Supporting Information. Russ, G.R., J.R. Rizzari, R.A. Abesamis and A.C. Alcala. 2020. Coral cover a stronger driver of reef fish trophic biomass than fishing. Ecological Applications.

Appendix S1

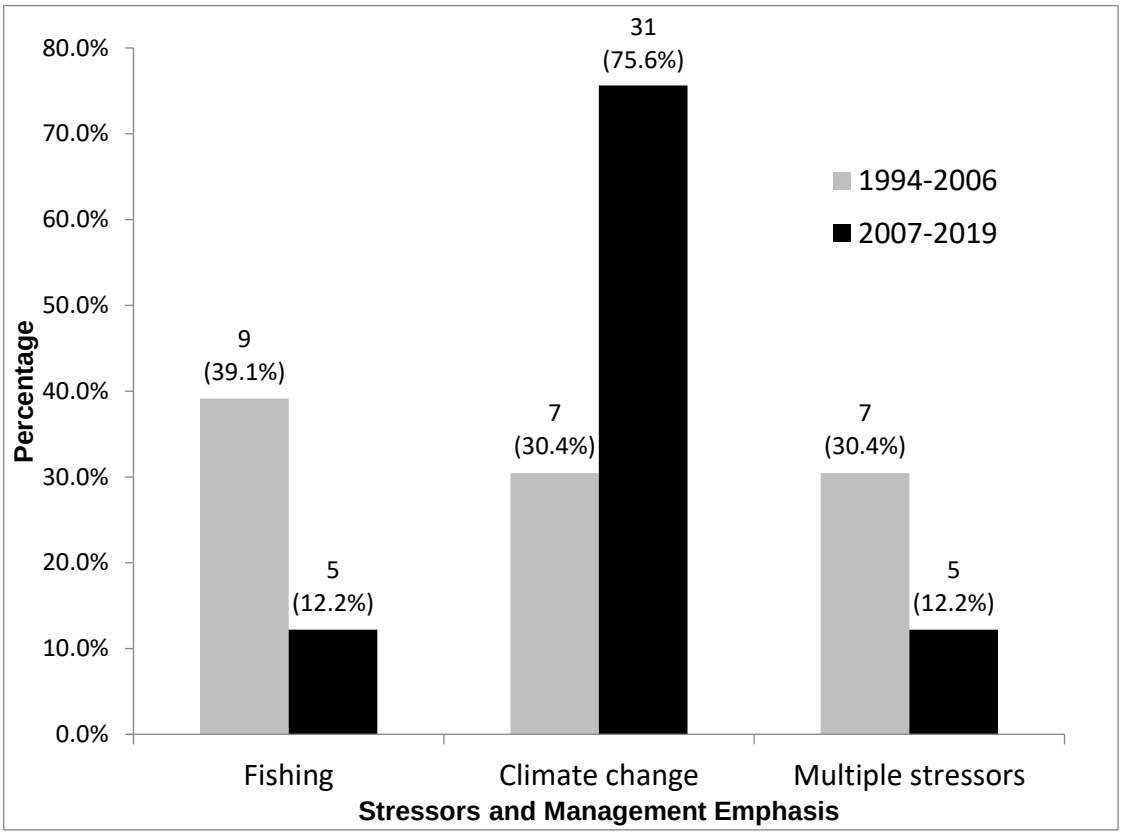

Figure S1. Results of a review of papers on stressors of "Coral Reefs" in Science and Nature, 1994-2019. Search Term “Coral Reefs”. Number of papers = 64. A full list of the papers, and how they were categorised, is available on request from GRR. Science**:** Review, Reports, Viewpoint, Policy Forum, Insights/Perspectives (BUT NOT Letters or News) Nature: Letters, Review, Articles, Research (BUT NOT Correspondence, News & Views, Communications Arising).

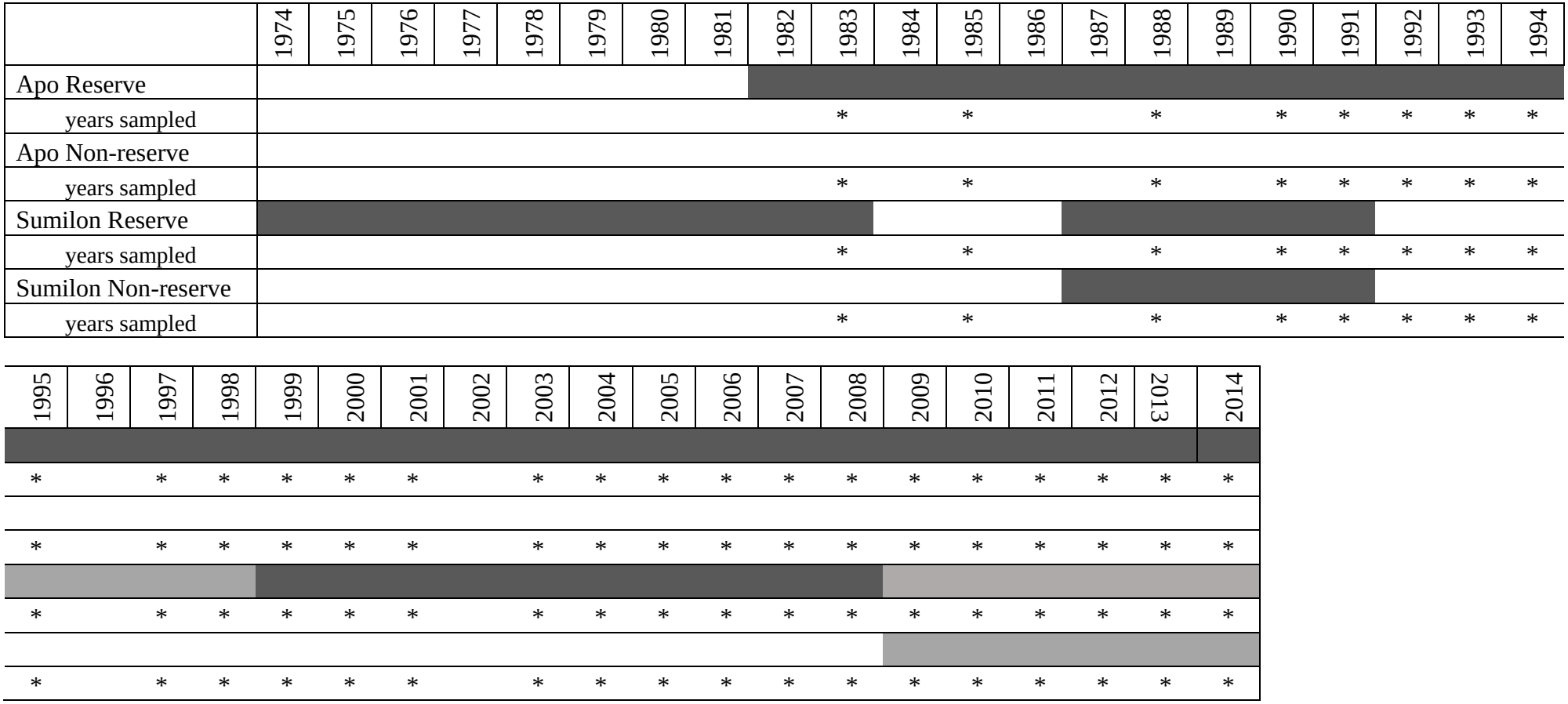

Figure S2. Protection history of study sites, 1974 – 2014. White bars = years that sites were open to all fishing, grey bars = years when sites were open to only hook and line fishing, and black bars = years when sites were closed to fishing. Asterisks = years of sampling.

Table S1. Coral reef fish species within trophic groups.

Trophic group/species	Trophic group/species	Trophic group/species	Trophic group/species	Trophic group/species
Generalist large predators	**Large benthic foragers**	**Detritivores**	**Small benthic foragers**	**Large planktivores**
Lethrinus atkinsoni	*Cheilinus diagramma*	*Acanthurus blochi*	*Chaetodon adiergastos*	*Acanthurus mata*
L. erythracanthus	*C. fasciatus*	*A. dussumieri*	*C. auriga*	*A. thomsoni*
L. erythropterus	*C. trilobatus*	*A. xanthopterus*	*C. ephippium*	*Aphareus furcatus*
L, harak	*Choerodon anchorago*	*Ctenochaetus binotatus*	*C. kleini*	*Caesio caerulaurea*
L. lentjan	*Hemigymnus fasciatus*	*C. striatus/strigosus*	*C. lineolatus*	*C. cuning*
L. microdon	*H. melapterus*	*C. tominiensis*	*C. lunula*	*C. lunaris*
L. obsoletus	*Lutjanus biguttatus*	**Excavators**	*C. melannotus*	*C. teres*
L. olivaceus	*L. fulviflamma*	*Cetoscarus bicolor*	*C. mertensii*	*Hemitauricthys polylepis*
L. ornatus	*Mulloides flavolineatus*	*Hipposcarus longiceps*	*C. ocellicaudus*	*Naso brevirostris*
L. spp	*Parupeneus barberinus*	*Chlorurus bleekeri*	*C. octofasciatus*	*N. minor*
Lutjanus argentimaculatus	*P. barberinoides*	*C. bowersi*	*C. punctatofasciatus*	*N. thynnoides*
L. bohar	*P. bifasciatus/crassilabris*	*C. gibbus/microrhinos*	*C. rafflesi*	*N. vlamingii*
L. decussatus	*P. ciliatus*	*C. sordidus/spilurus*	*C. semeion*	*Pterocaesio diagramma*
L. fulvus	*P. cyclostomus*	**Scrapers**	*C. speculum*	*P. pisang*
L. gibbus	*P. multifasciatus/trilineata*	*Scarus altipinnis*	*C. ulietensis*	*P. randalli*
L. monostigma	*P. vanicolensis*	*S. chameleon*	*C. unimaculatus*	*P. tessellata*
L. rivulatus	*Plectorhinchus chaetodonoides*	*S. dimidiatus*	*C. vagabundus*	*P. tile*
L. russelli	*P. gaterinoides/lineatus*	*S. forsteni*	*C. xanthurus*	**Small planktivores**
Macolor niger		*S. frenatus*	*Forcipiger flavissimus*	*Abudefduf vaigiensis*
Monotaxis grandoculis	*P. lessoni*	*S.. ghobban*	*Gomphosus varius*	*Amblyglyphidodon aureus*
Piscivores	*P. orientalis*	*S. globiceps*	*Scolopsis bilineatus*	*A. curacao*
Anyperodon leucogrammicus	*P. picus*	*S. lunula*	*S. lineatus*	*A. leucogaster*

Aetheloperca rogaa
Carangid spp.
Cephalopholis argus
C. boenack
C. cyanostigma
C. leopardus
C. microprion
C. miniatus
C. sexmaculatus
C. spp
C. urodeta
Epinephelus caeruleopunctatus
E. fasciatus
E. fuscoguttatus
E. malabaricus
E. merra
E. ongus
E. polyphekadion
E. spp
Plectropomus areolatus
P. laevis
P. oligocanthus
Variola albimarginata
V. louti

P. polytaenia
P. spp.

Croppers

Acanthurus japonicus
A. nigrofuscus
A. nigricans
Naso annulatus
N. brachycentron
N. lituratus
N. tuberosus
N. unicornis
Siganus argenteus
S. canaliculatus
S. corallinus
S. doliatus
S. guttatus
S. puellus
S. punctatus
S. punctatissimus
S. spinus
S. unimaculatus
S. virgatus
S. vulpinus
Zebrasoma scopas
Z. veliferum

S. niger
S. oviceps
S. prasiognathus
S. rivulatus
S. spinidens
S. tricolor
S. rubroviolaceus

Sandfeeders

Acanthurs leucocheilus
A. nigricauda
A. olivaceus
A. pyroferus
Scarus flavipectoralis
S. psittacus
S. quoyi
S. schlegeli

Thalassoma hardwickii
T. lunare
Zanclus cornutus

Obligate corallivores

Chaetodon baronessa
C. bennetti
C. ornatissimus
C. trifascialis
C. trifasciatus

Omnivorous pomacentrids

Pomacentrus amboinensis
P. brachialis
P. moluccensis

Chromis amboinensis
C. retrofasciata
C. ternatensis
C. viridis
C. weberi
Chrysiptera talboti
Cirrhilabrus spp.
Dascyllus aruanus
D. reticulatus
D. trimaculatus
Pomacentrus coelestis
P. lepidogenys
Pseudanthias huchtii
P. squammipinnis
P. tuka

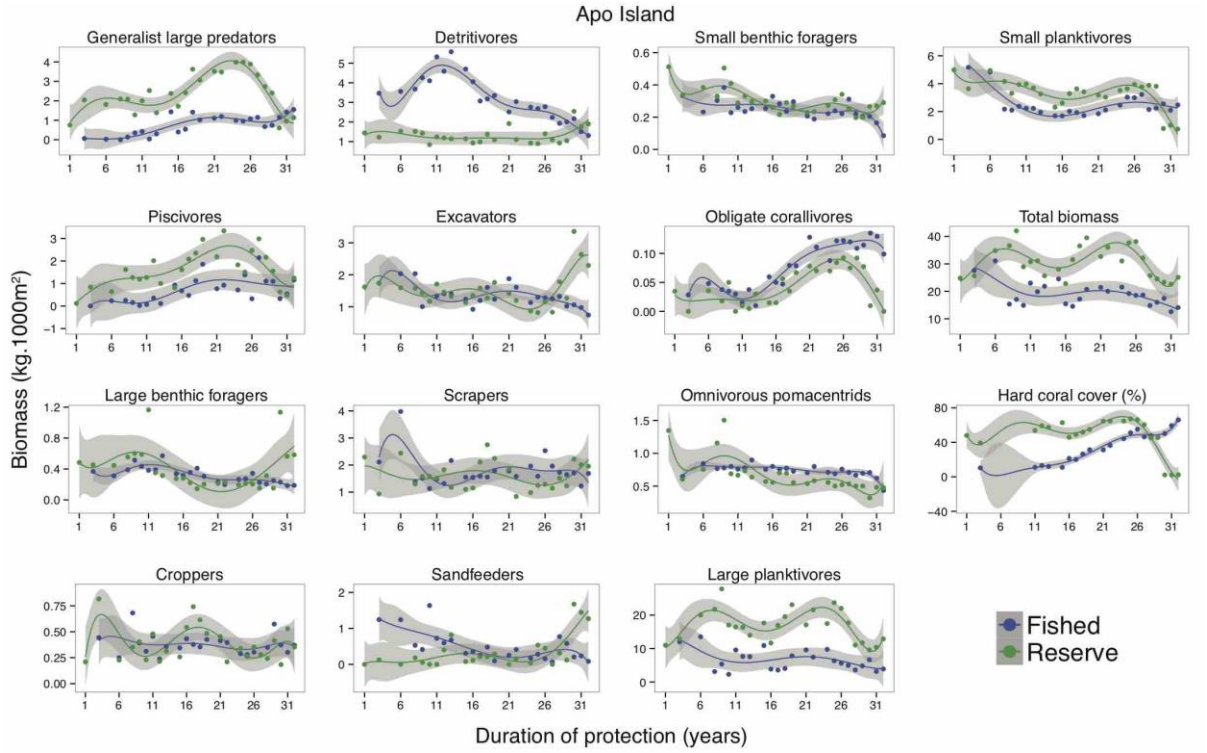

Figure S3. Long-term (1983-2014) temporal trends in biomass of different trophic groups, total fish biomass, and hard coral cover versus years of protection by no-take marine reserve (NTMR) status at Apo Island. Data points are means, trend lines are sixth order polynomials, and shading represents 95% confidence intervals. NTMR site is shown in green and fished site in blue. Note that the y-axis for hard coral is percent cover, not biomass. Note y-axis ranges differ among panels.

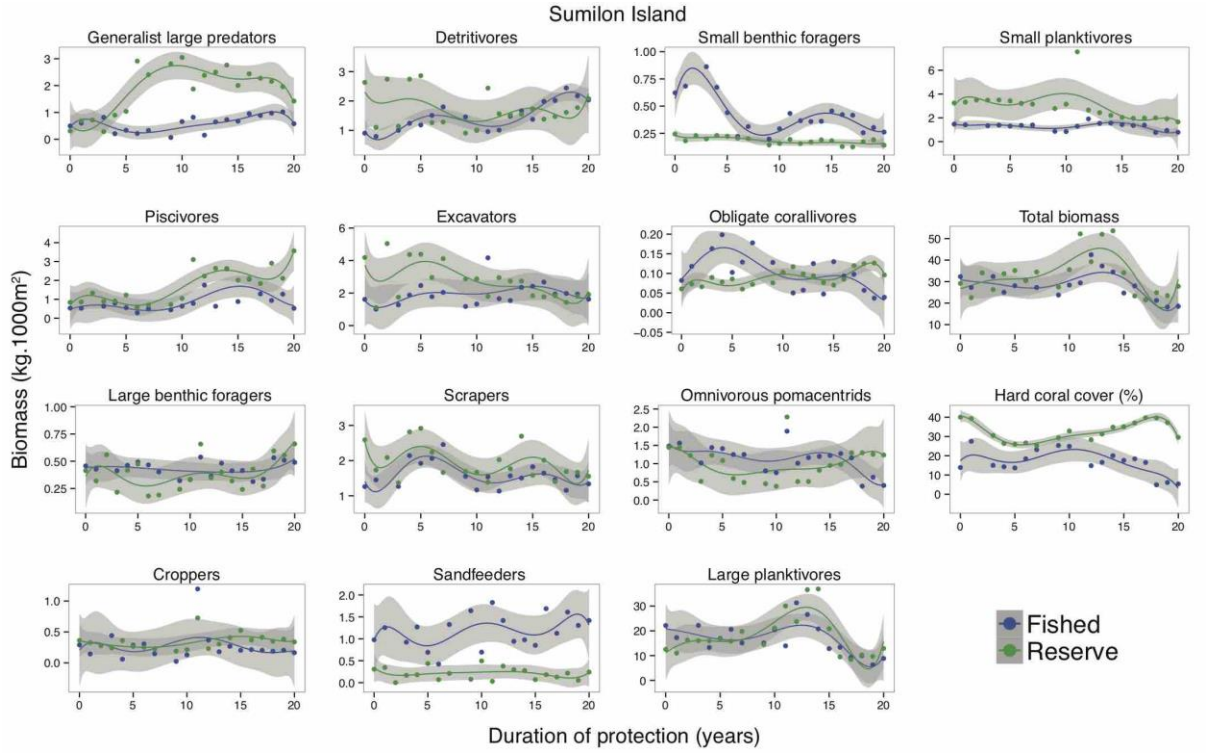

Figure S4. Long-term (1983-2014) temporal trends in biomass of different trophic groups, total fish biomass, and hard coral cover versus years of protection by no-take marine reserve (NTMR) status at Sumilon Island. Data points are means, trend lines are sixth order polynomials, and shading represents 95% confidence intervals. NTMR site shown in green and fished site in blue. Note that the y-axis for hard coral is percent cover, not biomass. Note y-axis ranges differ among panels.

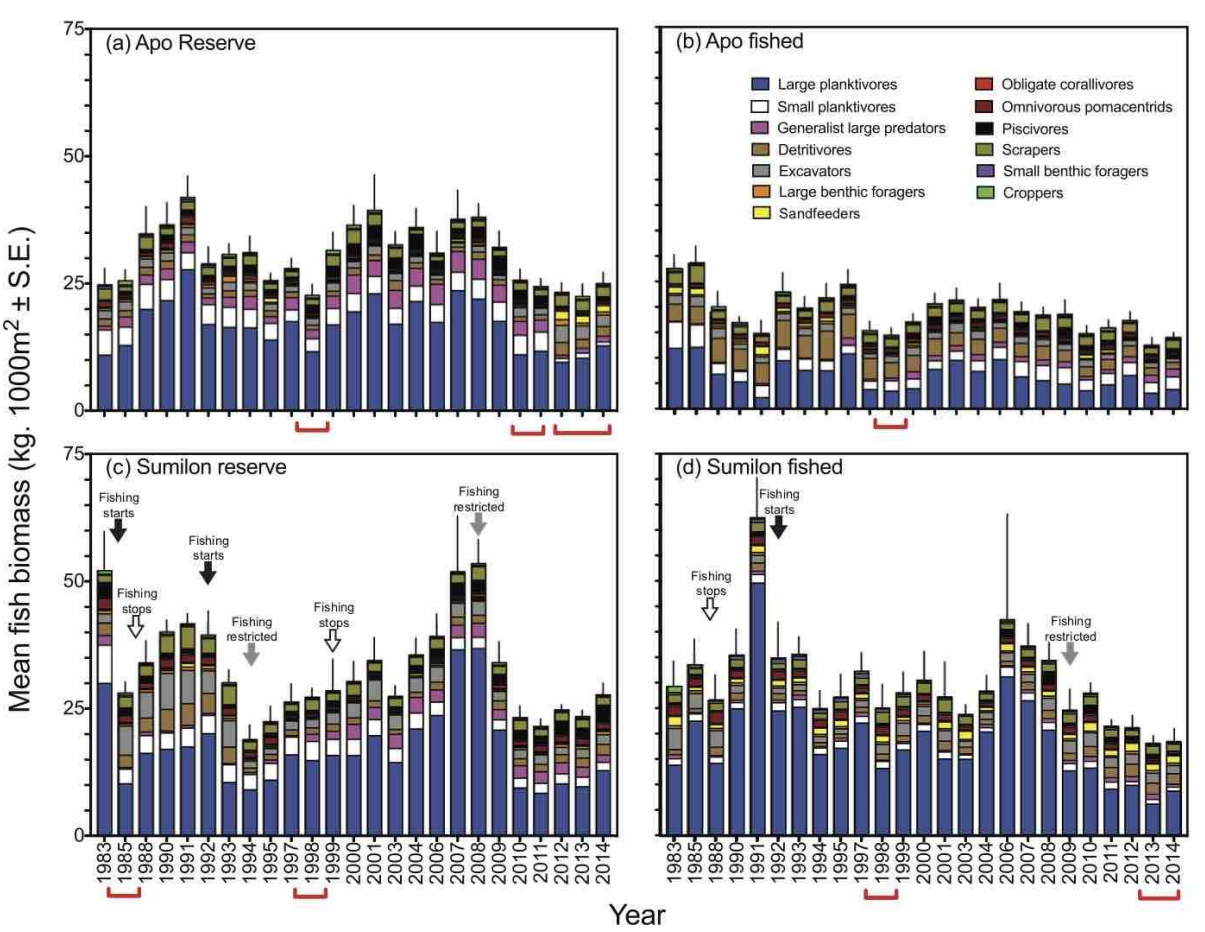

Figure S5. Long-term (1983-2014) temporal trends in mean biomass (± SE) of coral reef trophic groups at four sites. (a) Apo reserve – environmental disturbances (red brackets) from left to right are coral bleaching, local storm and back-to-back typhoons. (b) Apo fished – environmental disturbance (red brackets) is coral bleaching. (c) Sumilon reserve – environmental disturbances (red brackets) from left to right are destructive fishing, and crown-of-thorns and coral bleaching. Arrows indicate when fishing starts, stops or is restricted (= line fishing allowed). (d) Sumilon fished – environmental disturbances (red brackets) from left to right are coral bleaching and typhoon. Arrows indicate when fishing starts, stops or is restricted (= line fishing allowed).

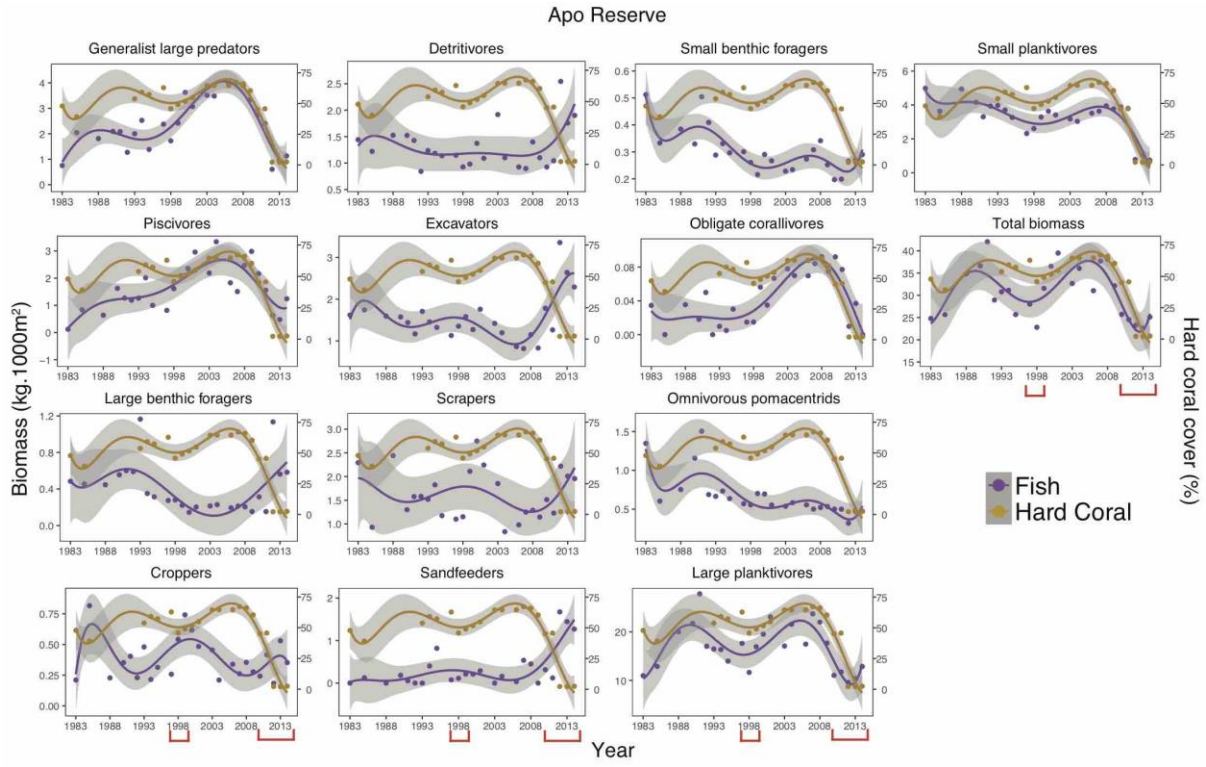

Figure S6. Long-term (1983-2014) temporal trends in biomass (left y-axis) of different trophic groups, and hard coral cover (right y-axis) at Apo Reserve. Data points are means, trend lines are sixth order polynomials, and shading represents 95% confidence intervals. Fish biomass is purple and hard coral is brown. Note y-axis ranges differ among panels. Environmental disturbances (red brackets) from left to right are coral bleaching (1998), local storm (2010) and back-to-back typhoons (2011-2012).

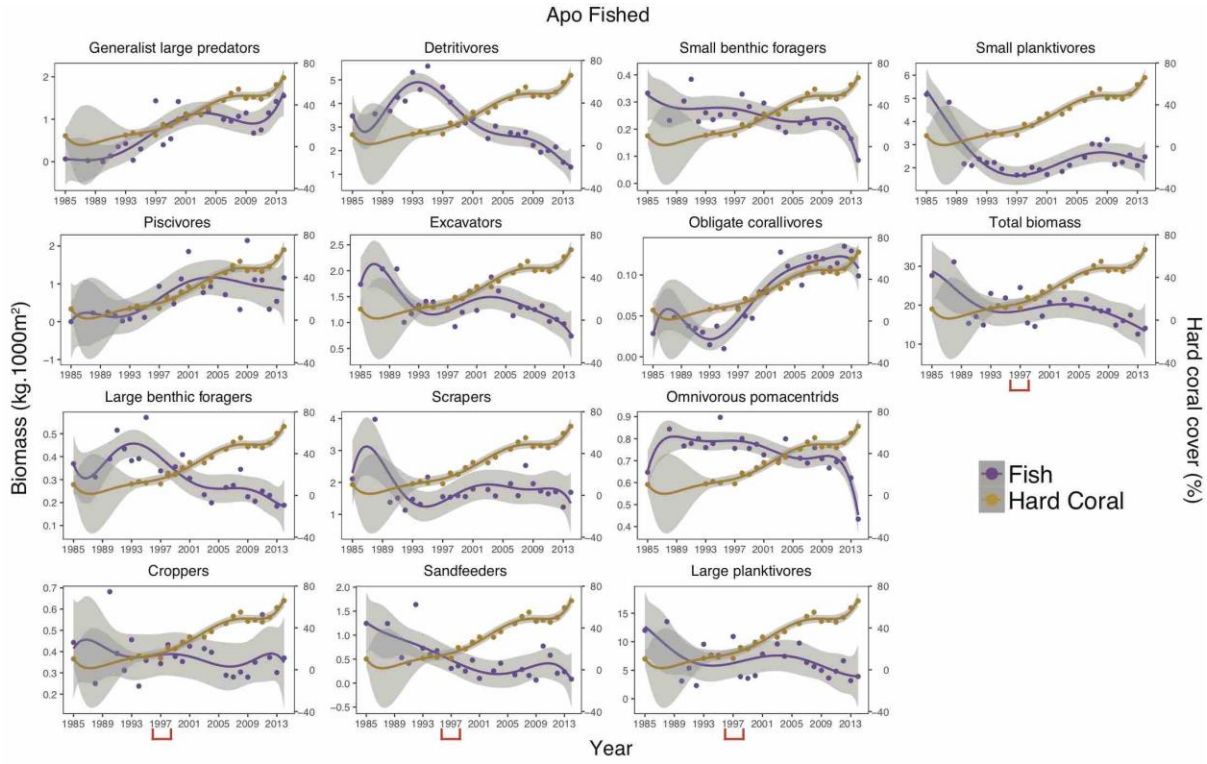

Figure S7. Long-term (1983-2014) temporal trends in biomass (left y-axis) of different trophic groups, and hard coral cover (right y-axis) at Apo fished site. Data points are means, trend lines are sixth order polynomials, and shading represents 95% confidence intervals. Fish biomass is purple and hard coral is brown. Note y-axis ranges differ among panels. Environmental disturbance (red brackets) is coral bleaching (1998).

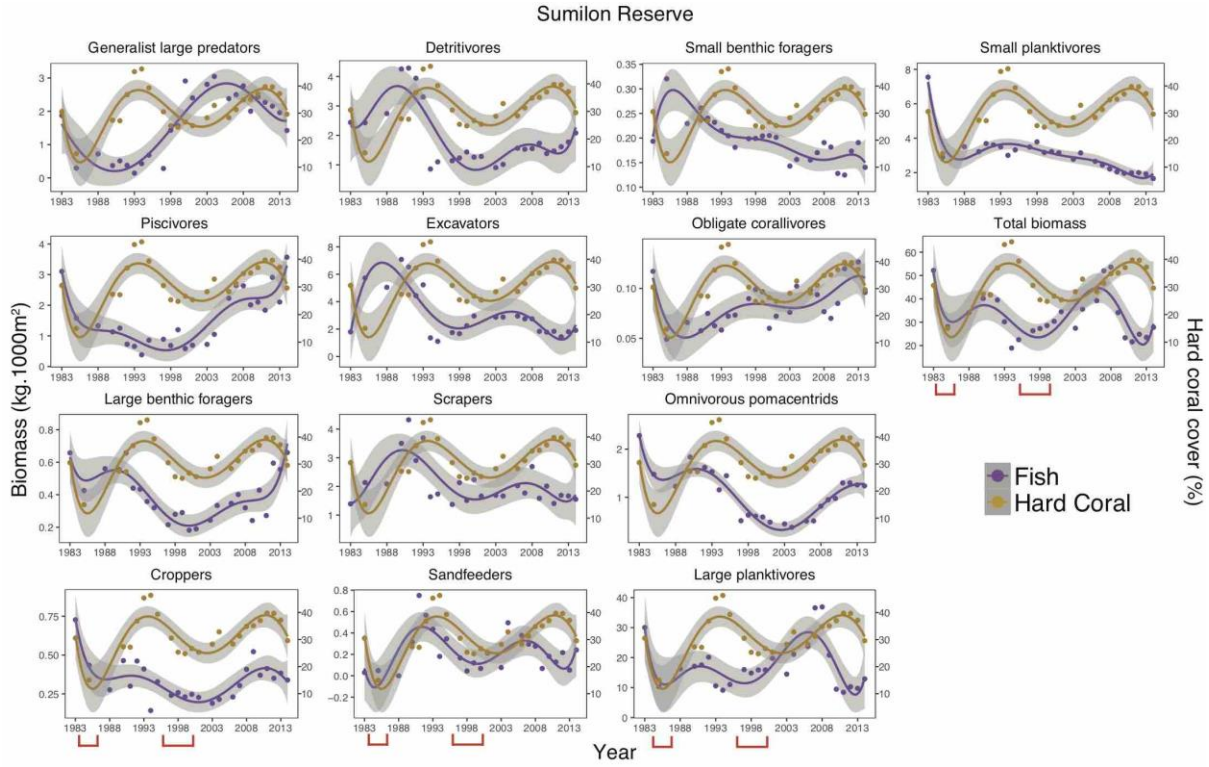

Figure S8. Long-term (1983-2014) temporal trends in biomass (left y-axis) of different trophic groups, and hard coral cover (right y-axis) at Sumilon Reserve. Data points are means, trend lines are sixth order polynomials, and shading represents 95% confidence intervals. Fish biomass is purple and hard coral is brown. Note y-axis ranges differ among panels. Environmental disturbances (red brackets) from left to right are destructive fishing (1984), and crown-of-thorns and coral bleaching (1998).

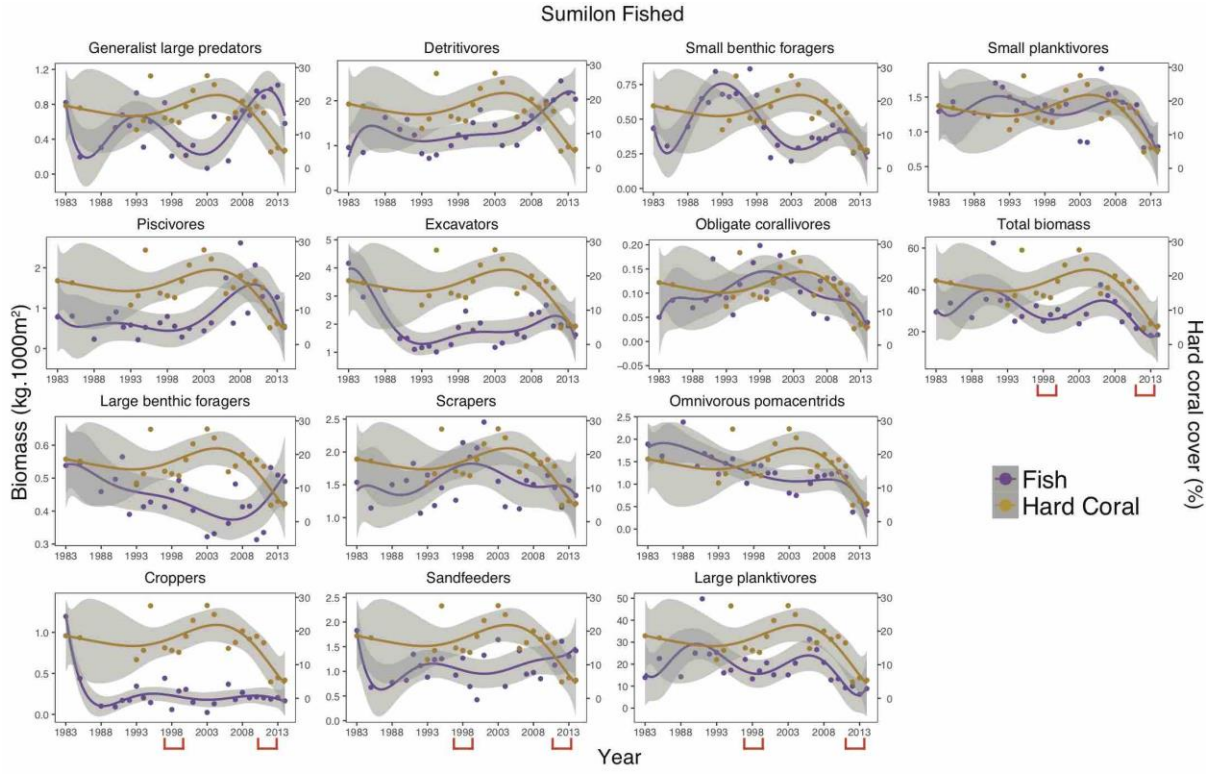

Figure S9. Long-term (1983-2014) temporal trends in biomass (left y-axis) of different trophic groups, and hard coral cover (right y-axis) at Sumilon fished site. Data points are means, trend lines are sixth order polynomials, and shading represents 95% confidence intervals. Fish biomass is purple and hard coral is brown. Note y-axis ranges differ among panels. Environmental disturbances (red brackets) from left to right are coral bleaching (1998) and typhoon (2012).