

Educator's Guide



A Reef Reborn

Science, Culture and Environmental Education for the XXI Century
Teaching-Learning Techniques and Communication Strategies



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Educational Model

Our educational model **emphasizes** the importance of an **inter-community, multidisciplinary, inter-institutional** and **international collaboration**. We want to **join efforts, information, resources** and **materials** that can **enrich** our **educational programs** and **help** us **bring** the scientific **discoveries** and the **experiences** of these communities to **all** so that **we** can **adopt BETTER ENVIRONMENTAL PRACTICES** in our **everyday life** and **together learn** to avoid more harm and **heal** the wounds that, sometimes without knowing, we do to **Nature** and to ourselves.



Acknowledgements and Dedication

We want to use this space to thank all the people and institutions that have participated in the film and have given us their unconditional support and permission to use their materials in this first version of the Educator's Guide.

We also want to thank all the people of the communities that have shared with us their stories and have inspired us to keep learning more about the transformation of their communities since the creation of the Cabo Pulmo National Park.

The Educational Program *A Reef Reborn* is dedicated, with much respect and admiration to those who research and teach us about nature so that we can learn how to heal, conserve, enjoy, protect and take care of our natural wonders today and always.

For teachers and educators, in schools and different projects and environmental programs, we have included links, ideas, suggestions, Power Point presentations, PDFs, activities, worksheets and special materials that will help us develop language and thinking skills and communication strategies in our classrooms, workshops and presentations and make the most of every moment and topic in *A Reef Reborn*.

Sponsors and collaborators

The English and Spanish versions of the Educational Program,
as well as the production of A Reef Reborn 3D, Mar Vivo 3D and 2D,
were possible thanks to generous contributions of:

Candeo
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The two versions of the Educator's Guide, in Spanish and English,
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- Sociedad de Historia Natural NIPARAJÁ – Meredith de la Garza– Executive Director
- Cabo Pulmo National Park – Carlos Ramón Godínez Reyes – Director
- Sociedad Mexicana de Arrecifes Coralinos – Pedro Medina Rosas – Director
- Octavio Aburto-Oropeza – Professor, Marine Biology Research Division, Scripps Institution of Oceanography
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- Directors and teachers – Grupo Educativo Muñoz en Sonora
- Teachers and students at *Sistemas Bilingües Especializados*

Author: Dolores Monterrubio-Alvarez
March 2016

Credits and Permissions

The movie *A Reef Reborn, Mar Vivo* in Spanish, produced by Summerhays Films, Inc., in its **2D** version, the Educator's Guide, the PP and PDF presentations and the extra printable materials, are available on the Web page www.areefreborn3d.com (in English) and on the Web page www.marvivo3d.com (in Spanish).

Teachers and educators, who want to learn more and teach about this story of resilience and success in conservation in Cabo Pulmo, may use all the materials, made by *Sistemas Bilingües Especializados*, **for educational purposes exclusively**, giving the corresponding credit to our collaborators on each page and in general to:

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A Reef Reborn Educational Program

For information regarding the Educator's Guide, workshops for teachers and school presentations, contact: educators@areefreborn3d.com

Message to Educators

In this first version of the Educational Program *A Reef Reborn – Science, Culture and Environmental Education for the XXI Century*, we have included information, ideas for activities, topics to discuss and think about and links to Web pages to learn more about the story of *A Reef Reborn*.

Each page can be a lesson or a combination of lessons. There is not a specific order that we have to follow and there are no recipes for the activities, only ideas and suggestions. What you will find is a variety of tools to use the movie *A Reef Reborn*, and the inspiring story of **20 years of success in conservation in the Cabo Pulmo National Park**, as a teaching tool in our classes, workshops, projects and programs about science, culture and environmental education.

During the XV Children's Conference for the Conservation of the Gulf of California, organized by the Acuario Mazatlán from the 7th to the 12th of March, 2016, we presented for the first time the Spanish version of our Educational Program *A Reef Reborn* to 90 6th graders and 20 teachers and guides, that came from 25 communities around the Gulf of California.

The enthusiastic participation and the final comments of these girls and boys tell us that the topics and activities may very well be presented to a large group of 11 and 12 year-old students. In the same way, the comments of teachers and representatives of different communities tell us that the Educational Program *A Reef Reborn* inspired them to continue learning, in order to share and include it in their lessons, participate and together protect our natural treasures.



Photo: 2016 Acuario Mazatlán

Other materials available for educators

visit: www.areefreborn3d.com

Printable cards for activities

- ☐ Matching pictures and texts **cards**
- ☐ Vocabulary **cards**

Printable materials for students

- ☐ Matching pictures and texts **worksheets** (2)
- ☐ Environmental Education **worksheet** (1)
- ☐ Informative and activity **brochure** SOMAC (Spanish)

Other suggested materials

- ☐ Niparájá **Poster**
Fish around the Espiritu Santo Island

Presentations

- ☐ México in the UNESCO World Heritage List
- ☐ UNESCO Basic Objectives for Environmental Education
- ☐ SOMAC
 - Arrecifes coralinos en México y en el Mundo
 - Servicios Ambientales
 - Los corales

Introduction

On **June 13th** and **14th** of last year, **2015**,
in a small community on the coast of the **Gulf of California**,
there was a **GREAT CELEBRATION** to honor
20 YEARS of SUCCESS in CONSERVATION.

When the **fishermen** of the **community** of **Cabo Pulmo**, and **neighboring communities**, realized the **damage** that **overfishing** had caused to their **reefs** - and what this **catastrophe** represented for their **families**, for their **communities** and for **nature** - with the **help** and **support** of **scientists**, **educational institutions**, the **Mexican government** and the **whole community**, they **made** a **very brave** and **hard choice**:

TO PROTECT their REEFS.



continued on next page...

To observe and talk about ...

Look at the logo of Cabo Pulmo National Park



What do you see?
Do you like it?
What elements can you see?
Why is this their logo?

Now, observe the invitation for the GRAND CELEBRATION of 20 YEARS of SUCCESS in CONSERVATION that took place in June 2015.



What do you see? Do you like it?
What is it that you like the most?
How many different organisms can you distinguish?
How many kinds of animals are represented?
Do you recognize the different species?

Introduction cont.

To protect their Reefs

What happens after people who all their life, and for generations, have lived from fishing, make a choice like this one?

How did the **fishermen** and their **families heal** the wounds of their reefs and **transform** the culture of their communities?

What natural processes occurred on the reefs during this 20 years?

Who and **what organizations** have supported the communities in order to achieve this success, a Mexican natural treasure and World Heritage?

What does it mean to be in the World Heritage List of the UNESCO?

What happened with the family of that boy who came to Cabo Pulmo almost 100 years ago?

What other examples of stories of SUCCESS in CONSERVATION are there in the Gulf of California, in Mexico and in our world?

What are the most important lessons in these stories that help us learn to avoid hurting more, and even cure other wounds that, sometimes without knowing, we are causing Nature **and** ourselves?

To think about ...

In Nature, as well as in our community and our family, ALL our actions count, matter and have an impact!

How can I know and **accept** that what I do, and perhaps what I have been doing for a long time, is wrong now?

Who and **how** should they tell me that I need to make a change in my habits, my way of life, so that **I understand, accept** and **make the choice to change**?

Who could I trust to help me and support me during the difficult process of change?

How can I distinguish and **define** the actions, the steps and the order that I have to follow to fulfill and achieve my small goals so that, in the end, I can successfully reach my higher goal?

How can I understand and **accept** patiently and without fighting that, most of the times, I will not see immediate results?

How can I recognize that, although I can not see the results clearly, my efforts are not in vain?

With whom can I **collaborate** so that my efforts can be multiplied and, at the same time, everything can be easier for those of us who have the same goals?

How can we celebrate and **share** our experiences of what we have learned and achieved so that it can be replicated in other parts?



Symposium

In **November** of last year, **2015**, at the **Autonomous University of Baja California Sur**, in the city of **La Paz**, was held the Symposium **20 YEARS OF RESEARCH AND MANAGEMENT FOR THE CONSERVATION OF THE CABO PULMO NATIONAL PARK**, organized by the **National Commission for Natural Protected Areas**.



Do you want to learn about the institutions that organized the Symposium?



Visit this page and see the Photographs of the Exposition "15 YEARS Conserving the Natural Heritage for the Future of Mexico"
http://www.conanp.gob.mx/difusion/pdf.php?id_subcontenido=825



Visit the page of Cabo Pulmo National Park:
<http://pncabopulmo.conanp.gob.mx>

UNIVERSIDAD AUTÓNOMA DE BAJA CALIFORNIA SUR
Visit: <http://www.uabcs.mx/inicio>



Visit the page of Niparaja:
<http://niparaja.org>

SCRIPPS INSTITUTION OF OCEANOGRAPHY UC SAN DIEGO
Visit: <https://scripps.ucsd.edu>

PRONATURA
Visit their page and read the annual report of 2015:
<http://pronatura-noroeste.org/consulta-nuestro-reporte-anual-2015/>



Visit the page of the UNESCO:
<http://www.unesco.org/new/es/unesco/about-us/who-we-are/introducing-unesco/>



Visit the page of SEMARNAT and learn about RAMSAR:
<http://www.semarnat.gob.mx/temas/agenda-internacional/ramsar>



Objective

The objective of the *A Reef Reborn* **Educational Program** is to **delve into** the **natural processes** that occurred on the **reefs** and the **transformation** of the **culture** of **Cabo Pulmo**, and **neighboring communities**, and to **learn** from the **lessons** of this **story** of **resilience** and **conservation** so that we can **replicate** what has happened here, in **other** places of **Mexico** and the **world**.

Replicate **what**?

What has happened **here**?

But, many things have happened and we are talking about **20 years**!

Where can we **start**?

Well, we could start with a **key word**:

One of the words that **is always present** when **Parque Nacional Cabo Pulmo** is mentioned.

S U C C E S S

What does it mean? Think about this...

Success is a word easy to define but not so easy to achieve.

success *n.* A happy and favorable result of a plan.

succeed *vi.* To manage to achieve what one has set as a goal.

So, first

We have to set our goal!

"Where there is a will, there is a way."

Definitely, the will to do something is the first step

but finding the right way **is not so easy!**

In order to **achieve** what we have set as our **goal**, it is necessary to **recognize** and **identify** clearly:

- Our **choice** and our big **goal**
- The **information** and the **method**
- Our **attitude**, especially in difficult times
- Our **skills**
- The **people, institutions** and **resources**
- The **report** to **evaluate** results

**This is what they have achieved
in Cabo Pulmo National Park**

For this reason, Cabo Pulmo has **surprised, interested** and **inspired** thousands of people who **visit** or **study** this wonderful place and **know** the **people** who **live, work** and **made this possible** here.

It is not necessary to be a professional scuba diver to **admire** and **feel the thrill** while we **accompany Iliana Ortega** on her **journey** through these **colorful reefs** and among the **amazing creatures** of Cabo Pulmo National Park.

The boy who came from the mountain

Jesus lived on the mountains of Baja California. When his parents died, he felt he was completely alone in the world.

He decided to look for his godmother, who lived by the shore. This was a very brave and difficult choice for a 10-year old boy. Jesus had to walk through the intense heat of the days and the cruel cold of the nights in the desert.

How happy he was when his godmother received him with a big embrace! Jesus felt safe and loved and he knew he would never feel lonely again.

At first, he helped his godmother with the cattle. Then, Jesus learned to fish, swim, dive and control his breathing long enough to reach the bottom of the reefs and find pearls. This sea was full of life!

The boy from the mountain became a man of the sea

Jesus would take his children on his *panga* to show them the magic and beauty of this sea that was the center of his life. His daughter, Maria, loved to spend time with her father and to see such colorful fish!

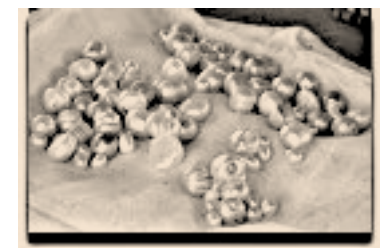
When Jesus went diving for pearls, Maria would always wait for him, playing on the beach. She knew her father would come back with a treasure! Maria was a happy little girl.

Do you want to listen to Maria?

With a smile on her face, Maria shares with us her happy memories in this very special interview:
visit: <http://cabopulmovivo.org/portal/wp-content/uploads/Programa-de-manejo-Cabo-Pulmo.pdf>

Imagine...

Before reading the text, look at these photographs, could you tell a story? Use your creativity and imagination!



This is a story of resilience, triumph and the hard brave choices of the people that made this possible.



I did not expect
this abundance here.
No one did.
There were hopes
but this is beyond them.



Way too often, the stories we have to tell about
our planet's natural life, seem to be about loss and decline.

What do these words mean?

- | | | | |
|----|--------------|----|---------------|
| 1 | ABUNDANCE | 13 | PARTICIPATION |
| 2 | AMAZEMENT | 14 | PROTECTION |
| 3 | AWARENESS | 15 | RECOVERY |
| 4 | CONSERVATION | 16 | SHELTER |
| 5 | COOPERATION | 17 | REBIRTH |
| 6 | CHOICE | 18 | RESILIENCE |
| 7 | EFFORT | 19 | REVIVAL |
| 8 | HOPE | 20 | LIVELIHOOD |
| 9 | SUCCESS | 21 | SURVIVAL |
| 10 | HAPPINESS | 22 | TREASURE |
| 11 | INSPIRATION | 23 | TRIUMPH |
| 12 | OPPORTUNITY | 24 | BRAVERY |

SUGGESTIONS: We could give the cards with these words to our group, or write them on the board, and:

- 1) Discuss the meaning of the words that we know.
- 2) Give examples and make sentences.
- 3) Share an experience or invent a story.
- 4) Find the definitions in the dictionary and look for synonyms and antonyms.
- 5) Before watching *A Reef Reborn*, think about the relation of these words with the story.
- 6) After watching *A Reef Reborn*, remember and discuss where in the story we hear or relate the word.
- 7) Find the verbs and/or adjectives to each noun (when possible). For example:

inspiration – to inspire – inspired

What happened in Cabo Pulmo before the creation of the Park?

At the beginning of the XX century

The reefs in Cabo Pulmo were full of **extraordinary life!** There was more than enough to eat. The abundance was overwhelming.

People from near and far heard about the wealth of this sea and many came to fish.



For many years

Pearl divers and fishermen from near and far came to this beautiful place to fish.

First from the shore, then from one *panga*, then two, three and four *pangas*. Later, a dozen *pangas*. And then, fleets of fishing boats.

Without knowing it then, **people were fishing more than what the sea could produce to recover itself.**

The sea ran out of **pearls**. But there were sharks. **Sharks** ran out but there were turtles. **Turtles** ran out but there were big fish. Finally, the sea ran out of **big fish**.

The reefs were hunted out.

All that was left was fish too small to eat.

Abundance turned to **scarcity** and finally... **nothing**.

In the decades of the 70s and 80s

The **effects** of **overfishing**, combined with natural events, such as **El Niño**, hurricanes and the **shipwreck** of El Vencedor, were **devastating!**



Cabo Pulmeños share their memories.

Juan Castro Montaña – (2nd generation)

"At the end of the 70s, I was already taking tourists to fish and dive. One day, when the sea was calm, I jumped in the water and I saw destruction. I also saw that, what was not destroyed, was beautiful."

Ricardo Castro Montaña – (2nd generation)

"My father was a pearl diver who did not know about masks or fins. He would dive, without any equipment, as deep as 25 meters to work. He was incredible. I admired him."

Edmundo Minjares - (2nd generation)

"Life here was different in those days. We did not have this culture of conservation. We only thought that we had to catch our product, we had to feed our family and we had to sell our product for our economy."

Francisco Castro Lucero – (3rd generation)

"I remember there was a pearl camp here. We were 100 boats, 200 boats. Then, we caught sharks with a long line with hooks."

"I remember my father telling me that, when he was a boy, there were many sharks and, with these words, he would tell me, 'Son, I wish you could have seen this place then because those days will never come back.'"

Ricardo Castro Fiol – (3rd generation)

"I did not fish much commercially but I remember, when I was a child, I used to go fishing with my father. One day, I saw a diver in his diving suit and I thought that I wanted to be like him."

Do you want to listen to these and more interviews?
visit: <http://areefreborn3d.com/about-the-film/interviews/>

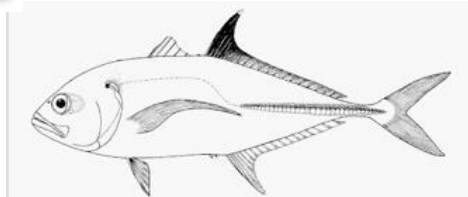


These fish are called bigeye trevally.
They are gathered on reefs
near a point of land
called Cabo Pulmo.

Scientific name: *Caranx sexfasciatus*

Spanish: Jurel ojón

English: Bigeye trevally



IPN-CICIMAR-SAGARPA-CONAPESCA: <http://sistemas.cicimar.ipn.mx/catalogo/ficha.php?simavi=8020308>

FishBase: <http://www.fishbase.us/comnames/CommonNamesList.php?ID=1917&GenusName=Caranx&SpeciesName=sexfasciatus&StockCode=2113>

A Reef Reborn – About fish: <http://areefreborn3d.com/explore-the-reef/about-the-fish/>



Municipality: **Los Cabos**

State: **Baja California**

Country: **México**



Do you want to know more about Cabo Pulmo and fish?
visit: <http://pncabopulmo.conanp.gob.mx> visit: <http://www.fishbase.us>
visit: https://es.wikipedia.org/wiki/Parque_nacional_Cabo_Pulmo
visit: <http://areefreborn3d.com/explore-the-reef/about-the-fish/>

Where is it?

The Cabo Pulmo National Park is located in the municipality of Los Cabos, in the state of Baja California Sur (between the cities of La Paz and San José del Cabo), between 23° 22' 30" and 23° 30' 00" North latitude and 109° 28' 03" and 109° 23' 00" West longitude, on the coast of the Gulf of California.

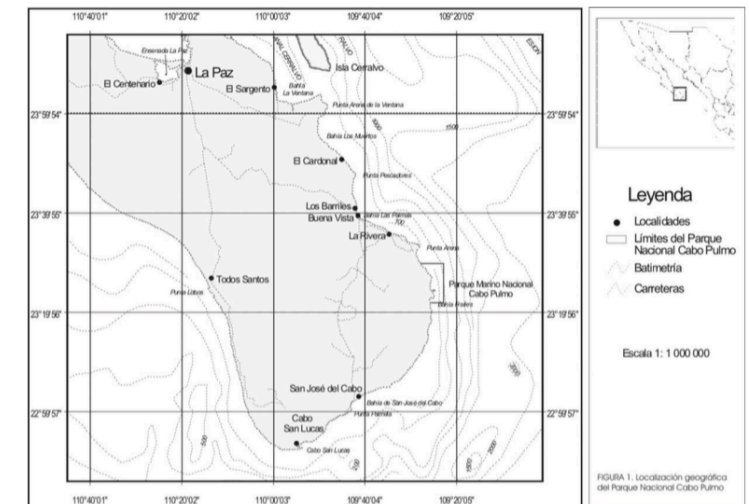
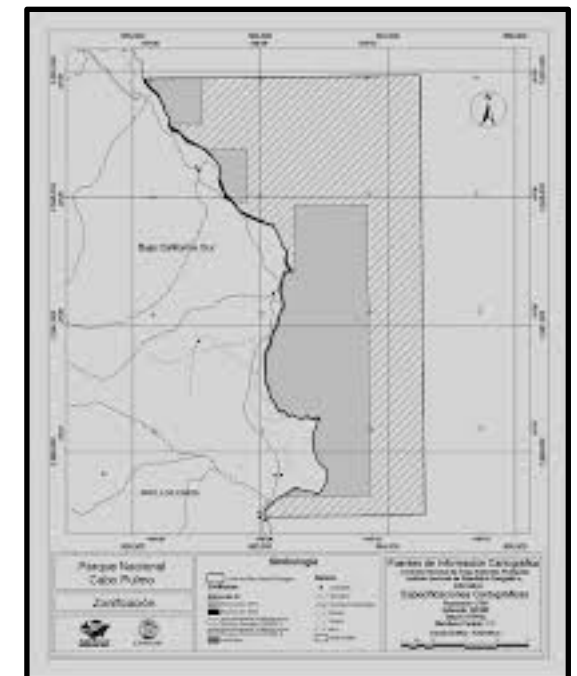


Figura 1. Ubicación geográfica del Parque Nacional Cabo Pulmo.

Do you want to know more about...
the Location of Cabo Pulmo National Park?
visit: <http://pncabopulmo.conanp.gob.mx/ubicacion.php>



Introduction to CORAL REEFS

The **OCEANS, SEAS** and **GULFS** ...

... cover **71%** of the surface of the Earth.

... provide **habitats** for more than **1 million** known species of marine **plants** and **animals**.

... produce **food** for many **organisms** including **human beings**.



Highly productive
MARINE ECOSYSTEMS

Coral reefs

Estuaries

Coastal wetlands

Barrier Islands

Mangroves

Sea grasses

Kelp forests

The **COASTAL ZONES** ...

... represent the **transition** from the land to the sea.

... include **coastal waters** and **adjacent shoreline** that are strongly **influenced** by **each other**.

... include **islands, transitional** and **intertidal** areas, **estuaries, marshes** or **swamps, wetlands** and **beaches**.

Other materials about ...

Introduction to Coral Reefs

(available in Spanish)

Title: Arrecifes Coralinos

Content:

1. Introduction
2. Coral reefs in Mexico and the world.
3. Environmental services
4. Corals

Source: SOMAC, A. C.

Special Thanks to: Dr. Pedro Medina-Rosas

Link to Web Page: www.somac.org.mx

Activities created by: Dolores Monterrubio



Important dates and events for Cabo Pulmo National Park

June 6, 1995

*The area is declared as
Protected Natural Area
under the category of
National Marine Park.*



June 7, 2000

*The category is modified to
Cabo Pulmo National Park
in accordance with the
Ley General del Equilibrio Ecológico y la Protección al Ambiente.*



July 14, 2005

*The Islands and Protected Areas of the Gulf of California
are inscribed in the
UNESCO World Heritage List of Natural Sites*



February 2, 2008

*The Cabo Pulmo National Park
is inscribed as
Contracting Party before the RAMSAR Convention.*



2010

*The Cabo Pulmo Vivo Coalition
is founded to support sustainable development that gets local communities involved and
values the environmental services the reef and the ecosystem provide to each of us.*

Do you want to learn more?

Cabo Pulmo National Park

visit: <http://pncabopulmo.conanp.gob.mx>

There is so much to learn about the Park, its history, its biodiversity, its priority species and especially its programs of community participation. (In Spanish)

La Ley General del Equilibrio Ecológico y la Protección al Ambiente

visit: http://www.diputados.gob.mx/LeyesBiblio/pdf/148_090115.pdf

Published for the first time in the *Diario Oficial de la Federación* on January 28th, 1988. In this link we find the last amendment to the *General Law of Ecological Equilibrium and Environmental Protection* published: DOF 09-01-2015. (In Spanish)

UNESCO

visit: <http://www.unesco.org/new/en/unesco/about-us/>

visit: <http://whc.unesco.org/en/conventiontext/>

visit: <http://mexicoescultura.com/temas/Patrimonio-mundial/en>

visit: <http://whc.unesco.org/archive/convention-en.pdf>

In the following link of the *Dirección de Patrimonio World Heritage* of the National Institute of Anthropology and History we can learn about the Obligations and Benefits of the Party States of the UNESCO. (In Spanish)

visit: <http://www.patrimonio-mexico.inah.gob.mx/index.php>

RAMSAR

visit: <http://www.ramsar.org>

The Convention on Wetlands, called the Ramsar Convention, is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. What are marshes? Why are they important?

CABO PULMO VIVO COALLITION

visit: <http://cabopulmovivo.org/portal2/>

Cabo Pulmo Vivo is a group of non-governmental organizations, citizens, scholars, researchers and members of the Cabo Pulmo and neighboring communities that work to promote the protection of the natural and cultural heritage of the Cabo Pulmo and East Cape zone, located in Baja California Sur,

A Mexican treasure and World Heritage

In the year **2005** ...

... the **Protected Areas and Island of the Gulf of California**

were included in the **World Heritage List**

of the **UNESCO** (United Nations Educational, Scientific and Cultural Organization),

complying with the following selection criteria **VII, IX** and **X** for **natural sites**.

Criteria **VII**

To contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance .

Criteria **IX**

To be outstanding and representative examples of significant on-going, ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals.

Criteria **X**

To contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.

Other materials about ...

UNESCO

Title: World Heritage Sites PDF
Number of slides: 7
Made by: Dolores Monterrubio

Content:

1. Introduction
2. Background
3. World Heritage List
4. Mexico in the World Heritage List
5. Ten criteria for selection
6. Islands and Protected Areas of the Gulf of California criteria
7. Final page

Source: UNESCO

Links to Web Pages:

<http://es.unesco.org>

<http://unesdoc.unesco.org/images/0003/000327/032763sb.pdf>

<http://whc.unesco.org/es/list/?iso=mx&search=&>

<http://www.unesco.org/new/es/mexico/work-areas/culture/world-heritage/>

<http://whc.unesco.org/en/criteria/>



UNESCO and A Reef Reborn Environmental Education

From the moment a site is *accepted* by the *UNESCO* as *World Heritage*,
it is *responsibility* of *all of us* to *conserve* it in order to *keep* it in the *List*.

AWARENESS

I know that I am part of
nature and my local actions
have a global impact.

ATTITUDE

I know I can do something,
here and now, for the environment,
and with my family, **we can do** more.

PARTICIPATION

Together **we can do** much.
We learn from each other,
we do our best and **participate**
in Harmony with Nature.

KNOWLEDGE

I find information
so that **I can make better choices**,
I learn to conserve, enjoy and
protect our natural resources.

SKILLS

I set myself a goal.
I acknowledge my talents
and my skills.
I do my best and **I work hard** to
achieve my objective.

EVALUATION

We register, report and **share**
our knowledge, experiences
and results.

Other materials about ...

UNESCO

Title: UNESCO Environmental Education
Number of slides: 9
Made by: Dolores Monterrubio

Content:

1. Introduction
2. Background
3. Awareness
4. Knowledge
5. Attitude
6. Skills
7. Participation
8. Evaluation
9. Final page



Source: UNESCO

Links to Web Pages:

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<http://www.unesco.org/new/es/mexico/work-areas/culture/world-heritage/>



What happened after the creation of the National Park?

Local **scientists** were studying the **corals**, for which Cabo Pulmo was **famous**. They suggested the community that **the reefs could be more attractive if they stopped fishing**.



Together with **scientists**, the **community** asked the **Mexican government** for help.

June 6th, 1995

With the community's full support, the Mexican Federal Government, **Cabo Pulmo** was declared **Marine National Park**, with a surface of **7,111 hectares**, **99%** of which corresponds to the **marine area**.

Do you want to read the document of the executive order?
visit: <http://pncabopulmo.conanp.gob.mx/docs/Cabopulmo.pdf>



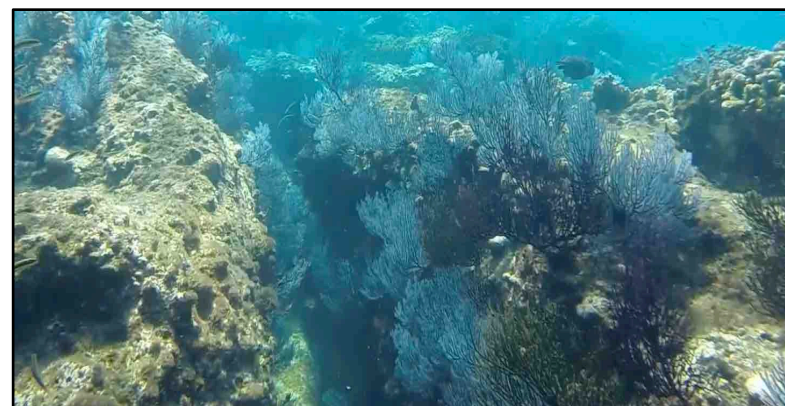
Four years later (1999)

Scientists **surveyed many** of the reefs in the Gulf of California and, **in spite of the efforts** of the communities to protect Cabo Pulmo during this time, the results were **not encouraging**.

There were **corals**, yes,
and **colorful**, yes,
but no big fish.

The reefs at Cabo Pulmo
looked as **damaged** as all the rest.

Perhaps the efforts
of the communities to protect
their reefs, during four long years,
had been in vain.



Would the reefs recover?

Or, was it too late?

Cabo Pulmeños share their memories.

Juan Castro Montaña – (2nd generation)

"Like a boxer who, after many years of boxing, decides to hang up his gloves, we quit fishing."

Edmundo Minjares - (2nd generation)

"The creation of the National Park helped our businesses. More people want to come to see and enjoy what it is conserved."

Francisco Castro Lucero – (3rd generation)

The change started when we received good pay for taking tourists to dive. The more life there was, the happier the divers were."

Mario Castro Lucero – (3rd generation)

"A live turtle is more precious for us than a dead turtle."

Judith Castro Lucero – (3rd generation)

"The economic change in Cabo Pulmo also allowed women to participate in the alternatives that opened. Many women were involved in programs such as Turtle Monitoring, for example."

Ricardo Castro Fiol – (3rd generation)

"My diving business gives me the privilege and honor to teach the children of Cabo Pulmo."

Do you want to listen to these and more interviews?

visit: <http://areefreborn3d.com/about-the-film/interviews/>

But, on the reef, very quietly, little by little, change was happening.



CONCEPTS: ecosystems, food web, energy, migrations, coral reefs, algae, herbivores, relationships among organisms, adaptations, prey and predators

Can you match these concepts with the pictures and the texts?

Do you want to see clips of these and other creatures in A Reef Reborn?
visit: <http://areefreborn3d.com/see-the-film/clips/>

What natural processes occurred?

- _____ are the most productive and diverse marine ecosystems. They are like the forests or the jungles in our planet.
- At first glance, this _____ around Cabo Pulmo seems like a desert.
- In fact, a host of _____ lives below the sand and provides food for resident animals who import that energy into Cabo Pulmo's food web.
- The _____, that live in Cabo Pulmo, disperse at night to hunt. They return to the reef with the food energy they have collected. So the food web blossoms.
- Every year, one of the most spectacular migrations in this sea passes Cabo Pulmo: _____
- At the southern end of Cabo Pulmo, _____ synchronize their migration to the arrival of sardines.
- As the _____ started to recover, more fish were able to reap the sardine harvest.
- Out on the reef, grazing _____ were also starting to recover.
- _____ harvest energy directly from sunlight. Herbivores eat the _____ and capture that energy. Herbivore numbers grow and so does their size.
- Out on the reef, bigger fish continued to return. _____ were among the first.
- The prey of the leopard groupers is small fish like these _____ which had become abundant in the absence of predators.
- Sometimes the leopard groupers coordinate with other predators such as this _____.

Trevally gather here during the day for refuge



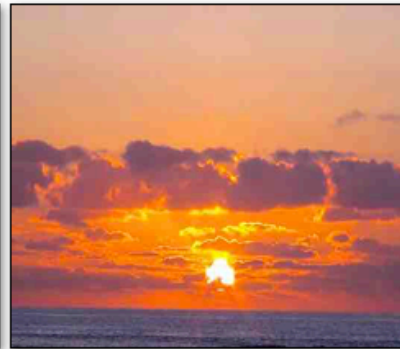
TREVALLY



MARAUDING PREDATORS



GULF GROUPERS AND DOG SNAPPERS



DAWN



NEWLY HATCHED TURTLES



HIDING PLACES



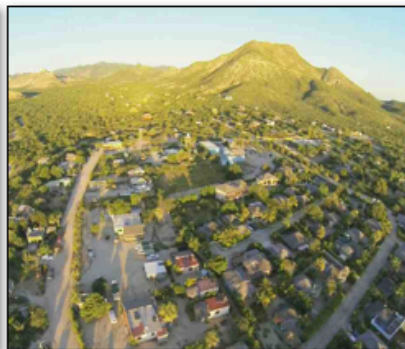
CLEANER FISH



TURTLES



SHARKS



CABO PULMO



A LITTLE GIRL AND HER DAD

CONCEPTS: artificial reefs, biodiversity, cleaner fish, the reef recovery, nature, a truly whole reef, participation of the communities, conservation

Can you match these concepts with the pictures and the texts?

Do you want to see more clips of A Reef Reborn?
visit: <http://areefreborn3d.com/see-the-film/clips/>

The recovery of the reefs and the communities

- The reefs today teem with life, like these _____. They gather here during the day for refuge and a place to breed. At night they disperse to hunt away from the reefs.
- Where there are so many fish, _____ are drawn in from afar.
- Giants such as _____ and _____ thrive here now. This reef has become a food basket big enough even for these huge eaters.
- It is a new _____ at Cabo Pulmo. Marine life is stirring, not just in the water.
- It is time for these _____ to find their way in the world. Some will return as adults to this same beach.
- Under the protection of _____, El Vencedor has attracted a staggering variety of life. Even some of the largest of all the species in the Gulf of California, which had been missing from Cabo Pulmo for decades, are appearing on this new reef.
- The diversity of El Vencedor's _____ invites cleaner fish.
- _____ not only serve the reef's residents, but they also attract the largest fish from the open sea.
- The young _____ that the communities have been protecting for years, have begun to return to the reefs in growing numbers. At the wreck they, too, take the advantage of the cleaner's services.
- The reappearance of _____ in Cabo Pulmo is the ultimate symbol of the reef's recovery. Cabo Pulmo's reefs are truly whole.
- Nature is indomitable. It is irrepressible. When we humans give it a chance, it can heal itself. And it can heal us, too. _____ has come back to its beginning.
- Cabo Pulmo holds the same wonder for us as it once did for _____ so long ago.

20 years in the Cabo Pulmo National Park



**T
O
D
A
Y**

Cabo Pulmo has come back to its beginning. Now it holds the same wonder for us today as it did for a little girl and her dad so long ago.



**2
0
0
5** Large predators return to Cabo Pulmo as fish abundances boom.

**2
0
0
0** The abundance of fish increases and local populations begin to show signs of recovery.



**1
9
9
5** Low fish diversity and few predators after many years of fishing activity.



What does it mean ...?

It is easy to say, "20 years of SUCCESS", but ...

We all know that, in order to achieve the SUCCESS in CONSERVATION, for which Cabo Pulmo is famous, there must have been a lot of hard work.

What is the relation of the following words with the story of A Reef Reborn and other stories of SUCCESS?

attitude

experience

learning

skills

science

information

commitment

leadership

communication

method

awareness

opportunities

culture

organization

data

patience

determination

participation

education

time

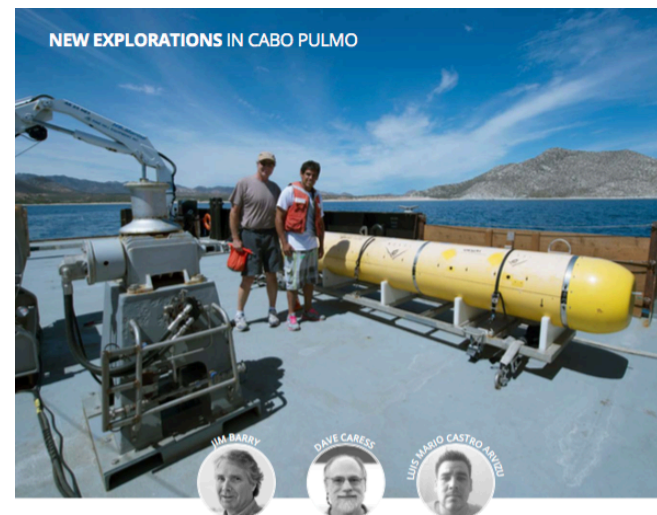
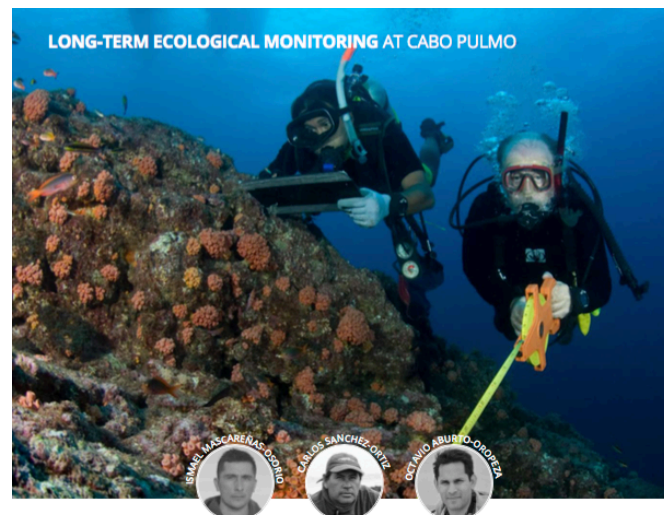
effort

tolerance

study

challenges

Research Programs at Cabo Pulmo



visit: <http://gulfprogram.ucsd.edu>

A report compiled by: Gulf of California **Marine Program**

Do you want to learn more about ...?

Research Programs in Cabo Pulmo

Members of the Cabo Pulmo community, David Castro among them, participate with professors and scientists of Mexico and the United States of America in different research programs.

Land and Sea at CABO PULMO

- The terrestrial biodiversity of Cabo Pulmo

Eggs at CABO PULMO

- Exploring fish diversity and spawning periods through genetic analyses of fish eggs and larvae.

Passive Acoustics at CABO PULMO

- Cabo Pulmo as a refuge and spawning site for the endangered Gulf Grouper (*Mycteroperca jordani*).

Active Acoustics at CABO PULMO

- Hydroacoustic fish surveys of the Cabo Pulmo National Park.

Long-term Ecological Monitoring at CABO PULMO

- Gulf of California long-term ecological monitoring program.

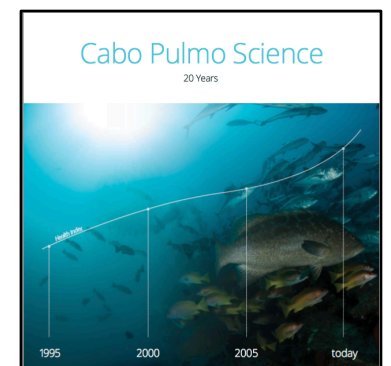
New Explorations in CABO PULMO

- Exploring the deep waters around Cabo Pulmo.

A report compiled by:
Gulf of California
Marine Program

Available in English

visit: https://scripps.ucsd.edu/centers/cmbc/wp-content/uploads/sites/39/2014/08/20_yrs_Cabo_Pulmo_GCMP_eng.pdf



His father, grandfather, great-grandfather and uncles were fishermen. David does not fish.

Jesús was David's great-grandfather. David was very young when his father (Mario), his grandfather (Enrique) and his uncles (Milo, Paco and Kiki) would go to the sea. Sometimes, they would return with their boats loaded with fish and other times their boats were empty.

Later, as many kids in Cabo Pulmo, David had to go to school to another community and he would come back home to spend the weekend. By then, his father had already started his scuba diving business. David always wanted to go with him but often his father would not let him because he was too young.

He loved everything related to the sea. He loved reading and he learned to speak English. Then, just like his father, he also decided to train to be a diver and stay in Cabo Pulmo.

Today, David is a **dive master**. He is responsible of guiding the divers that visit the Cabo Pulmo National Park. He has specialized in **diving for conservation** and, for the last 10 years, David guides and helps scientists in their **research studies**. As part of his job, David dives in these amazing reefs to **identify, classify** and **count species**.

David and this new generation of *Cabo Pulmeños* and neighboring communities show us that **it is possible to transform** our **minds**, our **actions** and our **life styles**, in order to **help nature recover** and to **learn, enjoy** and, in a **responsible manner**, **make the most of** the **environmental benefits** that nature offers us.



The transformation of the culture

With the support of academics, scientists, volunteers, educators, government institutions, NGOs and, above all, the **Pulmeños** and **members of neighboring communities**, today the CPNP has services, activities, campaigns, projects and programs such as:

- ✓ Management and conservation of reefs
- ✓ Management and conservation of turtles
- ✓ Community development
- ✓ Community gardens and organic crops
- ✓ Solid waste clean-up
- ✓ Recycling
- ✓ Water monitoring
- ✓ Educational field trips on land
- ✓ Environmental education
- ✓ Diving and snorkeling
- ✓ Research
- ✓ Restaurants and small hotels



visit: <http://cabopulmovivo.org/porta/wp-content/uploads/Programa-de-manejo-Cabo-Pulmo.pdf>

visit: <http://cabopulmovivo.org/porta/quienes-somos/coalicion/>

Friends and scientists of Cabo Pulmo

"I hope you enjoy this journey through Cabo Pulmo. It is a privilege for me, as a naturalist, as a Mexican, to share it with you."

Iliana Ortega

Marine Biologist and Conservationist

"There cannot be conservation unless we work, hand in hand, with the members of the communities.

Today, 20 years after the creation of the Park, families in Cabo Pulmo have a better quality of life. Not only economically. They say that they can spend time with their families. They have time to take care of each other, walk on the beach, look at the stars and admire what there is in the Park.

Carlos Godínez

Director of Cabo Pulmo National Park

"There are no recipes for conservation or restoration. Definitely, there are no recipes for community work. But there are stories that inspire and there are stories that convince. Cabo Pulmo inspires us, convinces us and helps us see opportunities. I hope that other communities learn from this example and find their own way to restore their marine ecosystems."

Gabriela Anaya

Marine Biologist and Conservationist

"After this quarter of a century of conservation process, we realize that Cabo Pulmo now is an international example. Sustainable development is possible when you put together environmental issues with social and economical issues. When you integrate them in order to protect the area, it is possible to manage it with success, with a sustainable approach for the area, and to improve your quality of life."

Oscar Arizpe

Professor/Scientist Universidad UABCS

"Cabo Pulmo is a model of conversation that we should be following along the Mexican coasts and even the coast of the whole world."

Octavio Aburto-Oropeza

Assistant Professor at Scripps Institution of Oceanography

"The corals are the base of the productivity in Cabo Pulmo, especially in the summer. When there is no plankton around, all the food for the trophic web comes from the algae, *zooxantela*, that live inside the corals. They produce carbohydrates and lipids that feed the invertebrates, the fish and then the big fish.

Fishermen, academy and civil organizations made the success in Cabo Pulmo possible. The lessons we learned from this experience helped us in 2005 when we started working with the communities in the Espíritu Santo Island to create the **Espíritu Santo Archipelago National Park**."

Parque Nacional Archipiélago Isla Espíritu Santo

visit: <http://pnaes.conanp.gob.mx>

Héctor Reyes

Professor/Scientist UABCS

"The **success** of the Cabo Pulmo National Park is due to a combination of **social** (strong **community leadership**, **social cohesion** and **effective enforcement**) and **ecological factors**."

Source: Aburto-Oropeza O, Erisman B, Galland GR, Mascareñas-Osorio I, Sala E, Ezcurra E (2011) Large Recovery of Fish Biomass in a No-Take Marine Reserve. PLoS ONE 6(8): e23601. doi:10.1371/journal.pone.0023601

visit: <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0023601>

Do you want to listen to the complete interviews? visit: <http://areefreborn3d.com/about-the-film/interviews/>

Do you want to learn more about the characters in A Reef Reborn? visit: <http://areefreborn3d.com/about-the-film/characters/>

Cabo Pulmeños share their present

"The days of my father, where there were many sharks and abundance in Cabo Pulmo, are back!"
Francisco Castro Lucero (3rd generation)

"For snorkeling and diving tours we do not have to go far. So, we do not spend as much in gas as we used to and our motors last longer."
Juan Castro Montaña (2nd generation)

"I am one of the first fortunate women of the community who was able to go to the university. Parents in Cabo Pulmo now have the opportunity to help their children continue their education."
Gabriela Castro Murillo (3rd generation)

"Imagine! I will give you an example. When we have our children, we take care of them with love, so that they can grow up strong and healthy and if they are good people, we feel proud. It is the same with our reefs. Not many people have the privilege to have something like this. The reefs are a gift that God gave us. We have to protect them with love, just like we love our children."

Ricardo Castro Montaña (2nd generation)

"Diving in the Cabo Pulmo National Park now is like traveling in a time machine that allows me to experience the thrill that Jacques Cousteau and Ramón Bravo felt and showed us in their documentaries about the Gulf of California. They are who inspired me to be the scientist and photographer that I am today."

Octavio Aburto-Oropeza

Assistant Professor at Scripps Institution of Oceanography

Source: Aburto, O. 2010. Los beneficios de las reservas marinas. CONABIO. Biodiversitas, 89:1-6

visit: <http://www.biodiversidad.gob.mx/Biodiversitas/Articulos/biodiv89art1.pdf>

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