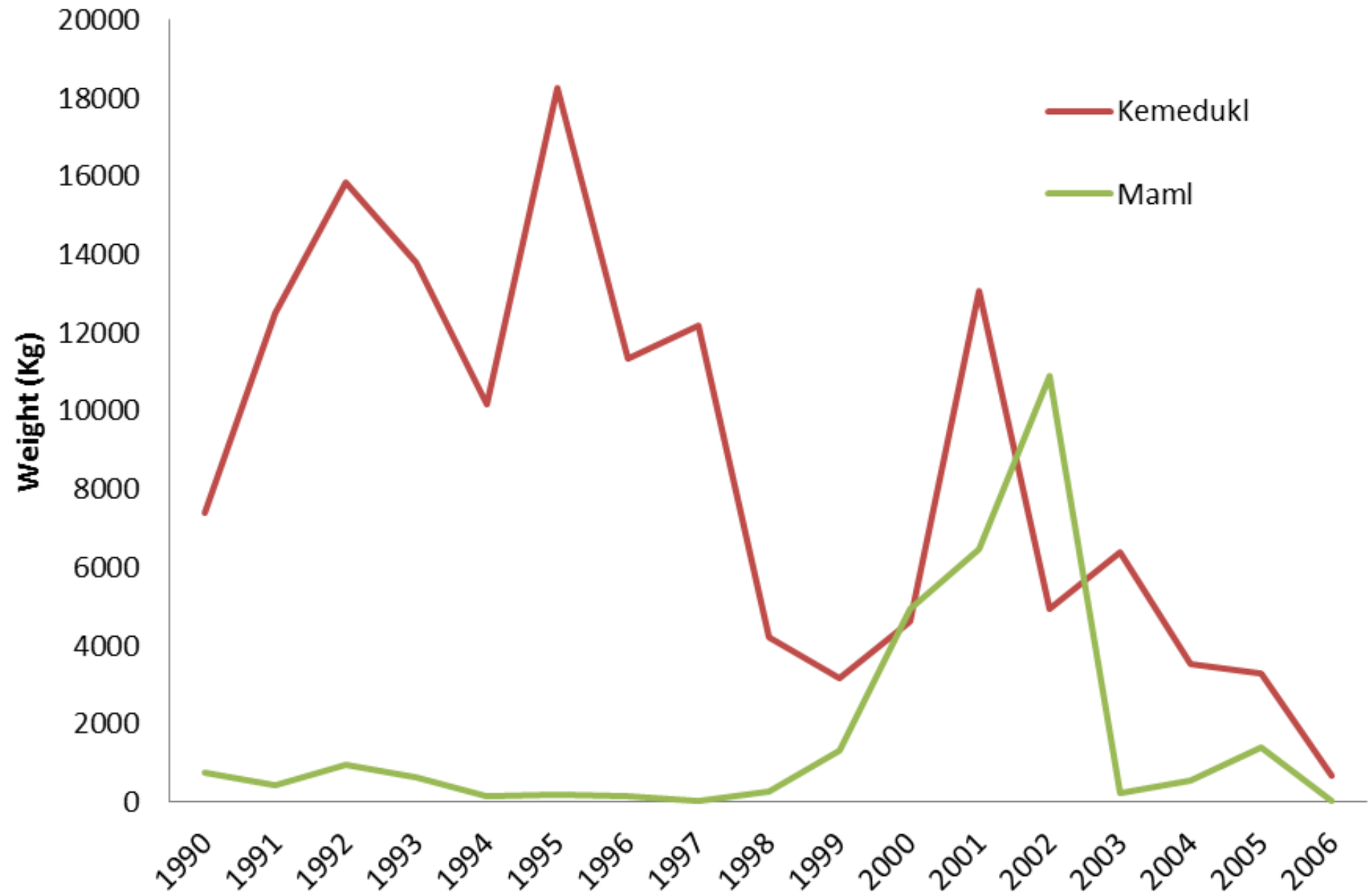


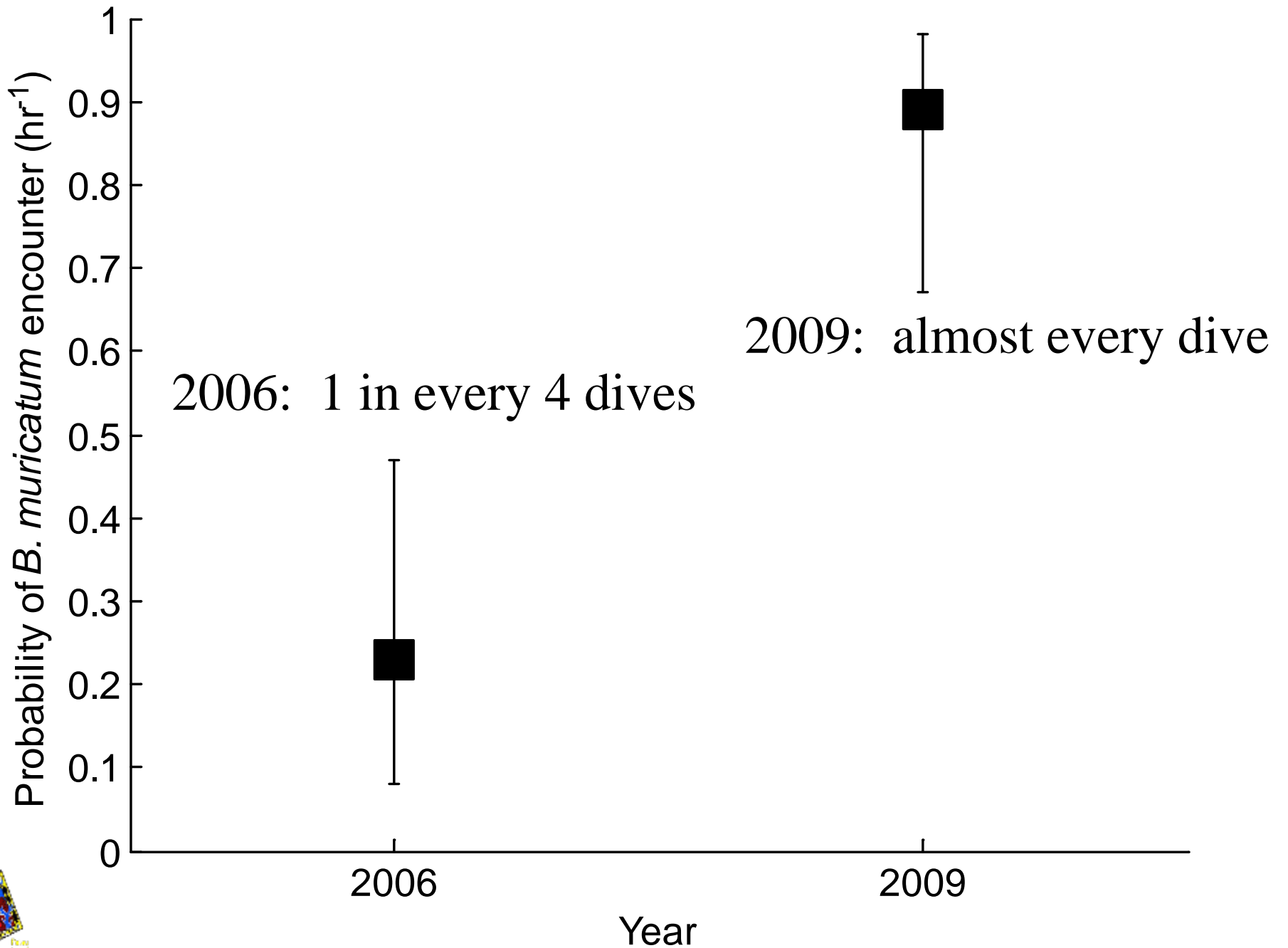
Palau Marine Protection Act of 1994

- Set size limit (25 inches) – bumphead parrotfish and humphead wrasse – based on fishermen input
- Ban on export
- Establishment of Marine Protected Areas



Annual Landing of Kemedukl and Maml





Density estimate stock assessment (cost: \$50,000 – 2 species)

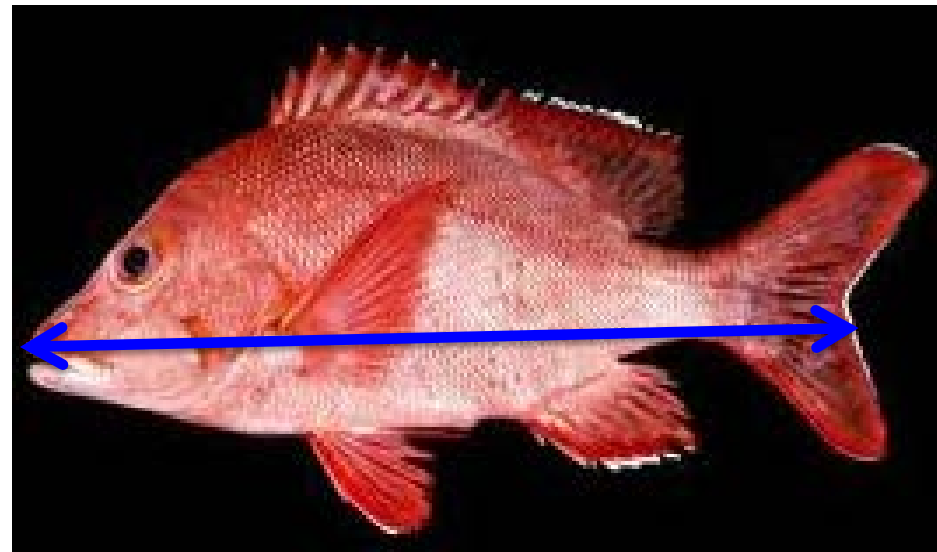
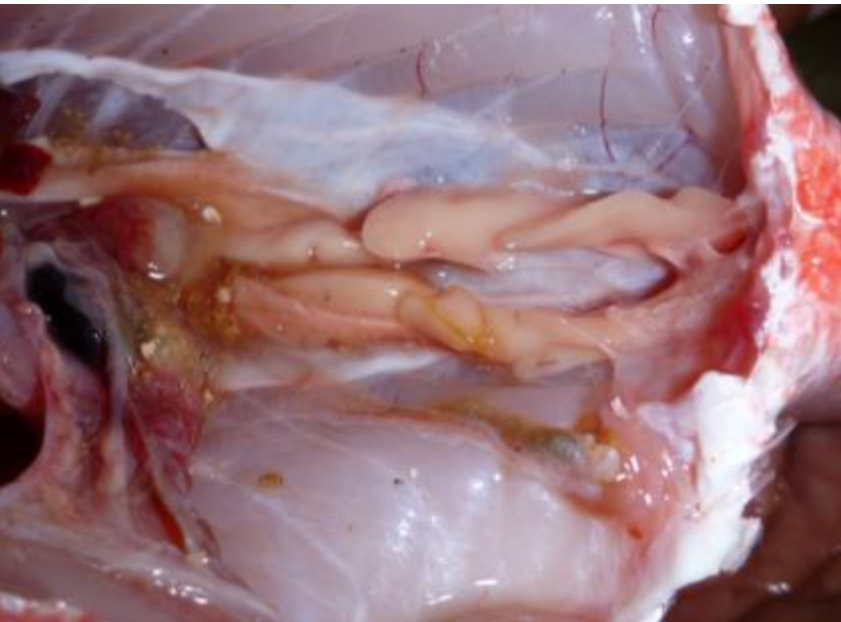
Fishing mortality (F) =0.01 and natural mortality (M) =0.3

Size Bin (cm)	Selectivity	Mean Density (#/ha)	SD	Estimated StockSize	Calculated Catch Limit	Individual Biomass_g	Total Biomass_kg
25	0	0.11	0.35	4605.63	0.00	288.93	0.00
30	0	0.25	0.79	11017.87	0.00	495.55	0.00
35	0	0.11	0.34	4838.35	0.00	781.95	0.00
40	0	0.20	0.54	8541.08	0.00	1160.85	0.00
45	0	0.15	0.37	6442.26	0.00	1644.90	0.00
50	0	0.13	0.33	5609.65	0.00	2246.65	0.00
55	1	0.07	0.24	3207.04	27.58	2978.62	82.14
60	1	0.03	0.15	1383.59	11.90	3853.29	45.84
65	1	0.04	0.15	1554.30	13.36	4883.07	65.26
70	1	0.03	0.15	1205.79	10.37	6080.34	63.04
75	1	0.01	0.06	273.99	2.36	7457.42	17.57
80	1	0.04	0.19	1527.06	13.13	9026.63	118.52
85	1	0.02	0.10	672.09	5.78	10800.23	62.41
90	1	0.04	0.21	1867.00	16.05	12790.46	205.33
100	1	0.05	0.20	2072.91	17.82	17469.58	311.38
105	1	0.01	0.10	442.86	3.81	20182.81	76.85
110	1	0.01	0.08	380.90	3.28	23161.33	75.86
120	1	0.01	0.08	380.90	3.28	29962.62	98.13
Total					128.72		1222.33

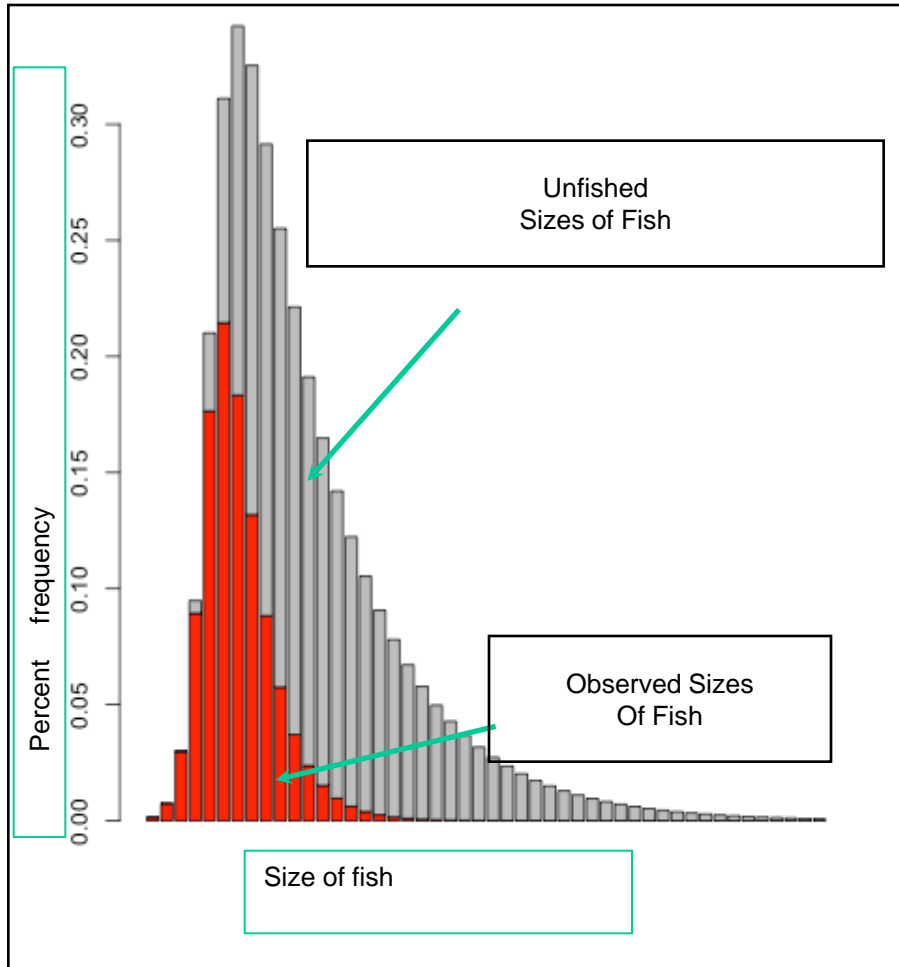


Length based estimate of spawning potential

1. Studying Size of Maturity
2. Measuring Size composition



Data Poor Stock Assessment @ size estimate

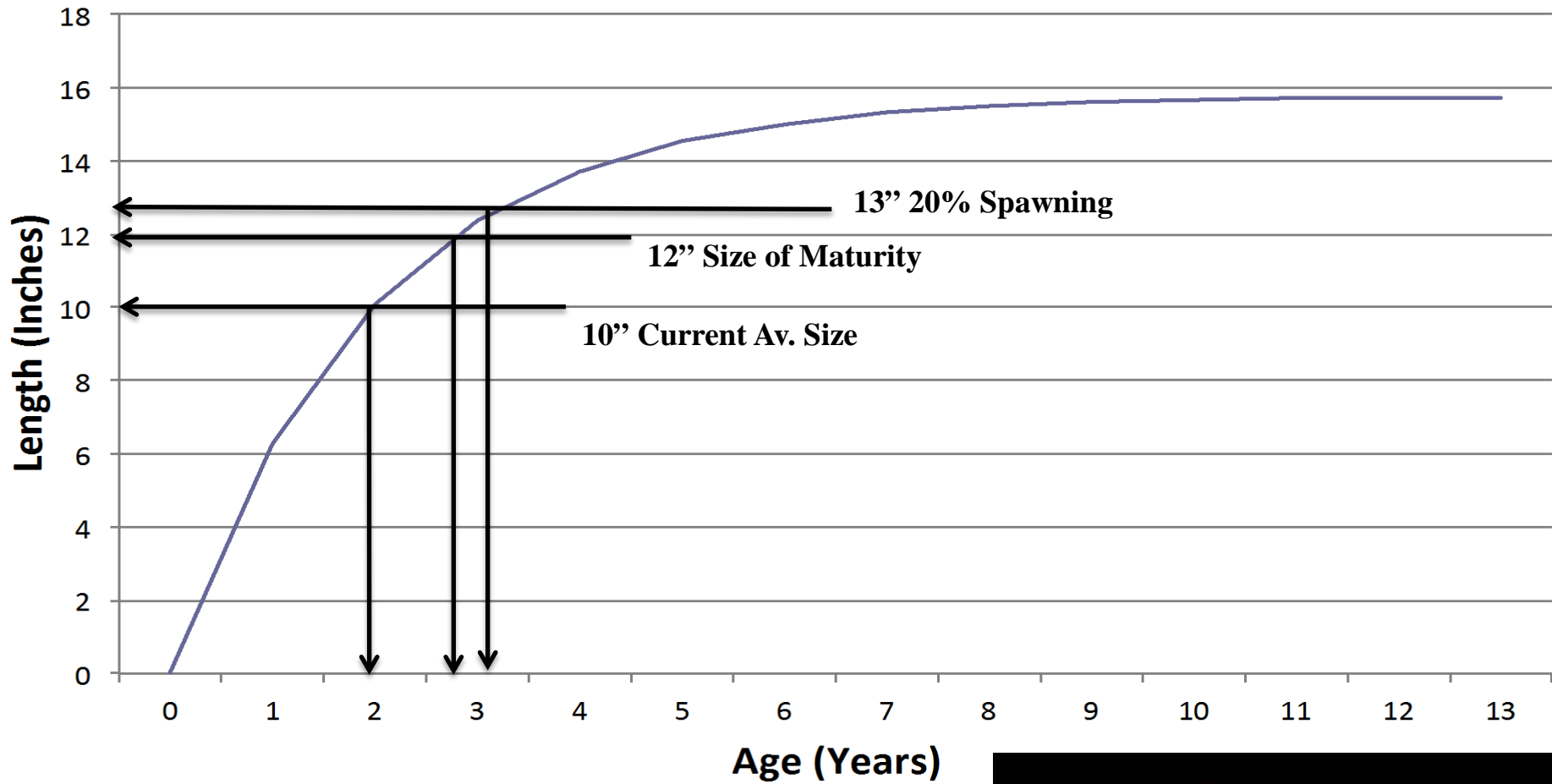


Palau Fish

61% - - Immature

39% - Mature

Lujanus gibbus





Palau Data Poor Stock Assessments



Keremlal – Humpback Snapper

Status of the population: 5% of unfished conditions

Within 1 year:

- Meet sustainability target
- + 170% average weight gain



Tiau – Square Tail Grouper

Status of the population: 7% of unfished conditions

Within 2 year:

- Meet sustainability target
- +300% average weight gain

Conclusions

- Existing management strategies inadequate for fisheries
- Species ban has immediate impact on stock recovery
- SPR@size estimate provides rapid status of spawning potential, cost effective, and easily understood by fishermen

