

UNESCO environmental DNA (eDNA) Expeditions in marine World Heritage sites

Biodiversity survey for Lord Howe Island Group

Interim Results Based on 50% of Samples Analyzed
Not for public distribution

UNESCO's eDNA Expeditions is a global, citizen science initiative that is conducted with the intention to measure marine biodiversity and predict the impact climate change on marine community composition across UNESCO World Heritage marine sites.

eDNA is a cost effective and minimally invasive method to measure biodiversity in any given area. Marine species continuously shed DNA into the water around them in the form of waste, mucus, or cells. By collecting this DNA from water samples, and subsequently amplifying and sequencing specific regions within these DNA strands, experts can detect a wide variety of species without removing any organisms from their environment. The amplified regions are selected depending on the scope of the study: while some markers are suitable to obtain a broad overview of biodiversity across many groups of species, other markers are particularly suited to get high resolution insight for a more specific taxonomic group. The UNESCO eDNA Expeditions initiative combines a number of markers tailored for marine vertebrates (fish, mammals, and turtles). A general marker was added to allow to detect also species from other groups such as invertebrates which can give a broader insight in the marine species diversity in a given area.

Between September 2022 and May 2023, UNESCO organized eDNA sampling campaigns in 21 marine World Heritage sites across 17 countries around the world. At every World Heritage site, about 20 samples were collected from different habitats. Over 250 young people participated in the local sampling expeditions. They were guided by local experts and park management staff, using protocols and eDNA sampling equipment provided by UNESCO.

Biodiversity inventories generated from the samples are being combined with existing species distribution data from public biodiversity databases such as the Ocean Biodiversity Information System (OBIS) in view of obtaining a comprehensive overview of marine life across marine World Heritage sites. Through the use of climate scenarios and species distribution models, an estimate will be made of the impact of climate change, in particular rising temperatures, on local biodiversity and its potential future distribution patterns.

More information about the initiative is available on the UNESCO website: <https://www.unesco.org/en/edna-expeditions>.

Results

Sampling and sample processing

eDNA sampling was conducted in Lord Howe Island Group in December 2022 to February 2023. A total of 20 samples were collected at 6 locations in the park: Comets Hole - Lord Howe Island lagoon, Erscotts Hole - Lord Howe Island lagoon, N/A control, North Bay - Lord Howe Island lagoon, Not specified - Lord Howe, and Sylphs Hole - Lord Howe Island lagoon (Figure 1). Up to 1500 mL of seawater was filtered through filter cartridges with a 0.8 µm pore size. After sampling, the filter cartridges were flushed with preservation liquid and shipped to UNESCO. From the 20 samples, 10 have now (December 2023) been processed. A second batch of samples will be processed in January 2024. DNA from these samples was extracted and amplified, and then sent to the sequencing facility at KU Leuven in Belgium, a specialized university eDNA lab contracted by UNESCO for this work. PCR amplification was done using five primer pairs selected to capture as much biodiversity as possible in the target groups of the study: fish, mammals, and turtles. The results in this preliminary report are based on a first batch of 10 samples that were analyzed covering all locations that were sampled in the World Heritage site.

DNA sequencing

Sequencing of the DNA from 10 samples resulted in over 15 million sequence reads (Table 2), from which we collected 21286 unique sequences or ASVs. By matching those sequences with reference sequences in public databases, we were able to detect 403 species. Most of these species are vertebrates, but also species from other groups were detected, including algae, molluscs, crustaceans, sponges, and starfish (Figure 2). Of the 403 species detected, 190 are not among the 2792 species previously reported from Lord Howe Island Group to the UNESCO OBIS database.

reads	asvs
15066343	21286

Table 1: Reads, ASVs, and species across all samples.

locality	materialSampleID	sampleSize	reads	asvs	species
Comets Hole - Lord Howe Island lagoon	EE0143	1500	1834205	10520	224
Comets Hole - Lord Howe Island lagoon	EE0341	1500	1736853	10408	189
Erscotts Hole - Lord Howe Island lagoon	EE0130	1500	968929	5362	145
Erscotts Hole - Lord Howe Island lagoon	EE0132	1500	326419	1188	28
N/A control	EE0144	1500	558929	511	6
North Bay - Lord Howe Island lagoon	EE0140	1500	1705215	9466	228
North Bay - Lord Howe Island lagoon	EE0141	1500	1841015	9849	229
Not specified - Lord Howe	EE0138	1500	2530456	4114	90
Sylphs Hole - Lord Howe Island lagoon	EE0079	1500	1706690	7897	171
Sylphs Hole - Lord Howe Island lagoon	EE0145	1500	1856049	8892	187

Table 2: Reads, ASVs, and species by sample.

Species identification

The marker sequences obtained from sequencing were matched with sequence reference databases built using public data available from the National Center for Biotechnology Information (NCBI). This resulted in the identification of 403 species, of which 131 fish species, 0 mammalian species, and 0 turtle species (Table 3). This represents about NA% of the species known from Lord Howe Island Group in the OBIS database. 3 of the

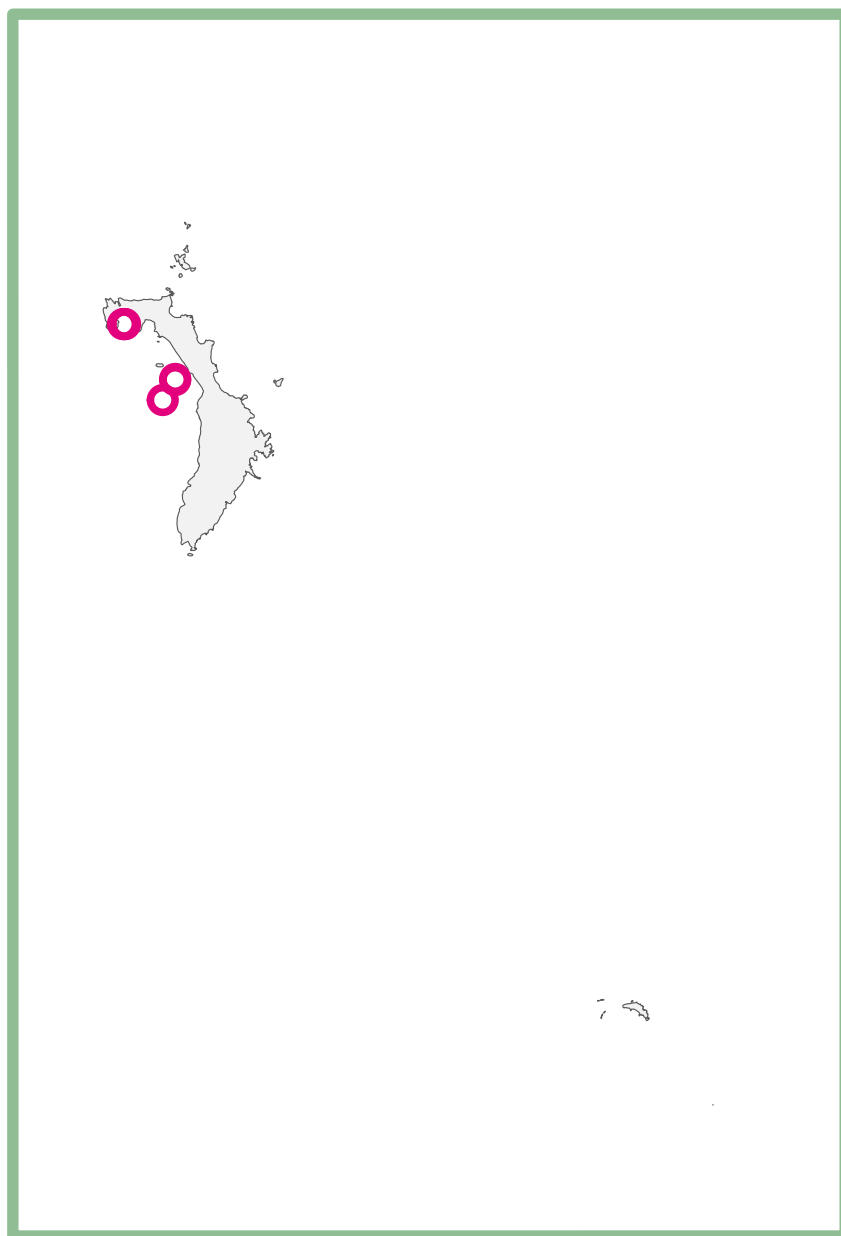


Figure 1: Map of the sampling locations.

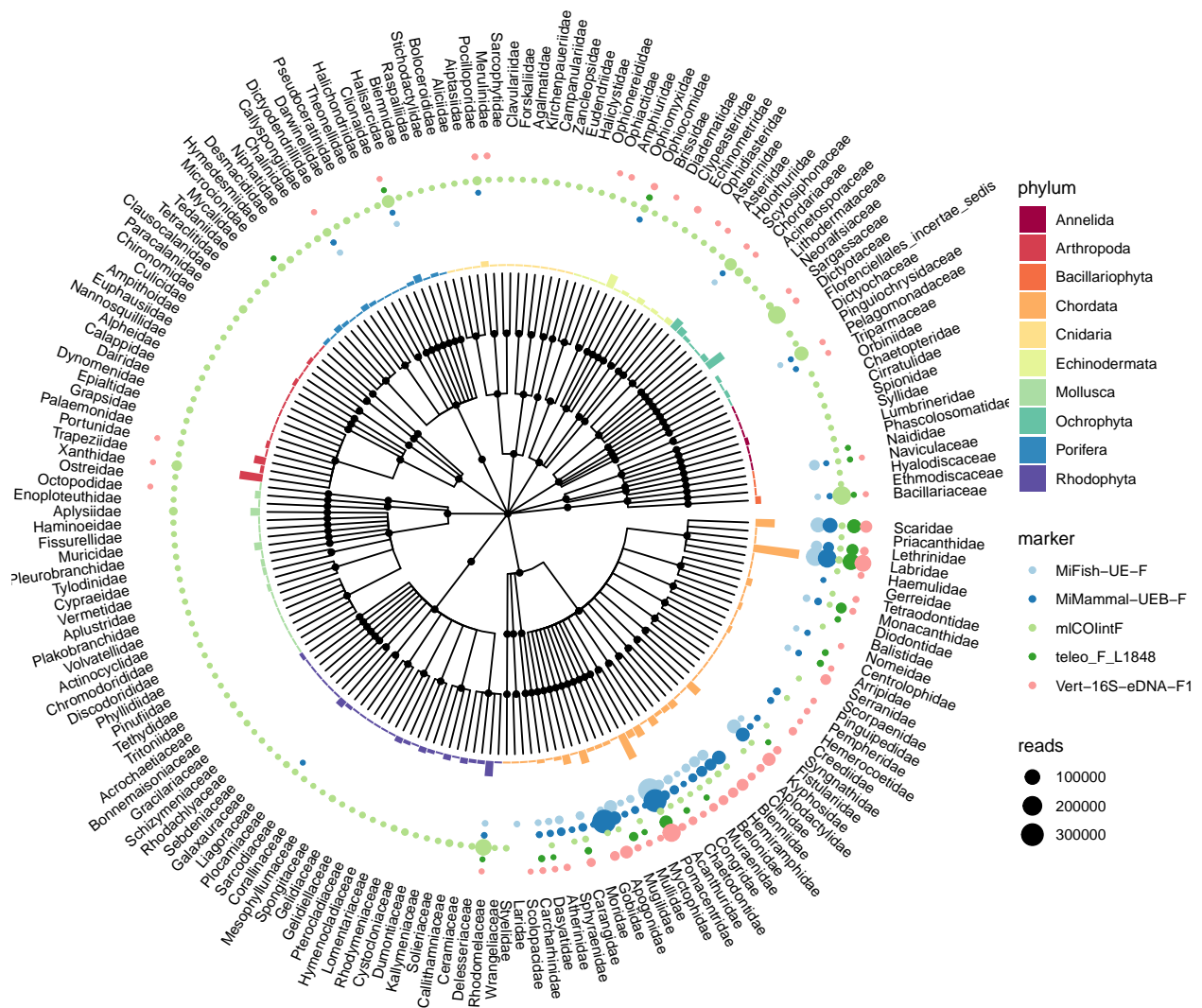


Figure 2: Number of DNA reads (bubbles) and species detected (bars) by family.

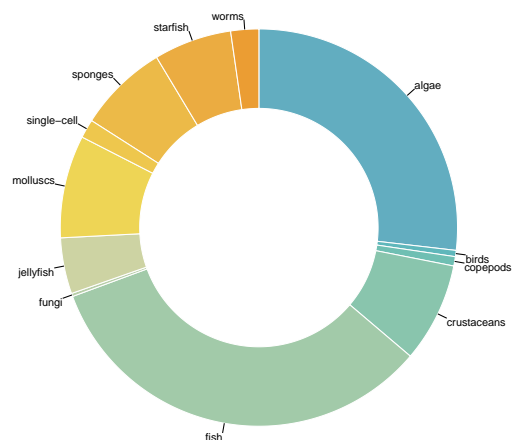


Figure 3: Distribution of detected species across groups.

detected species are listed as threatened on the IUCN Red List (Table 4). A full list of species is added at the end of this report.

group	eDNA species	total species	fraction
fish	131	775	0.17
mammals		11	
turtles		3	

Table 3: Number of species in the three target groups, from the OBIS database and from eDNA sampling.

category	eDNA species	total species	fraction
CR		7	
EN	1	11	0.09
VU	2	42	0.05

Table 4: Number of species by IUCN Red List category, from the OBIS database and from eDNA sampling.

phylum	class	species	group	category	new	vernacular
Amoebozoa	Discosea	Neoparamoeba aestuarina	single-cell		yes	
Amoebozoa	Discosea	Neoparamoeba pemaquidensis	single-cell		yes	
Amoebozoa	Discosea	Pseudoparamoeba pagei	single-cell		yes	
Annelida	Clitellata	Heronidrilus heronae	worms		yes	
Annelida	Polychaeta	Boccardia polybranchia	worms		yes	
Annelida	Polychaeta	Lumbrineris perkinsi	worms		yes	
Annelida	Polychaeta	Megasyllis inflata	worms		yes	
Annelida	Polychaeta	Myrianida pachycera	worms		yes	
Annelida	Polychaeta	Phyllochaetopterus verrilli	worms		yes	
Annelida	Polychaeta	Scoloplos dayi	worms		yes	
Annelida	Polychaeta	Timarete punctata	worms		yes	
Annelida		Phascolosoma (Phascolosoma) nigrescens	worms			
Arthropoda	Copepoda	Clausocalanus furcatus	copepods		yes	
Arthropoda	Copepoda	Mecynocera clausi	copepods		yes	
Arthropoda	Copepoda	Paracalanus nanus	copepods		yes	
Arthropoda	Hexapoda	Culex quinquefasciatus			yes	
Arthropoda	Hexapoda	Pontomyia natans			yes	
Arthropoda	Malacostraca	Actaeodes tomentosus	crustaceans			
Arthropoda	Malacostraca	Alpheus lottini	crustaceans			coral snapping shrimp
Arthropoda	Malacostraca	Ampithoe caddi	crustaceans		yes	
Arthropoda	Malacostraca	Calappa hepatica	crustaceans			smooth box crab
Arthropoda	Malacostraca	Caphyra rotundifrons	crustaceans			
Arthropoda	Malacostraca	Chlorodiella barbata	crustaceans		yes	
Arthropoda	Malacostraca	Chlorodiella cytherea	crustaceans			
Arthropoda	Malacostraca	Cuapetes grandis	crustaceans		yes	
Arthropoda	Malacostraca	Cyclodius obscurus	crustaceans		yes	
Arthropoda	Malacostraca	Daira perlata	crustaceans			
Arthropoda	Malacostraca	Danielea noelensis	crustaceans		yes	
Arthropoda	Malacostraca	Etisus bifrontalis	crustaceans		yes	
Arthropoda	Malacostraca	Etisus electra	crustaceans			
Arthropoda	Malacostraca	Hirsutodynamene spinosa	crustaceans		yes	
Arthropoda	Malacostraca	Liocarpilodes integerrimus	crustaceans		yes	
Arthropoda	Malacostraca	Menaethius monoceros	crustaceans			
Arthropoda	Malacostraca	Pachygrapsus minutus	crustaceans		yes	
Arthropoda	Malacostraca	Paramedaeus simplex	crustaceans		yes	
Arthropoda	Malacostraca	Pilodius moranti	crustaceans			
Arthropoda	Malacostraca	Planes minutus	crustaceans			Gulfweed crab, crabe menu
Arthropoda	Malacostraca	Platypodia pseudogranulosa	crustaceans		yes	
Arthropoda	Malacostraca	Pleonexes kava	crustaceans		yes	
Arthropoda	Malacostraca	Portunus pubescens	crustaceans		yes	
Arthropoda	Malacostraca	Pullosquilla litoralis	crustaceans		yes	
Arthropoda	Malacostraca	Thalamita admete	crustaceans			
Arthropoda	Malacostraca	Thalamita pelsarti	crustaceans		yes	
Arthropoda	Malacostraca	Thalamita prymna	crustaceans			
Arthropoda	Malacostraca	Thysanoessa gregaria	crustaceans		yes	
Arthropoda	Malacostraca	Trapezia cymodoce	crustaceans			
Arthropoda	Malacostraca	Trapezia serenei	crustaceans		yes	
Arthropoda	Malacostraca	Xiphonectes longispinosus	crustaceans			
Arthropoda	Malacostraca	Zosimus aeneus	crustaceans			
Arthropoda	Thecostraca	Tetraclitella divisa			yes	

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phylum	class	species	group	category	new	vernacular
Bacillariophyta	Bacillariophyceae	Cylindrotheca closterium	algae			
Bacillariophyta	Bacillariophyceae	Ethmodiscus punctiger	algae		yes	
Bacillariophyta	Bacillariophyceae	Haslea pseudostrearia	algae		yes	
Bacillariophyta	Bacillariophyceae	Podosira stelligera	algae			
Bacillariophyta	Bacillariophyceae	Pseudo-nitzschia cuspidata	algae		yes	
Bacillariophyta	Bacillariophyceae	Pseudo-nitzschia sabit	algae		yes	
Cercozoa	Chlorarachnea	Bigelowiella natans	single-cell		yes	
Cercozoa	Chlorarachnea	Chlorarachnion reptans	single-cell		yes	
Chlorophyta	Mamiellophyceae	Bathycoccus prasinos	algae		yes	
Chlorophyta	Mamiellophyceae	Dolichomastix tenuilepis	algae		yes	
Chlorophyta	Mamiellophyceae	Micromonas commoda	algae		yes	
Chlorophyta	Mamiellophyceae	Micromonas pusilla	algae		yes	
Chlorophyta	Pyramimonadophyceae	Prasinoderma coloniale	algae		yes	
Chlorophyta		Chloroparvula pacifica	algae		yes	
Chlorophyta		Chloropicon laureae	algae		yes	
Chlorophyta		Chloropicon primus	algae		yes	
Chlorophyta		Chloropicon roscoffensis	algae		yes	
Chlorophyta		Chloropicon sieburthii	algae		yes	
Chordata	Asciidiacea	Symplegma reptans			yes	
Chordata	Aves	Onychoprion fuscatus	birds	LC		sooty tern
Chordata	Aves	Tringa incana	birds	LC		wandering tattler, chevalier errant
Chordata	Elasmobranchii	Bathytoshia lata	fish	VU		
Chordata	Elasmobranchii	Carcharhinus obscurus	fish	EN	yes	dusky shark
Chordata	Elasmobranchii	Taeniurops meyeri	fish	VU		
Chordata	Teleostei	Abudefduf sexfasciatus	fish	LC		scissortail sergeant
Chordata	Teleostei	Acanthistius ocellatus	fish	LC		
Chordata	Teleostei	Acanthurus triostegus	fish	LC		convict surgeonfish
Chordata	Teleostei	Aluterus scriptus	fish	LC		scrawled filefish
Chordata	Teleostei	Amblyglyphidodon leucogaster	fish	LC	yes	whitebelly damselfish
Chordata	Teleostei	Amblygobius phalaena	fish	LC		
Chordata	Teleostei	Amphiprion akindynos	fish	LC	yes	
Chordata	Teleostei	Anampses caeruleopunctatus	fish	LC		bluespotted wrasse
Chordata	Teleostei	Anampses elegans	fish	LC		
Chordata	Teleostei	Aplodactylus etheridgii	fish			
Chordata	Teleostei	Arripis trutta	fish			
Chordata	Teleostei	Bathygobius cocosensis	fish	LC		
Chordata	Teleostei	Callogobius hasseltii	fish	LC	yes	
Chordata	Teleostei	Calotomus spinidens	fish	LC	yes	spinytooth parrotfish
Chordata	Teleostei	Cantherhines pardalis	fish	LC		wier-net filefish
Chordata	Teleostei	Canthigaster callisterna	fish	LC		
Chordata	Teleostei	Caranx sexfasciatus	fish	LC		bigeye trevally
Chordata	Teleostei	Ceratoscopelus warmingii	fish	LC		Warming's lantern fish
Chordata	Teleostei	Chaetodon citrinellus	fish	LC		
Chordata	Teleostei	Chaetodon flavirostris	fish	LC		
Chordata	Teleostei	Chaetodon lunula	fish	LC		raccoon butterflyfish
Chordata	Teleostei	Chaetodon melannotus	fish	LC		blackback butterflyfish
Chordata	Teleostei	Chaetodon mertensii	fish	LC		
Chordata	Teleostei	Chaetodon plebeius	fish	LC		
Chordata	Teleostei	Cheilio inermis	fish	LC		cigar wrasse
Chordata	Teleostei	Chlorurus sordidus	fish	LC		

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phylum	class	species	group	category	new	vernacular
Chordata	Teleostei	Chromis atripectoralis	fish	LC		black-axil chromis
Chordata	Teleostei	Chromis hypsilepis	fish	LC		
Chordata	Teleostei	Chrysiptera galba	fish	LC	yes	
Chordata	Teleostei	Cirripectes castaneus	fish	LC		chestnut blenny
Chordata	Teleostei	Conger cinereus	fish	LC		mustache conger
Chordata	Teleostei	Coris aygula	fish	LC		clown wrasse
Chordata	Teleostei	Cubiceps capensis	fish	LC	yes	Cape cubehead
Chordata	Teleostei	Cymolutes torquatus	fish	LC		finescape razorfish
Chordata	Teleostei	Dascyllus aruanus	fish	LC		banded dascyllus
Chordata	Teleostei	Decapterus macarellus	fish	LC	yes	mackerel scad
Chordata	Teleostei	Decapterus muroadsi	fish	LC		amberstripe scad
Chordata	Teleostei	Diodon hystrix	fish	LC		spot-fin porcupinefish
Chordata	Teleostei	Echidna nebulosa	fish	LC		snowflake moray
Chordata	Teleostei	Enchelyurus ater	fish	LC		
Chordata	Teleostei	Entomacrodus striatus	fish	LC		reef margin blenny
Chordata	Teleostei	Eucinostomus gula	fish	LC	yes	Jenny mojarra
Chordata	Teleostei	Eviota afelei	fish	LC		Afele's fringe-fin goby
Chordata	Teleostei	Eviota prasina	fish	LC		green bubble goby
Chordata	Teleostei	Fistularia commersonii	fish	LC		cornetfish
Chordata	Teleostei	Fowleria vaiulae	fish		yes	
Chordata	Teleostei	Girella cyanea	fish			
Chordata	Teleostei	Gnatholepis anjerensis	fish	LC		
Chordata	Teleostei	Gomphosus caeruleus	fish	LC	yes	Red Sea bird wrasse
Chordata	Teleostei	Gymnothorax chilospilus	fish	LC		lipspot moray
Chordata	Teleostei	Gymnothorax eurostus	fish	LC		
Chordata	Teleostei	Gymnothorax kidako	fish	LC	yes	
Chordata	Teleostei	Gymnothorax meleagris	fish	LC		turkey moray
Chordata	Teleostei	Halichoeres margaritaceus	fish	LC		
Chordata	Teleostei	Halichoeres trimaculatus	fish	LC		
Chordata	Teleostei	Hemigymnus melapterus	fish	LC		thicklip wrasse
Chordata	Teleostei	Heteroclinus roseus	fish	LC		rosy weedfish
Chordata	Teleostei	Hypoatherina temminckii	fish			Samoa silver side
Chordata	Teleostei	Hyporhamphus australis	fish			
Chordata	Teleostei	Hyporhamphus melanochir	fish		yes	
Chordata	Teleostei	Hyporhamphus yuri	fish		yes	
Chordata	Teleostei	Iniistius pavo	fish	LC		peacock razorfish
Chordata	Teleostei	Kyphosus bigibbus	fish	LC		grey sea chub
Chordata	Teleostei	Kyphosus cinerascens	fish	LC		snubnose chub
Chordata	Teleostei	Kyphosus pacificus	fish			
Chordata	Teleostei	Kyphosus sydneyanus	fish			
Chordata	Teleostei	Kyphosus vaigiensis	fish	LC		brassy chub
Chordata	Teleostei	Labroides dimidiatus	fish	LC		cleaner wrasse
Chordata	Teleostei	Leptoscarus vaigiensis	fish	LC		marbled parrotfish
Chordata	Teleostei	Lethrinus nebulosus	fish	LC		spangled emperor
Chordata	Teleostei	Limnichthys fasciatus	fish	LC		
Chordata	Teleostei	Lotella phycis	fish			
Chordata	Teleostei	Matsubaraea fusiformis	fish		yes	
Chordata	Teleostei	Microcanthus strigatus	fish	LC		
Chordata	Teleostei	Mugil cephalus	fish	LC	yes	grey mullet, muge
Chordata	Teleostei	Myxus elongatus	fish			

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phylum	class	species	group	category	new	vernacular
Chordata	Teleostei	Naso lopezi	fish	LC	yes	
Chordata	Teleostei	Naso unicornis	fish	LC		bluespine unicornfish
Chordata	Teleostei	Neoglyphidodon polyacanthus	fish	LC		
Chordata	Teleostei	Neogobius fluviatilis	fish	LC	yes	monkey goby
Chordata	Teleostei	Notolabrus gymnogenis	fish	LC		
Chordata	Teleostei	Notolabrus inscriptus	fish	LC		
Chordata	Teleostei	Novaculoides macrolepidotus	fish			seagrass wrasse
Chordata	Teleostei	Ostorhinchus doederleini	fish	LC		
Chordata	Teleostei	Parapercis cylindrica	fish	LC		cylindrical sandperch
Chordata	Teleostei	Parma microlepis	fish	LC		
Chordata	Teleostei	Parma oligolepis	fish	LC		
Chordata	Teleostei	Parupeneus ciliatus	fish	LC		whitesaddle goatfish
Chordata	Teleostei	Parupeneus spilurus	fish	LC		blackspot goatfish, rouget-barbet à tache noire
Chordata	Teleostei	Pempheris rapa	fish		yes	
Chordata	Teleostei	Pervagor janthinosoma	fish	LC		blackbar filefish
Chordata	Teleostei	Pictilabrus laticlavus	fish	LC		
Chordata	Teleostei	Platybelone argalus	fish	LC		keeltail needlefish
Chordata	Teleostei	Plectorhinchus picus	fish			painted sweetlip
Chordata	Teleostei	Plectroglyphidodon dickii	fish	NT		blackbar devil
Chordata	Teleostei	Plectroglyphidodon gascoynei	fish			
Chordata	Teleostei	Plectroglyphidodon johnstonianus	fish	LC		Johnston Island damsel
Chordata	Teleostei	Plectroglyphidodon leucozonus	fish	LC		
Chordata	Teleostei	Priacanthus hamrur	fish	LC		goggle-eye
Chordata	Teleostei	Prionurus maculatus	fish	LC		
Chordata	Teleostei	Psenes pellucidus	fish	LC		bluefin driftfish
Chordata	Teleostei	Pseudocaranx dentex	fish	LC		guelly jack, carangue dentue
Chordata	Teleostei	Pseudocheilinus hexataenia	fish	LC		sixstripe wrasse
Chordata	Teleostei	Pseudolabrus luculentus	fish	LC		
Chordata	Teleostei	Scarus altipinnis	fish	LC		
Chordata	Teleostei	Scarus frenatus	fish	LC		bridled parrotfish
Chordata	Teleostei	Scarus ghobban	fish	LC		bluechin parrotfish
Chordata	Teleostei	Scarus globiceps	fish	LC		globehead parrotfish
Chordata	Teleostei	Scarus psittacus	fish	LC		palenose parrotfish
Chordata	Teleostei	Scarus rivulatus	fish	LC		
Chordata	Teleostei	Scarus schlegeli	fish	LC		
Chordata	Teleostei	Schedophilus velaini	fish	LC		
Chordata	Teleostei	Scorpaenodes evides	fish	LC		
Chordata	Teleostei	Seriola lalandi	fish	LC		yellowtail, sérieole chicard
Chordata	Teleostei	Sphyaena flavicauda	fish		yes	yellowtail barracuda
Chordata	Teleostei	Sphyaena obtusata	fish			obtuse barracuda
Chordata	Teleostei	Stanulus talboti	fish	LC		
Chordata	Teleostei	Stethojulis bandanensis	fish	LC		
Chordata	Teleostei	Stethojulis strigiventer	fish	LC		three-ribbon rainbowfish
Chordata	Teleostei	Stigmatopora nigra	fish	LC		
Chordata	Teleostei	Sufflamen fraenatum	fish	LC		
Chordata	Teleostei	Thalassoma hardwicke	fish	LC		
Chordata	Teleostei	Thalassoma lunare	fish	LC		moon wrasse
Chordata	Teleostei	Thalassoma lutescens	fish	LC		
Chordata	Teleostei	Thalassoma purpureum	fish	LC		surge wrasse
Chordata	Teleostei	Thalassoma trilobatum	fish	LC		Christmas wrasse

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phylum	class	species	group	category	new	vernacular
Chordata	Teleostei	Trachypoma macracanthus	fish	LC		
Chordata	Teleostei	Tylosurus crocodilus	fish	LC		houndfish
Cnidaria	Anthozoa	Bolocerooides mcmurrici	jellyfish		yes	
Cnidaria	Anthozoa	Clavularia crassa	jellyfish	LC	yes	
Cnidaria	Anthozoa	Exaiptasia diaphana	jellyfish			
Cnidaria	Anthozoa	Favites abdita	jellyfish	NT		larger star coral
Cnidaria	Anthozoa	Lobophytum crassum	jellyfish		yes	
Cnidaria	Anthozoa	Pocillopora acuta	jellyfish		yes	
Cnidaria	Anthozoa	Pocillopora damicornis	jellyfish	LC		cauliflower coral
Cnidaria	Anthozoa	Stichodactyla haddoni	jellyfish		yes	Haddon's sea anemone
Cnidaria	Anthozoa	Stylophora pistillata	jellyfish	NT		hood coral
Cnidaria	Anthozoa	Triactis producta	jellyfish		yes	crab anemone
Cnidaria	Hydrozoa	Clytia gracilis	jellyfish		yes	
Cnidaria	Hydrozoa	Eudendrium capillare	jellyfish		yes	
Cnidaria	Hydrozoa	Forskalia tholoides	jellyfish		yes	
Cnidaria	Hydrozoa	Kirchenpaueria halecioides	jellyfish		yes	
Cnidaria	Hydrozoa	Nanomia bijuga	jellyfish		yes	
Cnidaria	Hydrozoa	Zancleopsis dichotoma	jellyfish		yes	
Cnidaria	Staurozoa	Haliclystus inabai	jellyfish		yes	
Cryptophyta	Cryptophyceae	Hemiarma marina			yes	
Cryptophyta	Cryptophyceae	Hemiselmis andersenii			yes	
Ctenophora	Tentaculata	Vallicula multiformis	jellyfish		yes	
Echinodermata	Asteroidea	Aquilonastra anomala	starfish			
Echinodermata	Asteroidea	Coscinasterias muricata	starfish			
Echinodermata	Asteroidea	Linckia guildingi	starfish			
Echinodermata	Asteroidea	Parvalastra exigua	starfish			
Echinodermata	Echinoidea	Brissus agassizii	starfish			
Echinodermata	Echinoidea	Centrostephanus rodgersii	starfish			
Echinodermata	Echinoidea	Clypeaster japonicus	starfish		yes	
Echinodermata	Echinoidea	Diadema savignyi	starfish			
Echinodermata	Echinoidea	Echinometra mathaei	starfish			rock-boring urchin
Echinodermata	Echinoidea	Echinostrephus aciculatus	starfish			
Echinodermata	Echinoidea	Helicidaris tuberculata	starfish			
Echinodermata	Holothuroidea	Holothuria (Thymiosycia) arenicola	starfish			
Echinodermata	Holothuroidea	Holothuria atra	starfish	LC		
Echinodermata	Holothuroidea	Holothuria leucospilota	starfish	LC		
Echinodermata	Ophiuroidea	Amphipholis squamata	starfish			dwarf brittle star
Echinodermata	Ophiuroidea	Breviturma brevipes	starfish			
Echinodermata	Ophiuroidea	Breviturma dentata	starfish			
Echinodermata	Ophiuroidea	Breviturma pica	starfish			
Echinodermata	Ophiuroidea	Ophiactis savignyi	starfish			
Echinodermata	Ophiuroidea	Ophiocoma erinaceus	starfish		yes	
Echinodermata	Ophiuroidea	Ophiocoma ophiactoides	starfish		yes	
Echinodermata	Ophiuroidea	Ophiocoma sexradia	starfish			
Echinodermata	Ophiuroidea	Ophiomastix endeani	starfish			
Echinodermata	Ophiuroidea	Ophiomyxa australis	starfish			
Echinodermata	Ophiuroidea	Ophionereis porrecta	starfish			
Haptophyta	Coccolithophyceae	Emiliania huxleyi	algae		yes	
Haptophyta	Coccolithophyceae	Isochrysis galbana	algae		yes	
Haptophyta	Coccolithophyceae	Phaeocystis globosa	algae		yes	

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phylum	class	species	group	category	new	vernacular
Haptophyta	Coccolithophyceae	Phaeocystis pouchetii	algae		yes	
Hemichordata	Enteropneusta	Ptychodera flava			yes	Hawaiian acorn worm
Mollusca	Bivalvia	Dendostrea frons	molluscs		yes	frond oyster
Mollusca	Cephalopoda	Abrialopsis tui	molluscs	DD	yes	
Mollusca	Cephalopoda	Amphioctopus kagoshimensis	molluscs	LC		
Mollusca	Cephalopoda	Callistoctopus ornatus	molluscs	LC		ornate octopus
Mollusca	Cephalopoda	Octopus cyanea	molluscs	LC		Cyane's octopus
Mollusca	Gastropoda	Actinocyclus verrucosus	molluscs			
Mollusca	Gastropoda	Aplysia argus	molluscs			
Mollusca	Gastropoda	Aplysia concava	molluscs			
Mollusca	Gastropoda	Aplysia parvula	molluscs			dwarf sea hare, petit lièvre de mer
Mollusca	Gastropoda	Berthellina citrina	molluscs			lemon pleurobranch
Mollusca	Gastropoda	Carminodoris grandiflora	molluscs		yes	
Mollusca	Gastropoda	Cupolaconcha meroclista	molluscs		yes	
Mollusca	Gastropoda	Dendropoma gregarium	molluscs		yes	
Mollusca	Gastropoda	Dolabella auricularia	molluscs			wedge sea hare
Mollusca	Gastropoda	Elysia asbecki	molluscs		yes	
Mollusca	Gastropoda	Elysia bennettiae	molluscs			
Mollusca	Gastropoda	Hydatina physis	molluscs			striped bubble shell
Mollusca	Gastropoda	Lyncina vitellus	molluscs			
Mollusca	Gastropoda	Marionipopsis hawaiiensis	molluscs		yes	
Mollusca	Gastropoda	Melibe viridis	molluscs			
Mollusca	Gastropoda	Monetaria caputserpentis	molluscs			serpent's head cowry
Mollusca	Gastropoda	Oppomorus noduliferus	molluscs			
Mollusca	Gastropoda	Phanerophthalmus paulayi	molluscs		yes	
Mollusca	Gastropoda	Phyllidiella pustulosa	molluscs			pustulose wart slug
Mollusca	Gastropoda	Pinufius rebus	molluscs		yes	
Mollusca	Gastropoda	Pleurobranchus albiguttatus	molluscs			
Mollusca	Gastropoda	Pleurobranchus peronii	molluscs			
Mollusca	Gastropoda	Pleurobranchus varians	molluscs		yes	
Mollusca	Gastropoda	Scutus forsythi	molluscs			
Mollusca	Gastropoda	Stylocheilus striatus	molluscs			
Mollusca	Gastropoda	Tylodina perversa	molluscs		yes	yellow umbrella slug, tylodine jaune
Mollusca	Gastropoda	Verconia haliclona	molluscs		yes	
Mollusca	Gastropoda	Volvatella viridis	molluscs		yes	
Myzozoa	Dinophyceae	Amphidinium operculatum	single-cell		yes	
Ochrophyta	Bolidophyceae	Triparma laevis	algae		yes	
Ochrophyta	Dictyochophyceae	Octactis octonaria	algae		yes	
Ochrophyta	Dictyochophyceae	Pseudochattonella farcimen	algae		yes	
Ochrophyta	Dictyochophyceae	Vicicitus globosus	algae		yes	
Ochrophyta	Pelagophyceae	Aureococcus anophagefferens	algae		yes	
Ochrophyta	Pelagophyceae	Pelagomonas calceolata	algae		yes	
Ochrophyta	Phaeophyceae	Acinetospora filamentosa	algae		yes	
Ochrophyta	Phaeophyceae	Canistrocarpus cervicornis	algae		yes	
Ochrophyta	Phaeophyceae	Cladosiphon okamuranus	algae		yes	
Ochrophyta	Phaeophyceae	Colpomenia claytoniae	algae		yes	
Ochrophyta	Phaeophyceae	Colpomenia sinuosa	algae		yes	
Ochrophyta	Phaeophyceae	Dactylosiphon bullosus	algae		yes	
Ochrophyta	Phaeophyceae	Dictyota acutiloba	algae			
Ochrophyta	Phaeophyceae	Dictyota ciliolata	algae			

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phylum	class	species	group	category	new	vernacular
Ochrophyta	Phaeophyceae	Dictyota intermedia	algae			
Ochrophyta	Phaeophyceae	Dictyota mayae	algae		yes	
Ochrophyta	Phaeophyceae	Feldmannia mitchelliae	algae		yes	
Ochrophyta	Phaeophyceae	Hydroclathrus clathratus	algae			
Ochrophyta	Phaeophyceae	Hydroclathrus tilesii	algae		yes	
Ochrophyta	Phaeophyceae	Lobophora rickeri	algae		yes	
Ochrophyta	Phaeophyceae	Lobophora rosacea	algae		yes	
Ochrophyta	Phaeophyceae	Lobophora sonderi	algae		yes	
Ochrophyta	Phaeophyceae	Microspongium stilophorae	algae		yes	
Ochrophyta	Phaeophyceae	Nemacystus decipiens	algae		yes	
Ochrophyta	Phaeophyceae	Neoralsia expansa	algae		yes	
Ochrophyta	Phaeophyceae	Padina gymnospora	algae			
Ochrophyta	Phaeophyceae	Pseudolithoderma roscoffense	algae		yes	
Ochrophyta	Phaeophyceae	Punctaria latifolia	algae		yes	
Ochrophyta	Phaeophyceae	Rosenvingea intricata	algae		yes	
Ochrophyta	Phaeophyceae	Rugulopteryx marginata	algae		yes	
Ochrophyta	Phaeophyceae	Sargassum aquifolium	algae		yes	
Ochrophyta	Phaeophyceae	Sargassum polycystum	algae		yes	
Ochrophyta	Phaeophyceae	Sirophysalis trinodis	algae			
Ochrophyta	Pinguiphyceae	Pinguicoccus pyrenoidosus	algae		yes	
Oomycota		Anisopidium rosenvingei	fungi		yes	
Porifera	Demospongiae	Biemna fistulosa	sponges		yes	stinging tube sponge
Porifera	Demospongiae	Callyspongia (Cladochalina) diffusa	sponges		yes	
Porifera	Demospongiae	Callyspongia (Cladochalina) plicifera	sponges		yes	
Porifera	Demospongiae	Chelonaplysilla erecta	sponges		yes	
Porifera	Demospongiae	Cladocroce burapha	sponges		yes	
Porifera	Demospongiae	Clathria (Thalysias) curacaoensis	sponges		yes	
Porifera	Demospongiae	Clathria (Thalysias) reinwardti	sponges		yes	
Porifera	Demospongiae	Clathria (Wilsonella) rugosa	sponges		yes	
Porifera	Demospongiae	Cliona celata	sponges		yes	boring sponge, clone jaune
Porifera	Demospongiae	Cliona vermifera	sponges		yes	orange boring sponge
Porifera	Demospongiae	Cliothisa delitrix	sponges		yes	
Porifera	Demospongiae	Desmapsamma anchorata	sponges		yes	
Porifera	Demospongiae	Dictyodendrilla cavernosa	sponges		yes	
Porifera	Demospongiae	Gelliodes wilsoni	sponges		yes	
Porifera	Demospongiae	Halichondria (Halichondria) okadai	sponges		yes	
Porifera	Demospongiae	Halichondria (Halichondria) panicea	sponges		yes	breadcrumb sponge
Porifera	Demospongiae	Haliclona (Gellius) amboinensis	sponges		yes	
Porifera	Demospongiae	Haliclona (Reniera) tubifera	sponges		yes	
Porifera	Demospongiae	Halisarca dujardini	sponges		yes	soft horny sponge, éponge de Dujardin
Porifera	Demospongiae	Hooperia anfractuosa	sponges		yes	
Porifera	Demospongiae	Mycale (Carmia) cecilia	sponges		yes	
Porifera	Demospongiae	Phorbas clathratus	sponges		yes	
Porifera	Demospongiae	Pione vastifica	sponges		yes	boring sponge, clone rouge
Porifera	Demospongiae	Pseudoceratina purpurea	sponges		yes	
Porifera	Demospongiae	Sigmaxinella hipposiderus	sponges		yes	
Porifera	Demospongiae	Sollasella moretonensis	sponges		yes	
Porifera	Demospongiae	Tedania (Tedania) ignis	sponges		yes	
Porifera	Demospongiae	Tedania (Tedania) tubulifera	sponges		yes	
Porifera	Demospongiae	Theonella swinhoei	sponges		yes	

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phylum	class	species	group	category	new	vernacular
Rhodophyta	Florideophyceae	Acanthophora dendroides	algae		yes	
Rhodophyta	Florideophyceae	Acanthophora spicifera	algae			
Rhodophyta	Florideophyceae	Acrochaetium humile	algae		yes	
Rhodophyta	Florideophyceae	Acrochaetium plumosum	algae		yes	
Rhodophyta	Florideophyceae	Aglaothamnion callophyllidicola	algae		yes	
Rhodophyta	Florideophyceae	Amansia fimbriolia	algae		yes	
Rhodophyta	Florideophyceae	Antithamnion antillanum	algae		yes	
Rhodophyta	Florideophyceae	Asparagopsis taxiformis	algae			
Rhodophyta	Florideophyceae	Asteromenia anastomosans	algae			
Rhodophyta	Florideophyceae	Asteromenia pseudocoalescens	algae			
Rhodophyta	Florideophyceae	Austrokalymenia rosea	algae			
Rhodophyta	Florideophyceae	Botryocladia leptopoda	algae			
Rhodophyta	Florideophyceae	Callophyllis nana	algae			
Rhodophyta	Florideophyceae	Centroceras clavulatum	algae		yes	
Rhodophyta	Florideophyceae	Ceratodictyon scoparium	algae		yes	
Rhodophyta	Florideophyceae	Chondria armata	algae			
Rhodophyta	Florideophyceae	Corallina ferreyrae	algae		yes	
Rhodophyta	Florideophyceae	Crassitegula imitans	algae			
Rhodophyta	Florideophyceae	Crouania attenuata	algae		yes	
Rhodophyta	Florideophyceae	Cryptopleura ramosa	algae		yes	
Rhodophyta	Florideophyceae	Dudresnaya hawaiiensis	algae			
Rhodophyta	Florideophyceae	Eucheuma serra	algae			
Rhodophyta	Florideophyceae	Galaxaura rugosa	algae			
Rhodophyta	Florideophyceae	Ganonema farinosum	algae			
Rhodophyta	Florideophyceae	Gelidiella acerosa	algae			
Rhodophyta	Florideophyceae	Gelidium johnstonii	algae		yes	
Rhodophyta	Florideophyceae	Halichrysis micans	algae			
Rhodophyta	Florideophyceae	Haloplegma duperreyi	algae			
Rhodophyta	Florideophyceae	Helminthocladia australis	algae			
Rhodophyta	Florideophyceae	Heterosiphonia crassipes	algae			
Rhodophyta	Florideophyceae	Hydropuntia perplexa	algae			
Rhodophyta	Florideophyceae	Hypnea cervicornis	algae			
Rhodophyta	Florideophyceae	Hypnea valentiae	algae		yes	
Rhodophyta	Florideophyceae	Laurencia dendroidea	algae			
Rhodophyta	Florideophyceae	Laurencia pacifica	algae		yes	
Rhodophyta	Florideophyceae	Liagora ceranoides	algae			
Rhodophyta	Florideophyceae	Liagora mannarensis	algae		yes	
Rhodophyta	Florideophyceae	Melyvonnea erubescens	algae		yes	
Rhodophyta	Florideophyceae	Meredithia guiryorum	algae			
Rhodophyta	Florideophyceae	Neogoniolithon brassica-florida	algae		yes	
Rhodophyta	Florideophyceae	Palisada parvipapillata	algae		yes	
Rhodophyta	Florideophyceae	Platoma cyclocolpum	algae			
Rhodophyta	Florideophyceae	Plocamium cartilagineum	algae			
Rhodophyta	Florideophyceae	Plocamium hamatum	algae			
Rhodophyta	Florideophyceae	Polysiphonia stricta	algae		yes	
Rhodophyta	Florideophyceae	Pterocladia lucida	algae			
Rhodophyta	Florideophyceae	Pterocladia beachiae	algae		yes	
Rhodophyta	Florideophyceae	Pterocladia capillacea	algae			
Rhodophyta	Florideophyceae	Rhodachlya hawaiiiana	algae		yes	
Rhodophyta	Florideophyceae	Rhodomenia insularis	algae			

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phylum	class	species	group	category	new	vernacular
Rhodophyta	Florideophyceae	Sarcodia ciliata	algae			
Rhodophyta	Florideophyceae	Spyridia filamentosa	algae		yes	
Rotifera	Eurotatoria	Adineta steineri			yes	