



# Global Re-introduction Perspectives: 2016

Case-studies from around the globe

Edited by Pritpal S. Soorae



IUCN/SSC Re-introduction Specialist Group (RSG)



TURNER  
ENDANGERED  
SPECIES  
FUND





The designation of geographical entities in this book, and the presentation of the material, do not imply the expression of any opinion whatsoever on the part of IUCN or any of the funding organizations concerning the legal status of any country, territory, or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

The views expressed in this publication do not necessarily reflect those of IUCN.

**Published by:** IUCN/SSC Re-introduction Specialist Group & Environment Agency-ABU DHABI

**Copyright:** © 2016 International Union for the Conservation of Nature and Natural Resources

Reproduction of this publication for educational or other non-commercial purposes is authorized without prior written permission from the copyright holder provided the source is fully acknowledged.

Reproduction of this publication for resale or other commercial purposes is prohibited without prior written permission of the copyright holder.

**Citation:** Soorae, P. S. (ed.) (2016). *Global Re-introduction Perspectives: 2016. Case-studies from around the globe*. Gland, Switzerland: IUCN/SSC Re-introduction Specialist Group and Abu Dhabi, UAE: Environment Agency-Abu Dhabi. xiv + 276 pp.

**ISBN:** 978-2-8317-1761-6

**Cover photo:** Clockwise starting from top-left:  
i. Bolson's tortoise, USA @ Turner Endangered Species Fund  
ii. Wetapunga, New Zealand @ Richard Gibson  
iii. Morelos minnow, Mexico @ Topiltzin Contreras-MacBeath  
iv. *Silene cambessedesii*, Spain @ Emilio Laguna  
v. Tasmanian Devil, Maria Island, Tasmania @Simon DeSalis  
vi. Agile frog, Jersey @ States of Jersey Department of the Environment

**Cover design & layout by:** Pritpal S. Soorae, IUCN/SSC Re-introduction Specialist Group

**Produced by:** IUCN/SSC Re-introduction Specialist Group & Environment Agency-ABU DHABI

**Download at:** [www.iucnsscscrg.org](http://www.iucnsscscrg.org)

## Experimental re-introduction of *Acropora* corals from Lakshadweep Islands to Mithapur coral reef, Gulf of Kutch, Gujarat, India

S. Subburaman<sup>1</sup>, S. Goutham<sup>1</sup>, Diresh Joshi<sup>1</sup>, C. N. Abdul Raheem<sup>2</sup>, Rahul Kaul<sup>1</sup>, R.D. Kamboj<sup>3</sup>, Sathish Trivedi<sup>4</sup>, B. C. Choudhury\*<sup>1</sup> & Vivek Menon<sup>1</sup>

<sup>1</sup> - Wildlife Trust of India, F-13, Sector-8, Noida-201301, National Capital Region, Uttar Pradesh, India

<sup>2</sup> - Department of Environment and Forest, Agatti Island-682553, Union Territory of Lakshadweep, India

<sup>3</sup> - Gulf of Kutch Marine National Park & Sanctuary, Department of Environment & Forest, Ganjiwada, Naganathgate, Jamnagar-361001, Gujarat, India

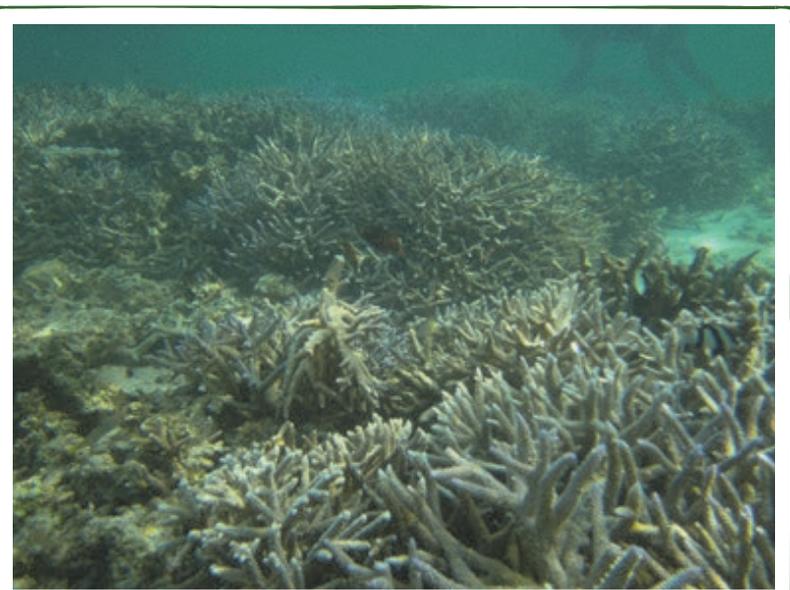
<sup>4</sup> - Tata Chemicals Society for Rural Development, Tata Chemicals Limited, Mithapur-361345, Gujarat, India

(Corresponding Author:\* - [bcchoudhury@wti.org.in](mailto:bcchoudhury@wti.org.in))

### Introduction

Coral reefs are complex marine ecosystems that provide shelter, feeding and breeding grounds to nearly 25% of all marine life forms. The Gulf of Kutch (GoK) on the western coast of India, is one of the major coral reef habitats in the country and comprises 32 reef islands. However, the coral diversities in GoK are quite low compared to other coral reefs like Gulf of Mannar, Lakshadweep Islands and Andaman & Nicobar Islands. Extreme environmental variations and anthropogenic pressures have led to coral reef degradation in GoK. GoK is dominated by boulder corals and branching forms are completely absent. The dead skeletons of branching coral, *Acropora* sp. (*A. humilis*) have been reported at various locations of GoK. There have been no live branching corals reported, leading to the conclusion that *Acropora* species may have died out or has a restricted distribution in GoK waters.

*Acropora* spp. are listed in Schedule I of the Indian Wildlife (Protection) Act of 1972 and the IUCN Red List has listed *A. humilis* as Near Threatened. *A. humilis* has a wide distribution and is native to Indian, Atlantic and Pacific oceans. The restoration experiment was based on the available guidelines (Soong & Chen, 2003; Edwards & Gomez, 2007; Edwards, 2010).



*Acropora* colony at Agatti © S. Subburaman/WTI



*Acropora* collection from donor colony

© S. Subburaman/WTI

## Goals

- Goal 1: Re-introduce locally extinct *Acropora* corals to GoK using a unique public-private partnership model.
- Goal 2: Establish artificial reefs and create conducive habitat for re-introduced *Acropora* and also other coral spawn to settle.
- Goal 3: Rescue and rehabilitation of boulder corals exposed during low tide.
- Goal 4: Remove all reef destructive fishing practices.
- Goal 5: Community awareness and involvement of communities in reef restoration activities.

## Success Indicators

- Indicator 1: Successful survival of re-introduced *Acropora* corals.
- Indicator 2: Settlement and growth of corals (both natural and rescued) on established artificial reefs.
- Indicator 3: Reef destructive fishing practices stopped.
- Indicator 4: Increased communities awareness on corals and other reef biota.
- Indicator 5: Community involvement in coral rescue and restoration.

## Project Summary

**Feasibility:** The project focused on restoring a small coral reef lying on the fringes of the Marine National Park in GoK using a unique public-private partnership model. The 10 km long Mithapur Reef is the westernmost reef of GoK and has only boulder corals. The livelihood dependency of local communities on this reef is high and reef destructive fishing practices (fishing using Calcium Hypochlorite, upturning the corals, etc.) is also documented. Historically branching corals, *Acropora* species were present along GoK reef (Pillai *et.al.*, 1979). However, presently, there is no record of live *Acropora* species, leading to the conclusion that the species may have died out or have a restricted distribution in GoK waters.

Branching corals provides refuge for fish fries and fingerlings to hide and act as nurseries. As one of restoration measures for the Mithapur coral reef, Wildlife Trust of India (WTI) and Gujarat Forest Department (GFD) planned to re-introduce *Acropora* species at Mithapur in partnership with TATA Chemical Limited (TCL) and Lakshadweep Forest Department.

**Implementation:** WTI surveyed the Mithapur coral reef in 2008. After initial assessments, WTI and TCL prepared a plan for restoration and recovery of the reef in collaboration with the two concerned forest departments. Twenty two fragments of *Acropora humilis* fragments that were 60 days old, growing in the *in-situ* nursery at Agatti lagoon (Lakshadweep Islands) were transported and transplanted in GoK during March 2012. This was the first long distance (1,300 km) coral translocation in India. The mode of transportation from the Agatti to GoK was by ship, rail and road. Four fragments died due to transportation stress (4 days of journey). Eighteen *Acropora* fragments (13 healthy fragments and five stressed fragments) were transplanted at two different locations in GoK (Subburaman *et.al.*, 2014).

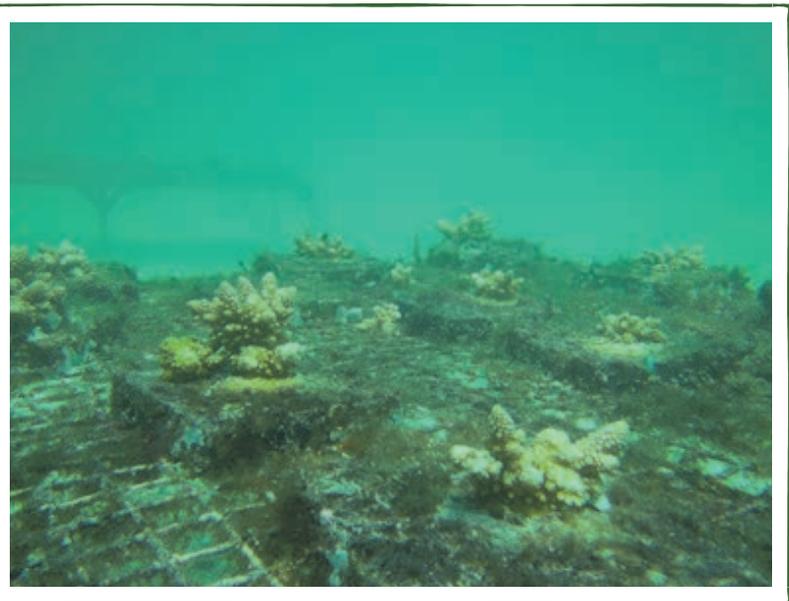
**Post-release monitoring:** Post-transplantation monitoring continued for 6 months. All the five stressed coral fragments died after few days of transplantation. But the healthy fragments survived till September 2012. Later they also got bleached and died. It was observed that after south-west monsoon (during October 2012) more resilient and locally occurring boulder corals of GoK also bleached severely and many perished. Macro algae were the major competitors of translocated corals and caused damage to coral tissue. However, other competitors like *Hydrozoans* and *Ascidians* were also found invading the translocated coral fragments during the post transplantation monitoring. One of the objectives of this project was to assess the survivability of re-introduced *Acropora* species in Gujarat waters. Oceanographic studies in GoK suggest that sedimentation is one of the major factors that restricting the coral survival. Edwards (2010) had recommended that a pilot study should be carried out before undertaking the full scale transplantation to avoid major loss.

### Major difficulties faced

- Distance between the nearest *Acropora* donor site and recipient site.

### Major lessons learned

- *A. humilis* can survive long distance transportation in experimental conditions.
- Branching corals can still survive in GoK (even though the experimental survival rate was only for few months).



*Acropora* in nursery in Lakshadweep

© S. Subburaman/WTI

## Success of project

Highly Successful	Successful	Partially Successful	Failure
		√	

### Reason(s) for success/failure:

- Water turbidity caused by suspended particles.
- Strong water currents during south-west monsoon.

## References

Edwards, A.J. (2010) Reef Rehabilitation Manual. Coral Reef Targeted Research & Capacity Building for Management Program: St Lucia, Australia. 1-166.

Edwards, A.J. & Gomez, A.D. (2007) Reef restoration concepts and guidelines: making sensible management choices in the face of uncertainty. Coral Reef Targeted Research & Capacity Building for Management Program, St. Lucia, Australia.

Pillai, C.S.G., Rajagopalan, M.S. & Varghese, M.A. (1979) Preliminary report on a reconnaissance survey of the major coastal and marine ecosystem in Gulf of Kutch. Marine Fishery information Service. CMFRI, Cochin-682031, India. T&E Serv. No.14: 16-20.

Soong, K. & Chen, T.A. (2003) Coral transplantation: regeneration and growth of *Acropora* fragments in a nursery. Restoration Ecology 11: 62-71.

Subburaman, S., S. Goutham, C.N. Abdul Raheem, R. Kaul, R.D. Kamboj, S. Trivedi & Choudhury, B.C. (2014) Survival status of experimental transportation and transplantation of *Acropora* corals from Lakshadweep to Gujarat, India. Scientific transactions in environment and technovation, 7(3): 135-140.



INTERNATIONAL UNION  
FOR CONSERVATION OF NATURE

WORLD HEADQUARTERS  
Rue Mauverney 28  
1196 Gland, Switzerland  
Tel +41 22 999 0000  
Fax +41 22 999 0002  
[www.iucn.org](http://www.iucn.org)

