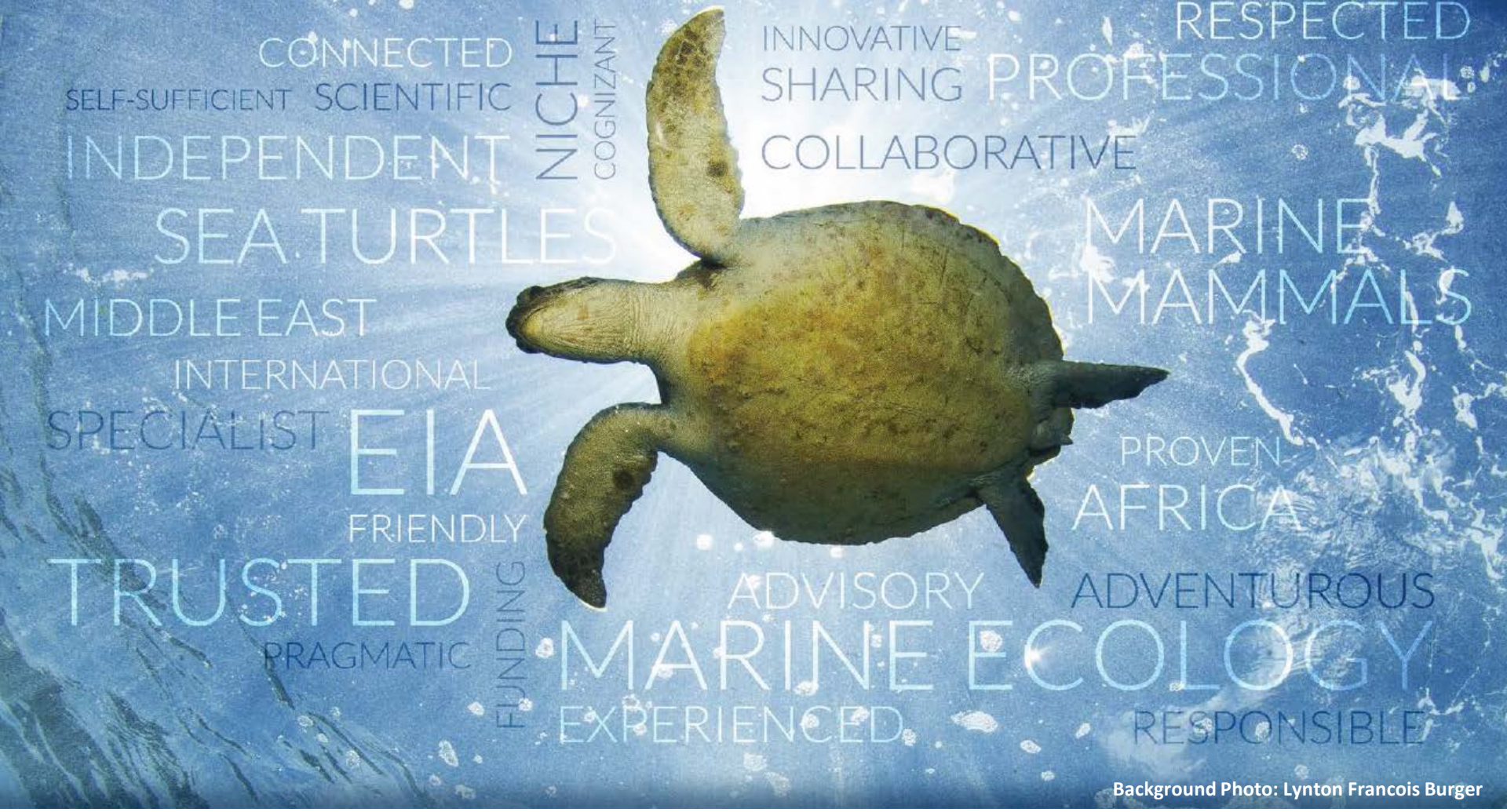


IAIA18: Applying the mitigation hierarchy to address marine biodiversity impacts

Addressing Data Paucity to Improve Avoidance for Marine Biodiversity

Neil Cousins, May 2018

bluedot associates

The first stage of recovery is understanding that there is a problem

We keep facing projects where there are conflicts with high coastal and marine biodiversity values and we are asked to use our advice to manage the issues


A new port in critical humpback whale habitat – post ESIA


A new port and national economic hub in critical humpback whale habitat – post ESIA


An LNG development in Ghana with nesting turtles – post site selection


A new port with nesting sea turtles – post ESIA


An a new mining terminal with nesting sea turtles – post site selection


Major tourism development adjacent to an international critical habitat for sea turtles – post spatial planning

What is happening?

Are these issues across projects, clients, countries, practitioners a function of:

- Lack of effective planning and screening?
- Ineffective delivery of studies and decision-making?
- The process?*
- Governance?
- Lack of data?*

** All of these may be apparent and lead to issues, but for this presentation we will focus on these aspects in line with the theme of the session – applying the mitigation hierarchy*

Mind the gap – is data the underlying limiter

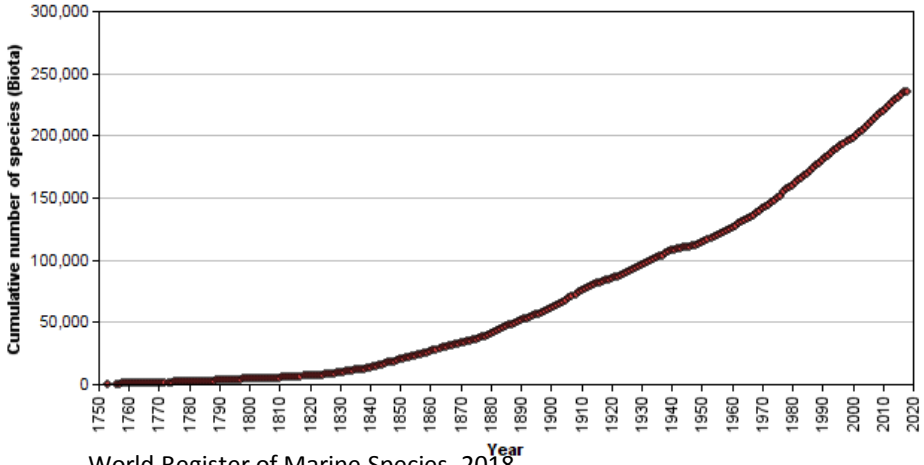
The gaps in what we know are big

The certainty in what we know can be low

We have a better resolution of Mars and the Moon than the seabed

Around 2000 new species are being identified each year

We are losing what we know and don't know

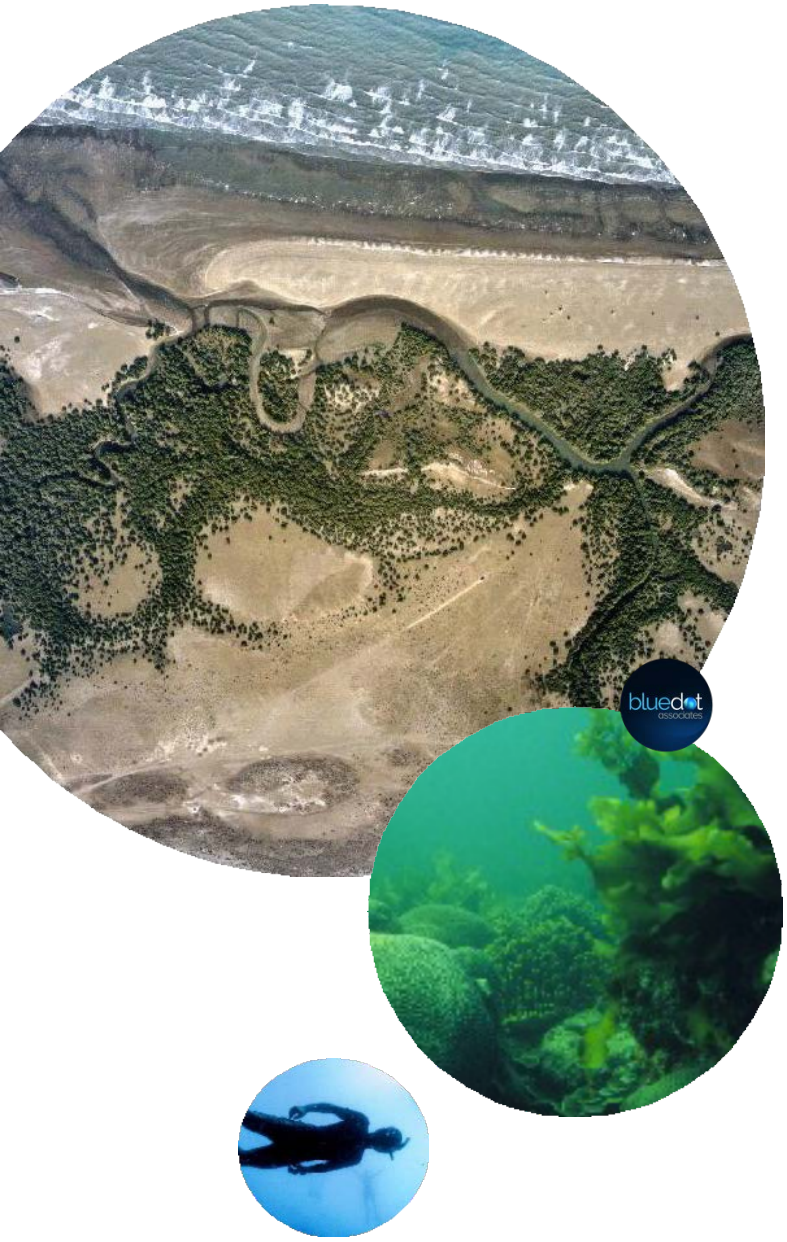


World Register of Marine Species, 2018

Mitigation and time

If we agree that avoidance is the first and most important step to protect marine biodiversity then we should pay most of our attention to delivering it wherever that influence is possible.

If the timing of actions affect the implementation of avoidance, and delivering this is vital to better manage risks and improve outcomes; then embedding early actions must be an important goal for effective decision-making.



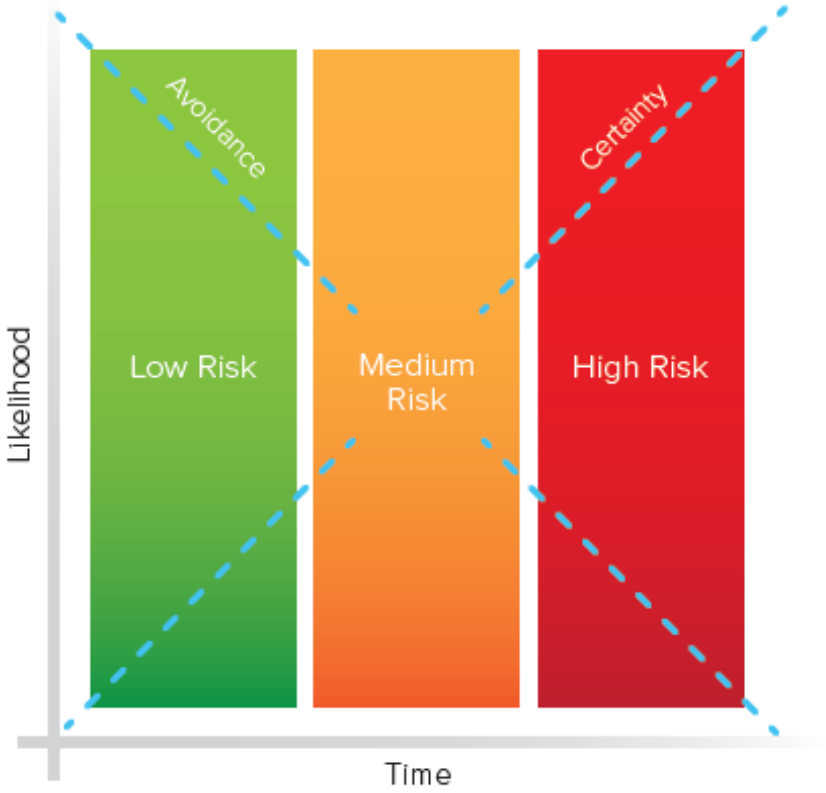
The certainty conundrum

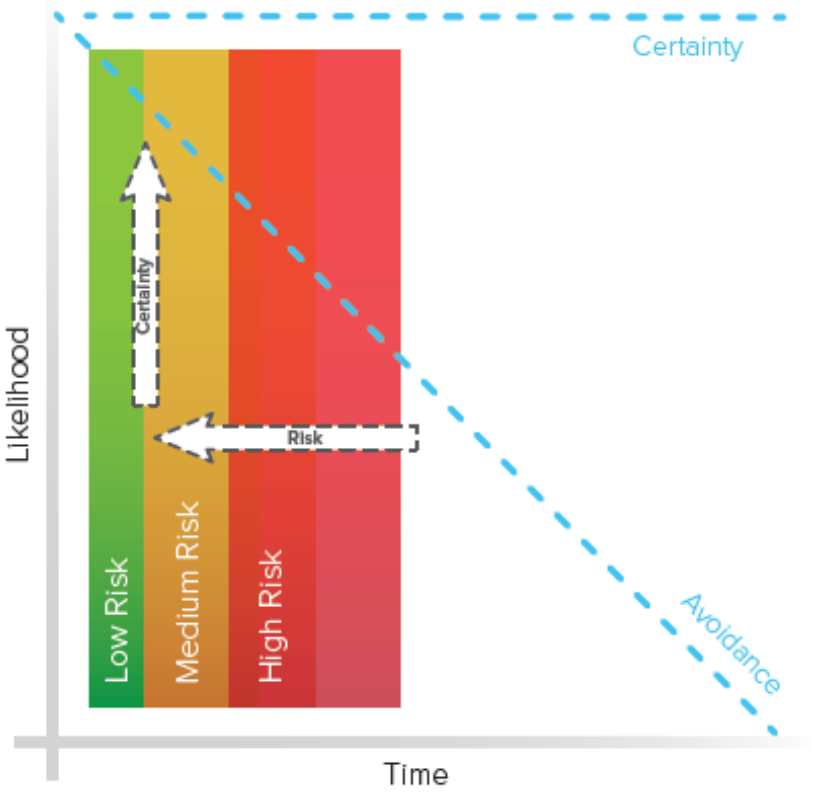
The quest for certainty drives research, processes, decision-making and the measurement of outcomes.

With marine biodiversity things are often quite uncertain even when data has been collected.

Understanding how to make effective actions to avoid impacts must therefore be dependent upon drawing the lines where there is acceptable certainty and risk.

Zones of decision-making to avoid impacts





Questioning and shifting the paradigms

To find good solutions we need to understand the framework in which they sit; and part of the solution may be to address the paradigms that drive the framework:

- How much certainty do we need?
- Is a best educated guess ok to make a decision?
- Must a good decisions for biodiversity be balanced by multi-criteria or be independent?
- How likely are we to trigger precaution early and what is the threshold?
- Are we able to convince when we propose uncertain options?
- How do we deal with acceptability when we know we will likely have uncertain and unexpected results?
- Does a complex problem require detailed and complex solutions?

How can we solve the issues – some solutions

Using independent expert panels as a function for delivering effective advice in an uncertain world

The Bluedot Advisors: addressing uncertainty, making expert judgements, building bridges in data, forming collaboration to solve issues, expanding networks, and using experience and aligned ethos to build capacity

Defining the goal and picking the right tools

Improving certainty and developing actions that lead to more effective early decisions & de-coupling decision-making from EIA

Screening & Avoidance:
Global screening tool to identify potential triggers for critical habitat related to sea turtle presence

Rapid Assessment of Priorities:
Sea Turtle Nesting Beach Indicator Tool to provide a rapid assessment approach to quickly understand the potential for sea turtle nesting.

Early Mitigation Planning:
Standardised Biodiversity Action Planning for addressing potential impacts on sea turtles

EIA

A drought is never ungrateful for a drop of rain and a waterfall has never formed without it

Simple solutions that address important common issues and support research, strategic planning, project studies, decision-making and management of risks

Rapid assessment predictive ground tools

Excel and printed form based to ease use and sharing

Sea Turtle Nesting Beach Indicator Tool

Version 1.0

Authors: Neil Cousins (Bluedot Associates Ltd), Alan Rees and Brendan Godley
(Centre for Ecology & Conservation, University of Exeter)

Beach / Survey details

Country / Location Name:

Coordinates (x.x Lat, y.y Lon):

Date (dd/mm/yy) :

Beach suitability assessments (select from drop-down categories and enable editing if prompted)

Beach sediment (to 50cm)	Please Select
Beach elevation (above high tide)	Please Select
Beach width (above high tide)	Please Select
Beach slope	Please Select
Beach length	Please Select

Human impact assessments (select from drop-down categories and enable editing if prompted)

Fixed or semi-fixed development behind the beach (houses, huts, bars, cantinas, sheds, fences, pipe lines etc.)	Please select
Obstructions on beach (boats, furniture, logs etc.)	Please select
Disturbance on the beach (e.g. access, recreation, fishing, livestock rearing, beach excavation,	Please select
Evidence of Light pollution on the beach (direct lighing [up to 1.5 km away for large developments] and skyglow)	Please select

Tool Predictions

Beach Suitability:	
Human impacts:	

Download from:

http://bluedotassociates.com/rapid-data/

Published in:

Marine Turtle Newsletter (#153, 2017)
http://www.seaturtle.org/mtn/PDF/MTN153.pdf

Africa Sea Turtle Newsletter (#8, 2017)
http://oceanecology.org/african-sea-turtle-newsletter/

State of the Worlds Turtles (SWOT) Report, Vol. XIII
http://seaturtlestatus.org/report/swot-report-vol-13

Indian Ocean Turtle Newsletter
https://www.iotn.org/wp-content/uploads/2018/03/IOTN-26.pdf

Rapid assessment predictive remote tools

Satellite derived imagery intertidal and subtidal habitat mapping, topography and bathymetry: spectral analysis, textural analysis, water column correction, ground truthing etc.

For example: remote sensing of sea turtle nesting habitats and offshore foraging area.

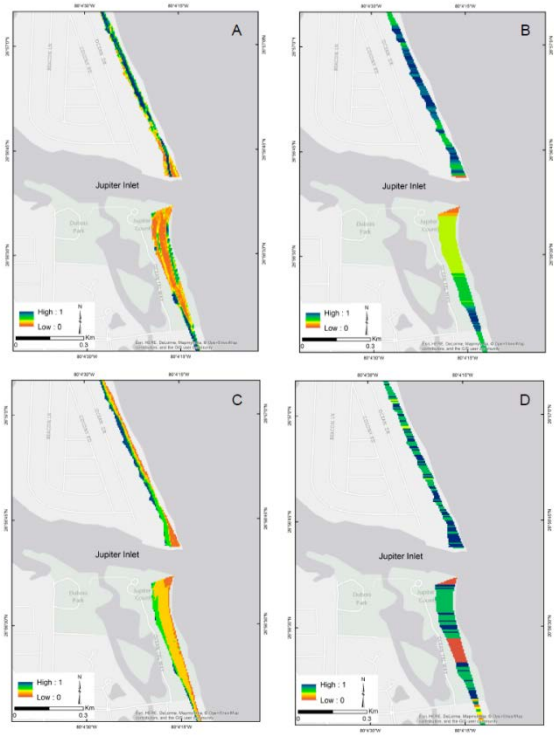
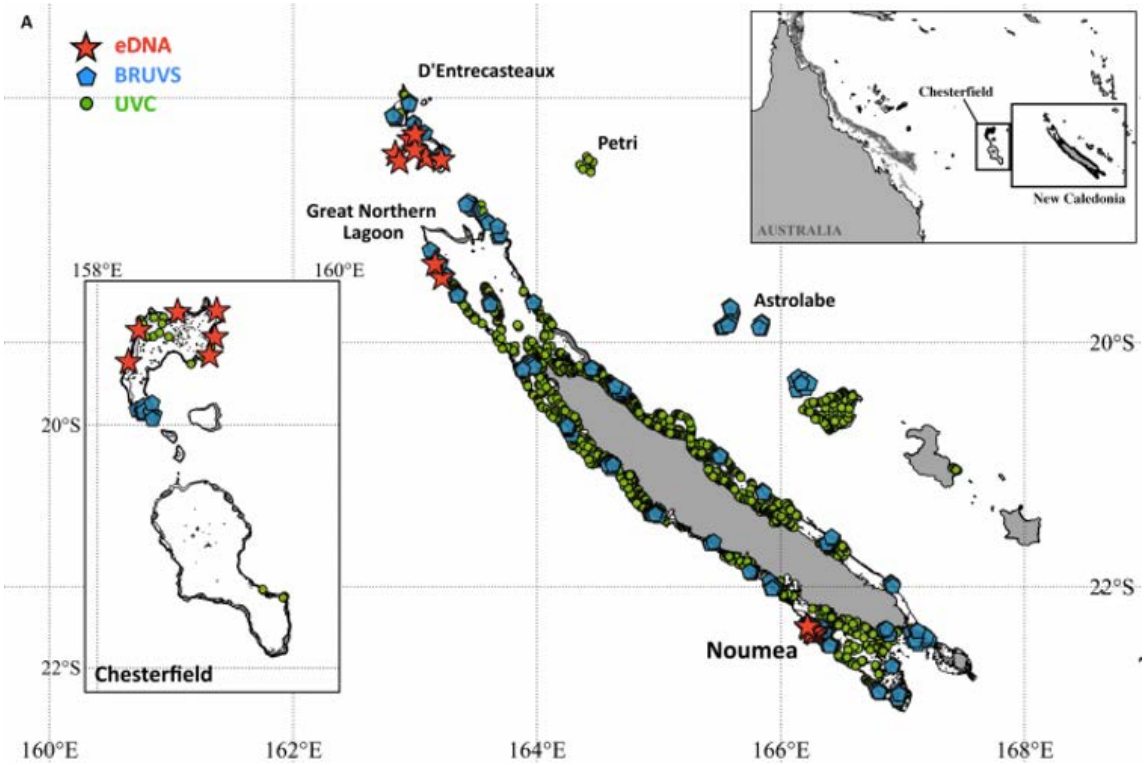


Figure 4. Rasterized model grids for: (A) slope; (B) beach width; (C) elevation; and (D) dune elevation for the area around Jupiter Inlet, FL.

gure 8. Nesting suitability, Model 17 (A); approximate dune vegetation (B); and potential artificial ht pollution (C).

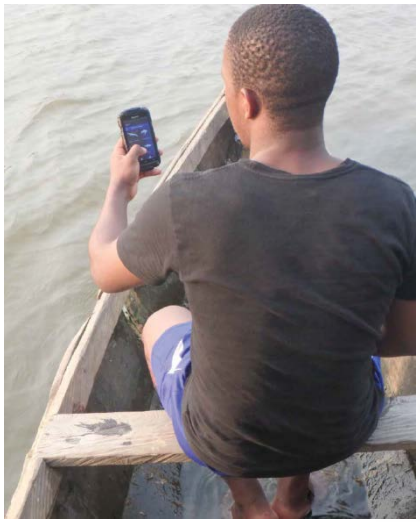
Source: Lauren Dunkin, Molly Reif, Safra Altman and Todd Swannack (2016). A Spatially Explicit, Multi-Criteria Decision Support Model for Loggerhead Sea Turtle Nesting Habitat Suitability: A Remote Sensing-Based Approach

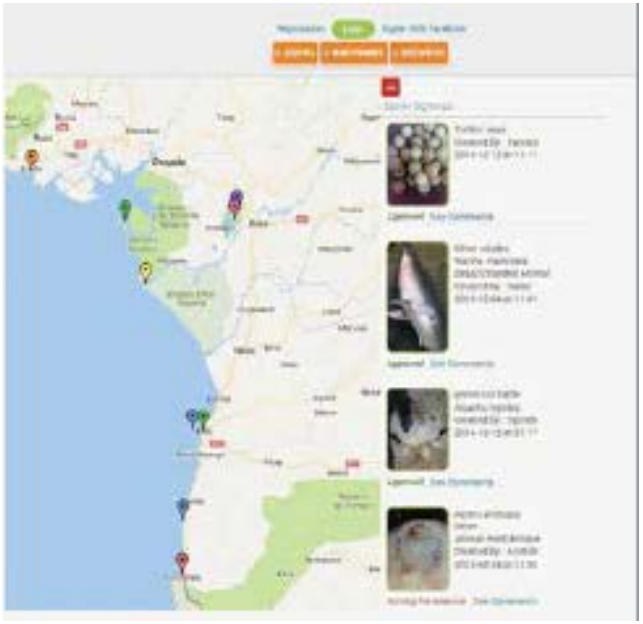
eDNA – rapid assessment indicators



22 eDNA water samples (red stars) detected more sharks than numerous camera recordings (blue) or scuba dives (green). (Boussarie & Bakker et al (2018))
Source of image: https://www.smithsonianmag.com/science-nature/scientists-have-new-way-knowing-how-many-sharks-are-in-sea-180968964/#p9X3kFQor13wkpPi.99

Using networks and building capacity





THIS PAGE: Screenshots from the SIREN-Turtles mobile phone application, which is designed to facilitate sea turtle nesting data collection, and the online map interface displaying reported observation data. © AMMCO. AT RIGHT: A SIREN app user reports an observation in Lake Ossa, Cameroon. © AMMCO

Images sourced from SWOT XII:
http://seaturtlestatus.org/sites/swot/files/report/0420517_SWOT12_p42-43_SIREN.pdf

Accepting scale and delivering broad understanding with conservation research

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WILEY

RESEARCH ARTICLE

Cetacean rapid assessment: An approach to fill knowledge gaps and target conservation across large data deficient areas

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Abstract

1. Many species and populations of marine megafauna are undergoing substantial declines, while many are also very poorly understood. Even basic information on species presence is unknown for tens of thousands of kilometres of coastline, particularly in the developing world, which is a major hurdle to their conservation.
2. Rapid ecological assessment is a valuable tool used to identify and prioritize areas for conservation; however, this approach has never been clearly applied to marine cetaceans. Here a rapid assessment protocol is outlined that will generate broad-scale, quantitative, baseline data on cetacean communities and potential threats, that can be conducted rapidly and cost-effectively across whole countries, or regions.
3. The rapid assessment was conducted in Tanzania, East Africa, and integrated collection of data on cetaceans from visual, acoustic, and interview surveys with existing information from multiple sources, to provide low resolution data on cetacean community relative abundance, diversity, and threats. Four principal threats were evaluated and compared spatially using a qualitative scale: cetacean mortality in fishing gear (particularly gillnets); cetacean hunting, consumption or use by humans; shipping related collision risk and noise disturbance; and dynamite fishing.
4. Ninety-one groups of 11 species of marine mammal were detected during field surveys. Potentially the most important area for cetaceans was the Pemba Channel, a deep, high-current waterway between Pemba Island and mainland Africa, where by far the highest relative cetacean diversity and high relative abundance were recorded, but which is also subject to threats from fishing.
5. A rapid assessment approach can be applied in data deficient areas to quickly provide information on cetaceans that can be used by governments and managers for marine spatial planning, management of developments, and to target research activities into the most important locations.

KEYWORDS
cetaceans, distribution, environmental impact assessment, management, marine spatial planning, rapid assessment, Tanzania

1 | INTRODUCTION

Marine megafauna, such as elasmobranchs, marine mammals and sea turtles are some of the most iconic components of ocean biodiversity, yet many populations are undergoing large and unprecedented declines owing to unsustainable direct exploitation or incidental mortality in fisheries (Heithaus, Frid, Wirsing, & Worm, 2008; Lewison, Crowder, Read, & Freeman, 2004). Beyond their flagship status, these species

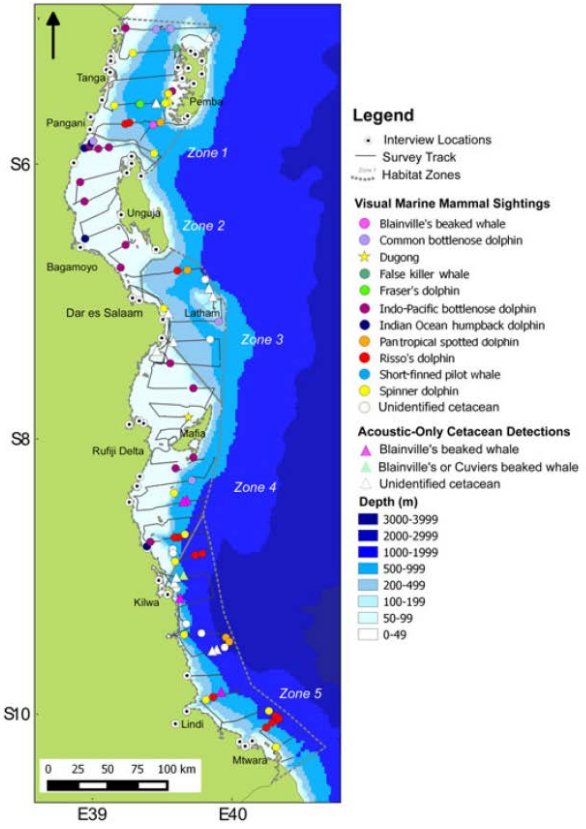

FIGURE 1 Boat survey track and the location of visual and acoustic marine mammal group detections made during the vessel-based cetacean survey of the entire coast of Tanzania conducted between 4 March and 6 April 2015

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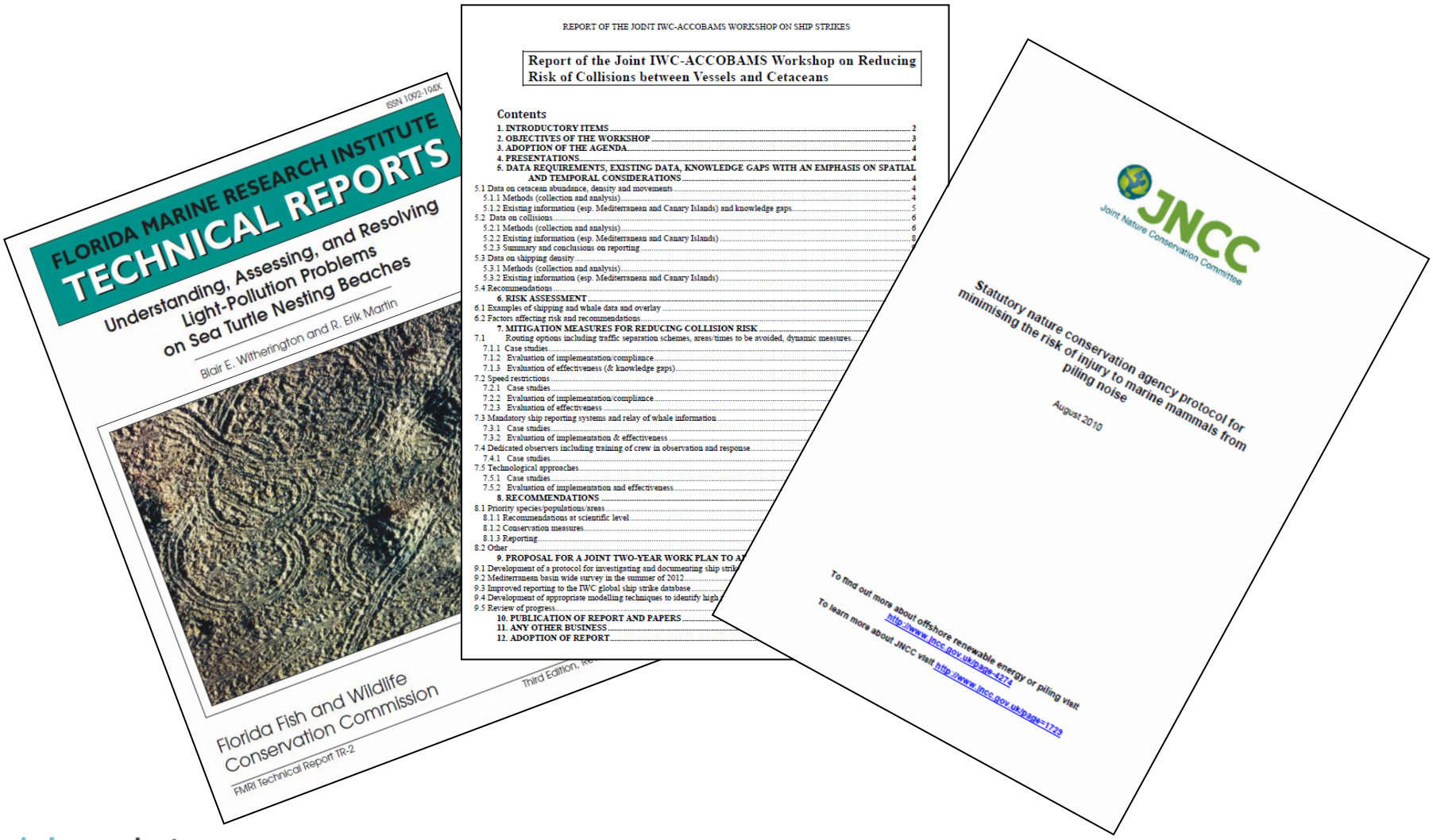
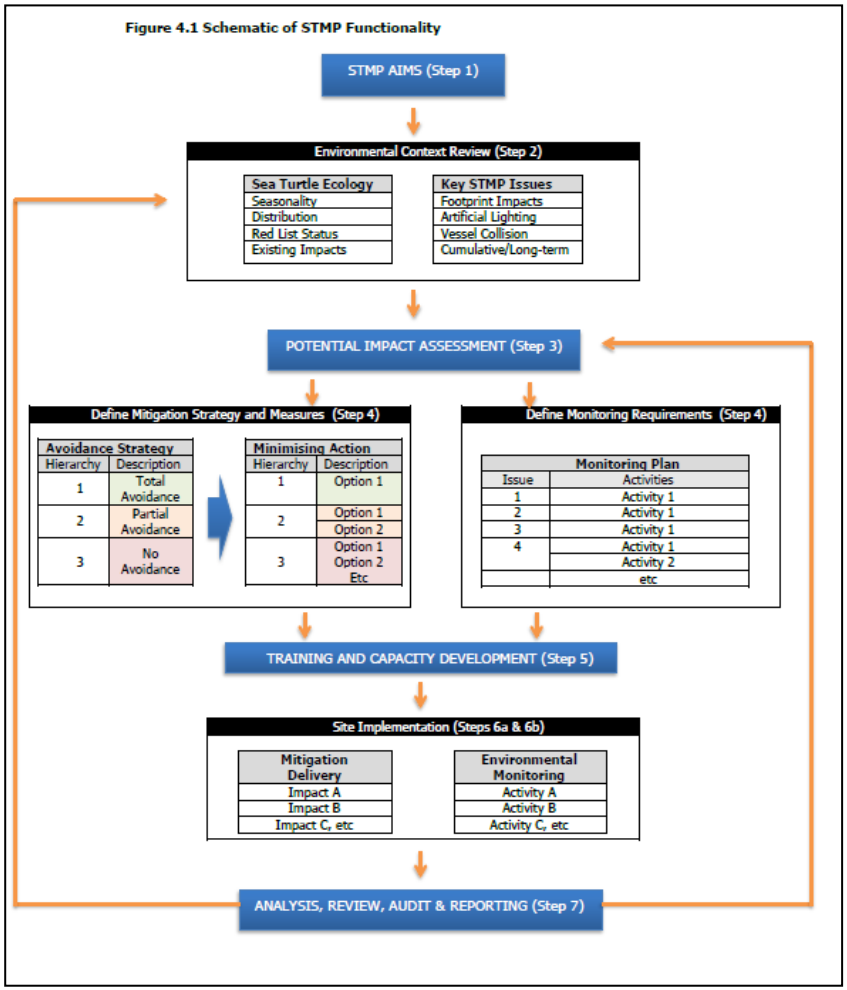
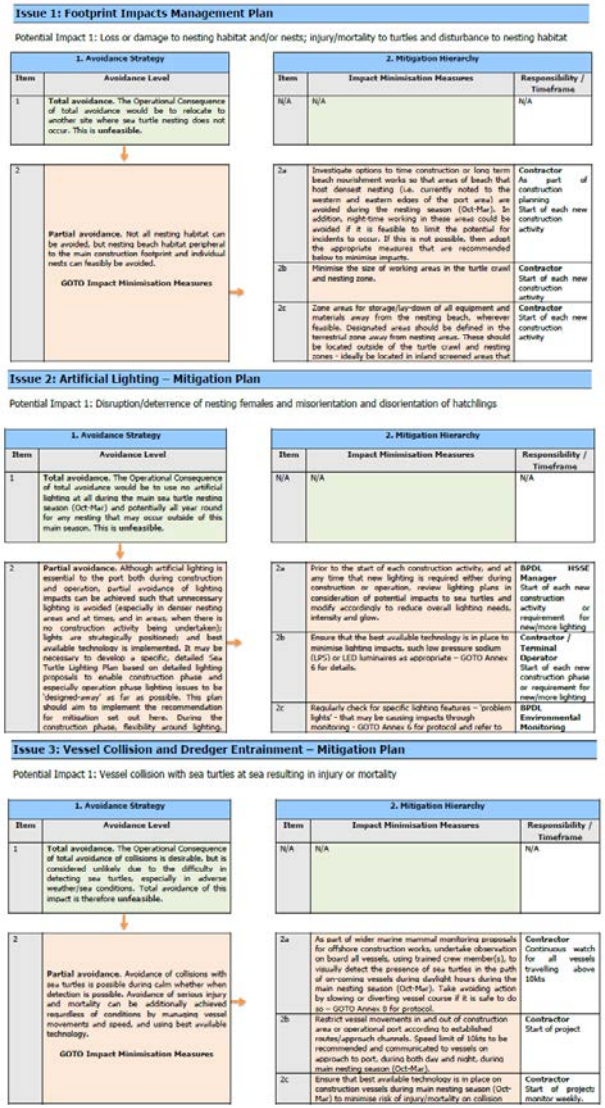
Form the options and framework to make better decisions

Mitigation is not always reliant on data if common issues are known and we understand how they can be managed



Establishing new guides for commonly encountered issues





- Loss and Damage
- Obstructions
- Pollution and entanglement
- Off-duty workforce

- Disruption, deterrence,
- Mis-orientation and disorientation

- Vessel collision
- Entrainment

Avoidance is simple - it then gets complicated…

More questions we must tackle and answer to make progress….

- If uncertainty undermines accurate definition of effects how do we measure implementation of the rest of the hierarchy if avoidance is not possible?
- Is no residual effect ever likely?
- If you have uncertainties should we seek to measure no net loss and net gain against these unknowns or by something else?
- Will accepting that no net loss and net gain is uncertain or immeasurable promote better avoidance?
- Will accepting uncertainty and changing the measurement of success improve offset implementation?
- If the processes we use for decision making are undermined should we continue to rely on it, endorse it and accept the outcomes?
- When are we going to start working on the alternatives?