

Assessment of the Wild Fisheries Resources in NSW: An Overview

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NSW DEPARTMENT OF PRIMARY INDUSTRIES

- **NSW Fisheries: Complex, Multi-Species, Data Poor**
 - **Traditional Stock Assessments Limited, Costly**
- **Alternate Resource Assessments: Empirical-Based Indicators**
 - **Life History Characteristics**
- Catch & CPUE Time Series
 - commercial landings, national recreational survey, creel surveys
- Length-Based Information
 - commercial & recreational catches
- Age-Based Information
 - growth, age composition, mortality (natural & fishing)
- Reproduction
 - maturity, spawning potential
- Borrow Other Assessments
 - Commonwealth, Qld
 - related species
 - evidence expert based

Resource Assessment Classes - Defined

Attribute	Class of Resource Assessment				
	One	Two	Three	Four	Five
Time series estimate of biomass from dynamic models	●				
Time series estimate of total, natural and fishing mortality from dynamic models	●				
Quantitative risk analysis of future harvesting using dynamic models	●				
Biological reference points	●	●			
Estimates of total, natural and fishing mortality (from catch-curves)	●	●			
Credible indicator of abundance	●	●			
Representative time-series of commercial catch	●	●	●	●	
Credible estimate of recreational catch	●	●			
Time series of age composition data (finfish only)	●	●			
Local (NSW) information for growth, mortality, selectivity and maturity	●	●	●		
Time series of length-composition data	●	●	●		
Non-local (not NSW) information for growth, mortality, selectivity and maturity				●	●
Single biological species or stock	●	●	●	●	●
Complex of related species			●	●	●

CATEGORY	CHARACTERISTIC
RECRUITMENT OVERFISHED	- Recruitment is being significantly or measurably suppressed as a result of a small spawning biomass - Other characteristics of an 'overfished' stock (see below) are likely to be evident - Unequivocal determination will require a well-calibrated population model or stock-recruitment relationship
OVERFISHED	- Fishing mortality rates are more than double natural mortality rates - Estimates of biomass are less than 30% of the estimated unfished stock - Catch rates are less than 30% of the initial catch rates - Length and age distributions unstable (excessively affected by recruitment, too few age or size classes in the exploitable population given a species' life history) - Trends in length/age compositions are evident which indicate increasing (and/or excessive) fishing mortality - The 'Spawning Potential Ratio' is less than 20%
GROWTH OVERFISHED	Yield per recruit would increase if length at first capture was increased or fishing mortality decreased
FULLY FISHED	- Fishing mortality is approximately the same as natural mortality - Estimates of the biomass are greater than 30% of the estimated unfished biomass - Catch rates have been steady for 5-10 years and/or catch rates are greater than 30% of initial catch rates. - Length and age distributions are stable - Species are fished throughout their entire geographic range
MODERATELY FISHED	- Fishing mortality is less than half of natural mortality - Estimates of the biomass are greater than 70% of the estimated unfished biomass - Catch rates are greater than 70% of initial catch rates - Species are fished in most of their geographic range but non-fishing areas are known to exist
LIGHTLY FISHED	- Fishing mortality less than 25% of natural mortality - Estimates of the biomass are greater than 90% of the estimated unfished biomass - Catch rates are greater than 90% of initial catch rates - Only small proportions of the geographic range are fished - Markets would likely limit catch and effort
UNCERTAIN	A significant amount of evidence has been collected and considered, but there are inconsistent or contradictory signals in the data that preclude determination of exploitation status
UNDEFINED	Commercial catch data are available but no reasonable attempt has been made to determine exploitation status

NSW DPI



Status of
**Fisheries
Resources**
in NSW
2006/07

2006/07

Status of **Fisheries Resources** in NSW



Fish images courtesy of Bernard Yu



NSW DEPARTMENT OF
PRIMARY INDUSTRIES

Yellowfin Bream

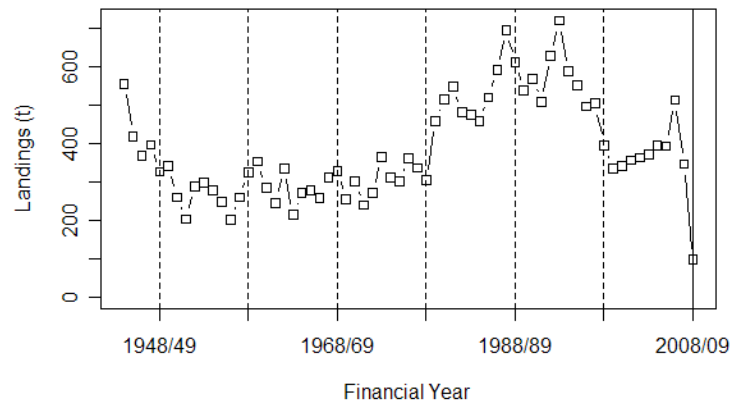
(*Acanthopagrus australis*)

EXPLOITATION STATUS FULLY FISHED

The yellowfin bream has a long history of stability of both the length composition and catch rate data. The species is the basis of very significant recreational and commercial fisheries in NSW.

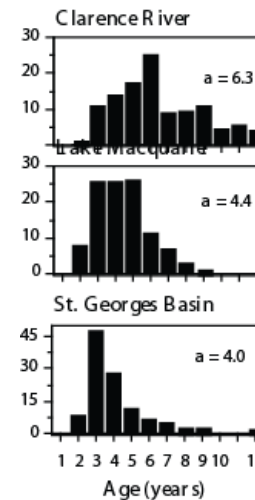
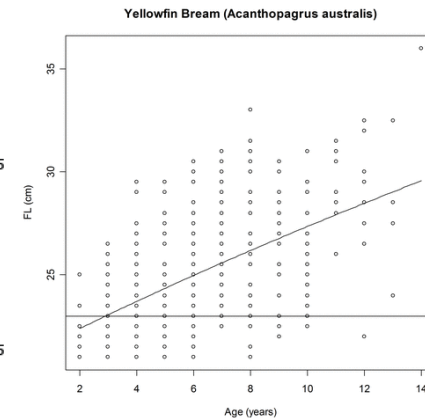
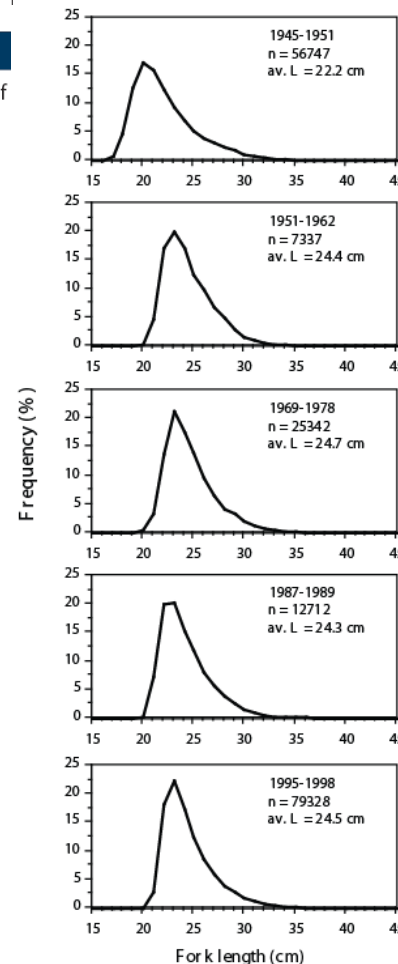
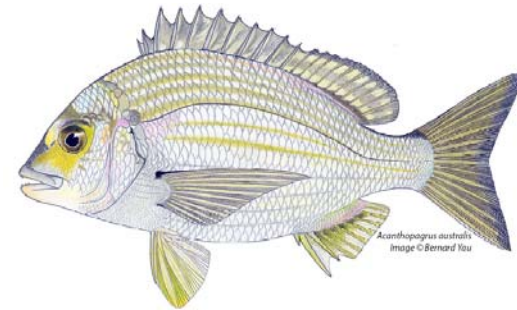
SCIENTIFIC NAME **STANDARD NAME** **COMMENT**

<i>Acanthopagrus australis</i>	yellowfin bream	This species represents the significant majority (~95%) of this group.
<i>Acanthopagrus butcheri</i>	black bream	Represents only ~5% of landings of this group. This species can also hybridise with yellowfin bream.



Stochastic Analysis of Commercial vs Recreational Catch: Median with (10th, 90th) Percentiles

Fishery	Com (t)	Rec (t)	Com (%)	Rec (%)
ALL	374 (366, 380)	942 (824, 1075)	28 (26, 31)	72 (69, 74)



Luderick

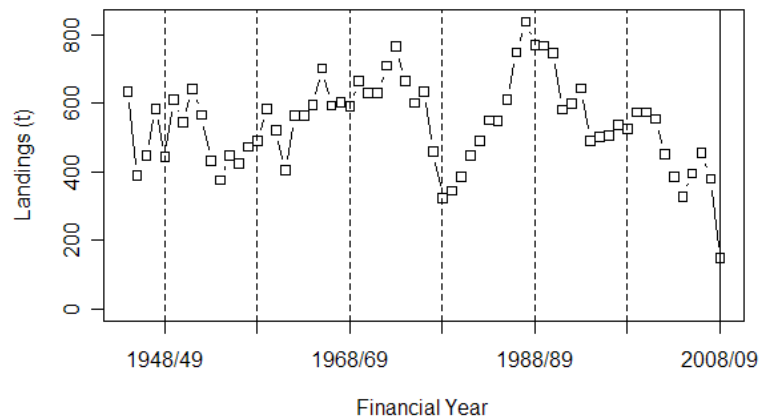
(*Girella tricuspidata*)

EXPLOITATION STATUS MODERATELY FISHED

The current levels of fishing appear to be moderate. Limited markets for luderick constrain commercial catches.

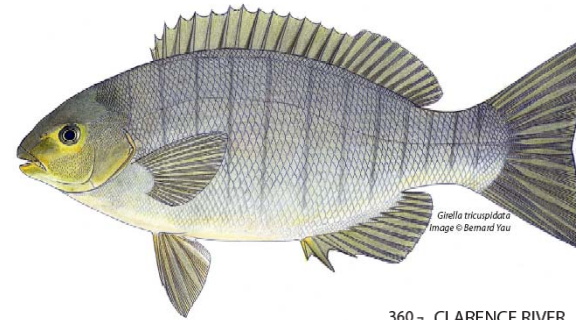
SCIENTIFIC NAME **STANDARD NAME** **COMMENT**

Girella tricuspidata luderick

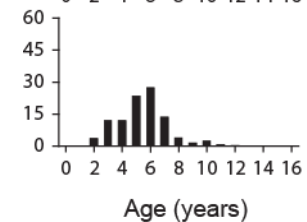
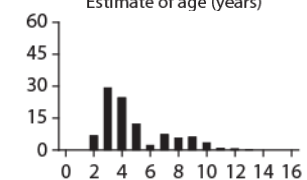
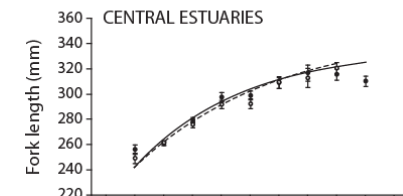
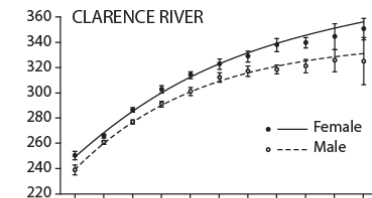
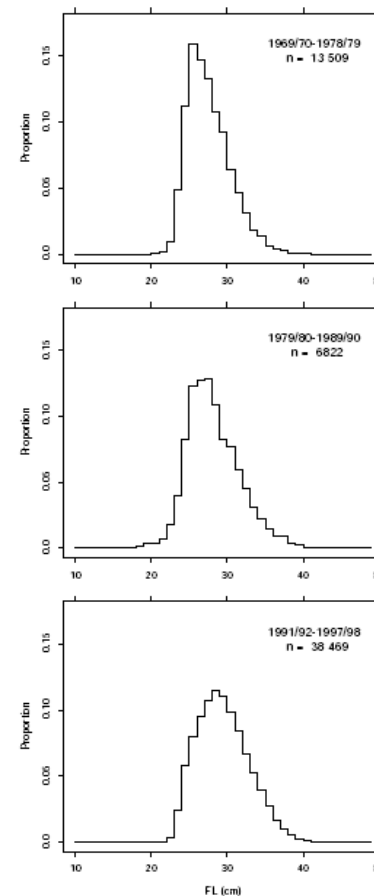


Stochastic Analysis of Commercial vs Recreational Catch:
Median with (10th, 90th) Percentiles

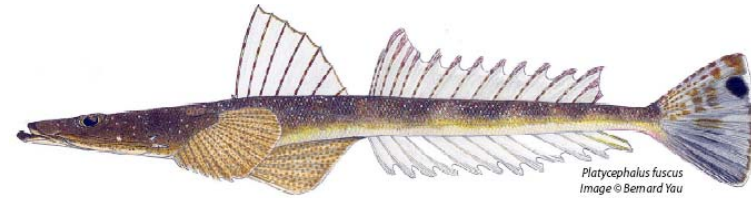
Fishery	Com (t)	Rec (t)	Com (%)	Rec (%)
ALL	352 (335, 373)	416 (267, 547)	46 (40, 57)	54 (43, 60)



Length Frequency of Luderick



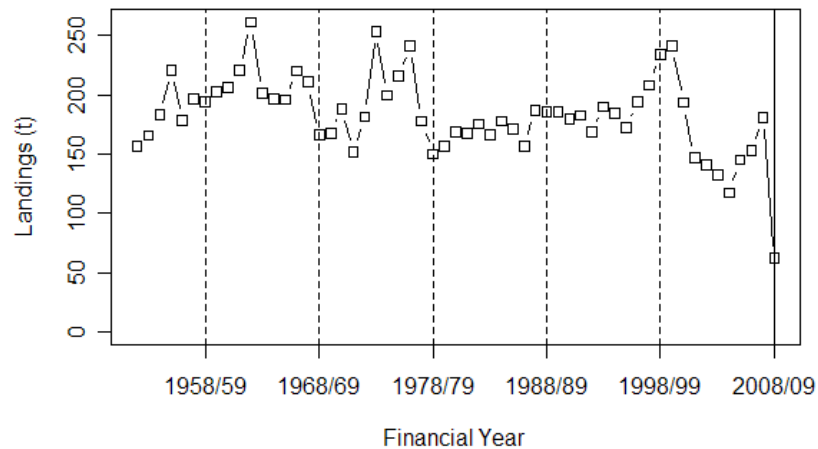
Dusky Flathead (*Platycephalus fuscus*)



EXPLOITATION STATUS FULLY FISHED		
Commercial catch rates are steady, but the species is primarily harvested by recreational fishers. More information is required on the recreational fishery. Detailed assessments will need to be at the scale of estuaries.		
SCIENTIFIC NAME	STANDARD NAME	COMMENT

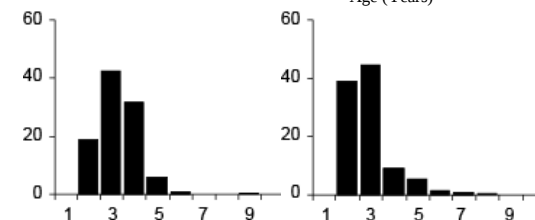
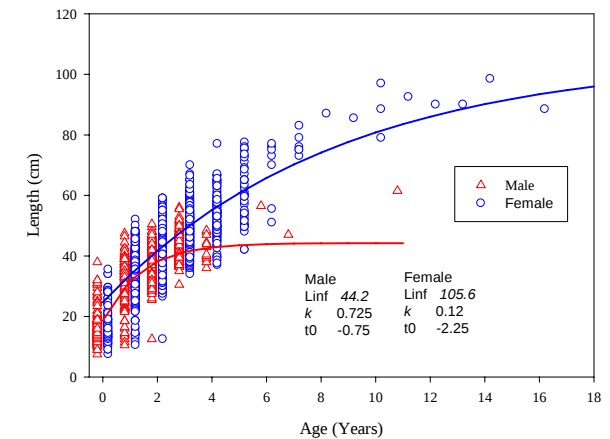
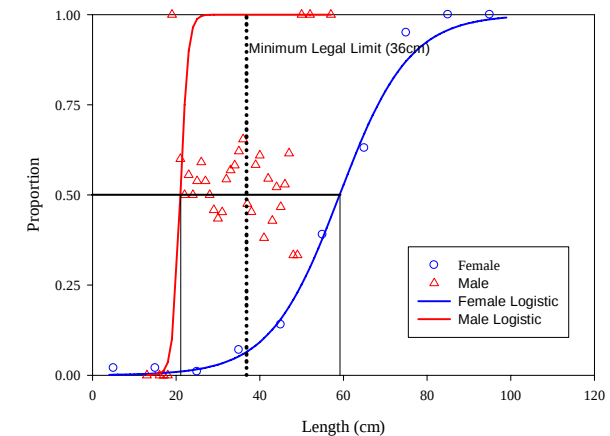
Platycephalus fuscus

dusky flathead



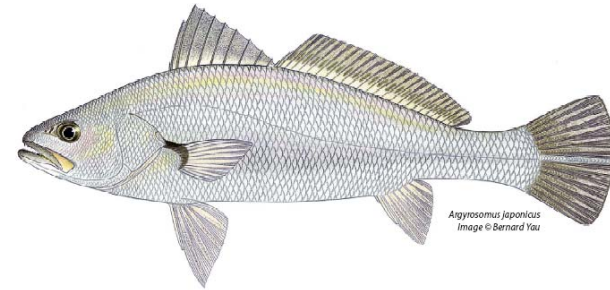
Stochastic Analysis of Commercial vs Recreational Catch: Median with (10th, 90th) Percentiles

Fishery	Com (t)	Rec (t)	Com (%)	Rec (%)
ALL	126 (119, 133)	714 (567, 832)	15 (13, 18)	85 (82, 87)



Mulloway

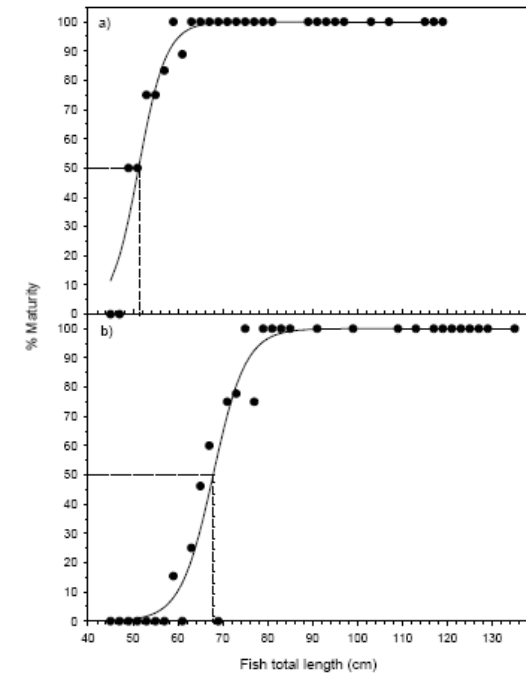
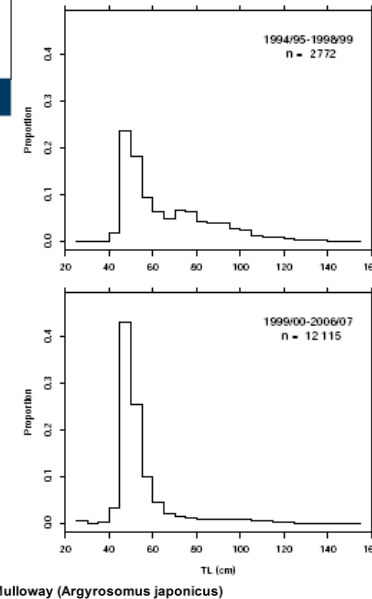
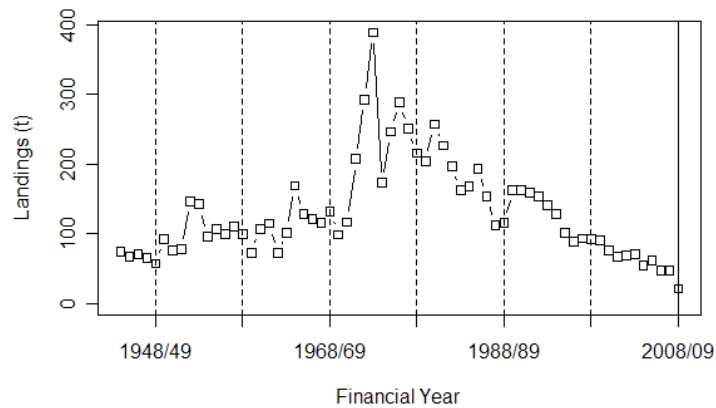
(*Argyrosomus japonicus*)



EXPLOITATION STATUS OVERFISHED

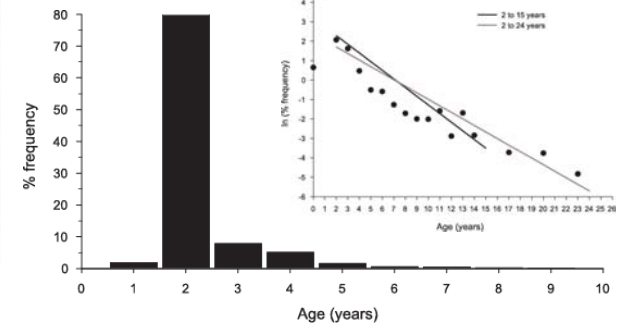
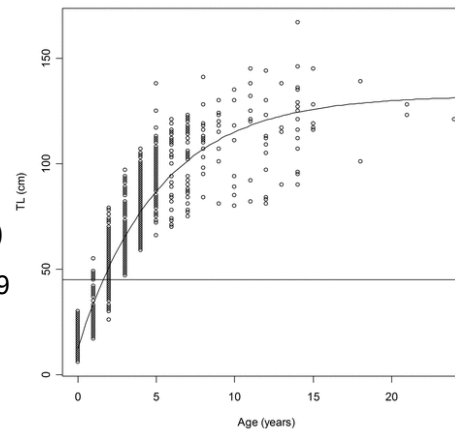
Age composition is strongly indicative of an overfished stock and the spawning potential ratio is below the recommended threshold. A recovery plan will be drafted in 2008.

SCIENTIFIC NAME	STANDARD NAME	COMMENT
<i>Argyrosomus japonicus</i>	mulloway	Also known as 'jewfish'.



Stochastic Analysis of Commercial vs Recreational Catch: Median with (10th, 90th) Percentiles

Fishery	Com (t)	Rec (t)	Com (%)	Rec (%)
ALL	60 (49, 71)	398 (259, 540)	13 (9, 20)	87 (80, 9



Snapper

(*Pagrus auratus*)

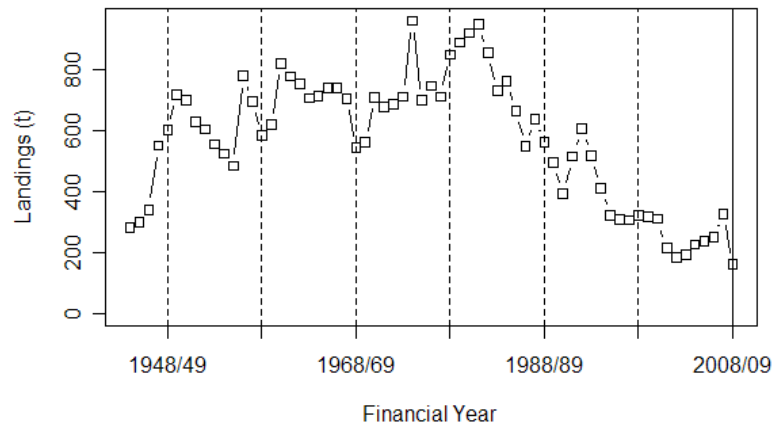
EXPLOITATION STATUS **GROWTH OVERFISHED**

Increasing the minimum legal length appears to have improved the state of the snapper stock, however the stock is still assessed as being growth overfished.

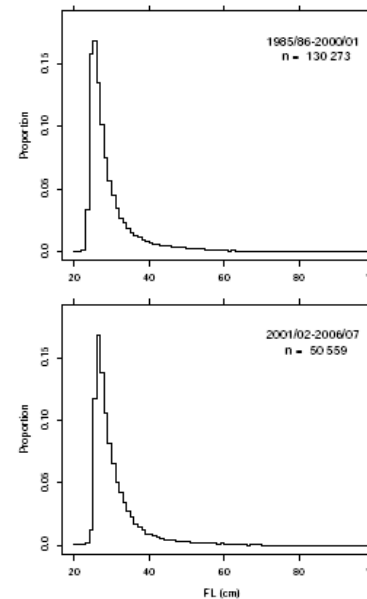
SCIENTIFIC NAME **STANDARD NAME** **COMMENT**

Pagrus auratus

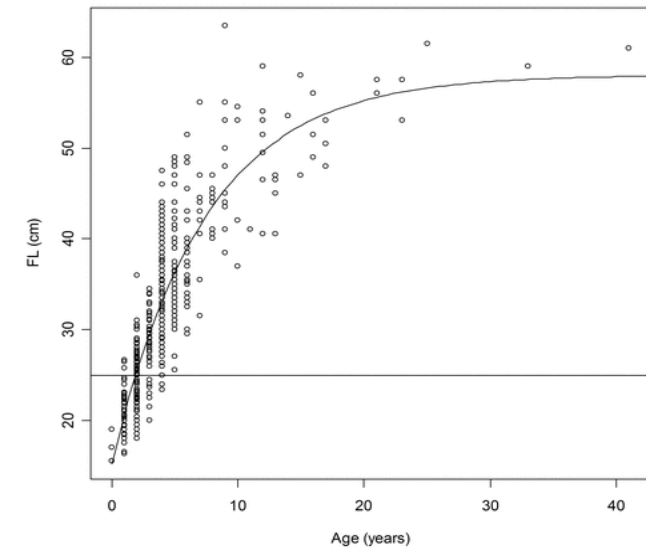
snapper



Length Frequency of Snapper

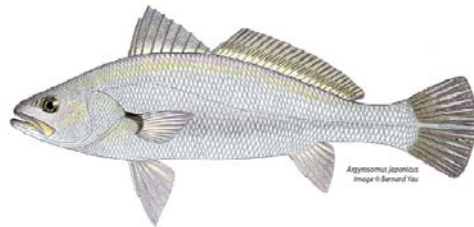
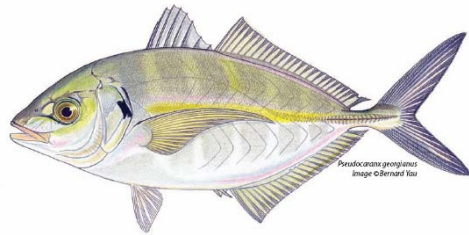


Snapper (*Pagrus auratus*)



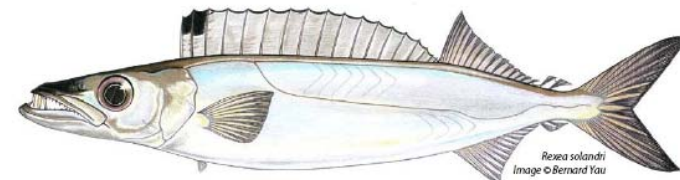
Stochastic Analysis of Commercial vs Recreational Catch:
Median with (10th, 90th) Percentiles

Fishery	Com (t)	Rec (t)	Com (%)	Rec (%)
ALL	219 (202, 237)	246 (210, 290)	47 (43, 52)	53 (48, 57)



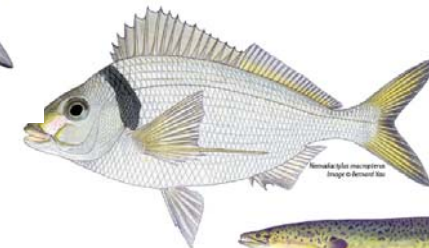
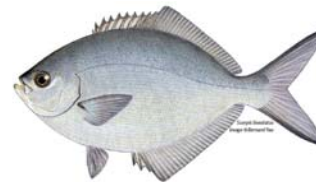
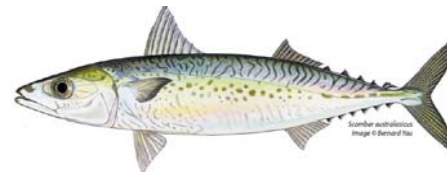
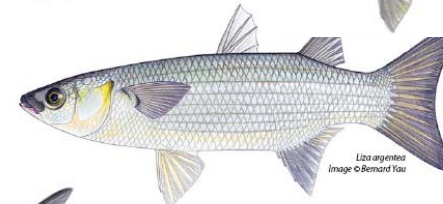
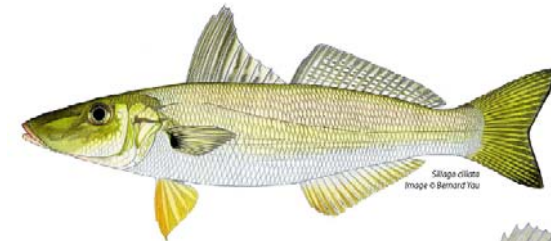
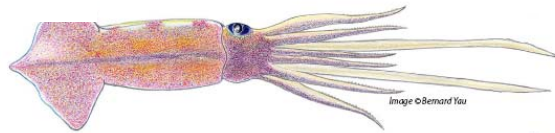
EXPLOITATION STATUS OVERFISHED

EXPLOITATION STATUS GROWTH OVERFISHED





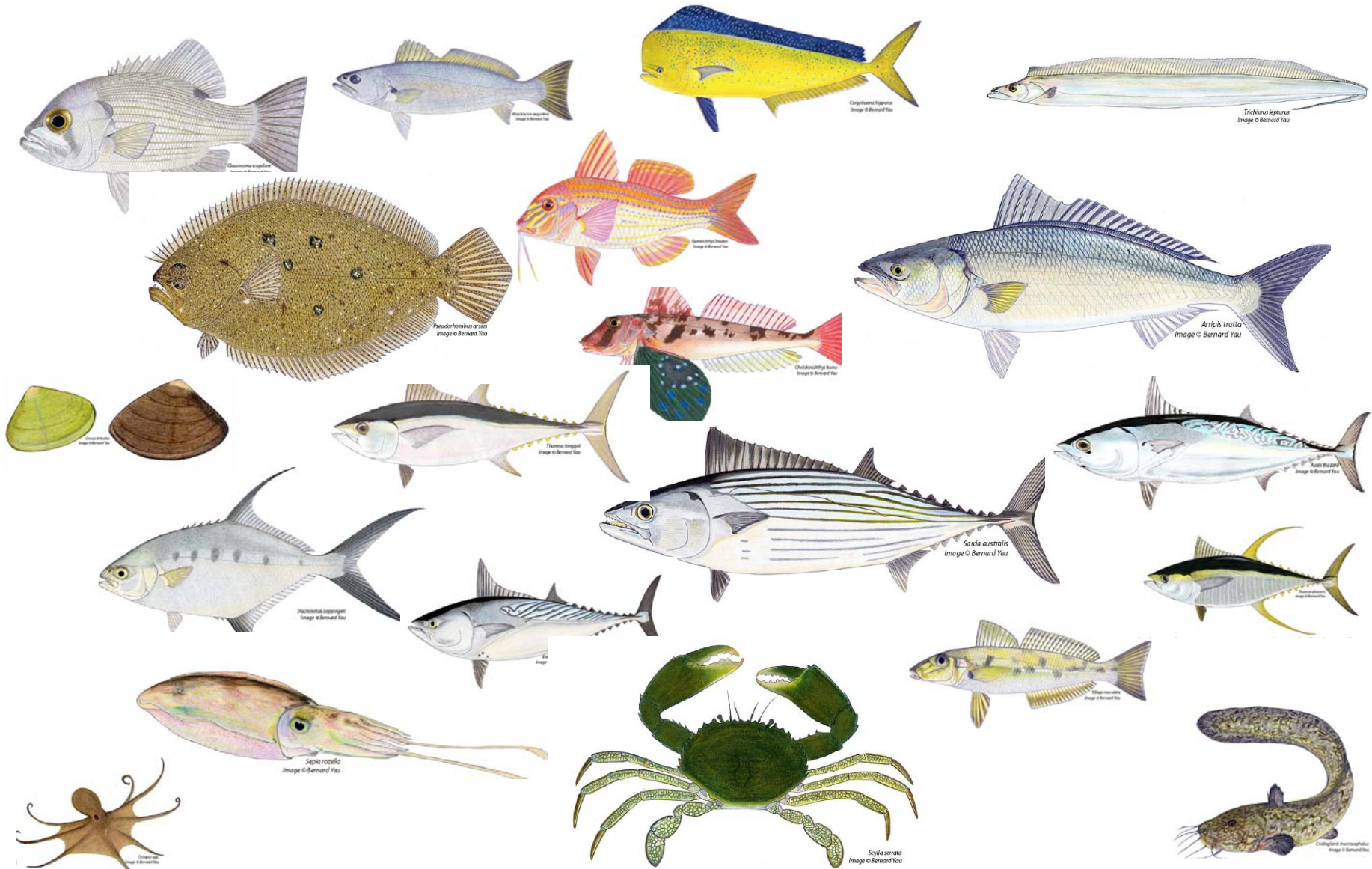
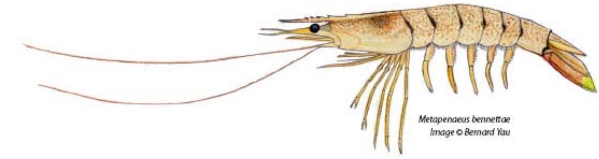
EXPLOITATION STATUS MODERATELY FISHED



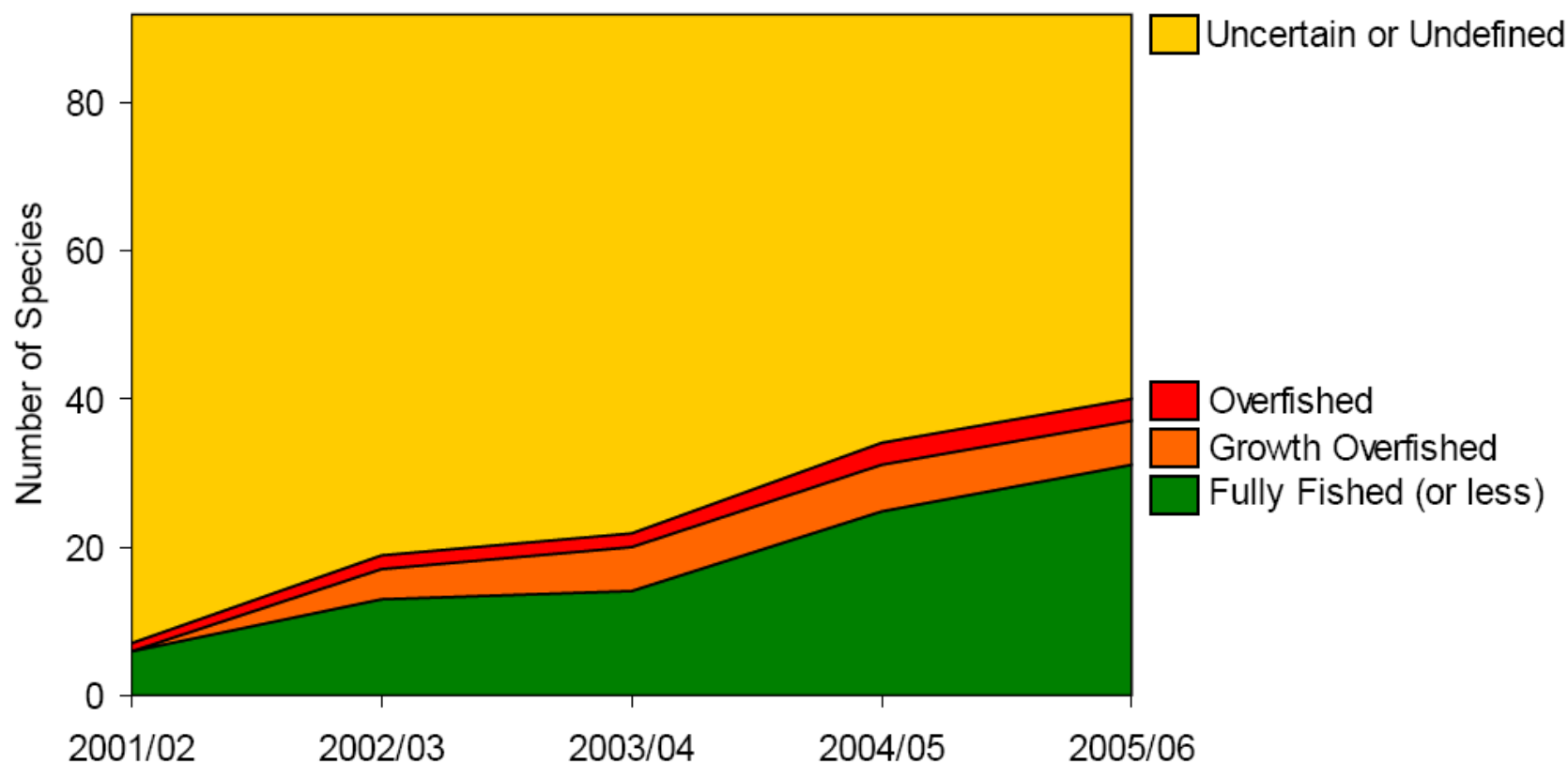
EXPLOITATION STATUS FULLY FISHED

EXPLOITATION STATUS	UNDEFINED
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EXPLOITATION STATUS **UNCERTAIN**



Exploitation Status of Key Species



Summary of the exploitation status of all key species from the Estuary General, Estuary Prawn Trawl, Ocean Hauling, Ocean Trawl and Ocean Trap and Line Fisheries from 2001/02 to 2005/06. Note that the species considered Overfished and Recruitment Overfished are combined and labelled as "Overfished", and that the species considered Uncertain and Undefined have been combined on this figure.