Supplementary Material

Appendix S1: Testing functional forms for the species-area model.

Although the power-law is the function most commonly fit to species-area data, a number of other models have been also used (Tjorve 2003). The next most frequent is the exponential model (Tjorve 2003). More recently, it has been suggested that a piecewise regression (Lomolino & Weiser 2001) or sigmoidal (Lomolino 2000) model may in some instances provide a better fit to such data. Lomolino (2000) contends that a sigmoidal species-area curve may be the result of an asymptoting of species richness at larger spatial scales - although this point is hotly debated (Williamson *et al.* 2001) - and a 'small-island effect' at smaller spatial scales (Lomolino & Weiser 2001), for which species richness is independent of island size below a certain threshold.

We fit four linear models (power, exponential, untransformed, and log(species) versus area, all two parameters), two piecewise regression models (piecewise-power and piecewise-exponential, both three parameters), and one nonlinear model (cumulative Weibull distribution, three parameters) to the data; see Tjorve (2003) for details of all models. Piecewise regression models were fit using the iterative breakpoint search procedure of Lomolino & Weiser (2001) between the minimum and maximum areas for each region, with the breakpoint location considered to be a third parameter.

Model diagnostics and statistical comparisons are at present poorly resolved in a mixed-effects framework (e.g. Pinheiro & Bates 2000). Therefore we compare candidate models in a least-squares framework by fitting each transect or site separately in each region and comparing mean adjusted r-squared values. The adjusted r-squared measure, however, suffers from the problem of potentially being affected by spatial dependence in the data (which is explicitly considered in the mixed-effects framework), and transformations of the dependent variable. Nonetheless, with these caveats in mind, the adjusted r-squared values provide a reasonable guide to model fit.

The results indicate that no one model provides the best fit at all locations (Table S1). The power-law model and exponential model provide consistently good and parsimonious results. The other two linear models give a far less satisfactory fit in all regions. Visual inspection of the data indicates that there is no evidence for a small-island effect in the data, and this is reflected in the fact that the adjusted r-squared values of the piecewise regression models are consistently lower than those for single regression lines of the same functional form. Similarly, there is little evidence for a sigmoidal shape to the data, and in three of four regions the sigmoidal model is outperformed by simpler linear models, despite an extra parameter that allows for far greater flexibility in terms of model fit. We also note that the formula for adjusted r-squared penalises extra parameters relatively lightly when there are a large number of data points, and this is of note when assessing the trade-off between parsimony and fit. Further evidence of lack of fit in the sigmoidal model is given by the fact that in three regions there were problems with model convergence that in some instances could not be resolved; testing the model in a full non-linear mixed-effects framework resulted in even greater convergence difficulties.

Given the results in Table S1 and the issues outlined above, we fit all species-area relationships in the mixed-effects model framework with both the power-law and exponential functions, the two most parsimonious models that perform consistently well across all regions. We focus on the power-law in the main paper is it is the model whose parameters are the most familiar and interpretable to most ecologists. Table S2 presents similar results for the minimal adequate exponential model. The effects of exploitation are consistently significant regardless of whether the power-law or the exponential model is used.

Appendix S2: Tests of statistical robustness.

In order to check the robustness of the results to the mixed-effects model framework, the data were analysed using a range of alternative statistical techniques. In the Pacific and Indian oceans, separate fished regions were combined into one set of 'fished' data for all tests. Firstly, we applied a permutation test (requiring no parametric assumptions) by randomly assigning 'exploited' and 'protected' tags to species-area relationships calculated from power-law least-squares regressions. Exploited and protected sites had significantly different slopes at the $P < 0.05$ level in all regions (i.e. differences between means were outside of the 97.5% quantile). Similar results held for a bootstrapping test (bias-corrected and accelerated method, 1000 repetitions sampling with replacement from power-law species-area slopes; 95% confidence limits for fished and exploited means did not overlap in all regions). Next we conducted a least-squares regression (using a power-law model to fit the species-area curve; habitat data not included in models) followed by an ANOVA, using AIC to determine the minimum adequate model. The effects of exploitation were significant for all regions (Atlantic: $P = 0.0067$, Indian: $P < 0.0001$, Pacific: $P = 0.04$, Mediterranean: $P = 0.0013$). It is suggested (Milliken & Johnson 1992) that if data do not satisfy the condition of homogeneity of variance at the 0.01 level then ANOVA should not be used; our data do satisfy this criterion for all locations (F test for variance equality; Atlantic: $P = 0.013$, Indian: $P = 0.32$, Pacific: $P = 0.50$, Mediterranean (Capraia): $P = 0.92$, (Giannutri): $P = 0.41$). Nevertheless, we also analysed data using Welsh's test (which does not assume equality of variance); $P < 0.02$ for all regions (Atlantic: $P = 0.012$; Indian: $P = 0.0017$; Pacific: $P = 0.011$; Mediterranean: $P = 0.0009$). We repeated the analysis on all data using Wilcoxon's rank-sum test (a non-parametric test that does not assume normality); effects of exploitation are significant at $P < 0.02$ for all regions (Atlantic: $P = 0.007$, Indian: $P = 0.003$, Pacific: $P = 0.019$, Mediterranean: $P = 0.0017$). ANOVA, unlike mixed-effects models, does not account for spatial dependence within nested species-

area data. We tested the Atlantic data by partitioning it in such a way as to ensure independence at each spatial scale, then conducting a linear regression followed by an ANOVA. We used two different partitioning schemes for each transect (*1*; 1 x 5m length, 1 x 10m, 1 x 15m, 1 x 20, 1 x 50m, *2*; 3 x 5m, 2 x 10m, 1 x 15m, 1 x 20m, 1x 40m). Results were significant at $P = 0.027$ (model 1) and $P = 0.0094$ (model 2). In both cases the minimum adequate model retained the effect of fishing intensity (location) only, not depth. Thus results were significant in all regions independent of whether a mixed-effects or more traditional statistical framework was used.

Appendix S3: Mixed-effects model equations

Equations depict linear terms only; first-order interaction terms are included in the full models but not shown for clarity

Atlantic

$$\log(\text{Species}_{ijkl}) = \alpha + \text{Transect}_j + \beta\log(\text{Area}) + \gamma\text{Protection} + \delta\text{Depth} + \varepsilon_{ijkl} \quad (1)$$

where $\text{Transect}_j \sim N(0, \sigma_T^2)$, $\varepsilon_{ijkl} \sim N(0, \sigma^2)$

Indian

$$\log(\text{Species}_{hjk}) = \alpha + \text{Transect}_j + \beta\log(\text{Area}) + \gamma\text{Location} + \delta(\text{Live Coral Cover}) + \zeta(\text{Algal Cover}) + \eta(\text{Rubble and dead coral}) + \theta(\text{Other habitat}) + \varepsilon_{hjk} \quad (2)$$

where $\text{Transect}_j \sim N(0, \sigma_T^2)$, $\varepsilon_{hjk} \sim N(0, \sigma^2)$

Pacific

$$\log(\text{Species}_{hjk}) = \alpha + \text{Transect}_j + \beta\log(\text{Area}) + \gamma\text{Location} + \delta(\text{Live coral cover}) + \varepsilon_{hjk} \quad (3)$$

$$\log(\text{Species}_{hjk}) = \alpha + \text{Transect}_j + \beta\log(\text{Area}) + \gamma\text{Location} + \delta(\text{Algal cover}) + \varepsilon_{hjk} \quad (4)$$

where $\text{Transect}_j \sim N(0, \sigma_T^2)$, $\varepsilon_{hjk} \sim N(0, \sigma^2)$

Mediterranean

$$\log(\text{Species}_{ijkm}) = \alpha + \text{ObsCirc}_j + \beta\log(\text{Area}) + \gamma\text{Protection} + \delta\text{Island} + \zeta(\text{Encrusting (coralline) algae}) + \eta(\text{Bare rock}) + \omega(\text{Algal and invertebrate cover}) + \varepsilon_{ijkm} \quad (5)$$

where $\text{ObsCirc}_j \sim N(0, \sigma_{OC}^2)$, $\varepsilon_{ijkm} \sim N(0, \sigma^2)$

and *h* represents location, *i* the protection (fishing) status, *j* the transect or observation circle number, *k* the spatial level within the transect or observation circle, *l* the depth, and *m* the island. The coefficients α, β, γ, δ, ζ, η θ, ω, and λ represent parameters to be estimated from the data, ε the error terms, and σ_T^2 and σ_{OC}^2 the variance of the random effects. The exponential models followed the same form but with the dependent variable being species, not log(species). Two models were used to assess habitat effects in the Pacific as a single model would not converge due to limited degrees of freedom.

Figure S1. Normalised change in family abundance relative to protected areas. Abundances are plotted as (F - U) / (F + U), where F is the mean abundance on fished transects and U the mean abundance of non-fished transects. Colours represent functional groups: red are piscivores, blue herbivores or omnivores. Hollow points represent poorly sampled families for which <10 individuals were observed in all transects or point counts. Data are ordered in terms of mean normalised change within a region. Family names are given in Table S5.

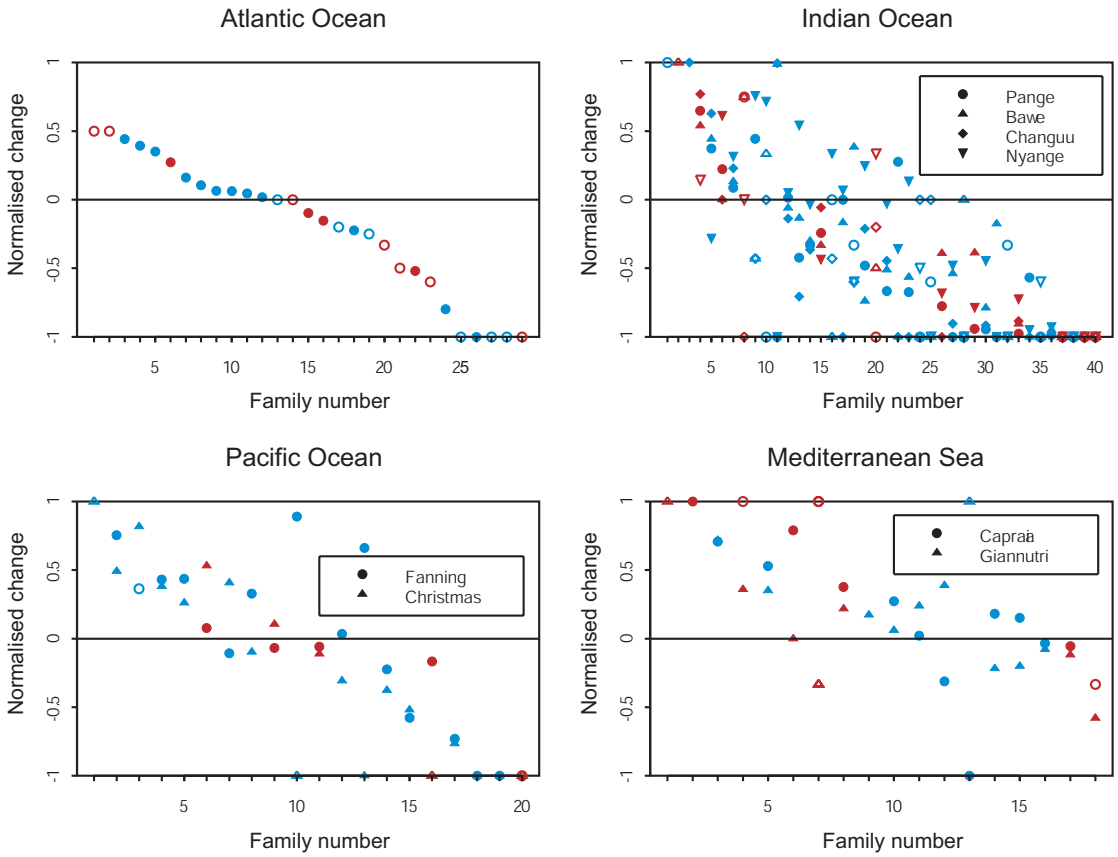

Table S1: Mean adjusted r-squared values for the seven least-squares regression models fit to species-area data. Adjusted r-squared values are transformed using Fisher's z-transform prior to taking the mean (Sokal & Rohlf, 1995). The z-transformed average is then back-transformed.

Ocean	Power-law	Log species	Exponential model	Untransformed	Piecewise power	Piecewise exponential	Weibull
Atlantic	0.867	0.350	0.871	0.780	0.863	0.878	0.882
Indian	0.914	0.483	0.930	0.906	0.859	0.910	0.901*
Pacific	0.563	0.468	0.524	0.422	0.474	0.425	0.529*
Mediterranean	0.698	0.579	0.705	0.658	0.694	0.703	0.704*

* Convergence difficulties meant that adjusted r-squared values could not be calculated for all sites.

Indian: 29 of 50 calculated. Pacific: 9 of 10 calculated. Mediterranean: 62 of 63 calculated.

Table S2. Results for minimal adequate mixed-effects models (exponential model). Atlantic: Intercept and Log(Area) are intercept and slope for the protected sites. Unprotected is the difference between protected and unprotected site intercepts. Log(Area) * Unprotected is the difference between protected and unprotected site slopes. Indian, Pacific, Mediterranean: results are presented in a similar manner; named sites are exploited. Non-significant coefficients retained only when overall term is significant or involved in an interaction term.

Parameter	Estimate	*s.e.*	*t*	*P*
Atlantic Ocean				
Intercept	-13.554	1.021	-13.281	<.0001
Log(Area)	22.342	0.497	44.925	<.0001
Unprotected	4.816	1.443	3.337	0.0049
Log(Area) * Unprotected	-4.391	0.703	-6.243	<.0001
Indian Ocean				
Intercept	-9.810	1.778	-5.517	<0.0001
Log(Area)	29.068	1.228	23.663	<0.0001
Bawe	5.274	2.514	2.097	0.042
Changuu	5.639	2.514	2.243	0.030
Nyange	2.781	2.514	1.106	0.28
Pange	7.875	2.514	3.132	0.0031
Log(Area) * Bawe	-9.239	1.737	-5.318	<0.0001
Log(Area) * Changuu	-11.551	1.737	-6.649	<0.0001
Log(Area) * Nyange	-2.825	1.737	-1.626	0.11
Log(Area) * Pange	-13.000	1.737	-7.483	<0.0001
Pacific Ocean				
Intercept	-17.674	2.395	-7.379	<0.0001
Log(Area)	11.190	0.889	12.590	<0.0001
Christmas Island	14.627	3.583	4.082	0.0047
Fanning Island	16.048	3.749	4.281	0.0037
Log(Area) * Christmas Island	-5.736	1.324	-4.334	<0.0001
Log(Area) * Fanning Island	-6.173	1.394	-4.429	<0.0001
Mediterranean Sea				
Intercept	11.922	37.310	0.320	0.75
Log(Area)	-18.075	10.050	-1.799	0.072
Unprotected	2.529	0.867	2.917	0.0050
Encrusting algae	-14.776	18.088	-0.817	0.42
Algal and invertebrate cover	-28.390	38.850	-0.731	0.47
Log(Area) * unprotected	-0.505	0.234	-2.161	0.031
Log(Area) * Encrusting algae	16.975	4.872	3.484	0.0005
Log(Area) * algal and invertebrate cover	32.415	10.465	3.097	0.0020

Table S3: Spatial combinations of transects used to calculate SARs in the Pacific. Combinations of transects depended upon the number of transects at each site. Every possible combination of appropriate transects was used.

No. of transects at site	Small	Medium-small	Medium	Large
3	1 transect	-	2 transects	3 transects
4	1 transect	-	2 transects	4 transects
5	1 transect	-	2 transects	5 transects
6	1 transect	2 transects	3 transects	6 transects
7	1 transect	2 transects	3 transects	7 transects

Table S4: GPS coordinates for Pacific and Indian sites.

Island	Site	Latitude	Longitude
Christmas	1	1º 56.417' N	157º 29.214' W
	2	1º 57.580' N	157º 29.053' W
	3	1º 56.424' N	157º 29.357' W
Fanning	1	3º 51.786' N	159º 2.170' W
	2	3º 54.605' N	159º 23.477' W
	3	3º 50.506' N	159º 21.640' W
Palmyra	1	5º 52.255' N	162º 06.612' W
	2	5º 52.622' N	162º 06.933' W
	3	5º 52.170' N	162º 06.901' W
	4	5º 52.241' N	162º 02.704' W
Bawe		6˚ 09.183’ S	39˚ 08.567’ E
Changuu		6˚ 06.900’ S	39˚ 09.967’ E
Chumbe		6˚ 16.767’ S	39˚ 10.533’ E
Nyange		6˚ 13.067’ S	39˚ 08.933’ E
Pange		6˚ 11.083' S	39˚ 09.617’ E

Table S5: Family names for Figure S1.

Family Number	Atlantic	Indian	Pacific	Mediterranean
1	Aulostomidae	Syngnathidae	Zanclidae	Congridae
2	Synodontidae	Muraenidae	Balistidae	Carangidae
3	Chaetodontidae	Plotosidae	Ostraciidae/Tetraodontidae	Atherinidae
4	Grammistinae	Synodontidae	Labridae	Gadidae
5	Tetraodontidae	Pomacentridae	Pomacentridae	Gobiidae
6	Serranidae	Nemipteridae	Carangidae	Scorpaenidae
7	Pomacanthidae	Labridae	Holocentridae / Priacanthidae	Sciaenidae
8	Holocentridae	Pinguipedidae	Pomacanthidae	Sparidae
9	Scaridae	Mullidae	Lutjanidae	Blenniidae
10	Pomacentridae	Microdesmidae	Caesionidae	Tripterygiidae
11	Gobiidae	Clupeidae	Serranidae	Apogonidae
12	Labridae	Chaetodontidae	Acanthuridae	Mullidae
13	Ostraciidae	Apogonidae	Syngnathidae / Belonidae	Mugilidae
14	Sciaenidae	Blenniidae	Chaetodontidae	Centracanthidae
15	Haemulidae	Serranidae	Scaridae	Labridae
16	Carangidae	Zanclidae	Lethrinidae	Pomacentridae
17	Chaenopsidae	Monacanthidae	Mullidae	Serranidae
18	Acanthuridae	Siganidae	Kyphosidae	Muraenidae
19	Mullidae	Tetraodontidae	Mugilidae	
20	Scombridae	Scorpaenidae	Sharks	
21	Sparidae	Scaridae		
22	Lutjanidae	Caesionidae		
23	Sphyraenidae	Pomacanthidae		
24	Labrisomidae	Ostraciidae		
25	Blenniidae	Gobiidae		
26	Balistidae	Lethrinidae		
27	Monacanthidae	Holocentridae		
28	Kyphosidae	Echeneidae		
29	Muraenidae	Lutjanidae		
30		Acanthuridae		
31		Balistidae		
32		Dasyatidae		
33		Haemulidae		
34		Kyphosidae		
35		Priacanthidae		
36		Pempheridae		
37		Aulostomidae		
38		Ephippidae		
39		Platycephalidae		
40		Cirrhitidae		

Table S6: Species list for all study locations. Columns labelled '+/-' indicate normalised abundance change in fished region relative to unfished; + indicates increase in species abundance, - indicates decrease, and • indicates no change. Wherever possible, common names for species follow FishBase nomenclature (Froese & Pauly, 2006).

Family	Species	Common name	Atl. +/-	Ind. +/-	Pac. +/-	Med. +/-
Acanthuridae	*Acanthurus bahianus*	Ocean surgeonfish	-			
Acanthuridae	*Acanthurus chirurgus*	Doctorfish	-			
Acanthuridae	*Acanthurus coeruleus*	Blue tang	-			
Acanthuridae	*Acanthurus leucosternon*	Powderblue surgeonfish		+		
Acanthuridae	*Acanthurus lineatus*	Lined surgeonfish		-		
Acanthuridae	*Acanthurus mata*	Elongate surgeonfish		-		
Acanthuridae	*Acanthurus nigricauda*	Epaulette surgeonfish		-		
Acanthuridae	*Acanthurus nigrofuscus*	Brown surgeonfish		+		
Acanthuridae	*Ctenochaetus binotatus*	Twospot surgeonfish		-		
Acanthuridae	*Ctenochaetus striatus*	Striated surgeonfish		-		
Acanthuridae	*Ctenochaetus strigosus*	Spotted surgeonfish		-		
Acanthuridae	*Naso annulatus*	Whitemargin unicornfish		-		
Acanthuridae	*Naso lituratus*	Orangespine unicornfish		-		
Acanthuridae	*Naso vlamingii*	Bignose unicornfish		-		
Acanthuridae	*sp. 1*	-		+		
Acanthuridae	*sp. 2*	-		+		
Acanthuridae	*Zebrasoma desjardinii*	Desjardin's sailfin tang		-		
Acanthuridae	*Zebrasoma scopas*	Twotone tang		-		
Acanthuridae					-	
Apogonidae	*Apogon imberbis*	Cardinal fish				+
Apogonidae	*Apogon leptacanthus*	Threadfin cardinalfish		+		
Apogonidae	*Archamia fucata*	Orangelined cardinalfish		-		
Apogonidae	*Cheilodipterus arabicus*	Tiger cardinal		+		
Apogonidae	*Cheilodipterus artus*	Wolf cardinalfish		+		
Apogonidae	*Cheilodipterus macrodon*	Large toothed cardinalfish		+		
Apogonidae	*Cheilodipterus quinquelineatus*	Five-lined cardinalfish		+		
Atherinidae	*Atherina sp.*	-				+
Aulostomidae	*Aulostomus chinensis*	Chinese trumpetfish		-		
Aulostomidae	*Aulostomus maculatus*	Trumpetfish	+			
Balistidae	*Balistapus undulatus*	Orange-lined triggerfish		-		
Balistidae	*Balistes vetula*	Queen triggerfish	-			
Balistidae	*Balistoides viridescens*	Titan triggerfish		+		
Balistidae	*Melichthys niger*	Black triggerfish	-	-		
Balistidae	*Sufflamen chrysopterus*	Halfmoon triggerfish		-		
Balistidae					+	
Belonidae / Syngnathidae					+	
Blenniidae	*Cirripectes sp.*	-		+		
Blenniidae	*Meiacanthus mossambicus*	Mozambique fangblenny		-		
Blenniidae	*Ophioblennius macclurei*	Redlip blenny	-			
Blenniidae	*Parablennius rouxi*	-				+
Blenniidae	*Plagiotremus rhinorhynchus*	Bluestriped fangblenny		-		
Blenniidae	*sp. 1*	-		+		
Caesionidae	*Caesio caerulaurea*	Blue and gold fusilier		+		
Caesionidae	*Caesio lunaris*	Lunar fusilier		-		
Caesionidae	*Pterocaesio marri*	Marr's fusilier		+		
Caesionidae	*Pterocaesio pisang*	Banana fusilier		-		
Caesionidae					+	
Carangidae	*Caranx ruber*	Bar jack	-			
Carangidae	*Seriola dumerili*	Forkbeard				+
Carangidae					+	

Carcharhinidae					-	
Centracanthidae	*Spicara flexuosa*	Blotched picarel				-
Centracanthidae	*Spicara maena*	Blotched picarel				-
Centracanthidae	*Spicara smaris*	Picarel				+
Chaenopsidae	*Emblemariopsis sp.*	Darkheaded blenny	•			
Chaenopsidae	*Lucayablennius zingaro*	Arrow blenny	-			
Chaetodontidae	*Chaetodon auriga*	Threadfin butterflyfish		+		
Chaetodontidae	*Chaetodon bennetti*	Bluelashed butterflyfish		+		
Chaetodontidae	*Chaetodon falcula*	Blackwedged butterflyfish		+		
Chaetodontidae	*Chaetodon guttatissimus*	Peppered butterflyfish		-		
Chaetodontidae	*Chaetodon kleinii*	Sunburst butterflyfish		+		
Chaetodontidae	*Chaetodon lineolatus*	Lined butterflyfish		+		
Chaetodontidae	*Chaetodon lunula*	Raccoon butterflyfish		+		
Chaetodontidae	*Chaetodon melannotus*	Blackback butterflyfish		+		
Chaetodontidae	*Chaetodon ocapistratus*	Foureye butterflyfish	+			
Chaetodontidae	*Chaetodon ocellatus*	Spotfin butterflyfish	+			
Chaetodontidae	*Chaetodon striatus*	Banded butterfyfish	•			
Chaetodontidae	*Chaetodon trifascialis*	Chevron butterflyfish		-		
Chaetodontidae	*Chaetodon trifasciatus*	Melon butterflyfish		+		
Chaetodontidae	*Chaetodon zanzibariensis*	Zanzibar butterflyfish		+		
Chaetodontidae	*Heniochus acuminatus*	Pennant coralfish		-		
Chaetodontidae	*Heniochus monoceros*	Masked bannerfish		-		
Chaetodontidae					-	
Cirrhitidae	*Paracirrhites arcatus*	Arc-eye hawkfish		-		
Cirrhitidae	*Paracirrhites forsteri*	Blackside hawkfish		-		
Clupeidae	*Herklotsichthys quadrimaculatus*	Bluestripe herring		-		
Clupeidae	*Spratelloides delicatulus*	Delicate round herring		+		
Congridae	*Conger conger*	European conger				+
Dasyatidae	*Taeniura lymma*	Bluespotted ribbontail ray		-		
Echeneidae	*Echeneis naucrates*	Live sharksucker		-		
Ephippidae	*Platax orbicularis*	Orbicular batfish		-		
Gobiidae	-	Unknown goby	+			
Gobiidae	*Amblygobius hectori*	Hector's goby		•		
Gobiidae	*Coryphopterus glaucofraenum*	Bridled goby	+			
Gobiidae	*Coryphopterus lipernes*	Peppermint goby	+			
Gobiidae	*Coryphopterus sp.*	Masked / Glass goby	+			
Gobiidae	*Cryptocentrus strigilliceps*	Target shrimp goby		-		
Gobiidae	*Gobiosoma genie*	Cleaning goby	-			
Gobiidae	*Gobiosoma oceanops*	Neon goby	-			
Gobiidae	*Gobiosoma prochilos*	Broadstripe goby	-			
Gobiidae	*Gobius cobitis*	Giant goby				+
Gobiidae	*Gobius cruentatus*	Red-mouthed goby				+
Gobiidae	*Gobius geniporus*	Slender goby				-
Gobiidae	*Gobius luteus*	Golden goby				+
Gobiidae	*Gobius niger*	Black goby				+
Gobiidae	*sp. 1*	-		+		
Gobiidae	*sp. 2*	-		-		
Grammatidae	*Gramma loreto*	Fairy basslet	+			
Haemulidae	*Diagramma pictum*	Painted sweetlips		-		
Haemulidae	*Haemulon album*	Margate	-			
Haemulidae	*Haemulon flavolineatum*	French grunt	-			
Haemulidae	*Haemulon plumieri*	White grunt	-			

Haemulidae	*Haemulon sciurus*	Bluestriped grunt	-			
Haemulidae	*Plectorhinchus flavomaculatus*	Lemon sweetlip		-		
Haemulidae	*Plectorhinchus gaterinus*	Blackspotted rubberlip		-		
Haemulidae	*Plectorhinchus schotaf*	Minstrel sweetlip		-		
Holocentridae	*Holocentrus adscensionis*	Squirrelfish	-			
Holocentridae	*Holocentrus rufus*	Longspine squirrelfish	+			
Holocentridae	*Myripristis murdjan*	Pinecone soldierish		-		
Holocentridae	*Myripristis violacea*	Lattice soldierfish		-		
Holocentridae	*Neoniphon sammara*	Sammara squirrelfish		-		
Holocentridae	*Sargocentron caudimaculatum*	Silverspot squirrelfish		+		
Holocentridae	*Sargocentron sp.*	-		-		
Holocentridae					+	
Kyphosidae	*Kyphosus cinerascens*	Blue seachub		+		
Kyphosidae	*Kyphosus sectator/incisor*	Bermuda/Yellow sea chub	-			
Kyphosidae	*Kyphosus vaigiensis*	Brassy chub		-		
Kyphosidae					-	
Labridae	*Anampses caeruleopunctatus*	Bluespotted wrasse		+		
Labridae	*Anampses meleagrides*	Spotted wrasse		-		
Labridae	*Anampses twistii*	Yellowbreated wrasse		-		
Labridae	*Bodianus axillaris*	Axilspot hogfish		•		
Labridae	*Bodianus diana*	Diana's hogfish		-		
Labridae	*Bodianus rufus*	Spanish hogfish	-			
Labridae	*Cheilinus chlorourus*	Floral wrasse		-		
Labridae	*Cheilinus fasciatus*	Redbreast wrasse		+		
Labridae	*Cheilinus oxycephalus*	Snooty wrasse		+		
Labridae	*Cheilinus trilobatus*	Tripletail wrasse		-		
Labridae	*Cheilio inermis*	Cigar wrasse		+		
Labridae	*Chelinus chlorurus*	-		+		
Labridae	*Cirrhilabrus exquisitus*	Exquisite wrasse		+		
Labridae	*Clepticus parrae*	Creole wrasse	-			
Labridae	*Coris cuvieri*	African coris		-		
Labridae	*Coris julis*	Mediterranean rainbow wrasse				-
Labridae	*Epibulus insidiator*	Slingjaw wrasse		+		
Labridae	*Gomphosus caeruleus*	Green birdmouth wrasse		+		
Labridae	*Halichoeres bivittatus*	Slippery dick	-			
Labridae	*Halichoeres garnoti*	Yellowhead wrasse	-			
Labridae	*Halichoeres hortulanus*	Checkerboard wrasse		-		
Labridae	*Halichoeres maculipinna*	Clown wrasse	-			
Labridae	*Halichoeres marginatus*	Dusky wrasse		+		
Labridae	*Halichoeres pictus*	Rainbow wrasse	-			
Labridae	*Halichoeres scapularis*	Zigzag wrasse		+		
Labridae	*Hemigymnus fasciatus*	Barred thicklip		+		
Labridae	*Hemigymnus melapterus*	Blackeye thicklip		-		
Labridae	*Labrichthys unilineatus*	Tubelip wrasse		+		
Labridae	*Labroides bicolor*	Bicolor cleaner wrasse		-		
Labridae	*Labroides dimidiatus*	Bluestreak cleaner wrasse		+		
Labridae	*Labrus merula*	Brown wrasse				+
Labridae	*Labrus viridis*	-				+
Labridae	*Lachnolaimus maximus*	Hogfish	-			
Labridae	*Macropharyngodon bipartitus*	Vermiculate wrasse		+		
Labridae	*Novaculichthys taeniourus*	Rockmover wrasse		+		
Labridae	*Oxycheilinus arenatus*	Speckled maori wrasse		+		

Labridae	*Oxycheilinus diagrammus*	Cheeklined wrasse		+		
Labridae	*Oxycheilinus mentalis*	Mental wrasse		+		
Labridae	*Pseudocheilinus evanidus*	Striated wrasse		+		
Labridae	*Pseudocheilinus hexataenia*	Sixline wrasse		+		
Labridae	*Pteragogus flagellifera*	Cocktail wrasse		+		
Labridae	*Pteragogus pelycus*	Sideburn wrasse		-		
Labridae	*sp. 1*	-		+		
Labridae	*sp. 2*	-		+		
Labridae	*Stethojulis albovittata*	Bluelined wrasse		+		
Labridae	*Stethojulis bandanensis*	Red shoulder wrasse		-		
Labridae	*Stethojulis interrupta*	Cutribbon wrasse		+		
Labridae	*Symphodus cinereus*	Grey wrasse				-
Labridae	*Symphodus doderleini*	-				-
Labridae	*Symphodus mediterraneus*	Axillary wrasse				-
Labridae	*Symphodus melanocercus*	-				+
Labridae	*Symphodus ocellatus*	-				+
Labridae	*Symphodus roissali*	Five-spotted wrasse				+
Labridae	*Symphodus rostratus*	-				+
Labridae	*Symphodus tinca*	East Atlantic peacock wrasse				+
Labridae	*Thalassoma amblycephalum*	Bluntheaded wrasse		-		
Labridae	*Thalassoma bifasciatum*	Bluehead	+			
Labridae	*Thalassoma hardwicke*	Sixbar wrasse		+		
Labridae	*Thalassoma hebraicum*	Goldbar wrasse		+		
Labridae	*Thalassoma lunare*	Moon wrasse		+		
Labridae	*Thalassoma pavo*	Ornate wrasse				-
Labridae					+	
Labrisomidae	*Malacoctenus boehlkei*	Diamond blenny	-			
Labrisomidae	*Malacoctenus triangulatus*	Sadled blenny	-			
Lethrinidae	*Lethrinus erythracantus*	-		-		
Lethrinidae	*Lethrinus harak*	Thumbprint emporer		-		
Lethrinidae	*Lethrinus obsoletus*	Orange-striped emporer		+		
Lethrinidae	*Lethrinus olivaceus*	Longface emporer		-		
Lethrinidae	*Monotaxis grandoculis*	Humpnose big-eye bream		-		
Lethrinidae	*sp. 1*	-		+		
Lethrinidae	*sp. 2*	-		-		
Lethrinidae					-	
Lutjanidae	*Aprion virescens*	Green jobfish		-		
Lutjanidae	*Lutjanus apodus*	Schoolmaster	+			
Lutjanidae	*Lutjanus bohar*	Two-spot red snapper		-		
Lutjanidae	*Lutjanus ehrenbergi/fulviflamma*	-		+		
Lutjanidae	*Lutjanus griseus*	Gray snapper	-			
Lutjanidae	*Lutjanus mahogoni*	Mahogany snapper	-			
Lutjanidae	*Lutjanus monostigma*	Onespot snapper		-		
Lutjanidae	*Macolor niger*	Black and white snapper		-		
Lutjanidae	*Ocyurus chrysurus*	Yellowtail snapper	-			
Lutjanidae					+	
Monacanthidae	*Aluterus scriptus*	Scrawled filefish	-	+		
Monacanthidae	*Amanses scopas*	Broom filefish		+		
Monacanthidae	*Cantherhines pardalis*	Honeycomb filefish		-		
Monacanthidae	*Oxymonacanthus longirostris*	Harlequin filefish		-		
Monacanthidae	*Pervagor janthinosoma*	Blackbar filefish		+		
Mugilidae	*Mugil sp.*	-				-

Mugilidae					-	
Mullidae	*Mulloidichthys martinicus*	Yellow goatfish	-			
Mullidae	*Mullus surmuletus*	Striped red mullet				+
Mullidae	*Parupeneus barberinus*	Dash-and-dot goatfish		+		
Mullidae	*Parupeneus cyclostomus*	Goldsaddle goatfish		+		
Mullidae	*Parupeneus macronemus*	Longbarbel goatfish		-		
Mullidae	*Parupeneus rubescens*	Rosy goatfish		+		
Mullidae	*Pseudupeneus maculatus*	Spotted goatfish	+			
Mullidae	*Upeneus tragula*	Freckled goatfish		+		
Mullidae					-	
Muraenidae	*Gymnothorax javanicus*	Giant moray		+		
Muraenidae	*Gymnothorax miliaris*	Goldentail moray	-			
Muraenidae	*Muraena helena*	Mediterranean moray				-
Nemipteridae	*Scolopsis ghanam*	Arabian monocle bream		+		
Ostraciidae	*Lactophrys trigonus*	Trunkfish	-			
Ostraciidae	*Lactophrys triqueter*	Smooth trunkfish	+			
Ostraciidae	*Ostracion cubicus*	Yellow boxfish		-		
Ostraciidae	*Ostracion meleagris*	Whitespotted boxfish		+		
Ostraciidae / Tetraodontidae					+	
Pempheridae	*Pempheris schwenkii*	Black-stripe sweeper		-		
Pempheridae	*Pempheris vanicolensis*	Vanikoro sweeper		-		
Phycidae	*Phycis phycis*	Forkbeard				+
Pinguipedidae	*Parapercis hexophtalma*	Speckled sandperch		+		
Platycephalidae	*Papilloculiceps longiceps*	Tentacled flathead		-		
Plotosidae	*Plotosus lineatus*	Striped eel catfish		+		
Pomacanthidae	*Centropyge bispinosus*	Twospined angelfish		+		
Pomacanthidae	*Centropyge multispinis*	Dusky angelfish		-		
Pomacanthidae	*Holacanthus ciliaris*	Queen angelfish	+			
Pomacanthidae	*Holacanthus tricolor*	Rock beauty	+			
Pomacanthidae	*Pomacanthus arcuatus*	Gray angelfish	-			
Pomacanthidae	*Pomacanthus chrysurus*	Goldtail angelfish		-		
Pomacanthidae	*Pomacanthus imperator*	Emporer angelfish		-		
Pomacanthidae	*Pomacanthus paru*	French angelfish	-			
Pomacanthidae	*Pomacanthus semicirculatus*	Semicircle angelfish		-		
Pomacanthidae	*Pygoplites diacanthus*	Royal angelfish		-		
Pomacanthidae					+	
Pomacentridae	*Abudefduf saxatilis*	Sergeant major	-			
Pomacentridae	*Abudefduf sexfasciatus*	Scissortail sergeant		+		
Pomacentridae	*Abudefduf sp.*	-		+		
Pomacentridae	*Abudefduf sparoides*	False-eye sergeant		+		
Pomacentridae	*Abudefduf vaigiensis*	Indo-Pacific sergeant		+		
Pomacentridae	*Amblyglyphidodon leucogaster*	Yellowbelly damselfish		+		
Pomacentridae	*Amphiprion akallopisos*	Skunk clownfish		+		
Pomacentridae	*Amphiprion allardi*	Twobar anemonefish		+		
Pomacentridae	*Chromis agilis*	Agile chromis		+		
Pomacentridae	*Chromis atripectoralis*	Black-axil chromis		+		
Pomacentridae	*Chromis chromis*	Damselfish				-
Pomacentridae	*Chromis cyanea*	Blue chromis	+			
Pomacentridae	*Chromis dimidiata*	Chocolatedip chromis		-		
Pomacentridae	*Chromis insolata*	Sunshinefish	-			
Pomacentridae	*Chromis lepidolepis*	Scaly chromis		-		
Pomacentridae	*Chromis multilineata*	Brown chromis	-			

Pomacentridae	*Chromis nigrura*	Blacktail chromis		-	
Pomacentridae	*Chromis opercularis*	Doublebar chromis		-	
Pomacentridae	*Chromis ternatensis*	Ternate chromis		-	
Pomacentridae	*Chromis viridis*	Blue green damselfish		+	
Pomacentridae	*Chromis weberi*	Weber's chromis		+	
Pomacentridae	*Dascyllus aruanus*	Whitetail dascyllus		-	
Pomacentridae	*Dascyllus carneus*	Cloudy dascyllus		+	
Pomacentridae	*Dascyllus trimaculatus*	Threespot dascyllus		•	
Pomacentridae	*Microspathodon chrysurus*	Yellowtail damselfish	-		
Pomacentridae	*Neoglyphidodon melas*	Bowtie damselfish		+	
Pomacentridae	*Neopomacentrus azysron*	Yellow-tail demoiselle		+	
Pomacentridae	*Neopomacentrus cyanomos*	Regal demoisells		-	
Pomacentridae	*Plectroglyphidodon dickii*	Blackbar devil		-	
Pomacentridae	*Plectroglyphidodon johnstonianus*	Johnston Island damsel		+	
Pomacentridae	*Plectroglyphidodon lacrymatus*	Whitespotted devil		+	
Pomacentridae	*Pomacentrus caeruleus*	Caerulean damselfish		+	
Pomacentridae	*Pomacentrus diencaeus*	Longfin damselfish	-		
Pomacentridae	*Pomacentrus fuscus*	Dusky damselfish	-		
Pomacentridae	*Pomacentrus leucostictus*	Beaugregory	-		
Pomacentridae	*Pomacentrus partitus*	Bicolor damselfish	+		
Pomacentridae	*Pomacentrus pavo*	Sapphire damsel		+	
Pomacentridae	*Pomacentrus planifrons*	Threespot damselfish	+		
Pomacentridae	*Pomacentrus sulfureus*	Sulphur samsel		+	
Pomacentridae	*Pomacentrus trichourus*	Paletail damsel		+	
Pomacentridae	*Pomacentrus trilineatus*	Threeline damsel		+	
Pomacentridae	*Pomacentrus variabilis*	Cocoa damselfish	+		
Pomacentridae	*sp. 1*	-		+	
Pomacentridae	*sp. 2*	-		+	
Pomacentridae	*sp. 3*	-		+	
Pomacentridae	*sp. 4*	-		-	
Pomacentridae	*sp. 5*	-		-	
Pomacentridae	*Stegastes nigricans*	Dusky farmerfish		+	
Pomacentridae					+
Priacanthidae	*Priacanthus blochii*	Paeony bulleye		-	
Priacanthidae	*Priacanthus hamrur*	Moontail bullseye		-	
Ptereleotris	*Ptereleotris evides*	Blackfin dartfish		+	
Scaridae	*Calotomus carolinus*	Carolines parrotfish		-	
Scaridae	*Cetoscarus bicolor*	Bicolor parrotfish		+	
Scaridae	*Chlorurus atrilunula*	Bluemoon parrotfish		+	
Scaridae	*Chlorurus sordidus*	Daisy parrotfish		-	
Scaridae	*Chlorurus strongylocephalus*	-		+	
+Scaridae	*Scarus coelestinus*	Midnight parrotfish	-		
Scaridae	*Scarus frenatus*	Bridled parrotfish		-	
Scaridae	*Scarus ghobban*	Blue-barred parrotfish		+	
Scaridae	*Scarus inserti*	Striped parrotfish	+		
Scaridae	*Scarus niger*	Dusky parrotfish		-	
Scaridae	*Scarus psittacus*	Common parrotfish		-	
Scaridae	*Scarus scaber*	Fivesaddle parrotfish		-	
Scaridae	*Scarus taeniopterus*	Princess parrotfish	-		
Scaridae	*Scarus tricolor*	Tricolour parrotfish		-	
Scaridae	*Scarus vetula*	Queen parrotfish	-		
Scaridae	*Scarus viridifucatus*	Roundhead parrotfish		-	

Scaridae	*Sp. 1 (juv)*	-		+		
Scaridae	*Sparisoma aurofrenatum*	Redband parrotfish	-			
Scaridae	*Sparisoma chrysopterum*	Redtail parrotfish	-			
Scaridae	*Sparisoma rubripinne*	Yellowtail parrotfish	-			
Scaridae	*Sparisoma viride*	Stoplight parrotfish	+			
Scaridae					-	
Sciaenidae	*Equetus punctatus*	Spotted drum	•			
Sciaenidae	*Sciaena umbra*	Brown meagre				+
Scombridae	*Scomberomorus regalis*	Cero	-			
Scorpaenidae	*Pterois antennata*	Broadbarred firefish		-		
Scorpaenidae	*Pterois miles*	Devil firefish		+		
Scorpaenidae	*Pterois radiata*	Radial firefish		-		
Scorpaenidae	*Scorpaena porcus*	Black scorpionfish				+
Scorpaenidae	*Scorpaena scrofa*	Largescaled scorpionfish				-
Serranidae	*Aethaloperca rogaa*	Redmouth grouper		-		
Serranidae	*Anthias anthias*	Swallowtail seaperch				-
Serranidae	*Anyperodon leucogrammicus*	Slender grouper		-		
Serranidae	*Cephalopholis argus*	Peacock hind		-		
Serranidae	*Cephalopholis boenak*	Chocolate hind		+		
Serranidae	*Cephalopholis miniata*	Coral hind		-		
Serranidae	*Epinephelus cruentatus*	Graysby	+			
Serranidae	*Epinephelus fulvus*	Coney	-			
Serranidae	*Epinephelus guttatus*	Red hind	+			
Serranidae	*Epinephelus marginatus*	Dusky grouper				+
Serranidae	*Epinephelus striatus*	Nassau grouper	-			
Serranidae	*Hypoplectrus indigo*	Indigo hamlet	-			
Serranidae	*Hypoplectrus nigricans*	Black hamlet	+			
Serranidae	*Hypoplectrus puella*	Barred hamlet	+			
Serranidae	*Hypoplectrus unicolor*	Butter hamlet	+			
Serranidae	*Mycteroperca bonaci*	Black grouper	-			
Serranidae	*Mycteroperca tigris*	Tiger grouper	+			
Serranidae	*Plectropomus laevis*	Blacksaddled coralgrouper		-		
Serranidae	*Pseudanthias squamipinnis*	Sea goldie		-		
Serranidae	*Rypticus saponaceus*	Greater soapfish	-			
Serranidae	*Serranus cabrilla*	Comber				-
Serranidae	*Serranus scriba*	Painted comber				+
Serranidae	*Serranus tigrinus*	Harlequin bass	+			
Serranidae					-	
Siganidae	*Siganus argenteus*	Streamlined spinefoot		-		
Siganidae	*Siganus stellatus*	Brownspotted spinefoot		+		
Siganidae	*Siganus sutor*	Shoemaker spinefoot		+		
Sparidae	*Boops boops*	Bogue				+
Sparidae	*Calamus bajonado*	Jolthead porgy	-			
Sparidae	*Calamus calamus*	Saucereye porgy	-			
Sparidae	*Dentex dentex*	Common dentex				-
Sparidae	*Diplodus annularis*	Annular seabream				+
Sparidae	*Diplodus puntazzo*	Sharpsnout seabream				-
Sparidae	*Diplodus sargus*	White seabream				-
Sparidae	*Diplodus vulgaris*			-		
Sparidae	*Oblada melanura*	Saddled seabream				-
Sparidae	*Sarpa salpa*	Salema				+
Sparidae	*Spondyliosoma cantharus*	Black seabream				+

Sphyraenidae	*Sphyraena barracuda*	Great barracuda	-			
Sphyraenidae	*Sphyraena sphyraena*	European barracuda				-
Syngnathidae	*Corythoichthys flavofasciatus*	Network pipefish		+		
Synodontidae	*Synodus intermedius*	Sand diver	+			
Synodontidae	*Synodus variegatus*	Variegated lizardfish		+		
Tetraodontidae	*Arothron stellatus*	Starry toadfish		+		
Tetraodontidae	*Canthigaster rostrata*	Sharpnose puffer	+			
Tetraodontidae	*Canthigaster solandri*	Spotted sharpnose		-		
Tetraodontidae	*Canthigaster valentini*	Valentinni's sharpnose puffer		-		
Tripterygiidae	*Tripterygion sp.*	-				+
Unknown	-	Unknown blenny	+			
Unknown	-	-	-			
Zanclidae	*Zanclus cornutus*	Moorish Idol		-		
Zanclidae					+	

References:

Froese, D. & D. Pauly, Eds. (2006). Fishbase, version (02/2006) [WWW document]. URL http://www.fishbase.org

Lomolino M.V. (2000). Ecology's most general, yet protean pattern: the species-area relationship. *J. Biogeogr.*, 27, 17-26.

Lomolino M.V. & Weiser M.D. (2001). Towards a more general species-area relationship: diversity on all islands, great and small. *J. Biogeogr.* 28, 431-445.

Milliken G.A. & Johnson D.E. (1992). Analysis of Messy Data. Volume 1: Designed Experiments. Chapman & Hall, New York.

Sokal, R. R. & Rohlf, F. J. (1995). Biometry, 3rd edition. W. H. Freeman, New York.

Tjorve E. (2003). Shapes and functions of species-area curves: a review of possible models. *J. Biogeogr.*, 30, 827-835.

Williamson M., Gaston K.J. & Lonsdale W.M. (2001). The species-area relationship does not have an asymptote! *J. Biogeogr.*, 28, 827-830.