

WORLD SCIENCE FESTIVAL CORAL REEF DECK

THIS DOCUMENT INCLUDES 1 PAGE SPECIAL CORAL REEF INSTRUCTIONS, 9 PAGES OF CARDS (49 PHYLO CARDS) AND 1 CARD BACK PAGE (10 PAGES TOTAL)

NOTE THAT CARD SIZE IS IDENTICAL TO THAT OF POKEMON CARDS (62 mm x 87 mm or 2 7/16 inches x 3 7/16 inches).

WE RECOMMEND PRINTING THESE CARDS, IN COLOUR, ON 65LB+ WHITE CARD STOCK.

USING CARD SLEEVE PROTECTORS (~64mm x 89mm) OR LAMINATING CARDS WILL ALSO GREATLY ENHANCE THE FEEL OF THE CARDS.

FOR MORE CARDS, GAME RULES, AND GENERAL INFORMATION ABOUT THE PHYLO PROJECT, PLEASE GO TO:

<http://phylogame.org>



The World Science Festival is a production of the Science Festival Foundation, a 501(c)(3) non-profit organization headquartered in New York City. The Foundation's mission is to cultivate a general public informed by science, inspired by its wonder, convinced of its value, and prepared to engage with its implications for the future.

For more information, please visit www.worldsciencefestival.com

WORLD SCIENCE FESTIVAL/CORAL REEF EDITION

In general, coral reef ecosystems consist of plankton living together with corals, with Zooxanthellae playing an especially important role in warmer coral ecosystems. From this basic relationship, many other organisms can also take part in the ecosystem, including algae, fish, crustacea, and sharks. With this game, the purpose is to try and place as many of your species cards on the table, all the while making sure your species cards have something to sustain (feed) them. As well, there are EVENT cards, which can change things up a bit. When these are played, you may find that many of your food chains are disrupted, which may mean the loss of cards and therefore loss of points. Consequently, the Phylo game is all about building these chains, and also seeing how different things can affect them.

CORAL REEF PHYLO RULES (see <http://phylogame.org> for more details)

Place two ZOOXANTHELLAE CARDS in the center. ONE FACING EACH PLAYER.

Each Player picks up 5 cards and put the rest of the cards in a pile called the PICK-UP DECK. Cards that are removed from the game go into a DISCARD PILE.

The two players will take turns. In each TURN, they can pick up a new card and make 3 ACTIONS.

ACTIONS YOU CAN MAKE:

- PLAY a card in your hand onto the table (**make sure you play them facing you**).
- DROP a card in a DISCARD PILE and PICK UP three cards.
- MOVE a card (# of moves is on the card itself). MOVE# tells you how many spots the card can move. Up down left right movement only (no diagonal), and it must end up in a free space.
- You may PASS.

Once all the cards are finished in the PICK UP PILE, and no more moves can be made, pick up all the cards FACING YOU and add up all the points. Person with the most points WIN!

PLAYING A CARD

FOODCHAIN#1 cards can be played anywhere as long as it is placed adjacent to a card with at least 1 temperature and 1 terrain MATCH (this makes it compatible). NOTE that all Coral cards are OCEAN terrain.

FOODCHAIN#2 cards must be placed next to at least 1 compatible FOODCHAIN#1 cards.

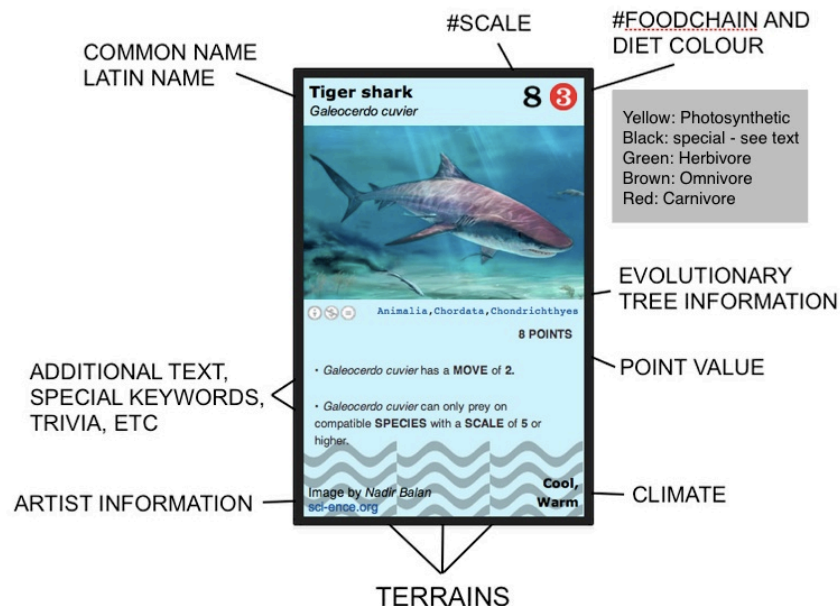
FOODCHAIN#3 cards must be placed next to at least 1 compatible FOODCHAIN#2 cards. Usually, FOODCHAIN#3 cards are carnivores (meat-eating): unless specified on card, this also means that it can only be played next to prey of equal or smaller SCALE.

Note that there are exceptions to these general placement rules. For example, omnivores (brown circle) are FOODCHAIN#3 but can technically be played next to plants of FOODCHAIN#1. Other exceptions may be highlighted in the card text.

In general, whether a card can be played (or needs to be discarded) depends on whether it is next to something that can sustain it. Also NOTE that it's o.k. to place your card next to opponent's cards.

Yellow = Photosynthesis
 Green = Herbivore (eats plants)
 Brown = Omnivore (eats plants and animals)
 Red = Carnivore (eats animals)
 Black = "special" usually described on the card

When an EVENT card is played, unless specified differently, the effect is immediate and then the EVENT card is removed from the table (into discard pile). Sometimes, the effect will result in broken food chains. Here, the opposing player has their next TURN to react to the EVENT card, before disconnected cards are removed (i.e. they can play a substitute card to replenish the food chains, or they can move cards to areas on the table that provide compatible linkage.



Zooxanthellae 2 1
Symbiodinium spp.



Chromalveolata, Dinoflagellata, Dinophyceae


3 POINTS

- ZOOXANTHELLAE is a PLANKTON SPECIES.
- ZOOXANTHELLAE must be present to play WARM WATER CORAL SPECIES (SYMBIOTIC relationship).

Image by Nadir Balan
sci-ence.org

Cool, Warm

Brain Coral 6 2
Diploria strigosa



Animalia, Cnidaria, Anthozoa


6 POINTS

- *Acropora millepora* is a WARM WATER CORAL SPECIES.
- It is a SUSPENSION FEEDER, and must be played adjacent to at least 1 ZOOXANTHELLAE PLANKTON SPECIES

Image by Nadir Balan
sci-ence.org

Warm

Great Star Coral 7 2
Monastrea cavernosa



Animalia, Cnidaria, Anthozoa


6 POINTS

- *Monastrea cavernosa* is a WARM WATER CORAL SPECIES.
- It is a SUSPENSION FEEDER, and must be played adjacent to at least 1 ZOOXANTHELLAE PLANKTON SPECIES.

Image by Jenny Mörtzell
www.jennysportfolio.com

Warm

Venus Sea Fan 6 2
Gorgonia flabellum



Animalia, Cnidaria, Anthozoa

6 POINTS

- *Gorgonia flabellum* is a WARM WATER CORAL SPECIES.
- It is a SUSPENSION FEEDER, and must be played adjacent to at least 1 ZOOXANTHELLAE PLANKTON SPECIES

Image by Joe Kloc
joekloc.com

Warm

Staghorn Coral 7 2
Acropora millepora



Animalia, Cnidaria, Anthozoa


6 POINTS

- *Acropora millepora* is a WARM WATER CORAL SPECIES.
- It is a SUSPENSION FEEDER, and must be played adjacent to at least 1 ZOOXANTHELLAE PLANKTON SPECIES

Image by Emilie Clark
www.emilieclark.com

Warm

Bubblegum coral 8 2
Paragorgia arborea



Animalia, Cnidaria, Anthozoa

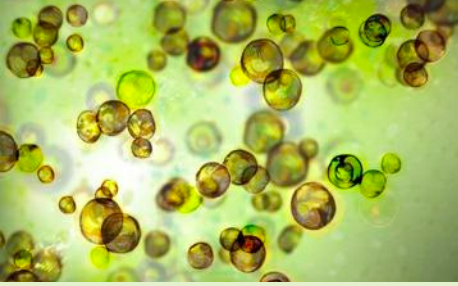
6 POINTS

- *Paragorgia arborea* is a COLD WATER CORAL.
- *Paragorgia arborea* is a SUSPENSION FEEDER, and needs to be played adjacent to at least 1 compatible PLANKTON SPECIES.

Image by Maki Naro
sci-ence.org

Cold

Zooxanthellae 2 1
Symbiodinium spp.

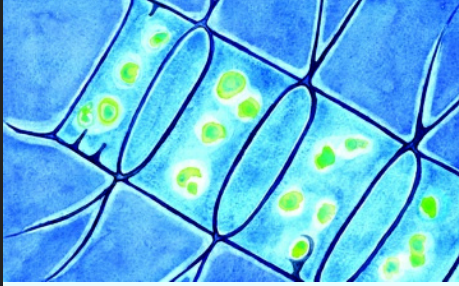


Chromalveolata, Dinoflagellata, Dinophyceae
 3 POINTS

- ZOOXANTHELLAE is a PLANKTON SPECIES.
- ZOOXANTHELLAE must be present to play WARM WATER CORAL SPECIES (SYMBIOTIC relationship).

Image by Nadir Balan sci-ence.org Cool, Warm

Diatom 3 1
Chaetocerus spp.




Chromalveolata, Heterokontophyta, Bacillaria
 3 POINTS

- *Prochlorococcus spp.* is a PLANKTON SPECIES.

Image by Melissa Guion www.melissaguion.com Cool, Warm

Cyanobacteria 1 1
Prochlorococcus spp.




Bacteria, Cyanobacteria, Prochlorococcales
 2 POINTS

- *Prochlorococcus spp.* is a PLANKTON SPECIES.

Image by Emilie Clark www.emilieclark.com Cool, Warm, Hot

Marine Protected Area
 Event Card



Event

PLAY: You may play this card immediately after your opponent has played an **EVENT** card on one of your **SPECIES**.

EFFECT: Negates effects of **EVENT** card. Does not work on **EVENT** cards that are not played specifically on top of a **SPECIES**.

Image by USFWS Pacific www.flickr.com/photos/usfwspacific/5565696408

Coral Bleaching
 Event Card



Event

PLAY: on 1 **CORAL SPECIES CARD**, and then discard.

EFFECT: the played **CORAL SPECIES CARD** is discarded immediately.

Image by Samuel Chow www.flickr.com/photos/cybersam/234971550

Rising Ocean Temperature
 Event Card



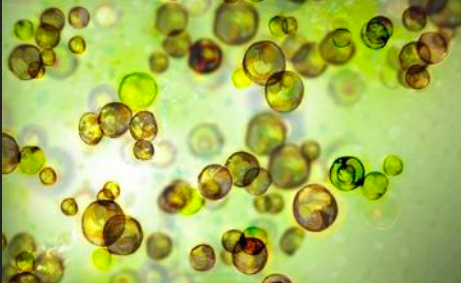
Event

PLAY: on 1 **PLANKTON SPECIES** card and then discard.

EFFECT: The played **PLANKTON SPECIES** card is discarded immediately.

Image by USFWS Pacific www.flickr.com/photos/usfwspacific/5565696408

Zooxanthellae 2 1
Symbiodinium spp.



Chromalveolata, Dinoflagellata, Dinophyceae
 3 POINTS

- ZOOXANTHELLAE is a PLANKTON SPECIES.
- ZOOXANTHELLAE must be present to play WARM WATER CORAL SPECIES (SYMBIOTIC relationship).

Image by Nadir Balan sci-ence.org Cool, Warm

Coralline algae 4 1
Porolithon spp.



Archaeplastida, Rhodophyta, Rhodophyceae
 3 POINTS

- *Porolithon spp.* is an ALGAE and PLANKTON SPECIES.

Image by Emilie Clark www.emilieclark.com Cool, Warm

Maiden's Hair 5 1
Chlorodesmis fastigiata



Plantae, Chlorophyta, Bryopsidophyceae
 3 POINTS

- *Chlorodesmis fastigiata* is an ALGAE and PLANKTON SPECIES.
- It is also OPPORTUNISTIC and may be played on top of other PLANKTON cards (discard other PLANKTON card)

Image by Nadir Balan sci-ence.org Warm

Brown macroalgae 8 1
Sargassum spp.




Chromalveolata, Heterokontophyta, Phaeophyta
 3 POINTS

- *Sargassum spp.* is an ALGAE and PLANKTON SPECIES.

Image by Emilie Clark www.emilieclark.com Cool, Warm

Brain Coral 6 2
Diploria strigosa

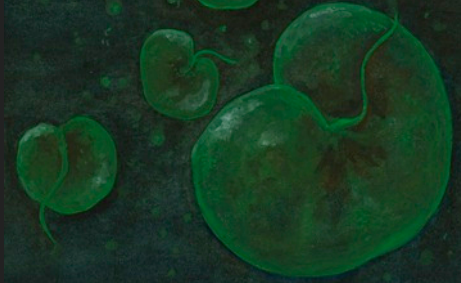


Animalia, Cnidaria, Anthozoa
 6 POINTS

- *Acropora millepora* is a WARM WATER CORAL SPECIES.
- It is a SUSPENSION FEEDER, and must be played adjacent to at least 1 ZOOXANTHELLAE PLANKTON SPECIES

Image by Nadir Balan sci-ence.org Warm

Sea Sparkle 2 2
Noctiluca scintillans

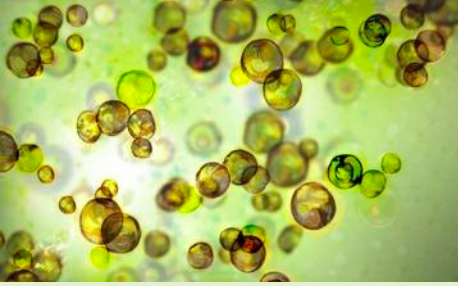


Chromalveolata, Dinoflagellata, Noctiluca
 5 POINTS

- The bioluminescence *Noctiluca scintillans* is a PLANKTON that feeds off of other PLANKTON SPECIES.
- It must be played adjacent to at least 1 compatible PLANKTON SPECIES.

Image by Joe Kloc joekloc.com Cool, Warm

Zooxanthellae 2 1
Symbiodinium spp.




Chromalveolata, Dinoflagellata, Dinophyceae
 3 POINTS

- ZOOXANTHELLAE is a **PLANKTON SPECIES**.
- ZOOXANTHELLAE must be present to play **WARM WATER CORAL SPECIES (SYMBIOTIC relationship)**.

Image by *Nadir Balan*
 sci-ence.org **Cool, Warm**

Great Star Coral 7 2
Monastrea cavernosa




Animalia, Cnidaria, Anthozoa
 6 POINTS

- *Monastrea cavernosa* is a **WARM WATER CORAL SPECIES**.
- It is a **SUSPENSION FEEDER**, and must be played adjacent to at least 1 **ZOOXANTHELLAE PLANKTON SPECIES**.

Image by *Jenny Mörtzell*
 www.jennysportfolio.com **Warm**

Venus Sea Fan 6 2
Gorgonia flabellum




Animalia, Cnidaria, Anthozoa
 6 POINTS

- *Gorgonia flabellum* is a **WARM WATER CORAL SPECIES**.
- It is a **SUSPENSION FEEDER**, and must be played adjacent to at least 1 **ZOOXANTHELLAE PLANKTON SPECIES**.

Image by *Joe Kloc*
 joekloc.com **Warm**

Staghorn Coral 7 2
Acropora millepora



Animalia, Cnidaria, Anthozoa
 6 POINTS

- *Acropora millepora* is a **WARM WATER CORAL SPECIES**.
- It is a **SUSPENSION FEEDER**, and must be played adjacent to at least 1 **ZOOXANTHELLAE PLANKTON SPECIES**.

Image by *Emilie Clark*
 www.emilieclark.com **Warm**

Bluebell Sea Squirts 4 2
Clavelina moluccensis

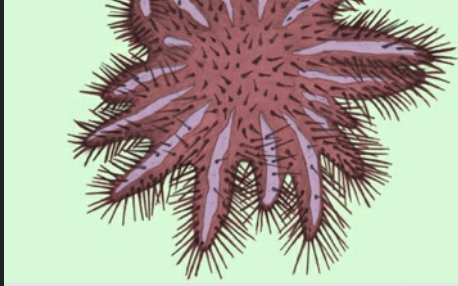


Animalia, Chordata, Ascidiacea
 5 POINTS

- *Clavelina moluccensis* is a **FILTER FEEDER**, and needs to be played adjacent to at least 1 compatible **PLANKTON SPECIES**.

Image by *Emilie Clark*
 www.emilieclark.com **Warm**

Crown of Thorns Starfish 5 3
Acanthaster planci




Animalia, Echinodermata, Asteroidea
 8 POINTS

- *Acanthaster planci* must be (played) adjacent to at least 1 compatible **WARM WATER CORAL SPECIES**.
- Or, *Acanthaster planci* is **OPPORTUNISTIC**. Place on top and discard any compatible **WARM CORAL SPECIES**.

Image by *Jenny Mörtzell*
 www.jennysportfolio.com **Warm**

Spinyhead Blenny 4 3
Acanthemblemaria spinosa



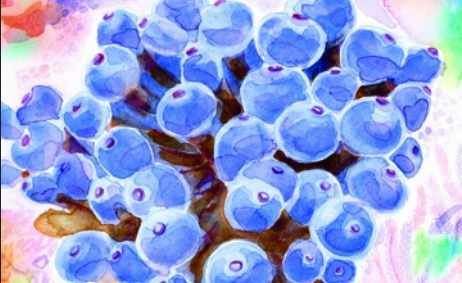
Animalia, Chordata, Actinopterygii
4 POINTS

• *Acanthemblemaria spinosa* has a **MOVE** of 2. • It must be played adjacent to at least 1 compatible **PLANKTON SPECIES** or 1 compatible *crustacea* **SPECIES** of **SCALE** 4 or less.

Image by Joe Kloc
joekloc.com

Warm

Bubble-tip anemone 5 2
Entacmaea quadricolor



Animalia, Cnidaria, Anthozoa
4 POINTS

• *Entacmaea quadricolor* is a **SUSPENSION FEEDER** and **CARNIVORE** of small animals. • It must be played adjacent to at least 1 compatible **PLANKTON SPECIES** or 1 compatible *crustacea* or *actinopterygii* **SPECIES** of **SCALE** 4 or less.

Image by Melissa Guion
www.melissaguion.com

Warm

Christmas Tree Worm 4 2
Spirobranchus giganteus




Animalia, Annelida, Polychaeta
6 POINTS

• *Spirobranchus giganteus* is a **SUSPENSION FEEDER**, and needs to be played adjacent to at least 1 compatible **PLANKTON SPECIES**.

Image by Melissa Guion
www.melissaguion.com

Warm

Feather Duster Worm 4 2
Sebellastarte magnifica



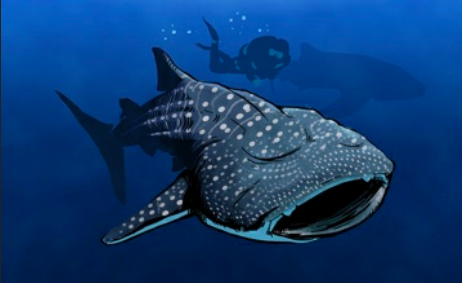
Animalia, Annelida, Polychaeta
5 POINTS

• *Sebellastarte magnifica* is a **SUSPENSION FEEDER**, and needs to be played adjacent to at least 1 compatible **PLANKTON SPECIES**.

Image by Maki Naro
sci-ence.org

Cool,
Warm

Whale Shark 9 2
Rhincodon typus



Animalia, Chordata, Chondrichthyes
6 POINTS

• *Rhincodon typus* has a **MOVE** of 2.

• *Rhincodon typus* is a **FILTER FEEDER**, and needs to be played adjacent to at least 1 compatible **PLANKTON SPECIES**.

Image by Maki Naro
sci-ence.org

Warm

Pajama Cardinalfish 5 3
Sphaeramia nematoptera



Animalia, Chordata, Actinopterygii
8 POINTS


• *Sphaeramia nematoptera* has a **MOVE** of 2.

• *Sphaeramia nematoptera* can only prey on compatible **SPECIES** with a **SCALE** of 4 or 5.

Image by Melissa Guion
www.melissaguion.com

Cool,
Warm

Stoplight Parrotfish 5 **3**
Sparisoma viride




Animalia, Chordata, Actinopterygii
5 POINTS

- *Sparisoma viride* has a **MOVE** of 2.
- *Sparisoma viride* eats **ALGAE** and **CORAL**, and must be placed adjacent to at least 1 compatible **ALGAE** or **CORAL** species card (irrespective of **SCALE**).

Image by *Melissa Guion*
 www.melissaguion.com **Cool, Warm**

Clown Triggerfish 5 **3**
Balistoides conspicillum




Animalia, Chordata, Actinopterygii
8 POINTS

- *Balistoides conspicillum* has a **MOVE** of 2.
- *Balistoides conspicillum* can only prey on compatible **SPECIES** with a **SCALE** of 4 or 5.

Image by *Jenny Mörtzell*
 www.jennysportfolio.com **Cool, Warm**

Nudibranch 4 **3**
Nembrotha cristata

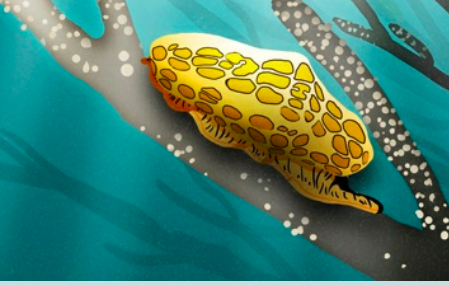


Animalia, Mollusca, Gastropoda
9 POINTS

- *Nembrotha cristata* has a **MOVE** of 1.
- *Nembrotha cristata* can only prey on compatible **CORAL** or **SPONGE SPECIES** cards (must be played adjacent to one of these regardless of **SCALE**).

Image by *Maki Naro*
 sci-ence.org **Cool, Warm**

Flamingo Tongue snail 4 **3**
Cyphoma gibbosum




Animalia, Mollusca, Gastropoda
9 POINTS

- *Cyphoma gibbosum* has a **MOVE** of 1.
- *Cyphoma gibbosum* eats **CORAL**, and must be placed adjacent to at least 1 compatible **CORAL** species card (irrespective of **SCALE**).

Image by *Maki Naro*
 sci-ence.org **Cool, Warm**

Bigfin reef squid 6 **3**
Sepioteuthis lessoniana




Animalia, Mollusca, Cephalopoda
8 POINTS

- *Sepioteuthis lessoniana* has a **MOVE** of 2. • *Sepioteuthis lessoniana* can only prey on compatible *crustacea* and *actinopterygii* **SPECIES** with a **SCALE** of 4 or higher.

Image by *Joe Kloc*
 joekloc.com **Cool, Warm**

Tiger shark 8 **3**
Galeocerdo cuvier




Animalia, Chordata, Chondrichthyes
8 POINTS

- *Galeocerdo cuvier* has a **MOVE** of 2.
- *Galeocerdo cuvier* can only prey on compatible **SPECIES** with a **SCALE** of 5 or higher.

Image by *Nadir Balan*
 sci-ence.org **Cool, Warm**

Bubblegum coral 8 2
Paragoria arborea



Animalia, Cnidaria, Anthozoa
 6 POINTS

- *Paragoria arborea* is a **COLD WATER CORAL**.
- *Paragoria arborea* is a **SUSPENSION FEEDER**, and needs to be played adjacent to at least 1 compatible **PLANKTON SPECIES**.

Image by Maki Naro sci-ence.org **Cold**

Caribbean Spiny lobster 5 3
Panulirus argus

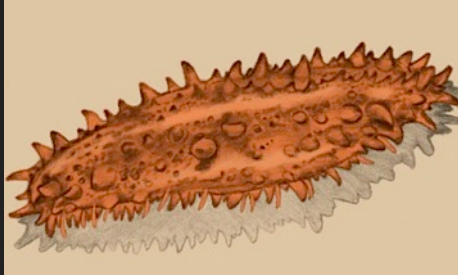


Animalia, Arthropoda, Crustacea
 7 POINTS

- *Panulirus argus* has a **MOVE** of 1, and can only prey on **SPECIES** with a **SCALE** of 4 or 5.
- *Panulirus argus* is a **SCAVENGER**. If removed due to a consequence of an **EVENT** card, return to your hand.

Image by Joe Kloc joekloc.com **Cool, Warm**

Sea Cucumber 5 3
Bohadschia argus




Animalia, Echinodermata, Holothuroidea
 3 POINTS

- *Bohadschia argus* has a **MOVE** of 1. • *Bohadschia argus* is a **SCAVENGER**. If removed due to a consequence of an **EVENT** card, return to your hand.

Image by Jenny Mörtzell www.jennysportfolio.com **Cool, Warm**

Lophelia Coral 9 2
Lophelia pertusa



Animalia, Cnidaria, Anthozoa
 5 POINTS

- *Lophelia pertusa* is a **COLD WATER CORAL**.
- *Lophelia pertusa* is a **SUSPENSION FEEDER**, and needs to be played adjacent to at least 1 compatible **PLANKTON SPECIES**.

Image by Jenny Mörtzell www.jennysportfolio.com **Cold, Cool**

Redfish 6 3
Sebastes spp.




Animalia, Chordata, Actinopterygii
 8 POINTS

- *Sebastes spp* has a **MOVE** of 2.
- Can only prey on **SPECIES** with a **SCALE** of 4, 5 or 6.

Image by Nadir Balan sci-ence.org **Cold, Cool**

Marine Protected Area
 Event Card




Event

PLAY: You may play this card immediately after your opponent has played an **EVENT** card on one of your **SPECIES**.

EFFECT: Negates effects of **EVENT** card. Does not work on **EVENT** cards that are not played specifically on top of a **SPECIES**.

Image by USFWS Pacific www.flickr.com/photos/usfwpacific/5565696408

Coastal Development
Event Card




Event

PLAY: can be played for below effect and then discarded.

EFFECT: Discard any 1 **CORAL SPECIES** card on the table. If you have a compatible **ALGAE SPECIES** card in your hand, you may play it in the open spot.

Image by *Adam Kerfoot-Roberts*
www.flickr.com/photos/adamkr/3834105631

Coral Bleaching
Event Card



Event

PLAY: on 1 **CORAL SPECIES CARD**, and then discard.

EFFECT: the played **CORAL SPECIES CARD** is discarded immediately.

Image by *Samuel Chow*
www.flickr.com/photos/cybersam/234971550

Ocean Acidification
Event Card




Event

PLAY: on 1 **CORAL SPECIES** card, and then discard.

EFFECT: The played **CORAL SPECIES** card is discarded immediately.

Image by *Rachel Macniven*
www.flickr.com/photos/thedinglydell/5829707307

Bottom Trawling
Event Card




Event

PLAY: on 1 **COLD WATER CORAL SPECIES** card, and then discard.

EFFECT: The played **CORAL SPECIES** card, as well as **one** other adjacent card of your choice, are discarded immediately.

Image by *Jens Auer*
www.flickr.com/photos/danslegrandbleu/2914816714/

Too Many Scuba Divers
Event Card



Event

PLAY: On 1 **WARM WATER CORAL SPECIES** card, and then discard.

EFFECT: The played **CORAL SPECIES** card is discarded immediately.

Image by *Richard Ling*
www.flickr.com/photos/phylomon/7315032774

Algae Takeover
Event Card



Event

PLAY: can be played for below effect and then discarded.

EFFECT: Use any 1 **ALGAE** card in your hand, OR any 1 **ALGAE** card on the table. Place on top of any compatible **CORAL** card. Discard **CORAL** card: leave **ALGAE** card in its place.

Image by *eutrophication&hypoxia*
www.flickr.com/photos/48722974@N07/4464986156/

Rising Ocean Temperature
Event Card



Event

PLAY: on 1 **PLANKTON SPECIES** card and then discard.

EFFECT: The played **PLANKTON SPECIES** card is discarded immediately.

Image by *USFWS Pacific*
www.flickr.com/photos/usfwspacific/5565696408



phylogame.org card back
pattern: suzanne norris | www.sakurasnow.com
logo: haley fiege | www.kingdomofawesome.com

