Database contents for the Abstract, Results, Tables and Figures of the Fish and Fisheries paper 2011 resubmission

Abstract

Assessments were assembled for 331 stocks (295 fish populations representing 45 families, and 36 invertebrate populations representing 12 families). Assessments were obtained from 21 national and international management institutions. Stocks present in the database come from 32 Large Marine Ecosystems. Assessed marine fish stocks comprise a relatively small proportion of harvested taxa (18%), and an even smaller proportion of marine fish biodiversity (1%). Reference points were available or could be calculated for about 64% of these stocks. The available data provide new insight into the status of exploited populations, 59% of stocks with reference points were estimated to be below B_{msy}, and 30% had exploitation levels estimated to be above U_{msy}. Temporal coverage of assessments is recent with 90% of catch time-series ranging 1966-2007 and 90% of biomass time-series ranging 1972-2007.

Results

Summary

Total number of proper stocks assessments: 331, from 295 marine fish populations and 36 invertebrate populations.

Taxonomy

Number of species in FishBase: 12339

Number of species in SAUP: REF:SQL:SAUPNUMSPP

Number of species in RAM Legacy: 163 (from 58 families and 20 orders)

Top 5 taxonomic orders: Gadiformes (n=70), Perciformes (n=65), Pleuronectiformes

(n=53), Scorpaeniformes (n=41), Clupeiformes (n=36)

Timespan

Number of assessments with catch timeseries: 313.

Number of assessments with recruitment timeseries: 274.

Number of assessments with spawning stock biomass timeseries: 280.

Together these comprise time series of catch/landings for 313 stocks (95%), SSB estimates for 280 stocks (85%), and recruitment estimates for 274 stocks (83%).

The median lengths of catch/landings, SSB, and recruitment timeseries were 39, 34, and 33 years, respectively (Figure 1). The time period covered by 90% of assessments is: catch/landings (1966-2007), SSB (1972-2007), recruitment (1971-2006), while that covered by 50% of assessments is: catch/landings (1983-2004), SSB (1985-2005), recruitment (1984-2003)

Assessment methodologies and reference points

The three most common assessment methods were Statistical catch-at-age/length models (n=168), Virtual Population Analyses (n=92) and Biomass dynamics model (n=46). Regionally, Virtual Population Analysis (VPA) is still the most common assessment model for European stocks (71% of 63 assessments), Canada (54% of 26 assessments) and Argentina (83% of 6 assessments), whereas statistical catch-at-age and -length models are more common for the United States (67% of 138 assessments), Australia (82% of 17 assessments) and New Zealand (76% of 29 assessments).

Biomass- or exploitation-based reference points were available for 262 (81%) and 224 (69%) assessments, respectively.

Stock status

Of the 216 stocks presented in Figure , 112 and 104 of the biomass reference points and 84 and 132 of the exploitation reference points come from assessments and from surplus

production model fits, respectively.

To identify potential biases arising from using BRPs derived from surplus production models we computed a contingency table of status classification for stocks that have both assessment- and Schaefer-derived BRPs (Table S2). Surplus production models correctly classified ratios of current biomass to BRPs in 76% of cases (for 58 of 76 assessments) and 64% of cases for exploitation BRPs (for 28 of 44 assessments).

Overall, 58% of stocks are estimated to be below their biomass-related MSY BRP, that is $B_{curr} < B_{msy}$, and 30% are estimated to be above their exploitation-related MSY BRP, $U_{curr} > U_{msy}$ (n=216 stocks total; Figure). Of the stocks for which biomass is currently estimated to be below B_{msy}, 56% have had their exploitation rate reduced below U_{msy}, suggesting potential for recovery (Figure). The remaining 44% of these stocks however, still have excessive exploitation rates (Figure). On a positive note, 42% of all stocks are estimated to be above B_{msy}, and 91% of the stocks above B_{msy} also have $U_{current}$ below U_{msy}.

Global fisheries

Management bodies and geography

Number of assessments from NMFS: 138 (82 with reference points, 41 (50 %) are below B_{msy}, 65 (79 %) are below U_{msy},)

Number of assessments from ICES: 63 (48 with reference points, 39 (81 %) are below B_{msy}, 22 (46 %) are below U_{msy},)

Number of assessments from MFish: 29 (28 with reference points, 11 (39 %) are below B_{msy}, 22 (79 %) are below U_{msy},)

Number of assessments from DFO: 26 (14 with reference points, 12 (86 %) are below B_{msy}, 13 (93 %) are below U_{msy},)

Number of assessments from AFMA: 17 (11 with reference points, 7 (64 %) are below B_{msy}, 7 (64 %) are below U_{msy},)

Number of assessments from DETMCM: 14 (6 with reference points, 3 (50 %) are below B_{msy}, 5 (83 %) are below U_{msy},)

The status of exploited marine stocks, as estimated from biomass- and exploitaion-BRPs, varied widely depending on the management body (Figure). Most European stocks (managed by ICES) have biomasses less than B_{msy} (81%), and over half of these stocks (59%) still have exploitation rates exceeding U_{msy}. Canadian stocks (managed by DFO) also had low biomass (86% $< B_{msy}$), but all but one of these has had its exploitation rate reduced below U_{msy}. In contrast, about half (50%) of U.S. stocks (managed by NMFS) are estimated to still be above B_{msy}, and of the 41 stocks that are below B_{msy} 66% have exploitation rates below U_{msy} (Figure). In the New Zealand and Australian waters, stocks managed by MFish and AFMA are above B_{msy} in 61% and 36% of cases, respectively. For the stocks grouped as ''Atlantic'' in Figure we found that 6 of the 10 ICCAT stocks and 6 of the 10 of NAFO stocks were below B_{msy} .

Assessments were available for 32 LMEs, with the greatest number of assessed stocks coming from Northeast U.S. Continental Shelf (n=59), California Current (n=35), New Zealand Shelf (n=29), Gulf of Alaska (n=27), Celtic-Biscay Shelf (n=26), East Bering Sea (n=21) and Southeast U.S. Continental Shelf (n=20).

The proportion of stocks below B_{msy} and below U_{mys} varies considerably by management body.

ICES has 48 assessments in Table 4, 39 (81%) of which are below B_{msy} and 22 are below U_{msy}.

Stock status by taxonomic orders

Of the 48 stocks for Gadiformes, 15 are below B_{msy} and above U_{msy}, 2 are above B_{msy} and above U_{msy}, 9 are above B_{msy} and below U_{msy} and 22 are below B_{msy} and below U_{msy}.

Of the 45 stocks for Perciformes, 13 are below B_{msy} and above U_{msy}, 1 are above B_{msy} and above U_{msy}, 17 are above B_{msy} and below U_{msy} and 14 are below B_{msy} and below U_{msy}.

Of the 38 stocks for Pleuronectiformes, 14 are below B_{msy} and above U_{msy}, 1 are

above B_{msy} and above U_{msy}, 18 are above B_{msy} and below U_{msy} and 5 are below B_{msy} and below U_{msy}.

Of the 27 stocks for Scorpaeniformes, 2 are below B_{msy} and above U_{msy}, 1 are above B_{msy} and above U_{msy}, 15 are above B_{msy} and below U_{msy} and 9 are below B_{msy} and below U_{msy}.

Of the 23 stocks for Clupeiformes, 4 are below B_{msy} and above U_{msy}, 2 are above B_{msy} and above U_{msy}, 7 are above B_{msy} and below U_{msy} and 10 are below B_{msy} and below U_{msy}.

Of the 12 stocks for Decapoda, 5 are below B_{msy} and above U_{msy}, 1 are above B_{msy} and above U_{msy}, 2 are above B_{msy} and below U_{msy} and 4 are below B_{msy} and below U_{msy}.

Stock status by Mean Trophic Level

Of the 24 stocks of MTL between 2 and 3 , 10 are below B_{msy} and above U_{msy}, 1 are above B_{msy} and above U_{msy}, 5 are above B_{msy} and below U_{msy} and 8 are below B_{msy} and below U_{msy}.

Of the 90 stocks of MTL between 3 and 4 , 18 are below B_{msy} and above U_{msy}, 3 are above B_{msy} and above U_{msy}, 36 are above B_{msy} and below U_{msy} and 33 are below B_{msy} and below U_{msy}.

Of the 85 stocks of MTL above 4 , 22 are below B_{msy} and above U_{msy}, 4 are above B_{msy} and above U_{msy}, 34 are above B_{msy} and below U_{msy} and 25 are below B_{msy} and below U_{msy}.

References

Worm, B., Hilborn, R., Baum, J.K. *et al.* (2009). Rebuilding global fisheries. *Science* 325, 578--585.

Tables

Table 1: Number of assessments included in the RAM Legacy database

Country/Ocean	*Management Body*	*Acronym*	*No. stocks*
USA	National Marine Fisheries Service	NMFS	141
Multinational	International Council for the Exploration of the Sea	ICES	63
New Zealand	Ministry of Fisheries	MFish	29
Canada	Department of Fisheries and Oceans	DFO	26
Australia	Australian Fisheries Management Authority	AFMA	17
South Africa	South African national management	DETMCM	14
Multinational	International Commission for the Conservation of Atlantic Tunas	ICCAT	10
Multinational	Northwest Atlantic Fisheries Organization	NAFO	8
Argentina	Consejo Federal Pesquero	CFP	6
Multinational	Western and Central Pacific Fisheries Commission	WCPFC	5
USA	US state-level management	US State	3
Multinational	Inter-American Tropical Tuna Commission	IATTC	2
Russia	Russian Federal Fisheries Agency	RFFA	2
Multinational	Commission for the Conservation of Antarctic Marine Living Resources	CCAMLR	1
Multinational	Commission for the Conservation of Southern Bluefin Tuna	CCSBT	1

Figures

Figure legends

Figure 1. Orca plots showing the temporal coverage of (A) catch/landings, (B) spawning stock biomass and (C) recruitment. The temporal coverage for individual assessments is represented by thin alternating black and grey horizontal lines in the main panels. Orca plots are named because their distinctive shape is uncannily similar to the individually-identifiable nicked and notched dorsal fins of killer whales (orcas). Thick horizontal lines at the base of each main panel represent the time periods which are present in 90% (black) and 50% (grey) of all series for that data type. Subfigure histograms contain the frequency of occurrence of the various timespans without reference to time period. Solid and long-dash vertical lines within the subfigures represent the median, 2.5% and 97.5% quantiles, respectively.

Figure 2. Map of Large Marine Ecosystems (LMEs) and high seas areas (ovals) showing the number of stock assessments present in the database for each area. This map illustrates the limited spatial coverage of available stock assessments.

Figure 3. Comparison of the taxonomic diversity of marine species as provided by FishBase (top panel), the coverage of catch data as provided by the Sea Around Us database (middle panel) and the new RAM Legacy database (bottom panel). The circle located near the middle of the circular dendrogram represents kingdom Animalia and each subsequent branching represents a different taxonomic group (Kingdom to Phylum to Class to Order to Family to Genus to Species). The width of each line is proportional to the square root of the number of species in a branch. To facilitate the identification of the taxonomic groups that are not presented in the catch and assessment data, the FishBase branching pattern of the spoked dendrogram is maintained to generate the other two dendrograms. This figure only compares fish and elasmobranch species present in FishBase. Additonal species of molluscs and arthropods are present in both the Sea

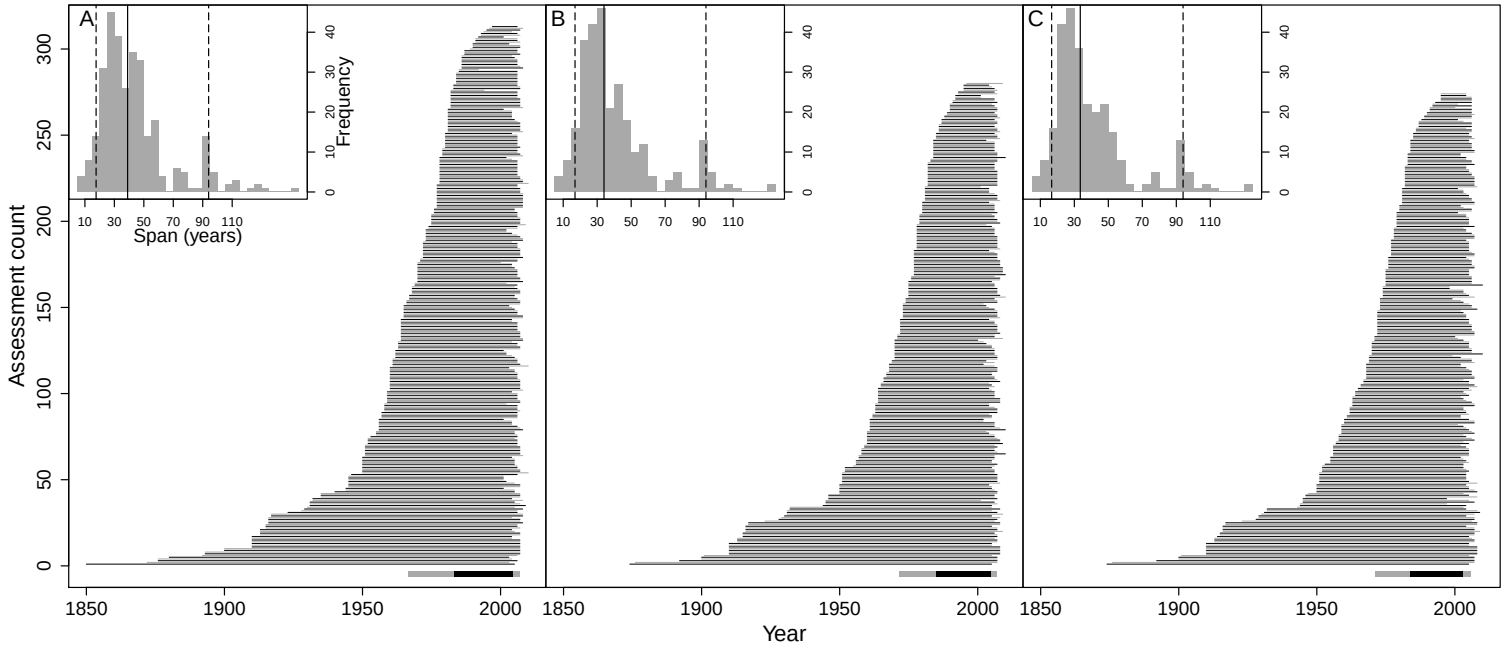
Around Us and RAM Legacy databases but are not presented here.

Figure 4. Current exploitation rate versus current biomass for 213 individual stocks and for individual stocks grouped by management unit. Exploitation is scaled relative to that which should allow maximum sustainable yield (U_{msy}); biomass is scaled relative to B_{msy}. Shades of grey indicate probability of occurrence as revealed by a kernel density smooth function. Solid circles indicate B_{msy} and U_{msy} that were obtained directly from assessments; open circles indicate that they were estimated from surplus production models. The panel labelled ''Atlantic'' includes ICCAT and NAFO. This figure is an updated version of Fig 3B from Worm *et al.* (2009).

Figure 5. Current exploitation rate versus current biomass grouped by the six taxonomic orders with the most assessments.

Figure 6. Current exploitation rate versus current biomass grouped by mean trophic level.

Figures


A
B
C
Assessment count
Year
Span (years)
Frequency
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100
150
200
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1900
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2000
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30
50
70
90
110
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10
20
30
40

Figure 1:

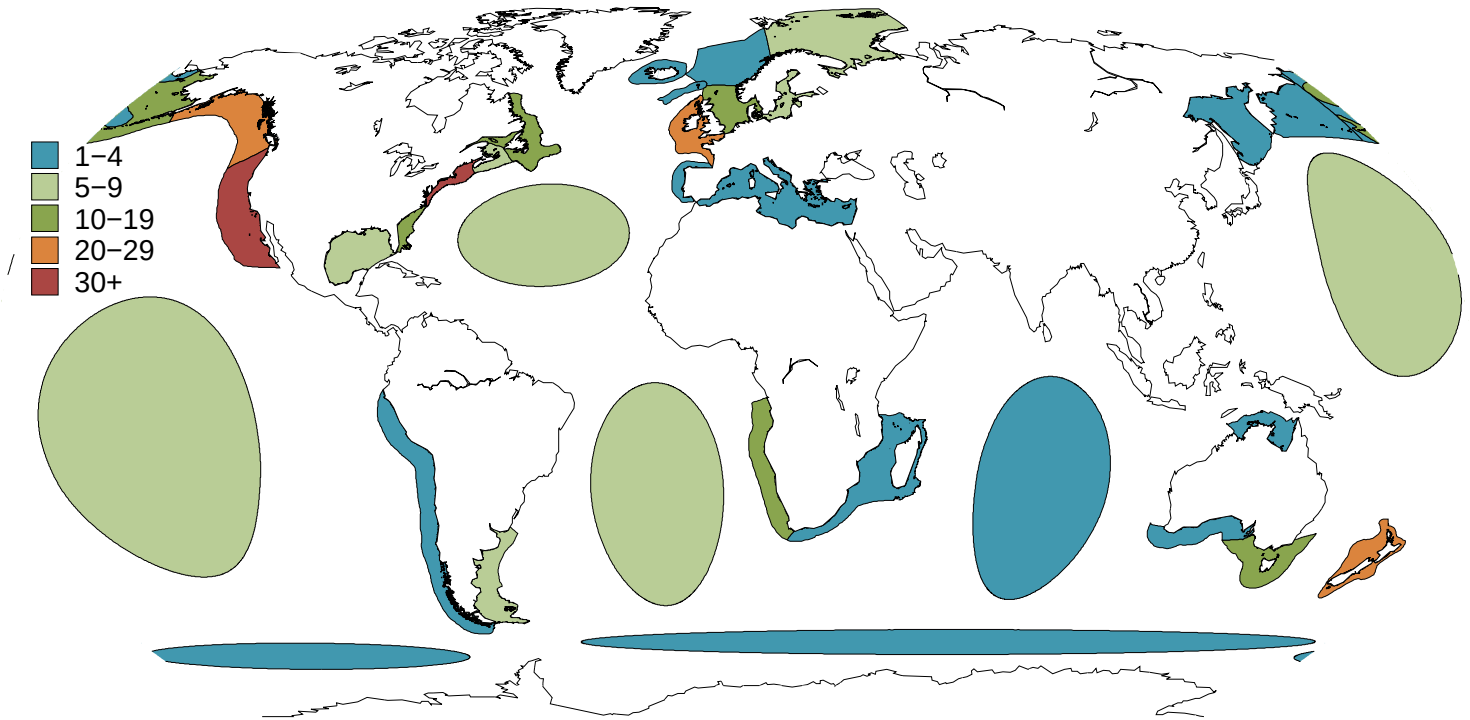
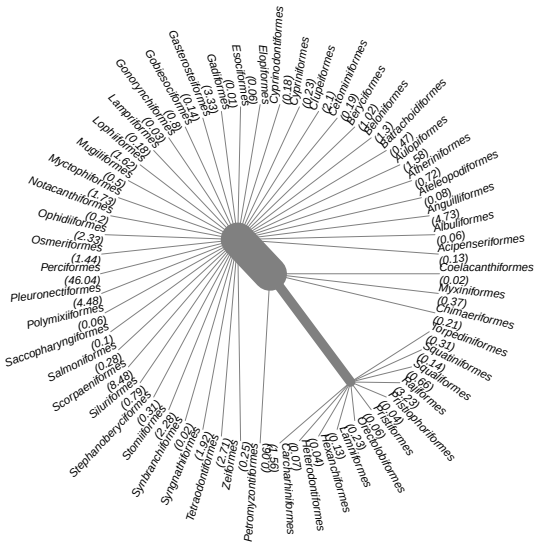
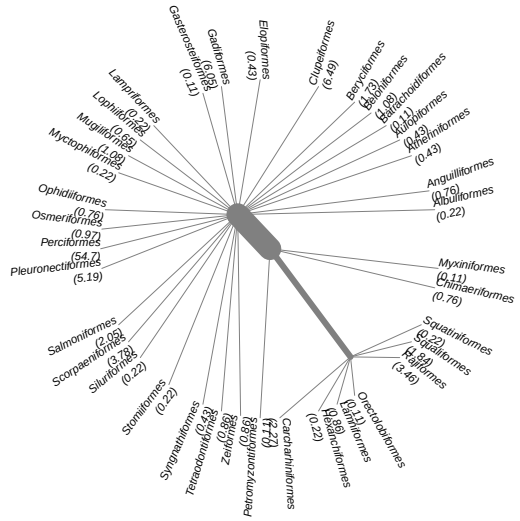


Figure 2:

FishBase



Sea Around Us



RAM Legacy

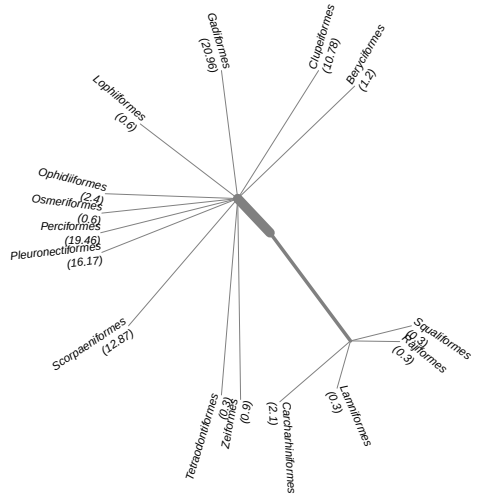
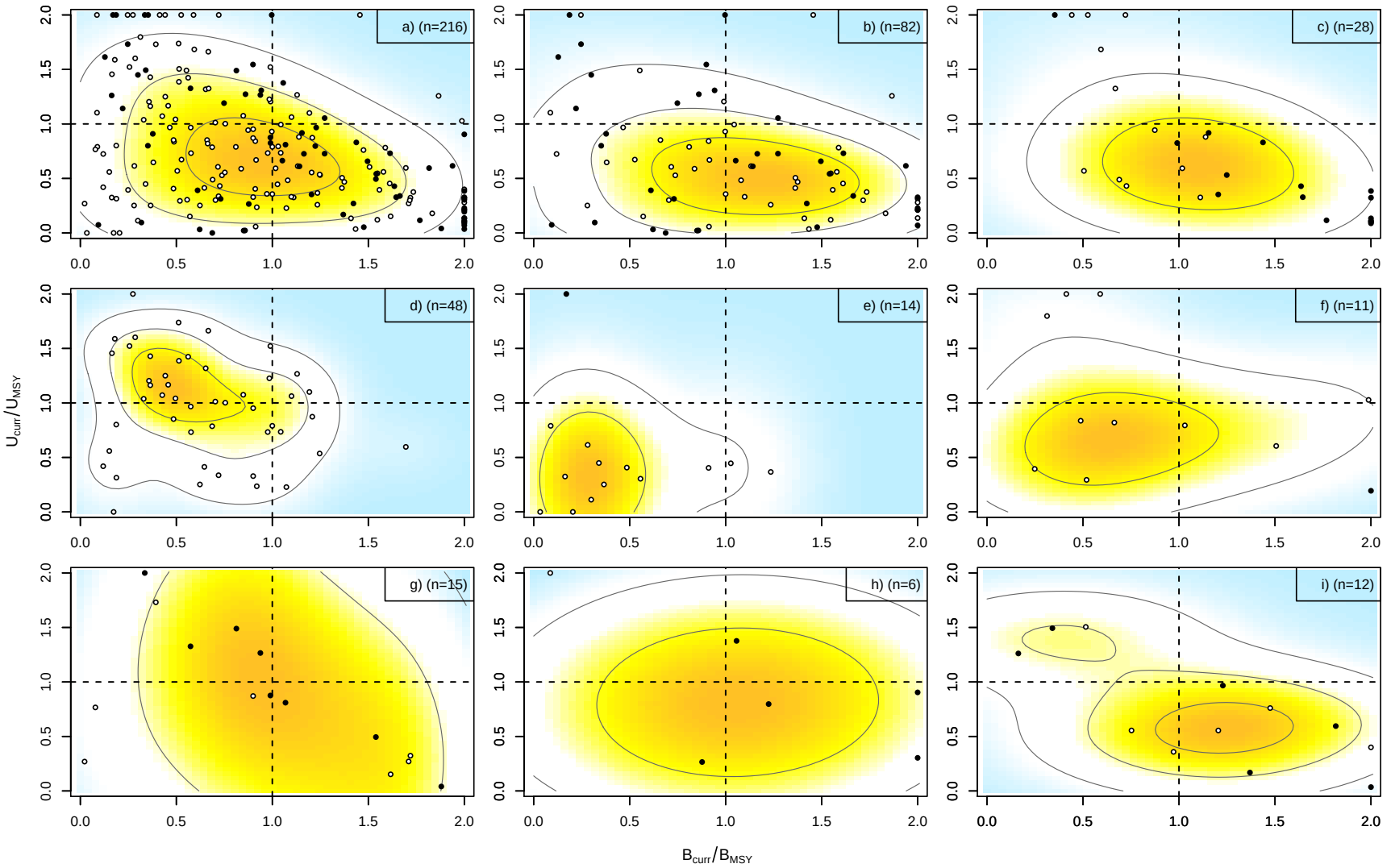


Figure 3:


a) (n=216)
b) (n=82)
c) (n=28)
d) (n=48)
e) (n=14)
f) (n=11)
g) (n=15)
h) (n=6)
i) (n=12)
U_{curr}/U_{MSY}
B_{curr}/B_{MSY}
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0.5
1.0
1.5
2.0

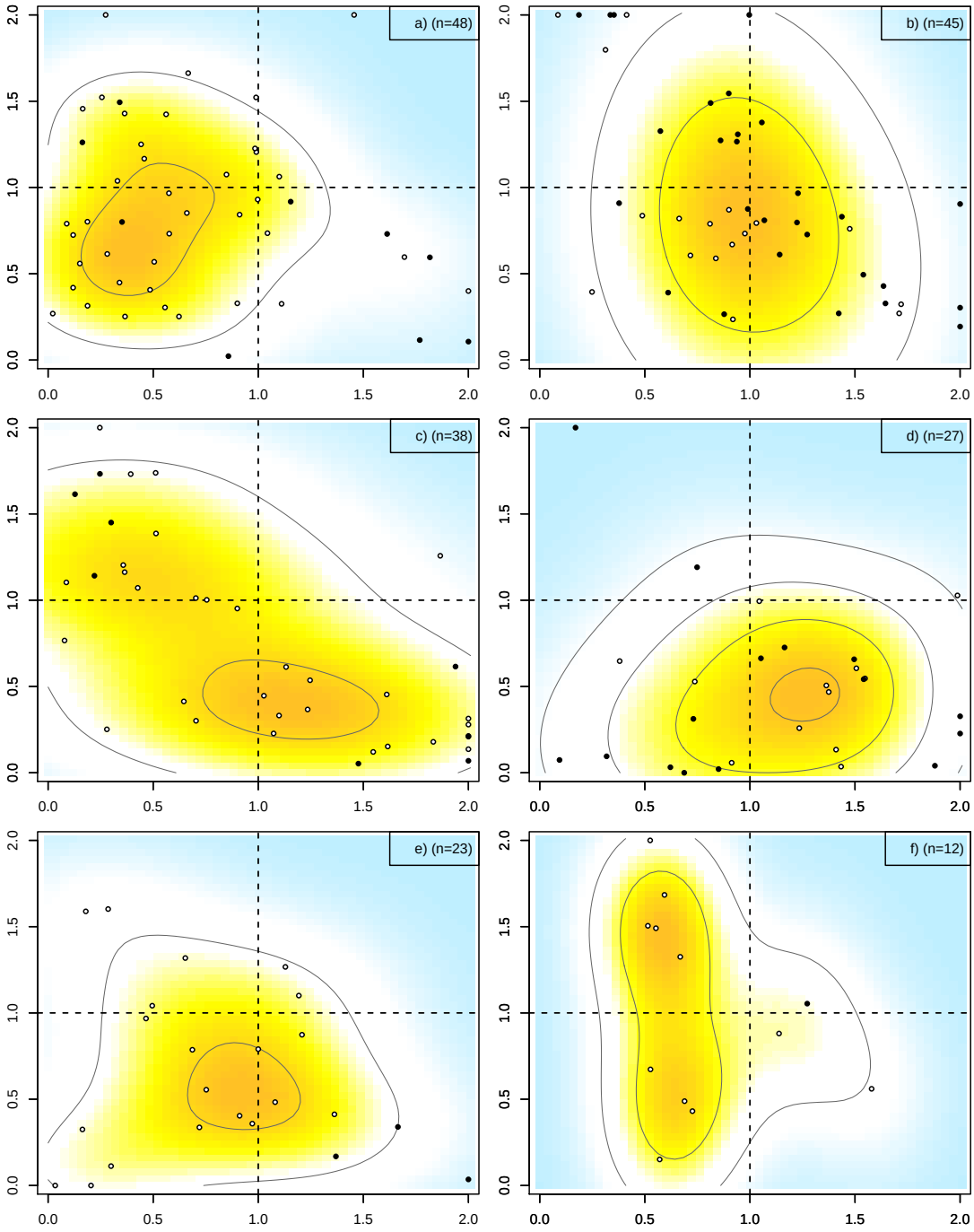

Figure 4: Top 6 taxonomic orders.

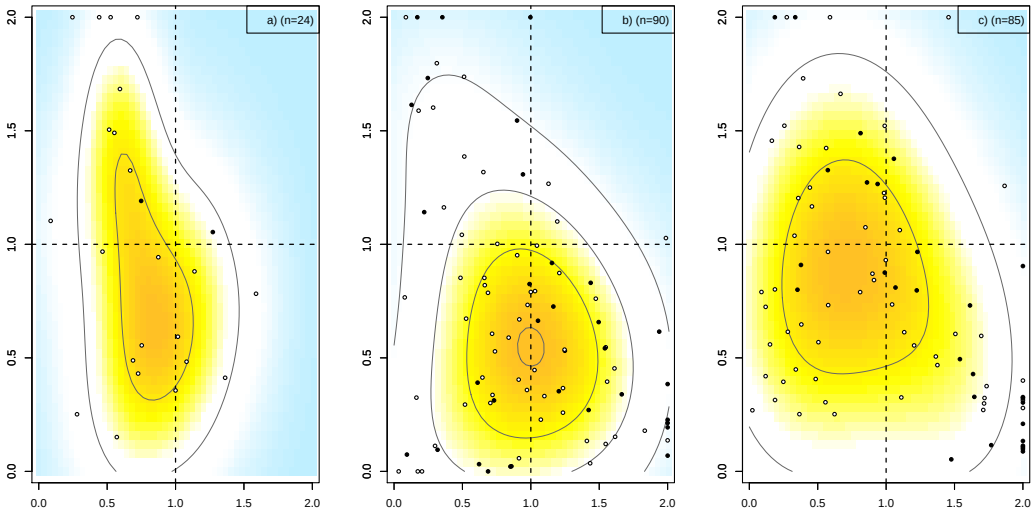

Figure 5: By mean trophic level (MTL).

Contents for Supplementary Materials

	SP U/Umsy < 1	SP U/Umsy > 1
U/Umsy < 1	20	14
U/Umsy > 1	2	8
B/Bmsy < 1	28	6
B/Bmsy > 1	12	30

Table .2: Contingency tables of stock status classification for biomass and exploitation reference points obtained from assessments and those derived from surplus production models.

Management	Country	Stock	Scientific name	Taxonomic order	Trophic Level	Methodology	Timespan	Current year	B ratio	U ratio
AFMA	Australia	Bight redfish Southeast Australia	*Centroberyx gerrardi*	Beryciformes	4.08	Integrated Analysis	1958-2007			
AFMA	Australia	Patagonian toothfish Macquarie Island	*Dissostichus eleginoides*	Perciformes	3.96	Integrated Analysis	1975-2010	2010	2.3	0.19
AFMA	Australia	New Zealand ling Western half of Southeast Australia	*Genypterus blacodes*	Ophidiiformes	4.34	Integrated Analysis	1968-2007			
AFMA	Australia	New Zealand ling Eastern half of Southeast Australia	*Genypterus blacodes*	Ophidiiformes	4.34	Integrated Analysis	1968-2007	2007	0.59	2.2 *
AFMA	Australia	Orange roughy Southeast Australia	*Hoplostethus atlanticus*	Beryciformes	3.98	Integrated Analysis	1978-2007	2007	0.52	0.29 *
AFMA	Australia	Orange roughy Cascade Plateau	*Hoplostethus atlanticus*	Beryciformes	3.98	Integrated Analysis	1987-2006			
AFMA	Australia	Jackass morwong Southeast Australia	*Nemadactylus macropterus*	Perciformes	3.41	Integrated Analysis	1913-2007	2007	0.31	1.8 *
AFMA	Australia	Tiger flathead Southeast Australia	*Neoplatycephalus richardsoni*	Scorpaeniformes	3.87	Integrated Analysis	1913-2006	2006	1.99	1.03 *
AFMA	Australia	Northern Australia grooved Tiger Prawn	*Penaeus esculentus*	Decapoda	2.70	Biomass dynamics model	1970-2006			
AFMA	Australia	Northern Australia brown tiger shrimp	*Penaeus esculentus*	Decapoda	2.70	Biomass dynamics model	1970-2006			
AFMA	Australia	Deepwater flathead Southeast Australia	*Platycephalus conatus*	Scorpaeniformes	4.20	Integrated Analysis	1978-2007	2007	1.51	0.61 *
AFMA	Australia	Tasmanian giant crab Tasmania	*Pseudocarcinus gigas*	Decapoda		Unknown	1990-2007			
AFMA	Australia	common gemfish Southeast Australia	*Rexea solandri*	Perciformes	4.25	Integrated Analysis	1966-2007	2007	0.25	0.39 *
AFMA	Australia	Blue Warehou Eastern half of Southeast Australia	*Seriolella brama*	Perciformes		Integrated Analysis	1984-2006	2006	0.49	0.84 *
AFMA	Australia	Blue Warehou Western half of Southeast Australia	*Seriolella brama*	Perciformes		Integrated Analysis	1984-2006	2006	0.41	2.04 *
AFMA	Australia	Silverfish Southeast Australia	*Seriolella punctata*	Perciformes	3.40	Integrated Analysis	1978-2006	2006	1.03	0.79 *
AFMA	Australia	School whiting Southeast Australia	*Sillago flindersi*	Perciformes	3.34	Integrated Analysis	1945-2007	2007	0.66	0.82 *

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Management	Country	Stock	Scientific name	Taxonomic order	Trophic Level	Methodology	Timespan	Current year	B ratio	U ratio
CCAMLR	Multinational	Antarctic toothfish Ross Sea	*Dissostichus mawsoni*	Perciformes		Integrated Analysis	1995-2007			
CCSBT	Multinational	Southern bluefin tuna Southern Oceans	*Thunnus maccoyii*	Perciformes		Integrated Analysis	1931-2009			
CFP	Argentina	Argentine anchoita Northern Argentina	*Engraulis anchoita*	Clupeiformes		VPA	1989-2007	2007	1.37	0.17
CFP	Argentina	Argentine anchoita Southern Argentina	*Engraulis anchoita*	Clupeiformes		Biomass dynamics model	1992-2007	2007	3.13	0.04
CFP	Argentina	Patagonian grenadier Southern Argentina	*Macruronus magellanicus*	Gadiformes		VPA	1983-2006	2006	1.82	0.6
CFP	Argentina	Argentine hake Southern Argentina	*Merluccius hubbsi*	Gadiformes		VPA	1985-2008	2008	0.34	1.49
CFP	Argentina	Argentine hake Northern Argentina	*Merluccius hubbsi*	Gadiformes		VPA	1985-2007	2007	0.16	1.26
CFP	Argentina	Southern blue whiting Southern Argentina	*Micromesistius australis*	Gadiformes	3.79	VPA	1985-2007			
DETMCM	South Africa	Patagonian toothfish South Africa Subantarctic Prince Edward Islands	*Dissostichus eleginoides*	Perciformes	3.96	Biomass dynamics model	1960-2008			
DETMCM	South Africa	Anchovy South Africa	*Engraulis encrasicolus*	Clupeiformes	3.11	Statistical catch at age model	1984-2006	2006	0.97 *	0.36 *
DETMCM	South Africa	Kingklip South Africa	*Genypterus capensis*	Ophidiiformes	4.44	Biomass dynamics model	1932-2008	2008	1.2	0.55 *
DETMCM	South Africa	South African abalone South Africa	*Haliotis midae*	Archaeogastropoda	2.00	Statistical catch at age model	1951-2008			
DETMCM	South Africa	South African west coast rock lobster South Africa Area 7	*Jasus lalandii*	Decapoda	2.60	Statistical catch at age model	1910-2008			
DETMCM	South Africa	South African west coast rock lobster South Africa Areas 3-4	*Jasus lalandii*	Decapoda	2.60	Statistical catch at age model	1910-2008			
DETMCM	South Africa	South African west coast rock lobster South Africa Area 8	*Jasus lalandii*	Decapoda	2.60	Statistical catch at age model	1910-2008			

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Management	Country	Stock	Scientific name	Taxonomic order	Trophic Level	Methodology	Timespan	Current year	B ratio	U ratio
DETMCM	South Africa	South African west coast rock lobster South Africa Areas 1-2	*Jasus lalandii*	Decapoda	2.60	Statistical catch at age model	1910-2008			
DETMCM	South Africa	South African west coast rock lobster South Africa Areas 5-6	*Jasus lalandii*	Decapoda	2.60	Statistical catch at age model	1910-2008			
DETMCM	South Africa	Shallow-water cape hake South Africa	*Merluccius capensis*	Gadiformes	4.45	Biomass dynamics model	1917-2008	2008	2.3	0.4 *
DETMCM	South Africa	Deep-water cape hake South Africa	*Merluccius paradoxus*	Gadiformes	4.66	Biomass dynamics model	1917-2008			
DETMCM	South Africa	Southern spiny lobster South Africa South coast	*Palinurus gilchristi*	Decapoda	2.60	Statistical catch at age model	1973-2008	2008	0.51 *	1.5 *
DETMCM	South Africa	Sardine South Africa	*Sardinops sagax*	Clupeiformes	2.43	Statistical catch at age model	1984-2006	2006	0.75 *	0.55 *
DETMCM	South Africa	Cape horse mackerel South Africa South coast	*Trachurus capensis*	Perciformes	3.47	Biomass dynamics model	1950-2007	2007	1.47 *	0.76 *
DFO	Canada	Sablefish Pacific Coast of Canada	*Anoplopoma fimbria*	Scorpaeniformes	3.83	Integrated Analysis	1913-2004	2004	0.17	3.86
DFO	Canada	Cusk NAFO 4X	*Brosme brosme*	Gadiformes		Biomass dynamics model	1970-2007			
DFO	Canada	Herring NAFO 4T spring spawners	*Clupea harengus*	Clupeiformes	3.23	VPA	1974-2007			
DFO	Canada	Herring NAFO 4T fall spawners	*Clupea harengus*	Clupeiformes	3.23	VPA	1974-2007			
DFO	Canada	Herring NAFO 4R fall spawners	*Clupea harengus*	Clupeiformes	3.23	VPA	1971-2003			
DFO	Canada	Herring Scotian Shelf and Bay of Fundy	*Clupea harengus*	Clupeiformes	3.23	VPA	1965-2006			
DFO	Canada	Herring NAFO 4R spring spawners	*Clupea harengus*	Clupeiformes	3.23	VPA	1963-2004			

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Management	Country	Stock	Scientific name	Taxonomic order	Trophic Level	Methodology	Timespan	Current year	B ratio	U ratio
DFO	Canada	Pacific herring Queen Charlotte Islands	*Clupea pallasii*	Clupeiformes	3.15	Statistical catch at age model	1951-2007	2007	0.2 *	0 *
DFO	Canada	Pacific herring Straight of Georgia	*Clupea pallasii*	Clupeiformes	3.15	Statistical catch at age model	1951-2007	2007	0.91 *	0.4 *
DFO	Canada	Pacific herring Prince Rupert District	*Clupea pallasii*	Clupeiformes	3.15	Statistical catch at age model	1951-2007	2007	0.16 *	0.32 *
DFO	Canada	Pacific herring West Coast of Vancouver Island	*Clupea pallasii*	Clupeiformes	3.15	Statistical catch at age model	1951-2007	2007	0.03 *	0 *
DFO	Canada	Pacific herring Central Coast	*Clupea pallasii*	Clupeiformes	3.15	Statistical catch at age model	1951-2007	2007	0.3 *	0.11 *
DFO	Canada	Pacific cod West Coast of Vancouver Island	*Gadus macrocephalus*	Gadiformes	4.01	Biomass dynamics model	1956-2002	2001	0.28 *	0.61 *
DFO	Canada	Pacific cod Hecate Strait	*Gadus macrocephalus*	Gadiformes	4.01	Biomass dynamics model	1956-2005	2004	0.37 *	0.25 *
DFO	Canada	Atlantic cod NAFO 4VsW	*Gadus morhua*	Gadiformes	4.42	Unknown	1958-2002			
DFO	Canada	Atlantic cod NAFO 5Zjm	*Gadus morhua*	Gadiformes	4.42	VPA	1978-2003	2002	0.34 *	0.45 *
DFO	Canada	Atlantic cod NAFO 2J3KL	*Gadus morhua*	Gadiformes	4.42	VPA	1850-2005			
DFO	Canada	Atlantic cod NAFO 3Ps	*Gadus morhua*	Gadiformes	4.42	VPA	1959-2004	2004	0.49 *	0.41 *
DFO	Canada	Atlantic cod NAFO 4TVn	*Gadus morhua*	Gadiformes	4.42	VPA	1965-2009			
DFO	Canada	Atlantic cod NAFO 3Pn4RS	*Gadus morhua*	Gadiformes	4.42	VPA	1964-2007	2006	0.09 *	0.79 *
DFO	Canada	Atlantic cod NAFO 2J3KL inshore	*Gadus morhua*	Gadiformes	4.42	VPA	1959-2006			
DFO	Canada	Rock sole Hecate Strait	*Lepidopsetta bilineata*	Pleuronectiformes	3.21	Statistical catch at age model	1945-2001	2001	1.03 *	0.45 *
DFO	Canada	Haddock NAFO-5Zejm	*Melanogrammus aeglefinus*	Gadiformes	4.09	VPA	1968-2003			
DFO	Canada	Haddock NAFO-4X5Y	*Melanogrammus aeglefinus*	Gadiformes	4.09	VPA	1960-2003			
DFO	Canada	English sole Hecate Strait	*Parophrys vetulus*	Pleuronectiformes	3.45	Statistical catch at age model	1944-2001	2001	1.23 *	0.37 *

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Management	Country	Stock	Scientific name	Taxonomic order	Trophic Level	Methodology	Timespan	Current year	B ratio	U ratio
DFO	Canada	Pollock NAFO-4VWX5Zc	*Pollachius virens*	Gadiformes	4.38	VPA	1974-2007	2006	0.56 *	0.3 *
IATTC	Multinational	Yellowfin tuna Eastern Pacific	*Thunnus albacares*	Perciformes	4.34	Statistical catch at age model	1975-2007			
IATTC	Multinational	Bigeye tuna Eastern Pacific	*Thunnus obesus*	Perciformes	4.50	Integrated Analysis	1975-2007			
ICCAT	Multinational	Skipjack tuna Western Atlantic	*Katsuwonus pelamis*	Perciformes	4.35	Biomass dynamics model	1952-2006	2006	1.72 *	0.32
ICCAT	Multinational	Skipjack tuna Eastern Atlantic	*Katsuwonus pelamis*	Perciformes	4.35	Biomass dynamics model	1950-2006	2006	1.71 *	0.27
ICCAT	Multinational	Albacore tuna North Atlantic	*Thunnus alalunga*	Perciformes	4.31	VPA	1929-2005	2005	0.81	1.49
ICCAT	Multinational	Yellowfin tuna Atlantic	*Thunnus albacares*	Perciformes	4.34	VPA	1970-2006	2006	1.07	0.81
ICCAT	Multinational	Bigeye tuna Atlantic	*Thunnus obesus*	Perciformes	4.50	Biomass dynamics model	1950-2005	2005	0.9 *	0.87
ICCAT	Multinational	Bluefin tuna Western Atlantic	*Thunnus thynnus*	Perciformes	4.43	VPA	1969-2007	2007	0.57	1.33
ICCAT	Multinational	Bluefin tuna Eastern Atlantic	*Thunnus thynnus*	Perciformes	4.43	VPA	1969-2007	2007	0.34	9.38
ICCAT	Multinational	Swordfish South Atlantic	*Xiphias gladius*	Perciformes	4.49	Biomass dynamics model	1970-2005	2005	1.54	0.49
ICCAT	Multinational	Swordfish Mediterranean Sea	*Xiphias gladius*	Perciformes	4.49	Biomass dynamics model	1968-2006	2006	0.94	1.27
ICCAT	Multinational	Swordfish North Atlantic	*Xiphias gladius*	Perciformes	4.49	Biomass dynamics model	1978-2007	2005	0.99	0.88
ICES	Multinational	Sandeel North Sea	*Ammodytes marinus*	Perciformes		VPA	1983-2007	2007	0.92 *	0.24 *
ICES	Multinational	Herring Northern Irish Sea	*Clupea harengus*	Clupeiformes	3.23	Statistical catch at age model	1960-2006	2006	0.72 *	0.34 *
ICES	Multinational	Herring ICES 22-24-IIIa	*Clupea harengus*	Clupeiformes	3.23	Statistical catch at age model	1991-2006			

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Management	Country	Stock	Scientific name	Taxonomic order	Trophic Level	Methodology	Timespan	Current year	B ratio	U ratio
ICES	Multinational	Herring ICES 30	*Clupea harengus*	Clupeiformes	3.23	VPA	1972-2007	2006	1.19 *	1.1 *
ICES	Multinational	Herring ICES VIa	*Clupea harengus*	Clupeiformes	3.23	Statistical catch at age model	1957-2006	2006	0.18 *	1.59 *
ICES	Multinational	Herring ICES 25-32	*Clupea harengus*	Clupeiformes	3.23	VPA	1973-2006	2006	0.69 *	0.79 *
ICES	Multinational	Herring North Sea	*Clupea harengus*	Clupeiformes	3.23	Statistical catch at age model	1960-2007	2006	0.65 *	1.32 *
ICES	Multinational	Herring ICES 31	*Clupea harengus*	Clupeiformes	3.23	VPA	1979-2006	2006	0.29 *	1.6 *
ICES	Multinational	Herring Iceland (Summer spawners)	*Clupea harengus*	Clupeiformes	3.23	VPA	1983-2007	2006	1 *	0.79 *
ICES	Multinational	Herring ICES VIa-VIIb-VIIc	*Clupea harengus*	Clupeiformes	3.23	VPA	1969-2000	2000	0.5 *	1.04 *
ICES	Multinational	Herring ICES 28	*Clupea harengus*	Clupeiformes	3.23	VPA	1976-2007	2006	1.21 *	0.87 *
ICES	Multinational	Anchovy ICES VIII	*Engraulis encrasicolus*	Clupeiformes	3.11	Biomass dynamics model	1986-2007			
ICES	Multinational	Atlantic cod Northeast Arctic	*Gadus morhua*	Gadiformes	4.42	VPA	1943-2006	2006	0.56 *	1.42 *
ICES	Multinational	Atlantic cod coastal Norway	*Gadus morhua*	Gadiformes	4.42	VPA	1982-2006	2006	0.27 *	2.17 *
ICES	Multinational	Atlantic cod West of Scotland	*Gadus morhua*	Gadiformes	4.42	Statistical catch at age model	1977-2006	2006	0.12 *	0.42 *
ICES	Multinational	Atlantic cod Irish Sea	*Gadus morhua*	Gadiformes	4.42	VPA	1968-2006	2006	0.15 *	0.56 *
ICES	Multinational	Atlantic cod Baltic Areas 25-32	*Gadus morhua*	Gadiformes	4.42	VPA	1964-2007	2006	0.16 *	1.46 *
ICES	Multinational	Atlantic cod Faroe Plateau	*Gadus morhua*	Gadiformes	4.42	VPA	1959-2006	2006	0.26 *	1.52 *
ICES	Multinational	Atlantic cod Kattegat	*Gadus morhua*	Gadiformes	4.42	VPA	1970-2006	2006	0.19 *	0.31 *
ICES	Multinational	Atlantic cod Baltic Areas 22 and 24	*Gadus morhua*	Gadiformes	4.42	VPA	1969-2007	2006	0.36 *	1.43 *
ICES	Multinational	Atlantic cod Iceland	*Gadus morhua*	Gadiformes	4.42	Statistical catch at age model	1952-2006	2006	0.46 *	1.17 *
ICES	Multinational	Atlantic cod North Sea	*Gadus morhua*	Gadiformes	4.42	VPA	1962-2007	2006	0.19 *	0.8 *
ICES	Multinational	Fourspotted megrim ICES VIIIc-IXa	*Lepidorhombus boscii*	Pleuronectiformes		VPA	1986-2006	2006	0.7 *	1.01 *

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Management	Country	Stock	Scientific name	Taxonomic order	Trophic Level	Methodology	Timespan	Current year	B ratio	U ratio
ICES	Multinational	Megrim ICES VIIIc-IXa	*Lepidorhombus whiffiagonis*	Pleuronectiformes		VPA	1985-2007	2006	0.43 *	1.07 *
ICES	Multinational	Capelin Iceland	*Mallotus villosus*	Osmeriformes	3.15	Survey index	1977-2007	2006	0.49 *	0.85 *
ICES	Multinational	Capelin Barents Sea	*Mallotus villosus*	Osmeriformes	3.15	Unknown	1965-2007	2006	0.17 *	0 *
ICES	Multinational	Haddock Irish Sea	*Melanogrammus aeglefinus*	Gadiformes	4.09	Survey index	1972-2006			
ICES	Multinational	Haddock Northeast Arctic	*Melanogrammus aeglefinus*	Gadiformes	4.09	VPA	1947-2006	2006	1.1 *	1.06 *
ICES	Multinational	Haddock Faroe Plateau	*Melanogrammus aeglefinus*	Gadiformes	4.09	VPA	1955-2006	2006	0.85 *	1.07 *
ICES	Multinational	Haddock West of Scotland	*Melanogrammus aeglefinus*	Gadiformes	4.09	Statistical catch at age model	1977-2006	2006	0.58 *	0.73 *
ICES	Multinational	Haddock Rockall Bank	*Melanogrammus aeglefinus*	Gadiformes	4.09	VPA	1990-2007			
ICES	Multinational	Haddock ICES VIIb-k	*Melanogrammus aeglefinus*	Gadiformes	4.09	VPA	1993-2006			
ICES	Multinational	Haddock ICES IIIa and North Sea	*Melanogrammus aeglefinus*	Gadiformes	4.09	VPA	1963-2006	2006	0.62 *	0.25 *
ICES	Multinational	Haddock Iceland	*Melanogrammus aeglefinus*	Gadiformes	4.09	VPA	1977-2007	2007	0.98 *	1.23 *
ICES	Multinational	Whiting ICES IIIa, VIId and North Sea	*Merlangius merlangus*	Gadiformes	4.29	VPA	1979-2006	2006	0.33 *	1.04 *
ICES	Multinational	Whiting ICES VIa	*Merlangius merlangus*	Gadiformes	4.29	Survey index	1984-2007			
ICES	Multinational	Whiting ICES VIIe-k	*Merlangius merlangus*	Gadiformes	4.29	VPA	1982-2007	2006	0.44 *	1.25 *
ICES	Multinational	Hake Northeast Atlantic North	*Merluccius merluccius*	Gadiformes	4.42	VPA	1977-2007	2006	1.04 *	0.74 *
ICES	Multinational	Hake Northeast Atlantic South	*Merluccius merluccius*	Gadiformes	4.42	VPA	1982-2007			
ICES	Multinational	Whiting Northeast Atlantic	*Micromesistius poutassou*	Gadiformes	4.01	Integrated Analysis	1980-2007	2006	0.67 *	1.66 *
ICES	Multinational	European Plaice North Sea	*Pleuronectes platessa*	Pleuronectiformes	3.26	VPA	1956-2006			
ICES	Multinational	European Plaice ICES IIIa	*Pleuronectes platessa*	Pleuronectiformes	3.26	VPA	1976-2006			
ICES	Multinational	European Plaice Irish Sea	*Pleuronectes platessa*	Pleuronectiformes	3.26	Statistical catch at age model	1962-2006	2006	1.07 *	0.23 *
ICES	Multinational	European Plaice ICES VIId	*Pleuronectes platessa*	Pleuronectiformes	3.26	VPA	1979-2006			
ICES	Multinational	European Plaice ICES VIIf-g	*Pleuronectes platessa*	Pleuronectiformes	3.26	VPA	1976-2006	2006	0.65 *	0.41 *

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Management	Country	Stock	Scientific name	Taxonomic order	Trophic Level	Methodology	Timespan	Current year	B ratio	U ratio
ICES	Multinational	European Plaice ICES VIIe	*Pleuronectes platessa*	Pleuronectiformes	3.26	VPA	1975-2006	2006	0.51 *	1.39 *
ICES	Multinational	Pollock Faroe Plateau	*Pollachius virens*	Gadiformes	4.38	VPA	1958-2006	2006	0.99 *	1.52 *
ICES	Multinational	Pollock ICES IIIa, VI and North Sea	*Pollachius virens*	Gadiformes	4.38	VPA	1964-2006	2006	0.57 *	0.97 *
ICES	Multinational	Pollock Northeast Arctic	*Pollachius virens*	Gadiformes	4.38	VPA	1957-2006	2006	1.7 *	0.6 *
ICES	Multinational	Greenland halibut Northeast Arctic	*Reinhardtius hippoglossoides*	Pleuronectiformes	4.48	VPA	1959-2007	2006	0.36 *	1.2 *
ICES	Multinational	European pilchard ICES VIIIc-IXa	*Sardina pilchardus*	Clupeiformes	3.10	Statistical catch at age model	1978-2007			
ICES	Multinational	Mackerel ICES Northeast Atlantic	*Scomber scombrus*	Perciformes	3.18	Statistical catch at age model	1972-2007	2006	0.98 *	0.73 *
ICES	Multinational	Golden Redfish Northeast Arctic	*Sebastes norvegicus*	Scorpaeniformes		Statistical catch at age model	1986-2006			
ICES	Multinational	common European sole Irish Sea	*Solea vulgaris*	Pleuronectiformes	3.17	VPA	1968-2006	2006	0.36 *	1.16 *
ICES	Multinational	common European sole ICES VIId	*Solea vulgaris*	Pleuronectiformes	3.17	VPA	1981-2006			
ICES	Multinational	common European sole ICES Kattegat and Skagerrak	*Solea vulgaris*	Pleuronectiformes	3.17	VPA	1982-2007	2006	1.25 *	0.54 *
ICES	Multinational	common European sole Bay of Biscay	*Solea vulgaris*	Pleuronectiformes	3.17	VPA	1982-2006	2006	0.76 *	1 *
ICES	Multinational	common European sole Celtic Sea	*Solea vulgaris*	Pleuronectiformes	3.17	VPA	1970-2006	2006	0.9 *	0.95 *
ICES	Multinational	common European sole Western English Channel	*Solea vulgaris*	Pleuronectiformes	3.17	VPA	1968-2006	2006	0.51 *	1.74 *
ICES	Multinational	common European sole North Sea	*Solea vulgaris*	Pleuronectiformes	3.17	VPA	1956-2006			
ICES	Multinational	Sprat ICES Baltic Areas 22-32	*Sprattus sprattus*	Clupeiformes	3.00	VPA	1973-2007	2006	1.13 *	1.27 *
ICES	Multinational	Sprat North Sea	*Sprattus sprattus*	Clupeiformes	3.00	Statistical catch at age model	1995-2007			

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Management	Country	Stock	Scientific name	Taxonomic order	Trophic Level	Methodology	Timespan	Current year	B ratio	U ratio
ICES	Multinational	Norway pout North Sea	*Trisopterus esmarkii*	Gadiformes		VPA	1983-2007	2006	0.9 *	0.33 *
IMARPE	Peru	Peruvian anchoveta North-Central Peru	*Engraulis ringens*	Clupeiformes		VPA	1963-2004			
IOTC	Multinational	Bigeye tuna Indian Ocean	*Thunnus obesus*	Perciformes	4.50	Biomass dynamics model	1957-2006	2004	1.23	0.97
IPHC	Multinational	Pacific halibut North Pacific	*Hippoglossus stenolepis*	Pleuronectiformes		Statistical catch at age model	1988-2009			
Iran	Iran	Anchovy kilka Caspian Sea	*Clupeonella engrauliformis*	Clupeiformes		Biomass dynamics model	1991-2007			
MFish	New Zealand	Black oreo West end of Chatham Rise	*Allocyttus niger*	Zeiformes	3.38	Integrated Analysis	1973-2007	2007	0.99	0.82
MFish	New Zealand	Australian salmon New Zealand	*Arripis trutta*	Perciformes	4.07	Integrated Analysis	1975-2006	2006	1.64	0.33
MFish	New Zealand	New Zealand snapper New Zealand Area 8	*Chrysophrys auratus*	Perciformes	3.32	Integrated Analysis	1931-2005	2005	0.35	2.5
MFish	New Zealand	New Zealand ling New Zealand Areas LIN 3 and 4	*Genypterus blacodes*	Ophidiiformes	4.34	Integrated Analysis	1972-2007	2007	3.07	0.09
MFish	New Zealand	New Zealand ling New Zealand Areas LIN 5 and 6	*Genypterus blacodes*	Ophidiiformes	4.34	Integrated Analysis	1972-2007	2007	3.96	0.1
MFish	New Zealand	New Zealand ling New Zealand Area LIN 72	*Genypterus blacodes*	Ophidiiformes	4.34	Integrated Analysis	1972-2007	2007	2.49	0.32
MFish	New Zealand	New Zealand ling New Zealand Area LIN 6b	*Genypterus blacodes*	Ophidiiformes	4.34	Integrated Analysis	1980-2006	2006	2.19	0.11
MFish	New Zealand	New Zealand ling New Zealand Area LIN 7WC - WCSI	*Genypterus blacodes*	Ophidiiformes	4.34	Integrated Analysis	1972-2008	2008	2.21	0.13
MFish	New Zealand	New Zealand abalone species New Zealand Area PAU 7	*Haliotis iris*	Archaeogastropoda	2.00	Integrated Analysis	1964-2008	2008	0.87 *	0.94 *
MFish	New Zealand	New Zealand abalone species New Zealand Area PAU 5D	*Haliotis iris*	Archaeogastropoda	2.00	Integrated Analysis	1964-2006	2006	0.44 *	2.1 *

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Management	Country	Stock	Scientific name	Taxonomic order	Trophic Level	Methodology	Timespan	Current year	B ratio	U ratio
MFish	New Zealand	New Zealand abalone species New Zealand Area PAU 5A	*Haliotis iris*	Archaeogastropoda	2.00	Integrated Analysis	1964-2006	2006	0.72 *	2.83 *
MFish	New Zealand	New Zealand abalone species New Zealand Area PAU 5B	*Haliotis iris*	Archaeogastropoda	2.00	Integrated Analysis	1963-2007	2007	1.02 *	0.59 *
MFish	New Zealand	Orange roughy New Zealand Mid East Coast	*Hoplostethus atlanticus*	Beryciformes	3.98	Integrated Analysis	1981-2004	2004	1.2	0.35
MFish	New Zealand	Red rock lobster New Zealand area CRA7	*Jasus edwardsii*	Decapoda	2.60	Unknown	1976-2005	2005	0.73 *	0.43 *
MFish	New Zealand	Red rock lobster New Zealand area CRA5	*Jasus edwardsii*	Decapoda	2.60	Unknown	1945-2002	2002	0.59 *	1.68 *
MFish	New Zealand	Red rock lobster New Zealand area CRA8	*Jasus edwardsii*	Decapoda	2.60	Unknown	1976-2005	2005	0.69 *	0.49 *
MFish	New Zealand	Red rock lobster New Zealand area CRA2	*Jasus edwardsii*	Decapoda	2.60	Unknown	1945-2001	2001	0.53 *	2.12 *
MFish	New Zealand	Red rock lobster New Zealand area CRA4	*Jasus edwardsii*	Decapoda	2.60	Unknown	1945-2005	2005	0.67 *	1.33 *
MFish	New Zealand	Red rock lobster New Zealand area CRA1	*Jasus edwardsii*	Decapoda	2.60	Unknown	1945-2001	2001	1.14 *	0.88 *
MFish	New Zealand	Red rock lobster New Zealand area CRA3	*Jasus edwardsii*	Decapoda	2.60	Unknown	1945-2007			
MFish	New Zealand	Hoki Eastern New Zealand	*Macruronus novaezelandiae*	Gadiformes	4.47	Integrated Analysis	1972-2007	2007	1.11 *	0.33 *
MFish	New Zealand	Hoki Western New Zealand	*Macruronus novaezelandiae*	Gadiformes	4.47	Integrated Analysis	1972-2007	2007	0.51 *	0.57 *
MFish	New Zealand	Southern hake Chatham Rise	*Merluccius australis*	Gadiformes	4.45	Integrated Analysis	1975-2006	2006	1.77	0.12
MFish	New Zealand	Southern hake Sub-Antarctic	*Merluccius australis*	Gadiformes	4.45	Integrated Analysis	1975-2007	2007	2.91	0.11
MFish	New Zealand	Southern blue whiting Campbell Island Rise	*Micromesistius australis*	Gadiformes	3.79	Integrated Analysis	1979-2006	2006	1.15	0.92
MFish	New Zealand	Trevally New Zealand Areas TRE 7	*Pseudocaranx dentex*	Perciformes	3.24	Integrated Analysis	1944-2005	2005	1.44	0.83
MFish	New Zealand	Smooth oreo Chatham Rise	*Pseudocyttus maculatus*	Zeiformes	3.61	Integrated Analysis	1979-2006	2006	2.25	0.38
MFish	New Zealand	Smooth oreo West end of Chatham Rise	*Pseudocyttus maculatus*	Zeiformes	3.61	Integrated Analysis	1973-2004	2004	1.25	0.53

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Management	Country	Stock	Scientific name	Taxonomic order	Trophic Level	Methodology	Timespan	Current year	B ratio	U ratio
MFish	New Zealand	common gemfish New Zealand	*Rexea solandri*	Perciformes	4.25	Integrated Analysis	1952-2007	2006	1.64	0.43
NAFO	Multinational	Atlantic cod NAFO 3NO	*Gadus morhua*	Gadiformes	4.42	VPA	1953-2007	2006	0.02 *	0.27 *
NAFO	Multinational	Atlantic cod NAFO 3M	*Gadus morhua*	Gadiformes	4.42	VPA	1959-2008			
NAFO	Multinational	American Plaice NAFO-3LNO	*Hippoglossoides platessoides*	Pleuronectiformes	3.65	VPA	1955-2007	2006	0.08 *	0.77 *
NAFO	Multinational	American Plaice NAFO-3M	*Hippoglossoides platessoides*	Pleuronectiformes	3.65	VPA	1960-2007			
NAFO	Multinational	Yellowtail Flounder NAFO 3LNO	*Limanda ferruginea*	Pleuronectiformes	3.22	Biomass dynamics model	1960-2009	2007	1.62 *	0.15 *
NAFO	Multinational	Greenland halibut NAFO 23KLMNO	*Reinhardtius hippoglossoides*	Pleuronectiformes	4.48	VPA	1960-2006	2006	0.39 *	1.73 *
NAFO	Multinational	Redfish species NAFO 3M	*Sebastes spp*	Scorpaeniformes	4.04	VPA	1989-2006			
NAFO	Multinational	Redfish species NAFO 3LN	*Sebastes spp*	Scorpaeniformes	4.04	Biomass dynamics model	1959-2008	2008	1.88	0.04
NMFS	USA	Sablefish Pacific Coast	*Anoplopoma fimbria*	Scorpaeniformes	3.83	Integrated Analysis	1900-2007			
NMFS	USA	Sablefish Eastern Bering Sea / Aleutian Islands / Gulf of Alaska	*Anoplopoma fimbria*	Scorpaeniformes	3.83	Statistical catch at age model	1956-2008	2008	1.05	0.66
NMFS	USA	Ocean quahog Atlantic Coast	*Arctica islandica*	Veneroida	2.00	Biomass dynamics model	1978-2008			
NMFS	USA	Gray triggerfish Gulf of Mexico	*Balistes capriscus*	Tetraodontiformes		Biomass dynamics model	1981-2004			
NMFS	USA	Gulf menhaden Gulf of Mexico	*Brevoortia patronus*	Clupeiformes	2.19	Statistical catch at age model	1964-2004	2004	1.08 *	0.48 *
NMFS	USA	Atlantic menhaden Atlantic	*Brevoortia tyrannus*	Clupeiformes	2.25	Statistical catch at age model	1940-2005	2005	0.47 *	0.97 *
NMFS	USA	Blacknose shark Atlantic	*Carcharhinus acronotus*	Carcharhiniformes		Biomass dynamics model	1950-2005			

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Management	Country	Stock	Scientific name	Taxonomic order	Trophic Level	Methodology	Timespan	Current year	B ratio	U ratio
NMFS	USA	Finetooth shark Atlantic	*Carcharhinus isodon*	Carcharhiniformes		Biomass dynamics model	1976-2005			
NMFS	USA	Blacktip shark Gulf of Mexico	*Carcharhinus limbatus*	Carcharhiniformes		Biomass dynamics model	1981-2004			
NMFS	USA	Blacktip shark Atlantic	*Carcharhinus limbatus*	Carcharhiniformes		Biomass dynamics model	1981-2004			
NMFS	USA	Sandbar shark Atlantic	*Carcharhinus plumbeus*	Carcharhiniformes		Biomass dynamics model	1975-2004			
NMFS	USA	Black sea bass Mid-Atlantic Coast	*Centropristis striata*	Perciformes	3.98	Statistical catch at age model	1968-2007	2007	0.92	0.67 *
NMFS	USA	Snow crab Bering Sea	*Chionoecetes opilio*	Decapoda	2.30	Biomass dynamics model	1979-2008	2008	0.55	1.49 *
NMFS	USA	Herring Northwestern Atlantic Coast	*Clupea harengus*	Clupeiformes	3.23	Statistical catch at age model	1960-2005			
NMFS	USA	Pacific herring Sitka	*Clupea pallasii*	Clupeiformes	3.15	Statistical catch at age model	1978-2007			
NMFS	USA	Pacific herring Prince William Sound	*Clupea pallasii*	Clupeiformes	3.15	Statistical catch at age model	1980-2006			
NMFS	USA	Weakfish Atlantic Coast	*Cynoscion regalis*	Perciformes		VPA	1981-2008			
NMFS	USA	Petrale sole Southern Pacific Coast	*Eopsetta jordani*	Pleuronectiformes	4.05	Integrated Analysis	1874-2005	2005	1.13	0.61 *
NMFS	USA	Petrale sole Northern Pacific Coast	*Eopsetta jordani*	Pleuronectiformes	4.05	Integrated Analysis	1910-2005	2005	1.87	1.26 *
NMFS	USA	Red grouper Gulf of Mexico	*Epinephelus morio*	Perciformes		Statistical catch at age model	1986-2005	2005	1.27	0.73
NMFS	USA	Snowy grouper Southern Atlantic coast	*Epinephelus niveatus*	Perciformes	4.04	Statistical catch at age model	1961-2002	2002	0.19	3.08

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Management	Country	Stock	Scientific name	Taxonomic order	Trophic Level	Methodology	Timespan	Current year	B ratio	U ratio
NMFS	USA	Pacific cod Gulf of Alaska	*Gadus macrocephalus*	Gadiformes	4.01	Integrated Analysis	1964-2008	2008	0.91	0.84 *
NMFS	USA	Pacific cod Bering Sea and Aleutian Islands	*Gadus macrocephalus*	Gadiformes	4.01	Integrated Analysis	1964-2008	2008	1	0.93 *
NMFS	USA	Atlantic cod Georges Bank	*Gadus morhua*	Gadiformes	4.42	VPA	1960-2008	2007	0.12	0.72 *
NMFS	USA	Atlantic cod Gulf of Maine	*Gadus morhua*	Gadiformes	4.42	VPA	1893-2008	2007	1.46 *	2.4
NMFS	USA	Witch Flounder NAFO-5Y	*Glyptocephalus cynoglossus*	Pleuronectiformes		VPA	1982-2008	2007	0.3	1.45
NMFS	USA	Rex sole Gulf of Alaska	*Glyptocephalus zachirus*	Pleuronectiformes	3.24	Statistical catch at age model	1979-2008			
NMFS	USA	Kelp greenling Oregon Coast	*Hexagrammos decagrammus*	Scorpaeniformes	3.59	Integrated Analysis	1979-2005			
NMFS	USA	Flathead sole Gulf of Alaska	*Hippoglossoides elassodon*	Pleuronectiformes	3.64	Statistical catch at age model	1978-2010			
NMFS	USA	Flathead sole Bering Sea and Aleutian Islands	*Hippoglossoides elassodon*	Pleuronectiformes	3.64	Statistical catch at age model	1977-2008	2008	1.83	0.18 *
NMFS	USA	American Plaice NAFO-5YZ	*Hippoglossoides platessoides*	Pleuronectiformes	3.65	VPA	1960-2008	2007	0.7	0.3 *
NMFS	USA	Atlantic Halibut NAFO-5YZ	*Hippoglossus hippoglossus*	Pleuronectiformes	4.53	Unknown	1800-2007			
NMFS	USA	American lobster Georges Bank	*Homarus americanus*	Decapoda	3.70	Biomass dynamics model	1981-2007			
NMFS	USA	American lobster Gulf of Maine	*Homarus americanus*	Decapoda	3.70	Biomass dynamics model	1981-2007			
NMFS	USA	American lobster Southern New England	*Homarus americanus*	Decapoda	3.70	Biomass dynamics model	1981-2007			
NMFS	USA	Northern shortfin squid Northwestern Atlantic Coast	*Illex illecebrosus*	Teuthida		Biomass dynamics model	1967-2005			
NMFS	USA	Northern rock sole Eastern Bering Sea and Aleutian Islands	*Lepidopsetta polyxystra*	Pleuronectiformes	3.21	Statistical catch at age model	1971-2008	2007	3.02	0.21

Continued on next page

Management	Country	Stock	Scientific name	Taxonomic order	Trophic Level	Methodology	Timespan	Current year	B ratio	U ratio
NMFS	USA	Yellowfin sole Bering Sea and Aleutian Islands	*Limanda aspera*	Pleuronectiformes	3.24	Statistical catch at age model	1959-2008	2008	1.94	0.62
NMFS	USA	Yellowtail flounder Georges Bank	*Limanda ferruginea*	Pleuronectiformes	3.22	VPA	1935-2008	2007	0.22	1.14
NMFS	USA	Yellowtail flounder Cape Cod / Gulf of Maine	*Limanda ferruginea*	Pleuronectiformes	3.22	VPA	1935-2008	2007	0.25	1.73
NMFS	USA	Yellowtail Flounder Southern New England-Mid Atlantic	*Limanda ferruginea*	Pleuronectiformes	3.22	VPA	1935-2008	2007	0.13	1.61
NMFS	USA	Golden king crab Aleutian Islands Eastern segment	*Lithodes aequispinus*	Decapoda		Statistical catch at length model	1990-2007			
NMFS	USA	Golden king crab Aleutian Islands Western segment	*Lithodes aequispinus*	Decapoda		Statistical catch at length model	1989-2007			
NMFS	USA	Monkfish Southern Georges Bank / Mid-Atlantic	*Lophius americanus*	Lophiiformes	4.49	Unknown	1964-2006	2006	1.72 *	0.3 *
NMFS	USA	Monkfish Gulf of Maine / Northern Georges Bank	*Lophius americanus*	Lophiiformes	4.49	Unknown	1964-2006	2006	1.73 *	0.38 *
NMFS	USA	Tilefish Southern Atlantic coast	*Lopholatilus chamaeleonticeps*	Perciformes	3.45	Statistical catch at age model	1961-2002	2002	0.9	1.55
NMFS	USA	Tilefish Mid-Atlantic Coast	*Lopholatilus chamaeleonticeps*	Perciformes	3.45	Biomass dynamics model	1973-2008	2005	0.72 *	0.61 *
NMFS	USA	Mutton snapper Southern Atlantic coast and Gulf of Mexico	*Lutjanus analis*	Perciformes	3.86	Statistical catch at age model	1981-2006			
NMFS	USA	Red snapper Eastern Gulf of Mexico	*Lutjanus campechanus*	Perciformes	4.01	Statistical catch at age model	1872-2003			
NMFS	USA	Red snapper Western Gulf of Mexico	*Lutjanus campechanus*	Perciformes	4.01	Statistical catch at age model	1880-2003			

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Management	Country	Stock	Scientific name	Taxonomic order	Trophic Level	Methodology	Timespan	Current year	B ratio	U ratio
NMFS	USA	Red snapper Southern Atlantic coast	*Lutjanus campechanus*	Perciformes	4.01	Statistical catch at age model	1945-2006			
NMFS	USA	Haddock Georges Bank	*Melanogrammus aeglefinus*	Gadiformes	4.09	VPA	1930-2008			
NMFS	USA	Haddock NAFO-5Y	*Melanogrammus aeglefinus*	Gadiformes	4.09	VPA	1956-2008	2007	0.99	1.21 *
NMFS	USA	Silver hake Gulf of Maine / Northern Georges Bank	*Merluccius bilinearis*	Gadiformes		Survey index	1955-2005			
NMFS	USA	Silver hake Southern Georges Bank / Mid-Atlantic	*Merluccius bilinearis*	Gadiformes		Survey index	1955-2005			
NMFS	USA	Pacific hake Pacific Coast	*Merluccius productus*	Gadiformes	4.35	Integrated Analysis	1966-2008	2008	1.61	0.73
NMFS	USA	Atlantic croaker Mid-Atlantic Coast	*Micropogonias undulatus*	Perciformes	3.31	Biomass dynamics model	1973-2002	2002	1.42	0.27
NMFS	USA	Dover sole Gulf of Alaska	*Microstomus pacificus*	Pleuronectiformes	3.27	Statistical catch at age model	1978-2010			
NMFS	USA	Dover sole Pacific Coast	*Microstomus pacificus*	Pleuronectiformes	3.27	Integrated Analysis	1910-2005	2005	1.61	0.45 *
NMFS	USA	Striped bass Gulf of Maine / Cape Hatteras	*Morone saxatilis*	Perciformes		Statistical catch at age model	1982-2006			
NMFS	USA	Gag Gulf of Mexico	*Mycteroperca microlepis*	Perciformes	3.65	Unknown	1963-2004	2004	1	2.44
NMFS	USA	Gag Southern Atlantic coast	*Mycteroperca microlepis*	Perciformes	3.65	Statistical catch at age model	1962-2005	2005	0.94	1.31
NMFS	USA	Yellowtail snapper Southern Atlantic Coast and Gulf of Mexico	*Ocyurus chrysurus*	Perciformes		Statistical catch at age model	1962-2001	2001	1.14	0.61
NMFS	USA	Lingcod Northern Pacific Coast	*Ophiodon elongatus*	Scorpaeniformes	4.32	Integrated Analysis	1956-2005			
NMFS	USA	Lingcod Southern Pacific Coast	*Ophiodon elongatus*	Scorpaeniformes	4.32	Integrated Analysis	1956-2005			
NMFS	USA	Red porgy Southern Atlantic coast	*Pagrus pagrus*	Perciformes	3.65	Statistical catch at age model	1972-2004	2004	0.61	0.39

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Management	Country	Stock	Scientific name	Taxonomic order	Trophic Level	Methodology	Timespan	Current year	B ratio	U ratio
NMFS	USA	Northern shrimp Gulf of Maine	*Pandalus borealis*	Decapoda		Statistical catch at age model	1960-2009	2008	1.58 *	0.56 *
NMFS	USA	Summer flounder Mid-Atlantic Coast	*Paralichthys dentatus*	Pleuronectiformes	4.49	Statistical catch at age model	1940-2007			
NMFS	USA	Red king crab Bristol Bay	*Paralithodes camtschaticus*	Decapoda	2.82	Statistical catch at length model	1960-2008	2008	1.27	1.05
NMFS	USA	Red king crab Norton Sound	*Paralithodes camtschaticus*	Decapoda	2.82	Statistical catch at length model	1976-2008			
NMFS	USA	English sole Pacific Coast	*Parophrys vetulus*	Pleuronectiformes	3.45	Integrated Analysis	1876-2007	2007	6.42	0.14 *
NMFS	USA	Atlantic butterfish Gulf of Maine / Cape Hatteras	*Peprilus triacanthus*	Perciformes	3.97	Unknown	1965-2005			
NMFS	USA	Sea scallop Mid-Atlantic Coast	*Placopecten magellanicus*	Ostreoida	2.00	Statistical catch at length model	1964-2006	2006	1 *	0.36 *
NMFS	USA	Sea scallop Georges Bank	*Placopecten magellanicus*	Ostreoida	2.00	Statistical catch at length model	1964-2006	2006	1.59 *	0.78 *
NMFS	USA	Starry flounder Southern Pacific Coast	*Platichthys stellatus*	Pleuronectiformes	3.32	Integrated Analysis	1970-2005	2005	1.55	0.12 *
NMFS	USA	Starry flounder Northern Pacific Coast	*Platichthys stellatus*	Pleuronectiformes	3.32	Integrated Analysis	1970-2005	2005	1.1	0.33 *
NMFS	USA	Atka mackerel Bering Sea and Aleutian Islands	*Pleurogrammus monopterygius*	Scorpaeniformes	3.33	Statistical catch at age model	1976-2009	2009	1.55	0.55 *
NMFS	USA	Alaska plaice Bering Sea and Aleutian Islands	*Pleuronectes quadrituberculatus*	Pleuronectiformes	3.10	Statistical catch at age model	1972-2008	2008	2.46	0.07
NMFS	USA	Pollock NAFO-5YZ	*Pollachius virens*	Gadiformes	4.38	Survey index	1963-2007			

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Management	Country	Stock	Scientific name	Taxonomic order	Trophic Level	Methodology	Timespan	Current year	B ratio	U ratio
NMFS	USA	Bluefish Atlantic Coast	*Pomatomus saltatrix*	Perciformes	4.50	Statistical catch at age model	1981-2007	2007	0.81 *	0.79
NMFS	USA	Winter Flounder Southern New England-Mid Atlantic	*Pseudopleuronectes americanus*	Pleuronectiformes	2.83	VPA	1940-2007	2007	0.09	1.1 *
NMFS	USA	Winter Flounder NAFO-5Z	*Pseudopleuronectes americanus*	Pleuronectiformes	2.83	VPA	1982-2007	2006	0.28	0.25 *
NMFS	USA	Winter Flounder NAFO-5Y	*Pseudopleuronectes americanus*	Pleuronectiformes	2.83	Unknown	1982-2008			
NMFS	USA	Longnose skate Pacific Coast	*Raja rhina*	Rajiformes	3.76	Integrated Analysis	1915-2007	2007	1.56 *	0.4 *
NMFS	USA	Greenland turbot Bering Sea and Aleutian Islands	*Reinhardtius hippoglossoides*	Pleuronectiformes	4.48	Statistical catch at age model	1960-2009	2009	1.48	0.05
NMFS	USA	Arrowtooth flounder Bering Sea and Aleutian Islands	*Reinhardtius stomias*	Pleuronectiformes	4.26	Statistical catch at age model	1970-2008	2008	2.7	0.31 *
NMFS	USA	Arrowtooth flounder Gulf of Alaska	*Reinhardtius stomias*	Pleuronectiformes	4.26	Statistical catch at age model	1958-2010	2010	3.02	0.28 *
NMFS	USA	Arrowtooth flounder Pacific Coast	*Reinhardtius stomias*	Pleuronectiformes	4.26	Integrated Analysis	1916-2007	2007	3.81	0.21
NMFS	USA	Atlantic sharpnose shark Atlantic	*Rhizoprionodon terraenovae*	Carcharhiniformes		Biomass dynamics model	1950-2005			
NMFS	USA	Vermilion snapper Southern Atlantic coast	*Rhomboplites aurorubens*	Perciformes	4.33	Statistical catch at age model	1946-2008	2007	0.86	1.27
NMFS	USA	Vermilion snapper Gulf of Mexico	*Rhomboplites aurorubens*	Perciformes	4.33	Biomass dynamics model	1981-2004			
NMFS	USA	Pacific sardine Pacific Coast	*Sardinops sagax*	Clupeiformes	2.43	Integrated Analysis	1981-2007			
NMFS	USA	Pacific chub mackerel Pacific Coast	*Scomber japonicus*	Perciformes	3.09	Statistical catch at age model	1929-2008			

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Management	Country	Stock	Scientific name	Taxonomic order	Trophic Level	Methodology	Timespan	Current year	B ratio	U ratio
NMFS	USA	King mackerel Gulf of Mexico	*Scomberomorus cavalla*	Perciformes		VPA	1992-2001			
NMFS	USA	King mackerel Southern Atlantic Coast	*Scomberomorus cavalla*	Perciformes		VPA	1981-2001			
NMFS	USA	Spanish mackerel Southern Atlantic Coast	*Scomberomorus maculatus*	Perciformes	4.50	Statistical catch at age model	1950-2008	2007	0.38	0.91
NMFS	USA	Atlantic mackerel Gulf of Maine / Cape Hatteras	*Scomber scombrus*	Perciformes	3.18	VPA	1960-2005			
NMFS	USA	Windowpane Southern New England-Mid Atlantic	*Scophthalmus aquosus*	Pleuronectiformes	3.55	Survey index	1975-2007			
NMFS	USA	Windowpane flounder - Gulf of Maine / Georges Bank	*Scophthalmus aquosus*	Pleuronectiformes	3.55	Survey index	1975-2007			
NMFS	USA	California scorpionfish Southern California	*Scorpaena guttata*	Scorpaeniformes		Statistical catch at age model	1990-2005			
NMFS	USA	Cabezon Southern California	*Scorpaenichthys marmoratus*	Scorpaeniformes	3.51	Integrated Analysis	1932-2005	2005	0.74	0.53 *
NMFS	USA	Cabezon Northern California	*Scorpaenichthys marmoratus*	Scorpaeniformes	3.51	Integrated Analysis	1916-2005	2005	1.04	0.99 *
NMFS	USA	Rougheye rockfish Bering Sea and Aleutian Islands	*Sebastes aleutianus*	Scorpaeniformes	3.65	Statistical catch at age model	1974-2009			
NMFS	USA	Rougheye rockfish Gulf of Alaska	*Sebastes aleutianus*	Scorpaeniformes	3.65	Statistical catch at age model	1974-2007			
NMFS	USA	Pacific ocean perch Gulf of Alaska	*Sebastes alutus*	Scorpaeniformes	3.50	Statistical catch at age model	1959-2010			
NMFS	USA	Pacific Ocean perch Eastern Bering Sea and Aleutian Islands	*Sebastes alutus*	Scorpaeniformes	3.50	Statistical catch at age model	1974-2009	2009	1.23	0.26 *
NMFS	USA	Pacific ocean perch Pacific Coast	*Sebastes alutus*	Scorpaeniformes	3.50	Statistical catch at age model	1953-2007	2007	0.69	0

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Management	Country	Stock	Scientific name	Taxonomic order	Trophic Level	Methodology	Timespan	Current year	B ratio	U ratio
NMFS	USA	Shortraker rockfish Bering Sea and Aleutian Islands	*Sebastes borealis*	Scorpaeniformes	3.87	Statistical catch at age model	1977-2008			
NMFS	USA	Gopher rockfish Southern Pacific Coast	*Sebastes carnatus*	Scorpaeniformes	3.62	Integrated Analysis	1965-2005			
NMFS	USA	Darkblotched rockfish Pacific Coast	*Sebastes crameri*	Scorpaeniformes	3.69	Integrated Analysis	1928-2007	2007	0.73	0.31
NMFS	USA	Widow rockfish Pacific Coast	*Sebastes entomelas*	Scorpaeniformes	3.68	Statistical catch at age model	1955-2006	2006	0.91 *	0.05
NMFS	USA	Acadian redfish Gulf of Maine / Georges Bank	*Sebastes fasciatus*	Scorpaeniformes	3.16	Statistical catch at age model	1913-2007			
NMFS	USA	Yellowtail rockfish Northern Pacific Coast	*Sebastes flavidus*	Scorpaeniformes	4.11	Integrated Analysis	1967-2005	2005	1.36	0.51 *
NMFS	USA	Chilipepper Southern Pacific Coast	*Sebastes goodei*	Scorpaeniformes	3.58	Integrated Analysis	1892-2007	2006	1.43 *	0.04
NMFS	USA	Shortbelly rockfish Pacific Coast	*Sebastes jordani*	Scorpaeniformes	3.20	Integrated Analysis	1950-2005			
NMFS	USA	Cowcod Southern California	*Sebastes levis*	Scorpaeniformes	3.69	Integrated Analysis	1900-2007	2007	0.09	0.07
NMFS	USA	Black rockfish Southern Pacific Coast	*Sebastes melanops*	Scorpaeniformes	4.20	Integrated Analysis	1915-2007	2007	2.23	0.33
NMFS	USA	Black rockfish Northern Pacific Coast	*Sebastes melanops*	Scorpaeniformes	4.20	Integrated Analysis	1914-2006	2006	1.37 *	0.47
NMFS	USA	Blackgill rockfish Pacific Coast	*Sebastes melanostomus*	Scorpaeniformes	3.69	Integrated Analysis	1950-2005			
NMFS	USA	Blue rockfish California	*Sebastes mystinus*	Scorpaeniformes	2.81	Integrated Analysis	1916-2007	2007	0.75	1.19
NMFS	USA	Bocaccio Southern Pacific Coast	*Sebastes paucispinis*	Scorpaeniformes	3.51	Integrated Analysis	1951-2006	2006	0.32	0.1
NMFS	USA	Canary rockfish Pacific Coast	*Sebastes pinniger*	Scorpaeniformes	3.80	Integrated Analysis	1916-2009	2009	0.62	0.03
NMFS	USA	Northern rockfish Bering Sea and Aleutian Islands	*Sebastes polyspinis*	Scorpaeniformes	3.57	Statistical catch at age model	1974-2009	2009	1.41	0.13 *

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Management	Country	Stock	Scientific name	Taxonomic order	Trophic Level	Methodology	Timespan	Current year	B ratio	U ratio
NMFS	USA	Northern rockfish Gulf of Alaska	*Sebastes polyspinis*	Scorpaeniformes	3.57	Statistical catch at age model	1959-2008	2008	1.5	0.66
NMFS	USA	Yelloweye rockfish Pacific Coast	*Sebastes ruberrimus*	Scorpaeniformes	4.43	Integrated Analysis	1923-2006	2006	0.38 *	0.65
NMFS	USA	Dusky rockfish Gulf of Alaska	*Sebastes variabilis*	Scorpaeniformes	3.69	Statistical catch at age model	1973-2008	2007	1.54	0.54
NMFS	USA	Shortspine thornyhead Pacific Coast	*Sebastolobus alascanus*	Scorpaeniformes	3.61	Integrated Analysis	1901-2005			
NMFS	USA	Longspine thornyhead Pacific Coast	*Sebastolobus altivelis*	Scorpaeniformes	3.61	Integrated Analysis	1962-2005	2005	2.65	0.23
NMFS	USA	Greater amberjack Southern Atlantic coast	*Seriola dumerili*	Perciformes	4.50	Statistical catch at age model	1946-2006			
NMFS	USA	Greater amberjack Gulf of Mexico	*Seriola dumerili*	Perciformes	4.50	Biomass dynamics model	1986-2004			
NMFS	USA	Bonnethead shark Atlantic	*Sphyrna tiburo*	Carcharhiniformes		Biomass dynamics model	1950-2005			
NMFS	USA	Atlantic surfclam Mid-Atlantic Coast	*Spisula solidissima*	Veneroida	2.00	Biomass dynamics model	1965-2008			
NMFS	USA	Spiny dogfish Atlantic Coast	*Squalus acanthias*	Squaliformes		Unknown	1962-2006			
NMFS	USA	Scup Atlantic Coast	*Stenotomus chrysops*	Perciformes		Statistical catch at age model	1960-2007			
NMFS	USA	Walleye pollock Eastern Bering Sea	*Theragra chalcogramma*	Gadiformes	3.45	Statistical catch at age model	1963-2008	2008	0.66	0.85 *
NMFS	USA	Walleye pollock Aleutian Islands	*Theragra chalcogramma*	Gadiformes	3.45	Statistical catch at age model	1976-2008	2008	0.86	0.02
NMFS	USA	Walleye pollock Gulf of Alaska	*Theragra chalcogramma*	Gadiformes	3.45	Statistical catch at age model	1964-2008			

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Management	Country	Stock	Scientific name	Taxonomic order	Trophic Level	Methodology	Timespan	Current year	B ratio	U ratio
NMFS	USA	White hake Georges Bank / Gulf of Maine	*Urophycis tenuis*	Gadiformes	4.20	Biomass dynamics model	1963-2007	2007	0.35	0.8
RFFA	Russia	Walleye pollock Western Bering Sea	*Theragra chalcogramma*	Gadiformes	3.45	VPA	1994-2004			
RFFA	Russia	Walleye pollock Northern Sea of Okhotsk	*Theragra chalcogramma*	Gadiformes	3.45	Biomass dynamics model	1985-1994			
SPRFMO	Multinational	Chilean jack mackerel Chilean EEZ and offshore	*Trachurus murphyi*	Perciformes	3.49	Integrated Analysis	1950-2010	2010	0.09 *	3.66 *
UNKNOWN	Multinational	Shortfin mako Nothwest Pacific Ocean	*Isurus oxyrinchus*	Lamniformes		VPA	1990-2003			
US State	USA	American lobster Rhode Island	*Homarus americanus*	Decapoda	3.70	Biomass dynamics model	1959-2007	2006	0.53 *	0.67 *
US State	USA	Winter flounder Rhode Island	*Pseudopleuronectes americanus*	Pleuronectiformes	2.83	Biomass dynamics model	1959-2007	2006	0.25 *	2.02
US State	USA	Tautog Rhode Island	*Tautoga onitis*	Perciformes	3.33	Biomass dynamics model	1959-2007	2006	0.84 *	0.59 *
WCPFC	Multinational	Striped marlin Southwestern Pacific Ocean	*Kajikia audax*	Perciformes		Statistical catch at age model	1950-2004	2004	0.88	0.27
WCPFC	Multinational	Skipjack tuna Central Western Pacific	*Katsuwonus pelamis*	Perciformes	4.35	Statistical catch at age model	1972-2006	2006	4.38	0.3
WCPFC	Multinational	Albacore tuna South Pacific Ocean	*Thunnus alalunga*	Perciformes	4.31	Statistical catch at age model	1959-2006	2006	2.46	0.9
WCPFC	Multinational	Yellowfin tuna Central Western Pacific	*Thunnus albacares*	Perciformes	4.34	Statistical catch at age model	1952-2005	2005	1.22	0.8
WCPFC	Multinational	Bigeye tuna Western Pacific Ocean	*Thunnus obesus*	Perciformes	4.50	Statistical catch at age model	1952-2006	2006	1.06	1.38

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Management	Country	Stock	Scientific name	Taxonomic order	Trophic Level	Methodology	Timespan	Current year	B ratio	U ratio

Table .3: Summary of population-dynamics model based assessments in the RAM Legacy database, including the management body (acronyms from Table 1), assessment method, timespan of their longest time series data, estimated ratios of current biomass to the biomass at MSY and current harvest rate to the harvest rate that results in MSY. Estimated ratios were preferentially obtained directly from the assessment document or derived from surplus production models. When both SSBmsy and Bmsy reference points were available, SSB was chosen preferentially.

Figure S1. Entity-relationship diagram.

Figure S2. Taxonomic coverage of assessed marine species present in the RAM Legacy database. The circle located near the middle of the circular dendrogram represents kingdom Animalia and each subsequent branching represents a different taxonomic group (Kingdom to Phylum to Class to Order to Family to Genus to Species). The width of each line is proportional to the square root of the number of assessments in the database. The outermost lines represent species and the number of lines is the number of assessments for each species. The names of multi-assessment species are not repeated on the outermost portion of the dendrogram but continue counter-clockwise from the first entry. Note that branch lengths are chosen for graphical purposes and do not convey phylogenetic distance.

Figure S3.

Figure S4.

Figure S5.


Animalia
Arthropoda
Mollusca
Chondrichtyes
Gadiformes
Pleuronectiformes
Clupeiformes
Scorpaeniformes
Perciformes
Clupea pallasii
Clupeonella engrauliformis
Sardinops sagax
Sprattus sprattus
Engraulis anchoita
Engraulis encrasicolus
Engraulis ringens
Gadus macrocephalus
Gadus morhua
Melanogrammus aeglefinus
Merlangius merlangus
Micromesistius australis
Micromesistius poutassou
Pollachius virens
Theragra chalcogramma
Trisopterus esmarkii
Macruronus novaezelandiae
Merluccius bilinearis
Merluccius australis
Merluccius capensis
Merluccius hubbsi
Merluccius merluccius
Merluccius paradoxus
Hoplostethus atlanticus
Eopsetta jordani
Glyptocephalus cynoglossus
Hippoglossoides platessoides
Hippoglossus hippoglossus
Limanda ferruginea
Microstomus pacificus
Parophrys vetulus
Platichthys stellatus
Pleuronectes platessa
Pseudopleuronectes americanus
Pleuronectes quadrituberculatus
Reinhardtius hippoglossoides
Reinhardtius stomias
Lepidorhombus boscii
Lepidorhombus whiffiagonis
Scophthalmus aquosus
Solea vulgaris
Paralichthys dentatus
Genypterus blacodes
Genypterus capensis
Mallotus villosus
Carcharhinus limbatus
Haliotis iris
Haliotis midae
Homarus americanus
Jasus edwardsii
Jasus lalandii
Palinurus gilchristi
Lithodes aequispinus
Paralithodes camtschaticus
Pandalus borealis
Penaeus esculentus
Pseudocarcinus gigas
Pseudocyttus maculatus
Ammodytes marinus
Epinephelus morio
Mycteroperca microlepis
Chrysophrys auratus
Pagrus pagrus
Stenotomus chrysops
Cynoscion regalis
Micropogonias undulatus
Dissostichus eleginoides
Dissostichus mawsoni
Katsuwonus pelamis
Scomber japonicus
Scomber scombrus
Scomberomorus cavalla
Scomberomorus maculatus
Thunnus alalunga
Thunnus albacares
Thunnus obesus
Thunnus thynnus
Lopholatilus chamaeleonticeps
Lutjanus campechanus
Seriolella brama
Seriolella punctata
Anoplopoma fimbria
Hexagrammos decagrammus
Ophiodon elongatus
Sebastes aleutianus
Sebastes alutus

Figure .6:

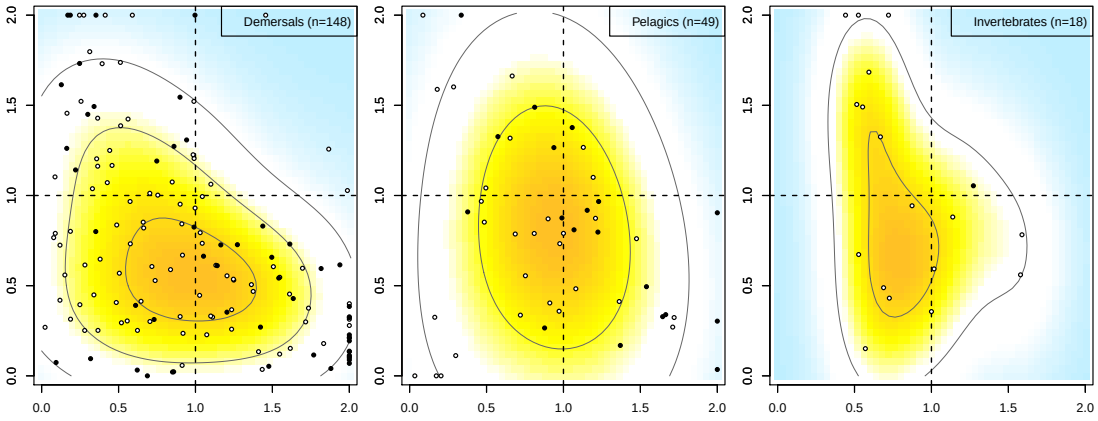

Figure .7: Invertebrates, demersal fish and pelagic fish.

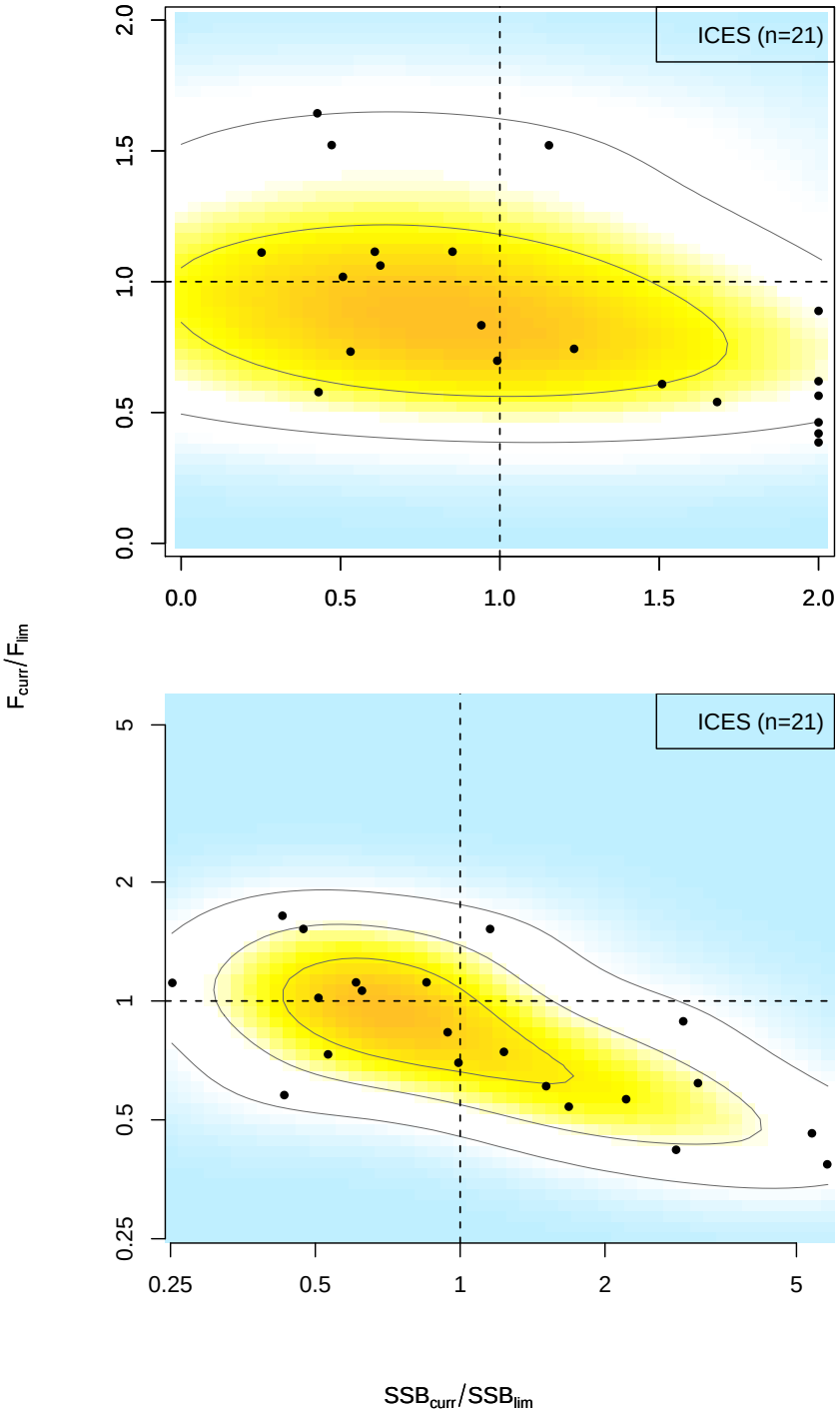

Figure .8: ICES SSBlim.

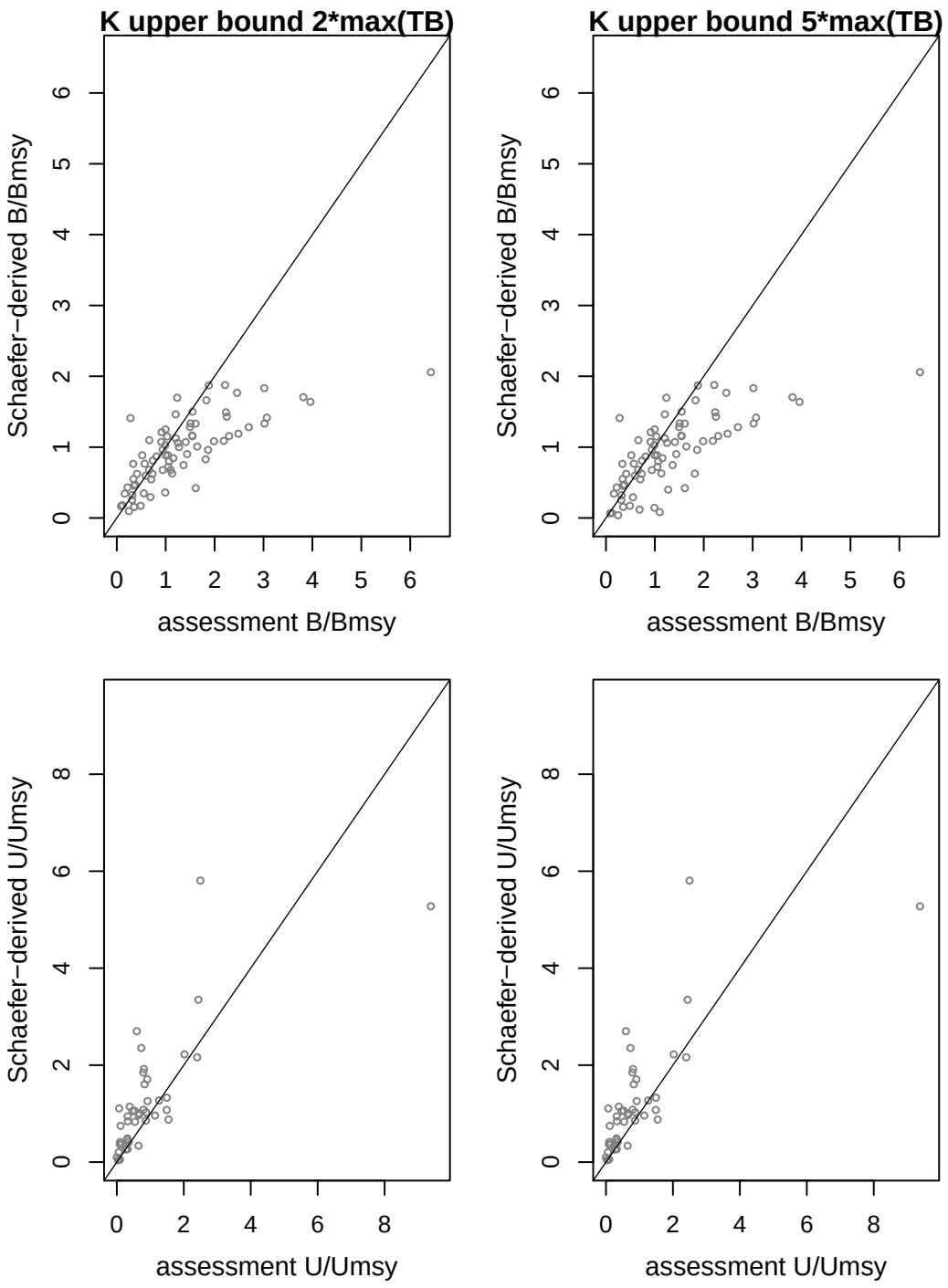
K upper bound 2*max(TB)
K upper bound 5*max(TB)
Schaefer−derived B/Bmsy
assessment B/Bmsy
Schaefer−derived U/Umsy
assessment U/Umsy
0
1
2
3
4
5
6
8

Figure .9: