How can information lead to better conservation outcomes?

Andrew Cottam
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Current tools

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BIOPAMA


Pacific Islands
Protected Area Portal

Current Tools

- Dashboard style
- Publishing and sharing of reference information
- Not clear how to use the information
- Link to conservation gain?

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Vision for future tools

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Vision for future tools

- Focus on conservation targets
- Community-based
- Distributed content and ownership
- Use information to direct conservation action
- Don’t publish and share just because you can

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Focus on conservation targets

Simple premise:

'If you achieve your target, you have a conservation outcome'

- User requirements analysis largely done
- Targets in policy documents

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Focus on conservation targets

Policies
↓
Targets
↓
Indicators
↓
Measure progress
↓
Direct conservation action

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Focus on conservation targets

Policies

↓

Targets

↓

Information ⟶ Indicators

↓

Measure progress

↓

Direct conservation action

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Example: Regional target for Intact Forest Landscapes

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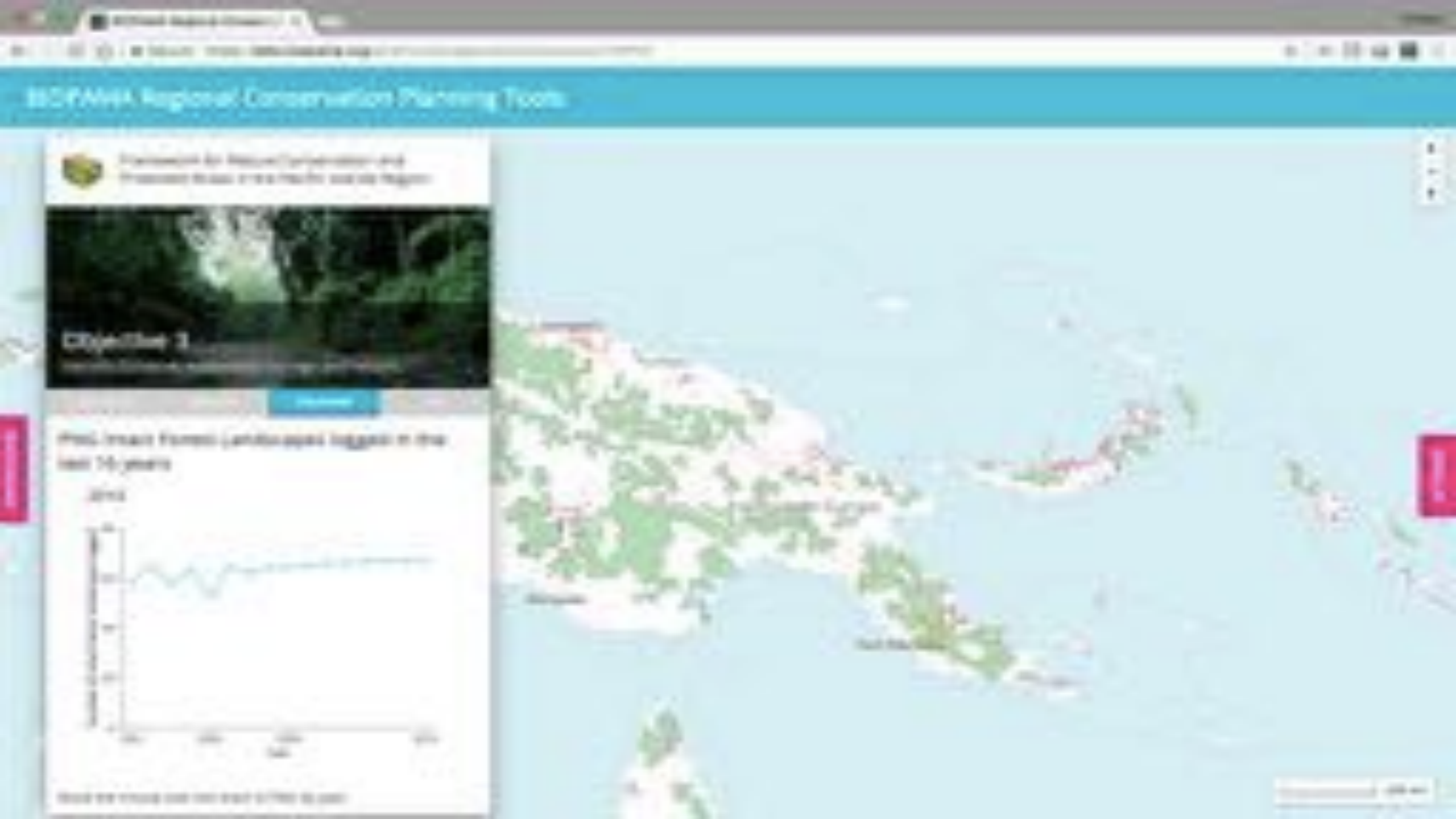
BCPAMA Regional Conservation Planning Tools


BIOPAMA Regional Conservation Planning Tools


SEOFANHA Regional Conservation Planning Tools
Objective 3
Number of countries tagging insert species
2014

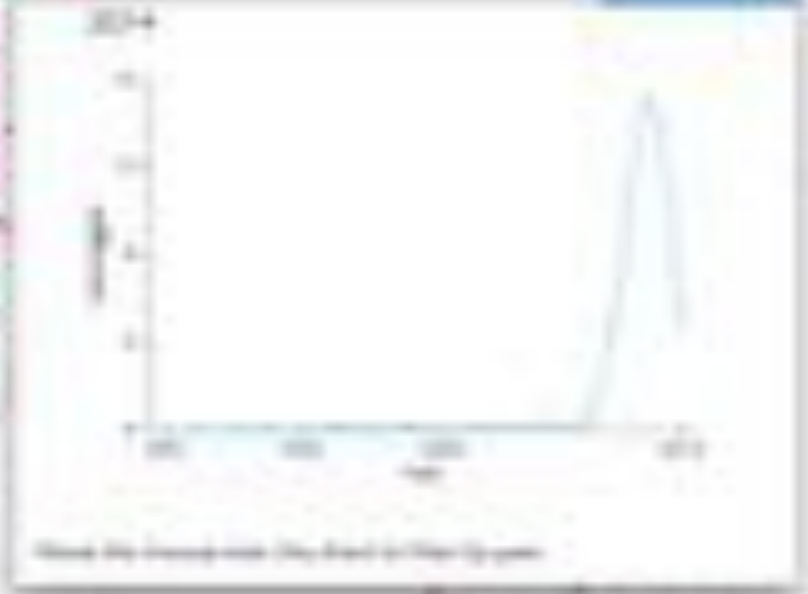

SEOANRA Regional Conservation Planning Tools
Objective 3
Most intact forest landscapes logged in the last 16 years


SEAPAHRA Regional Conservation Planning Tools
Objective 3


Objective 3


SCPMRA Regional Conservation Planning Tools
Objective 3

MCFMRA Regional Conservation Planning Tools




BCPMRA Regional Conservation Planning Tools
Objective 3


Objective 3


BC PARKS Regional Conservation Planning Tools
Objective 3


Objective 3
Contact enforcement agencies

Example: National target for PNG (CBD Target 11)

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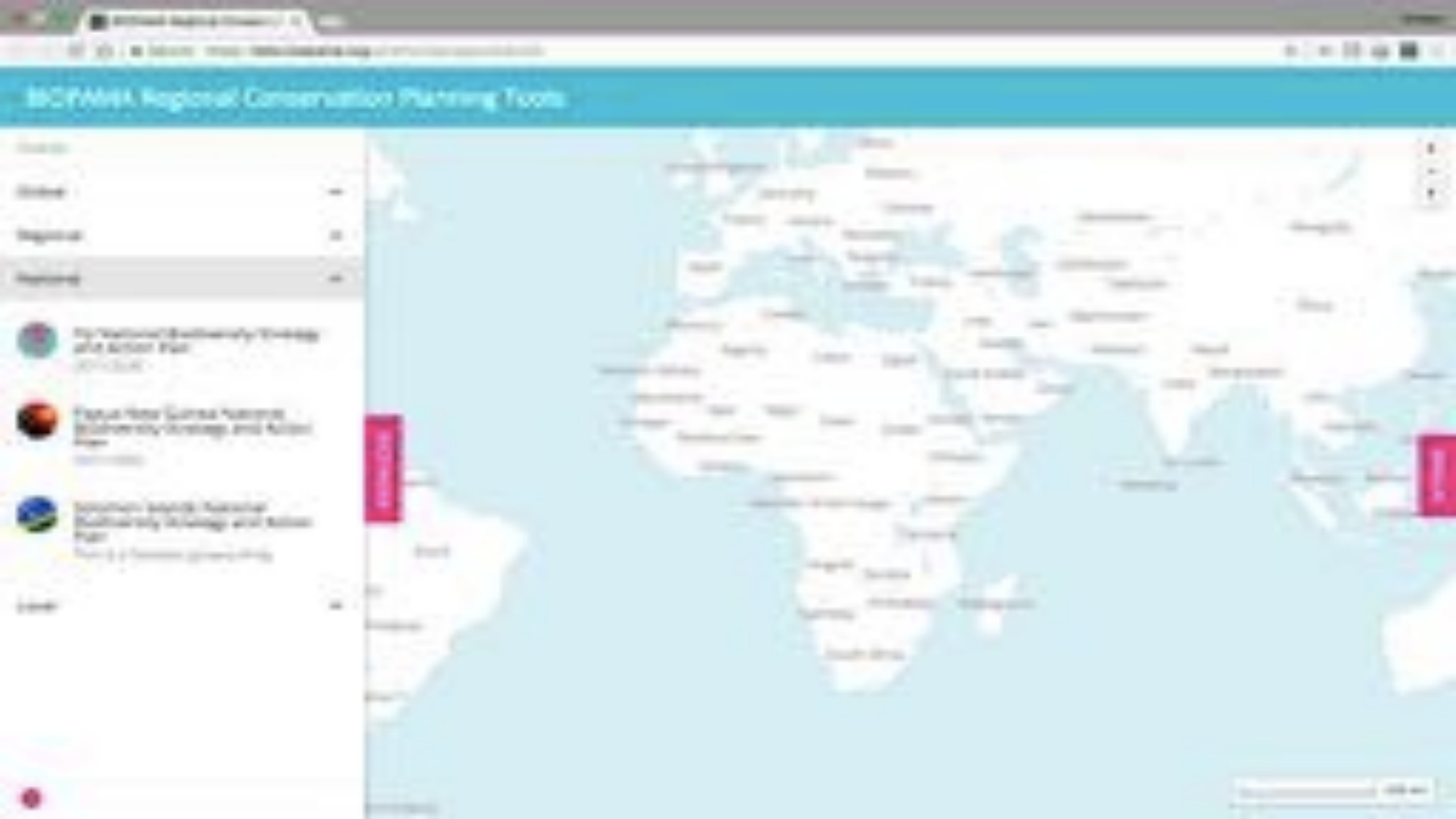
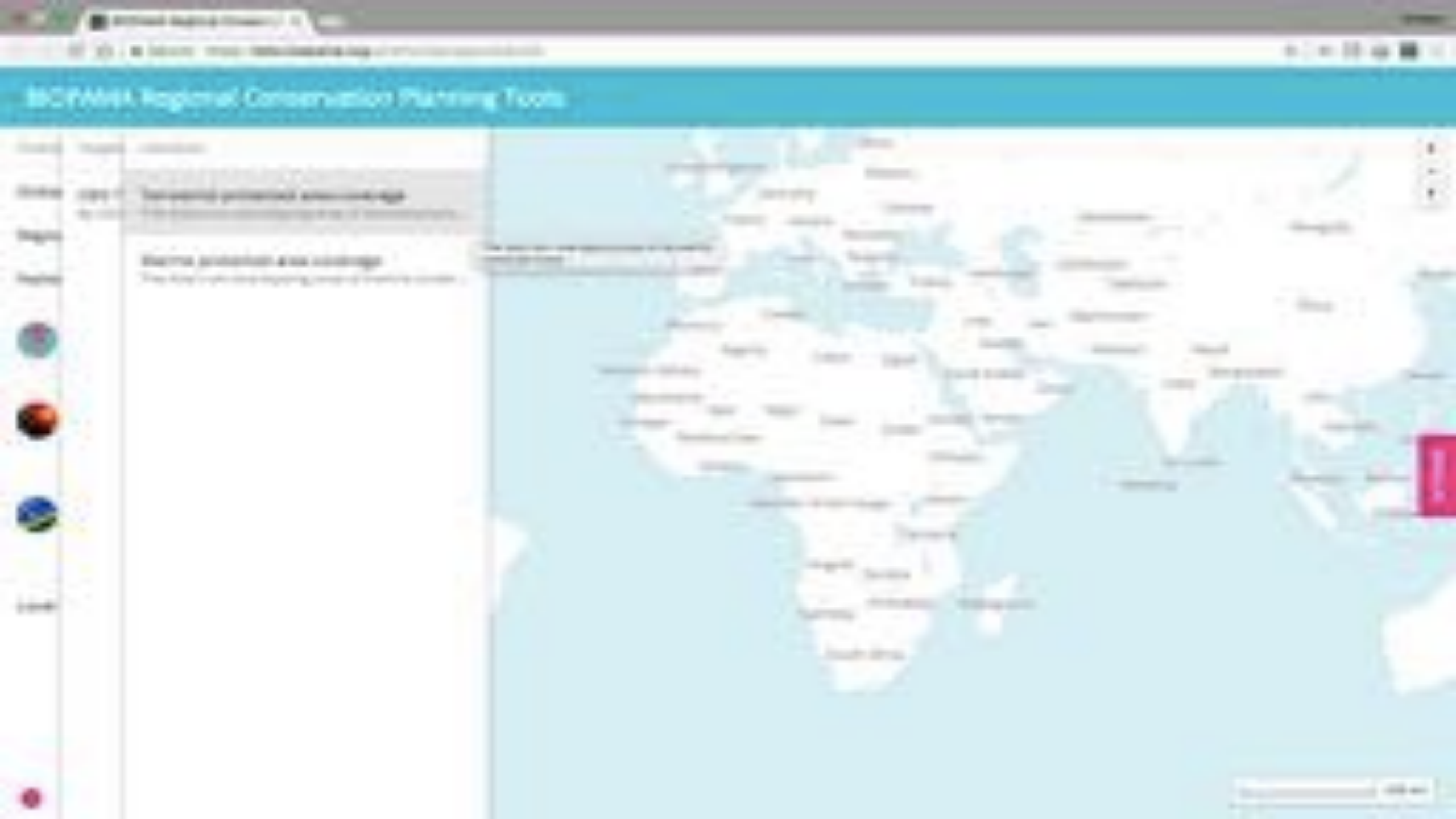

SPREP Regional Conservation Planning Tools




SEAFWA Regional Conservation Planning Tools
Convention on Biological Diversity
CBD Target 11


Convention on Biological Diversity
CBD Target 11
Post 2020 terrestrial protected area coverage


CBD Target 3

Example: Logging & coastal sedimentation (Ridge to Reef)

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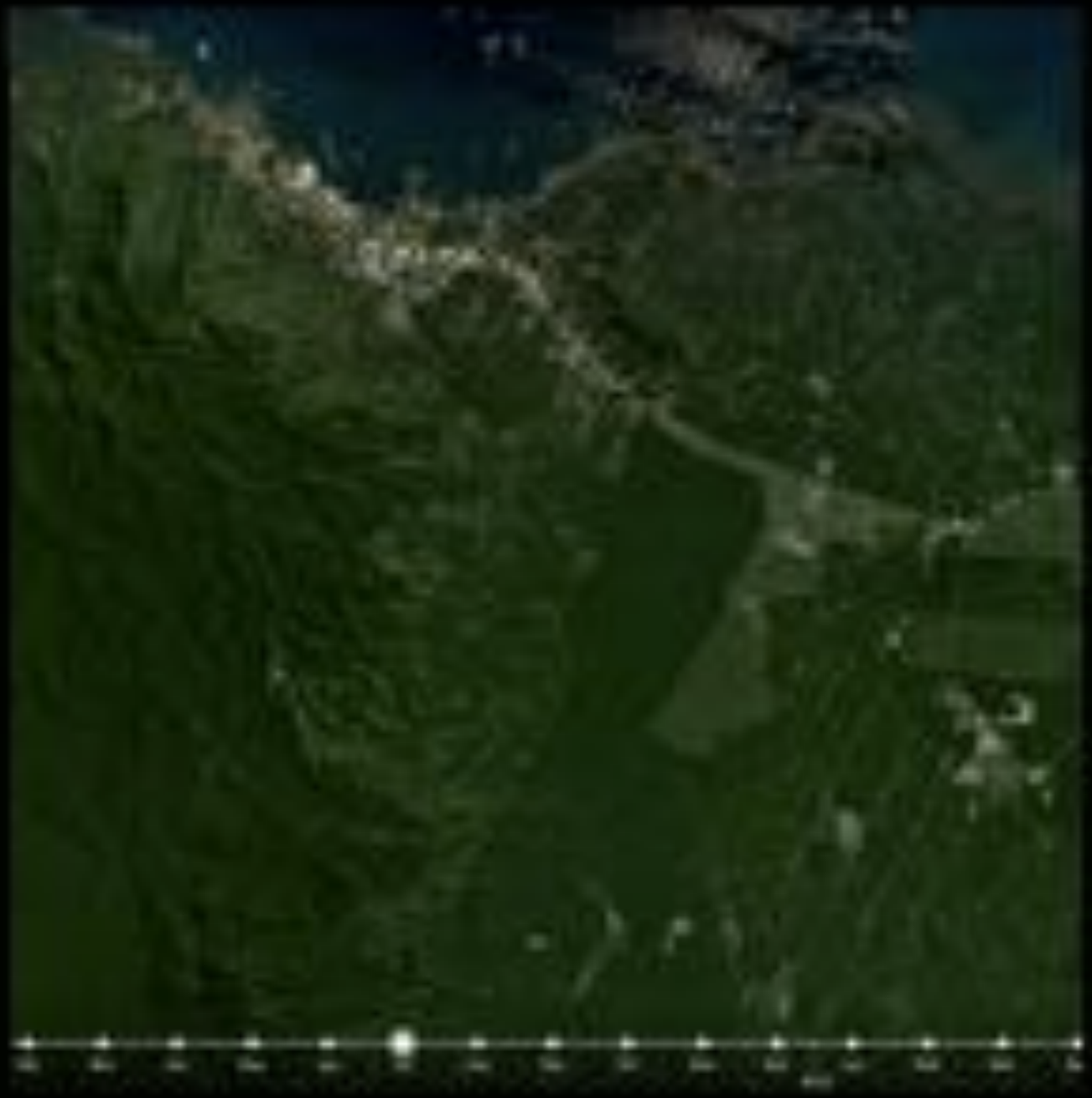

Kimbe
West New Britain, PNG

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West New Britain, PNG

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West New Britain, PNG

Kimbe
West New Britain, PNG

Reporting

- Standardised structure for indicators
- Every indicator has a time component
- Summarise targets across time and/or space

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Biosecurity ACP Conservation Knowledge Centre

Pacific Region Summary

Progression of Regional targets met

Regional targets

Framework for nature conservation and biosecurity in the Pacific Islands Region
2014-2018

Objective 1: Identify, conserve, sustainably manage and restore priority sites, habitats and ecosystems, including cultural sites

Progression of Country targets met

Community-based

- Conservation community:
  - Owns, prioritises and shares targets
  - Contributes and shares indicators
  - Contributes other data, images and maps (e.g. Open Street Map)
- Tools support these community roles, responsibilities and workflows

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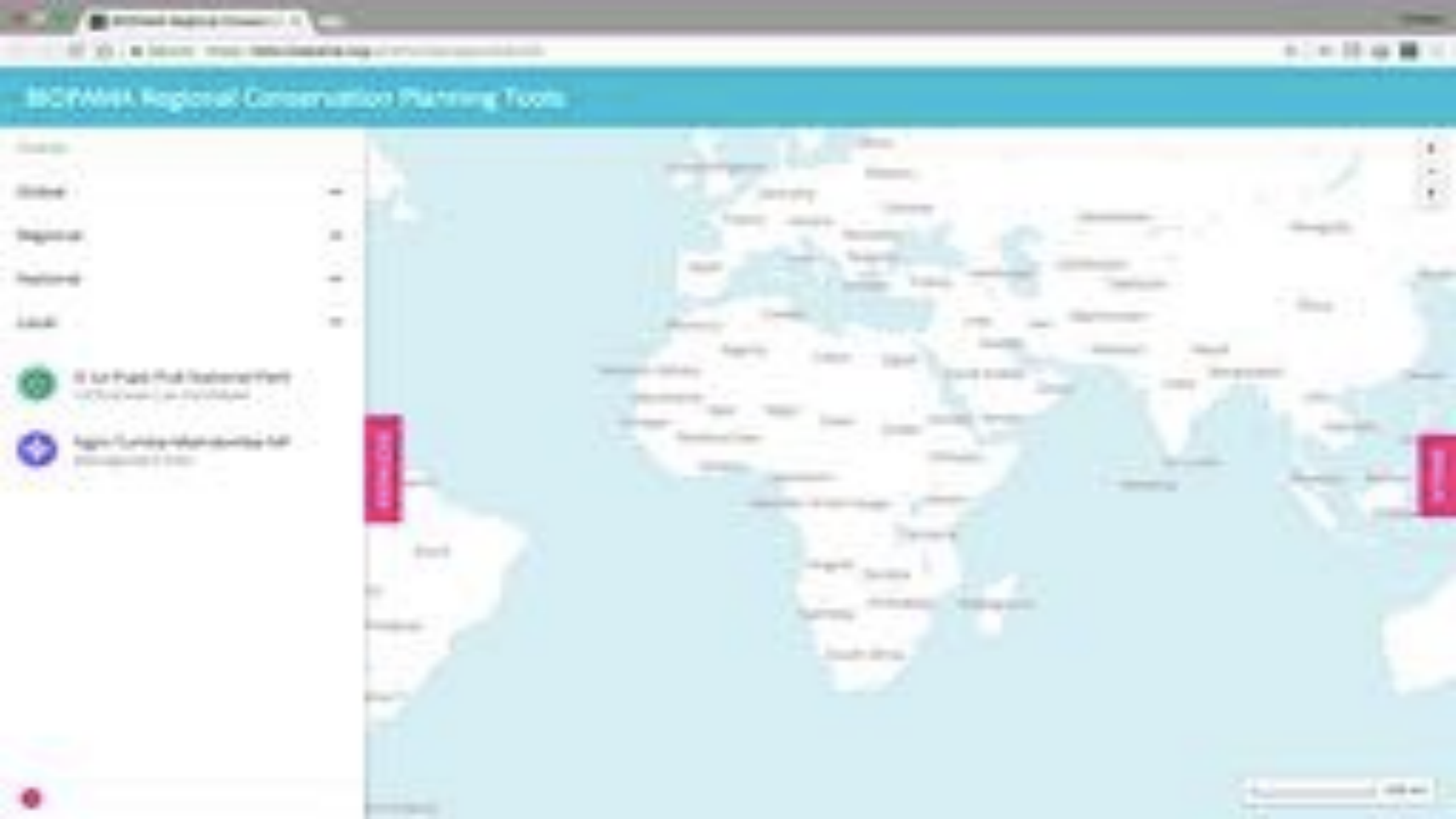

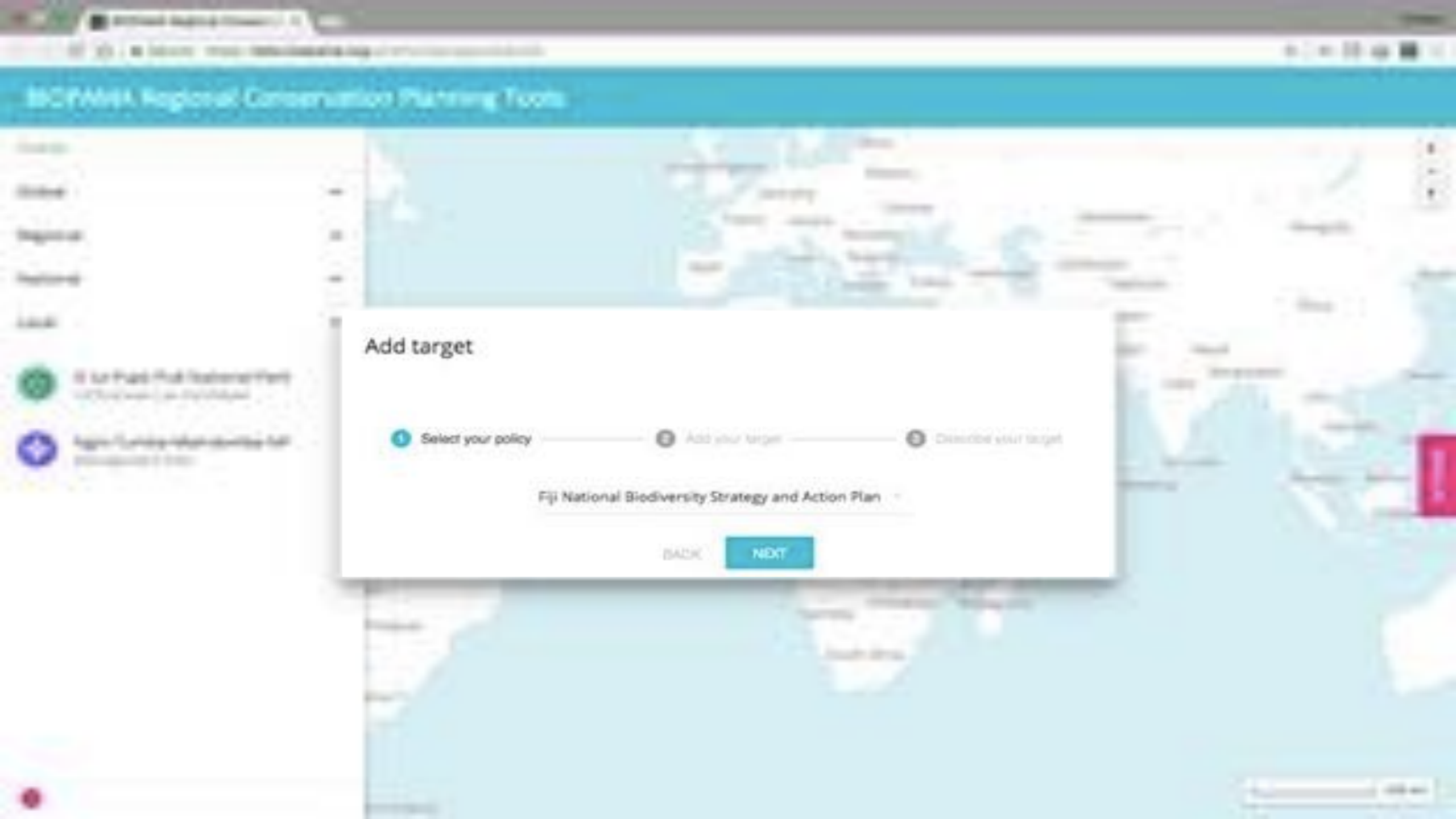
Add target
1 Select your policy
2 Add your target
3 Describe your target
Fiji National Biodiversity Strategy and Action Plan
BACK
NEXT

Indicators - Sources

- Global analyses – Biodiversity Indicators Partnership (BIP)
- Regional analyses – SPREP (e.g. INFORM), BIP
- National scale – PICTs, BIP, specific case studies (e.g. MaCBIO)
- Local scale – management effectiveness assessments, specific case studies

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Indicators - Rocket science

- Huge increase in satellite imagery, e.g. Planet, Sentinel
- Artificial Intelligence and Computer Vision
- Big data processing, e.g. Google Earth Engine
- Global monitoring data

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Planet, Paul G. Allen Philanthropies, & Leading Scientists Team Up To Map & Monitor World's Corals In Unprecedented Detail

Andrew Zolli | June 4, 2018

Jean-Francois Pekel, Andrew Cottam, Noel Gorelick, Alan S. Belward, High-resolution mapping of global surface water and its long-term changes. *Nature* 540, 418-422 (2016) Link

Timeline

- New tools developed by JRC/SPREP
- Integrated into PIPAP
- Roll-out this year
- https://beta.biopama.org

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Practical Exercise: Local-scale targets

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Rationale

- First step to achieving a target is capturing it
- We already have global, regional and national targets
- Sharing and publishing will help coordination and cooperation
- Prime the tools for BIOPAMA
- A set of common goals within the project

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Good examples

- Reduce coastal sedimentation by 50% by 2025 (*Remote sensing*)
- Eradicate rats from Rat Island by 2025 (*Global Biodiversity Information Facility*)
- Reduce illegal fishing in the MPA by 90% by 2025 (*Global Fishing Watch*)

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Bad examples

- Increase the number of pairs of the Samoan Moorhen from 0 to 10 by 2020

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Bad examples

- Increase the number of pairs of the Samoan Moorhen from 0 to 10 by 2020

Not achievable

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Bad examples

- Increase mammal happiness by 50%

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Bad examples

- Increase mammal happiness by 50%

Not measurable

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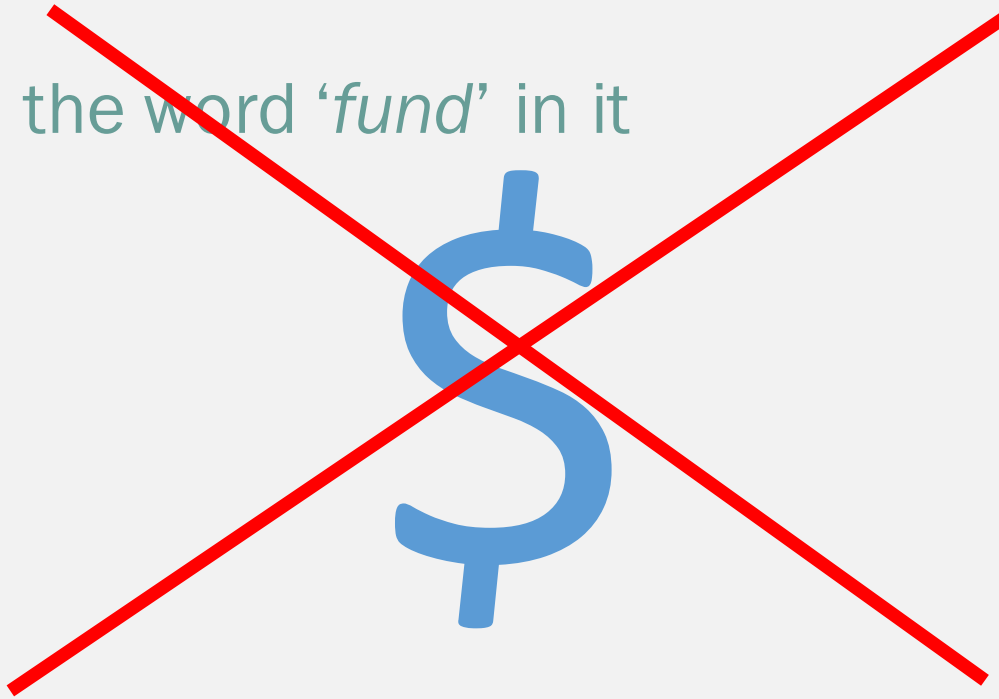
Bad examples

- Anything with the word '*fund*' in it



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3+ priority local-scale targets:

- Country
- Protected or conservation area name
- Target

https://biopama.org/node/254

Google Sheet at bottom: ‘Local-scale targets for Pacific Countries’

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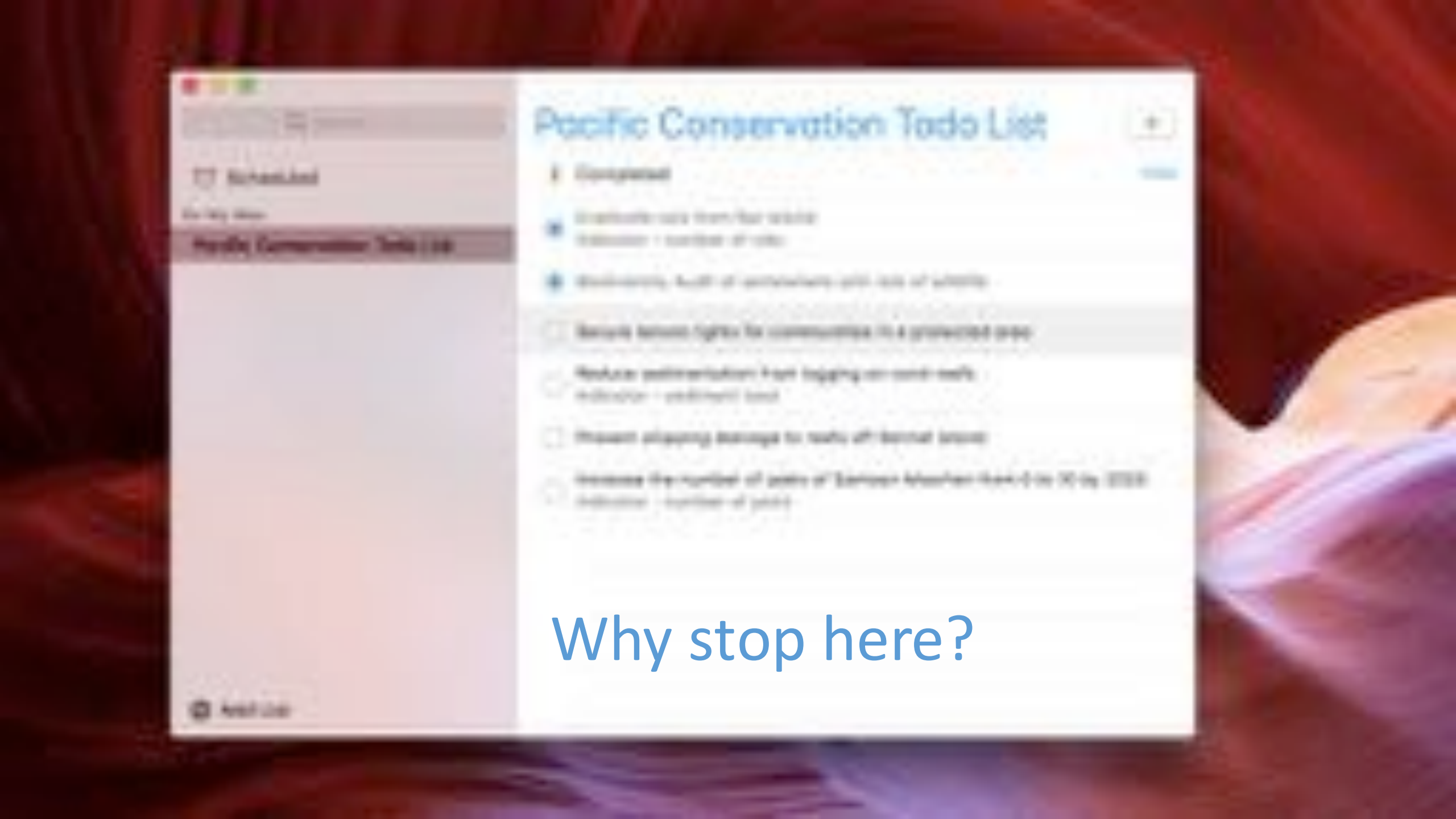
Pacific Conservation Todo List


Pacific Conservation Todo List
Why stop here?

Other uses of information

- Information can also be used for conservation outcome in:
  - *Measuring progress against targets (response)*
  - Assessing biodiversity value (state)
  - Assessing threats (pressure)
  - Assessing costs

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Example: Systematic conservation planning

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Decision-support for conservation

Jennifer McGowan

The ARC Centre of Excellence for Environmental Decisions, UQ

The Nature Conservancy

(starting July 1 2018)

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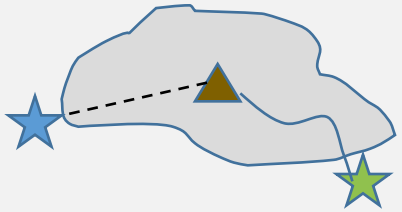

What is decision-science?

- The study of how people make decisions
- Developing approaches and tools to help people make better decisions

Stall 1: 4.99/kilo

Stall 2: 3.99/kilo

We are all making decisions all the time

- Should I bring my umbrella today?
- Where should I live?
- Should I eat another muffin at the afternoon tea break?

Objectives, actions (costs and feasibility), risks and uncertainty

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“Life” is just six things … and 31 one words

- What do you **want?**
- What **can you do?**
- How do **things you can do** change **what you want?**
- Choose from things you **can do** to get **what you want**
- **Do**
- **Learn**

- Prof Hugh Possingham
  Chief Scientist
  The Nature Conservancy

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What is spatial prioritization?

- The efficient allocation of resources to prioritise actions in space and time

Integrated Land-sea management and planning for the future

Do I collect more data, or just start managing?

Optimize poaching patrols

Do I manage now or monitor?

Optimize invasive species management

Allocate funding to different Pas/MPAs

Prioritizing across threatened species projects

Prioritize protected areas

Multi-objective planning

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How can information lead to conservation outcome?

- Review of post 2010 NBSAPs for 140 countries
  - 30% no maps at all (eeks!)
  - **3% included planning maps with priority PAs identified**
  - 2% included maps with biodiversity and Pas overlays
  - 1% included maps related to socio-economic services

Representation: a fundamental concept that aims to ensure a sample of all biodiversity is protected (species, habitats, ecological processes, cultural sites, etc)

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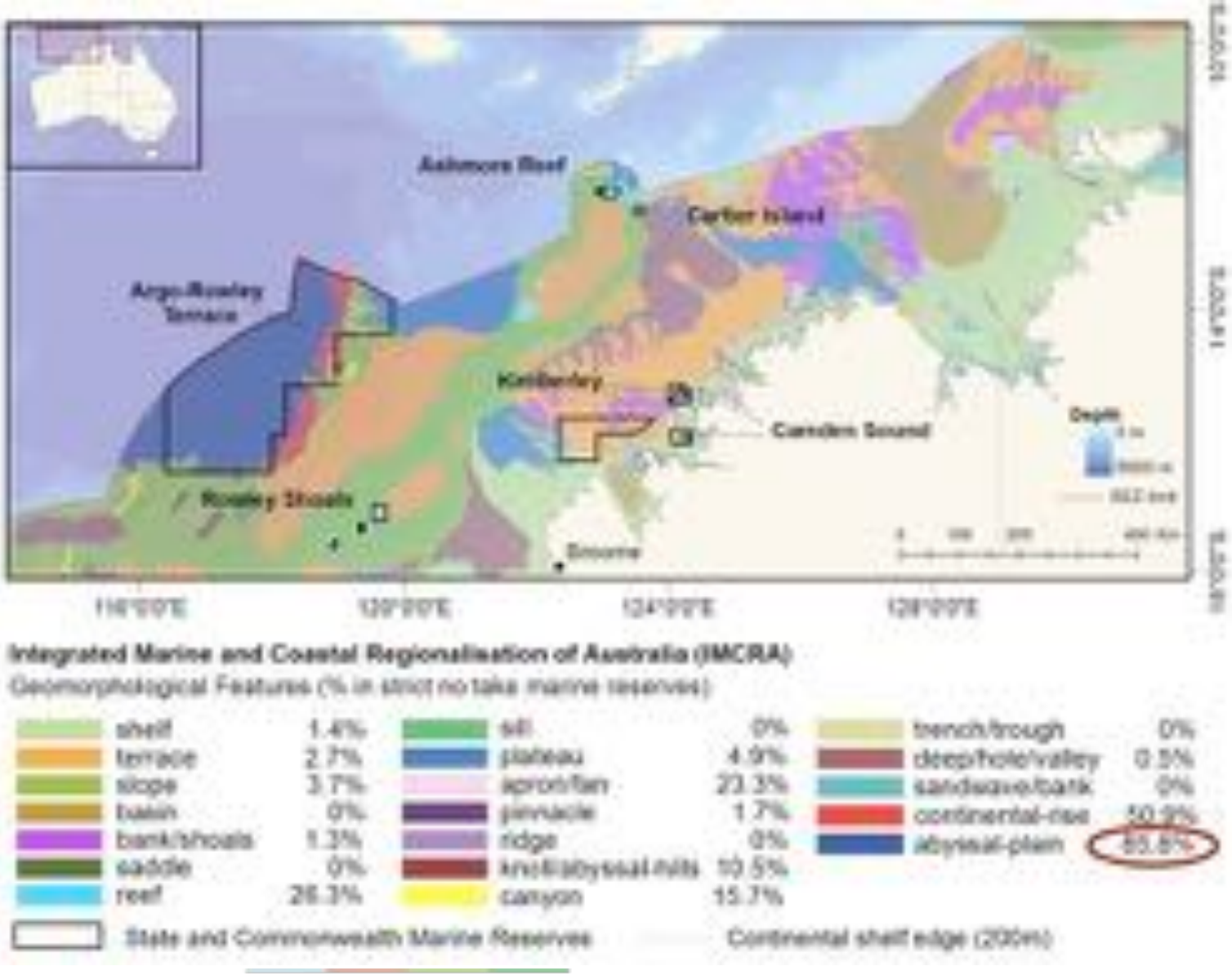

Australia has reached its Aichi target 11 (in terms of %) but it is an unrepresentative network of MPAs.

What are the biodiversity gains of a network that is not representative of biodiversity?

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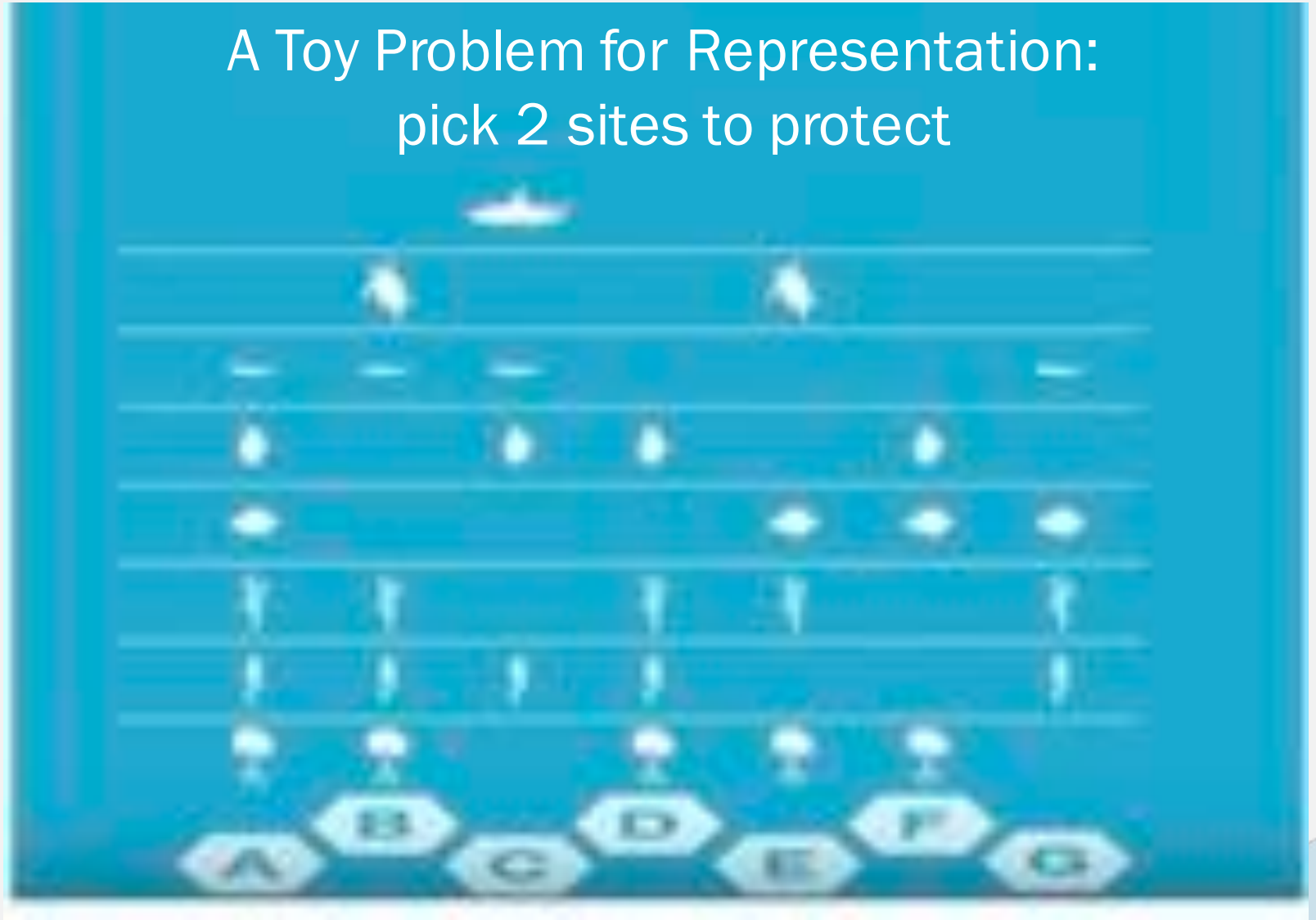
Hotspots approach: species richness



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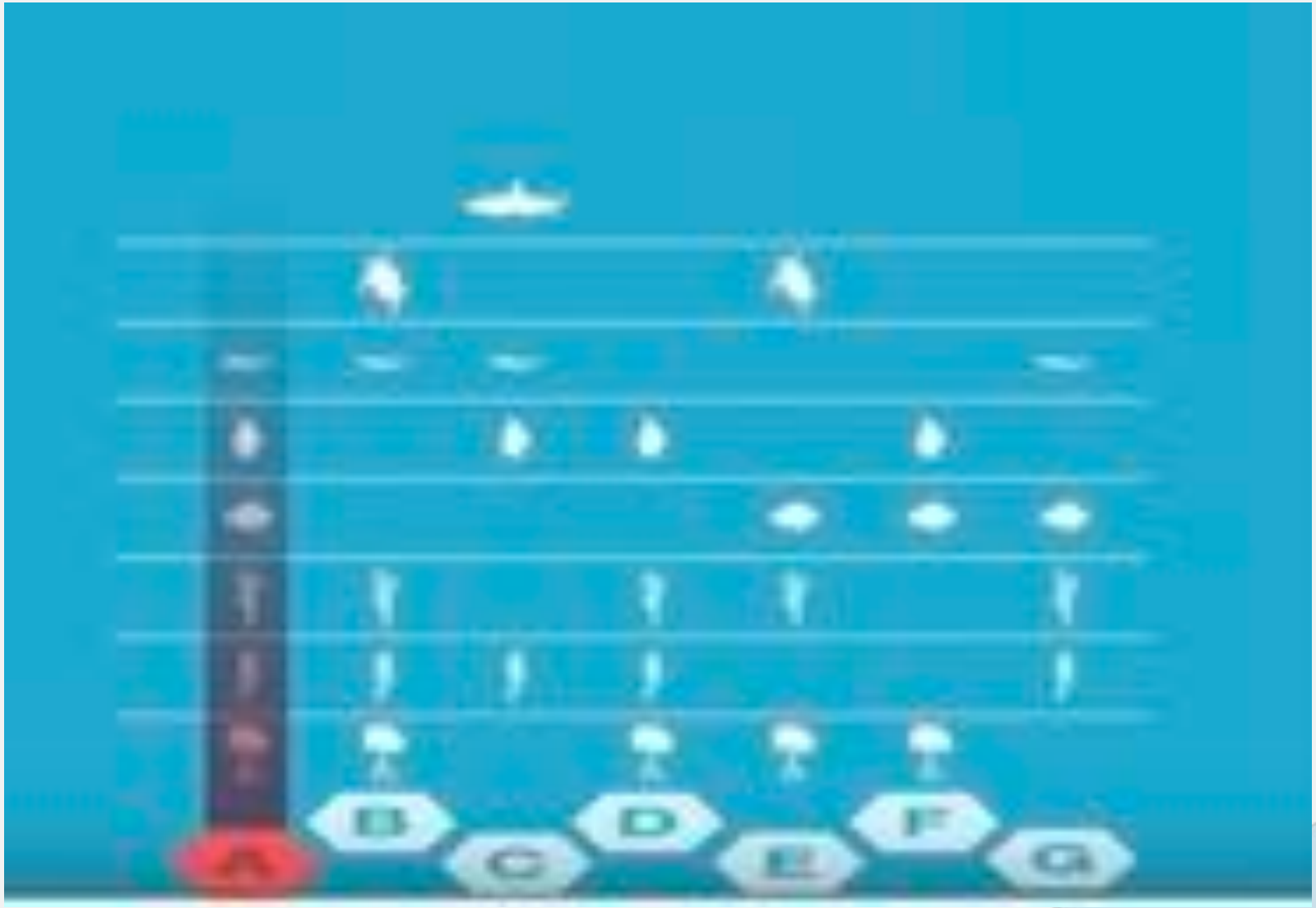
Hotspot approach: species richness



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Hotspot approach: species richness

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Scoring and adding (expert elicitation)

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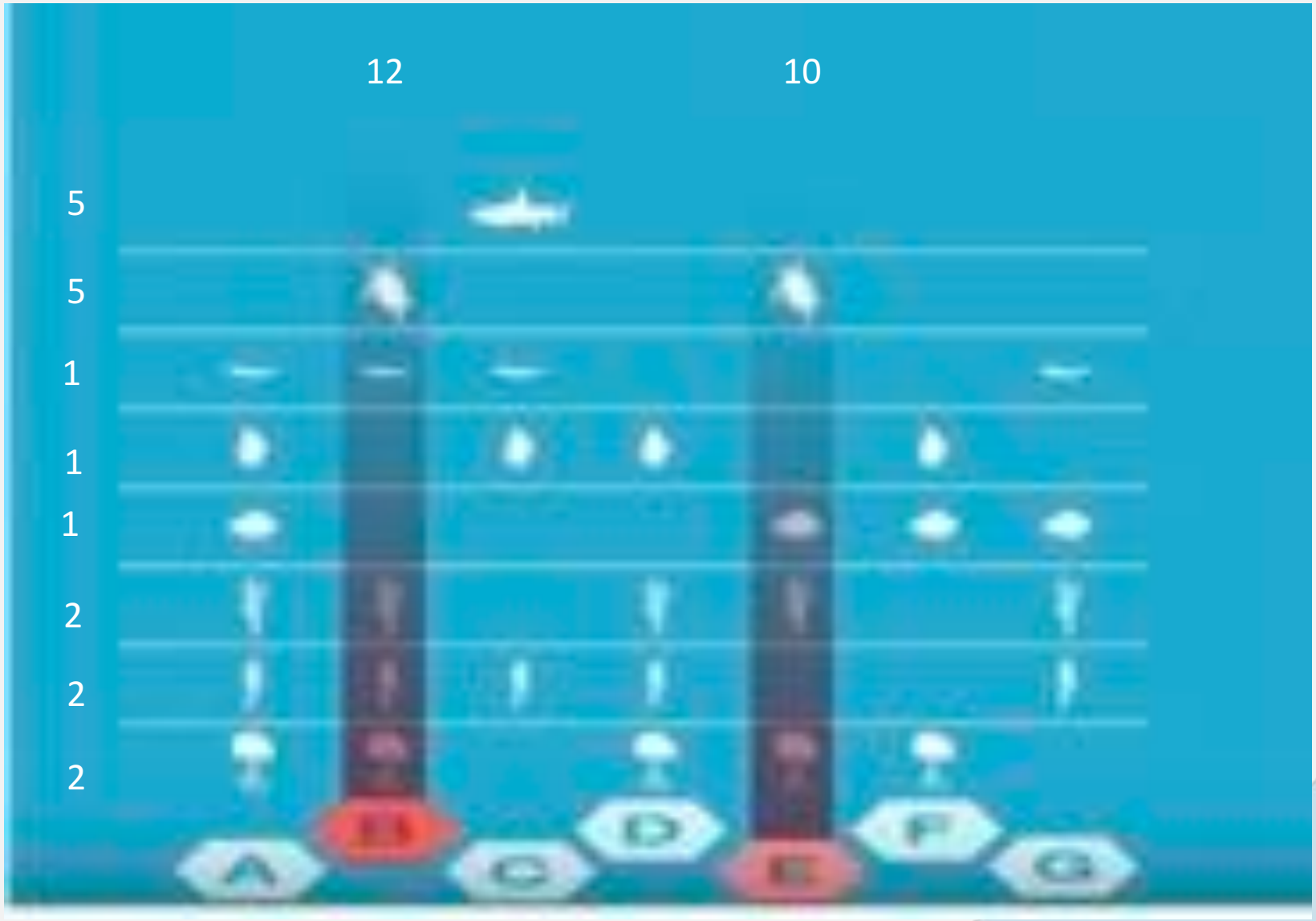
Scoring and adding (expert elicitation)



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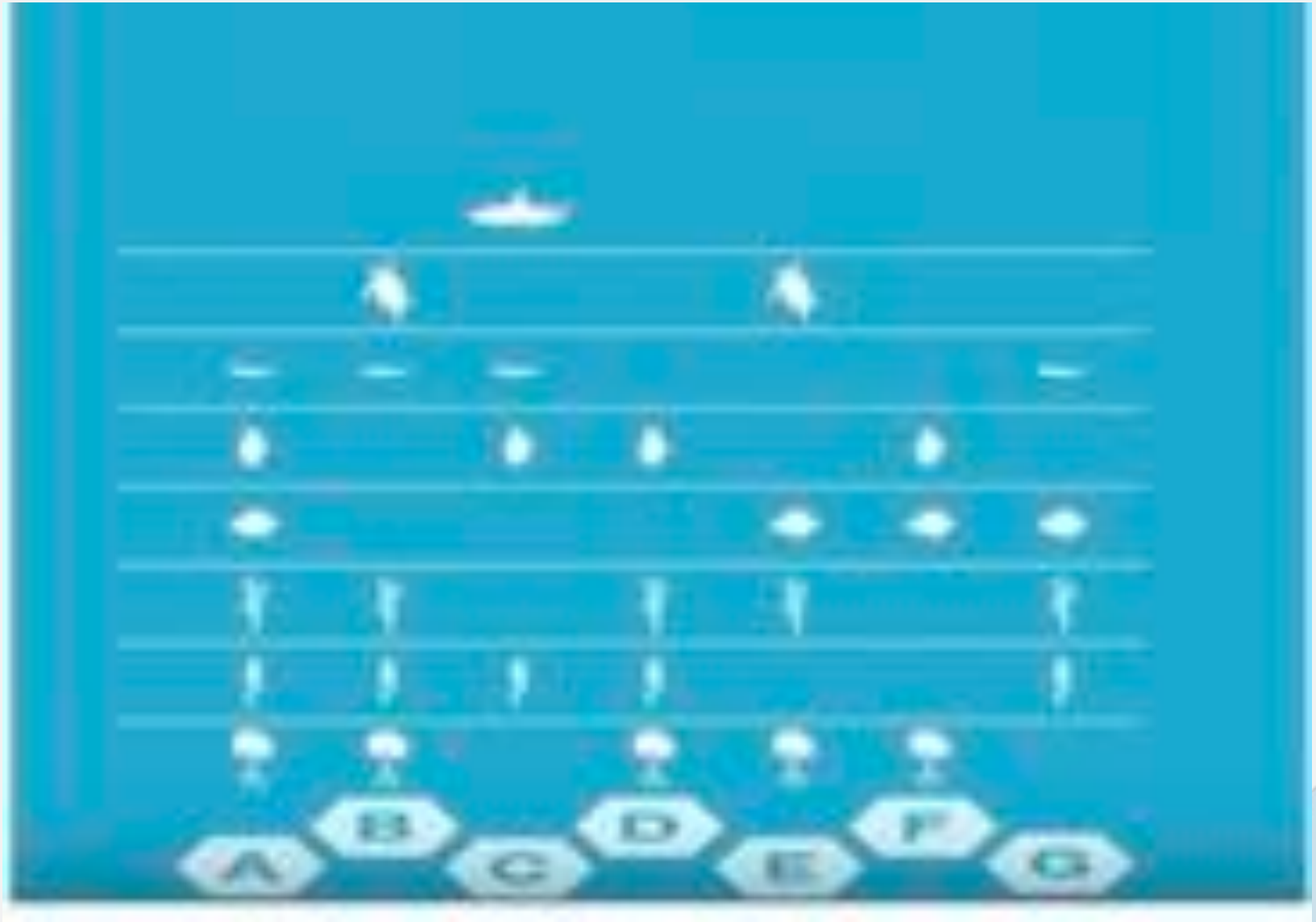
Criteria-based:
Sea turtles
AND
(presence of **two or more** corals, or seagrass or mangroves



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Criteria-based:
Sea turtles
AND
(presence of **two or more** corals, or seagrass or mangroves

KBA/IBA: Criteria E---to complement the identification of these sites with systematic spatial planning

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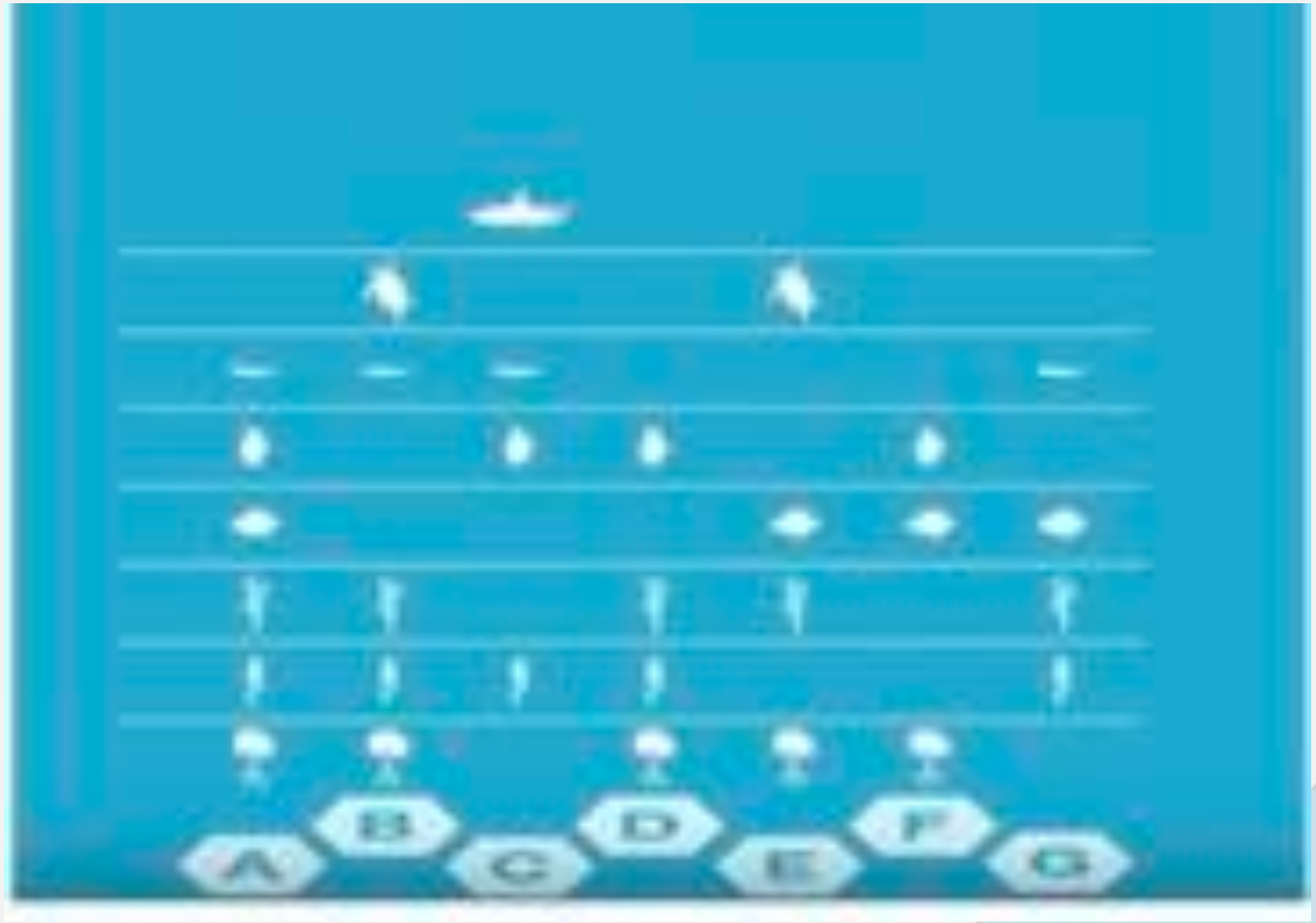
Target-based approaches:

Represent all species at least once

MARXAN conservation solutions



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25 SPREP Secretariat of the Pacific Regional Environment Programme

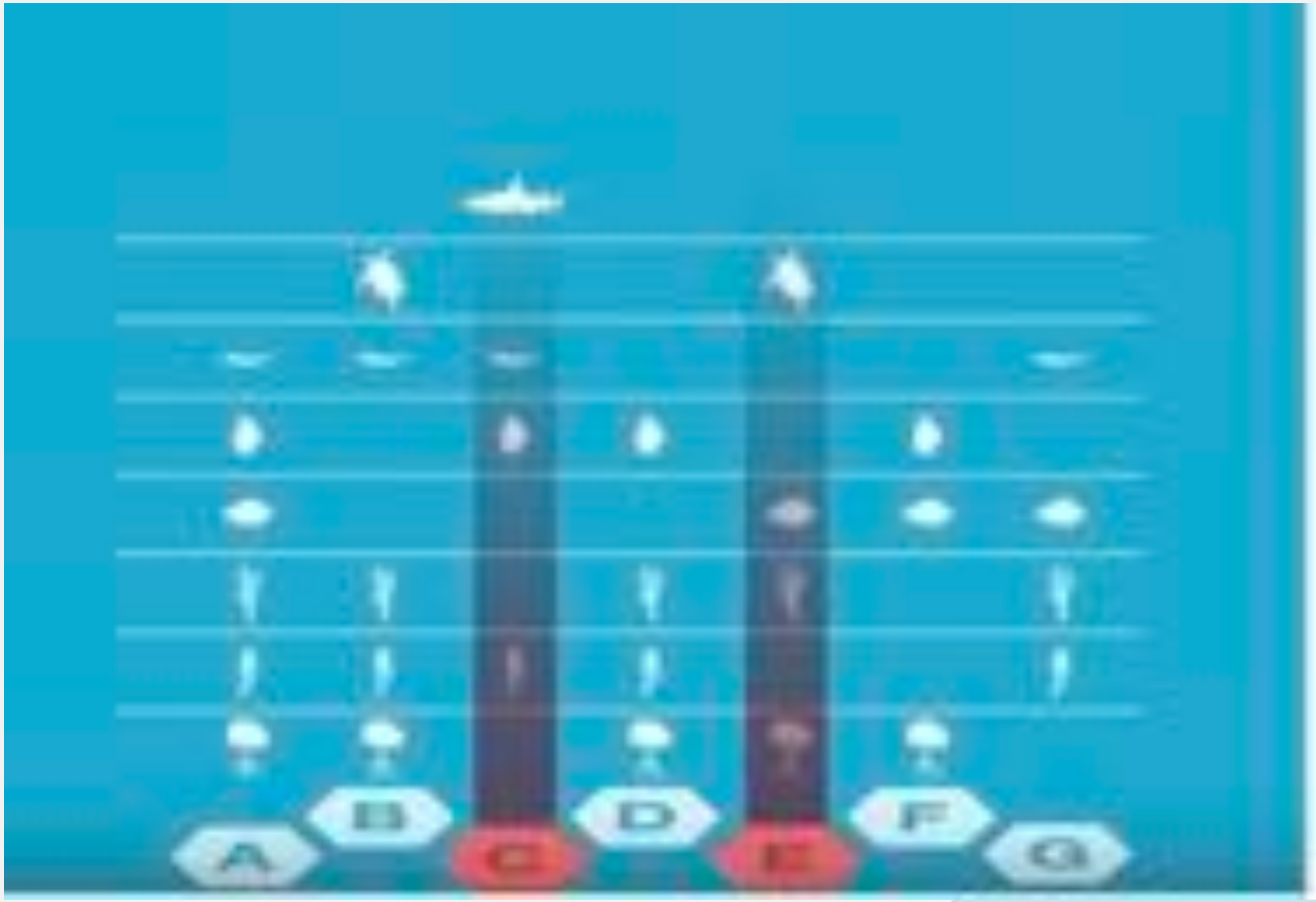
BIOPAMA From Knowledge to Action for a Protected Planet

Target-based approaches:

Represent all species at least once

MARXAN conservation solutions

Objective: Meet representation and impact as few people as possible



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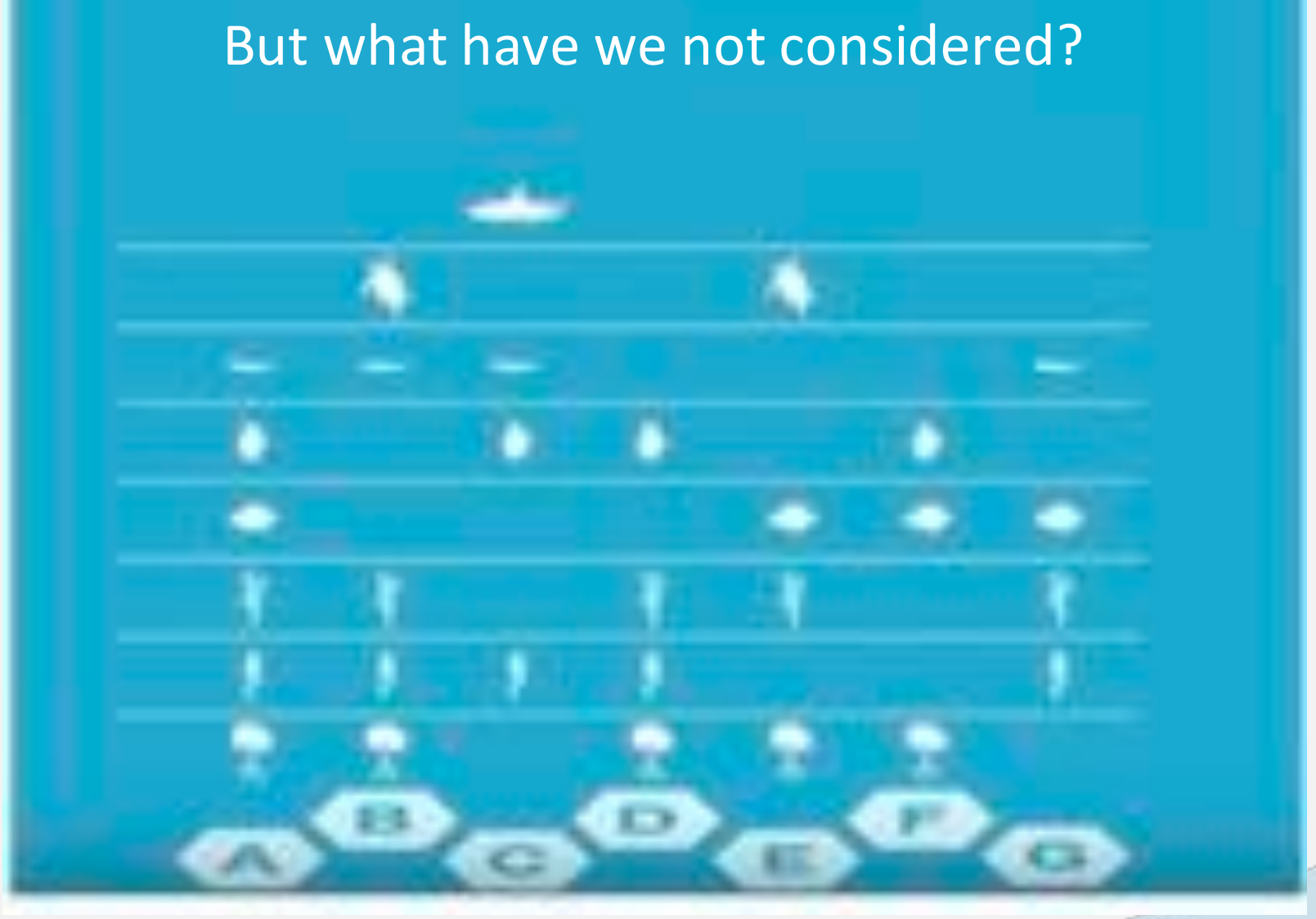
But what have we not considered?



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MARXAN
conservation solutions

Why decision-support tools can be useful

- Help us find good answers to really complex challenges
- Standardize the evaluation of benefits and impacts to stakeholders
- They create a transparent and repeatable decision-making process
- **They can provide you with a strategic plan –which is the starting point**
- Be used an multiple scales, different types of actions and data
- **Network scale versus site-by site planning (Aichi target 11)**
- Make iterative planning and assessment easy!

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MARXAN
conservation solutions

Photo: S. Jupiter

Photo: E. Game

Photo: N. Petersen

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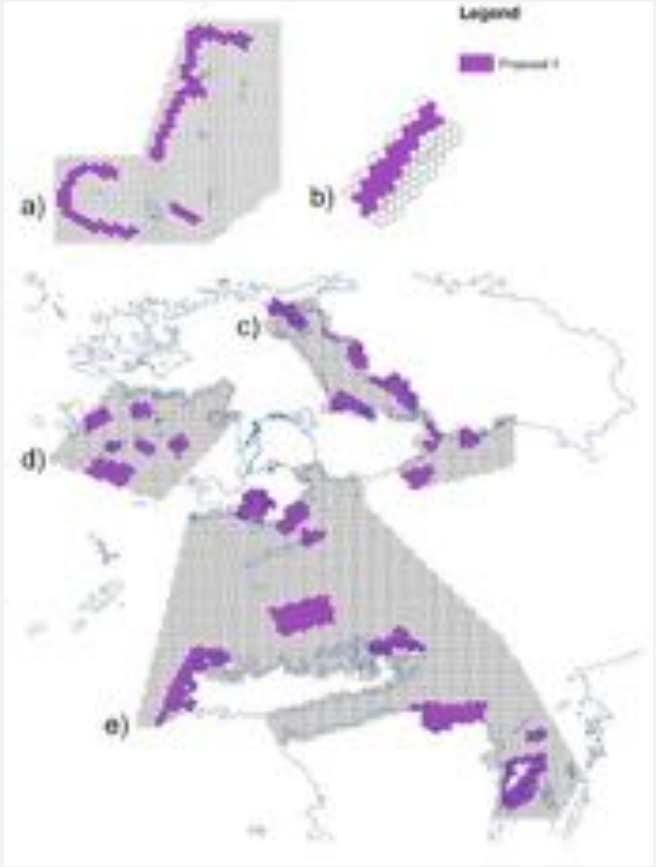
How can information lead to conservation outcome?

MARXAN conservation solutions

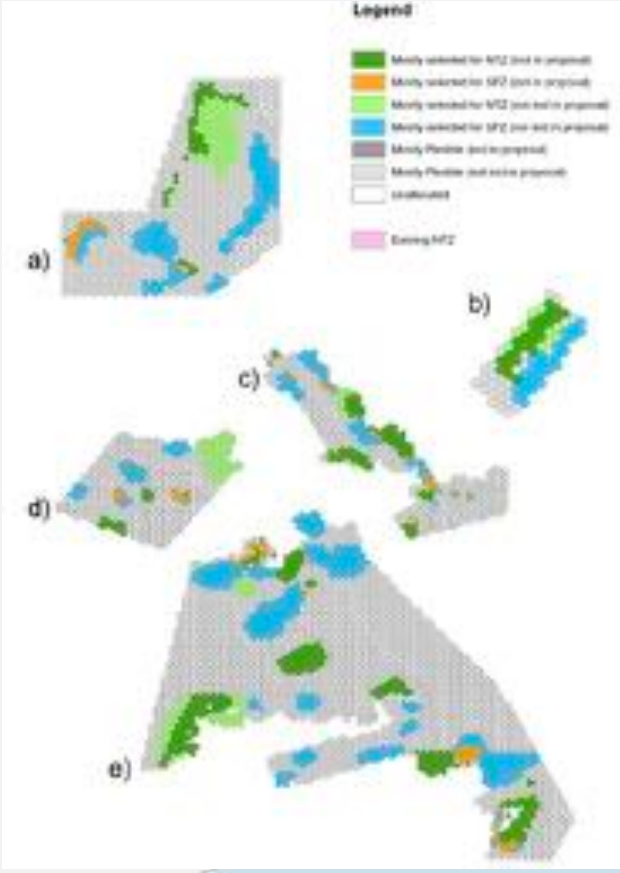
Common concerns

- Too complicated
- Too time consuming
- Don't trust the results
- Black box (e.g. modeling)
- Too top-down
- Not flexible enough
- Not enough capacity
- Not enough data to get started

Community-built by pen and paper



Representative plan with community



Decision-support tool, not the decision maker!!

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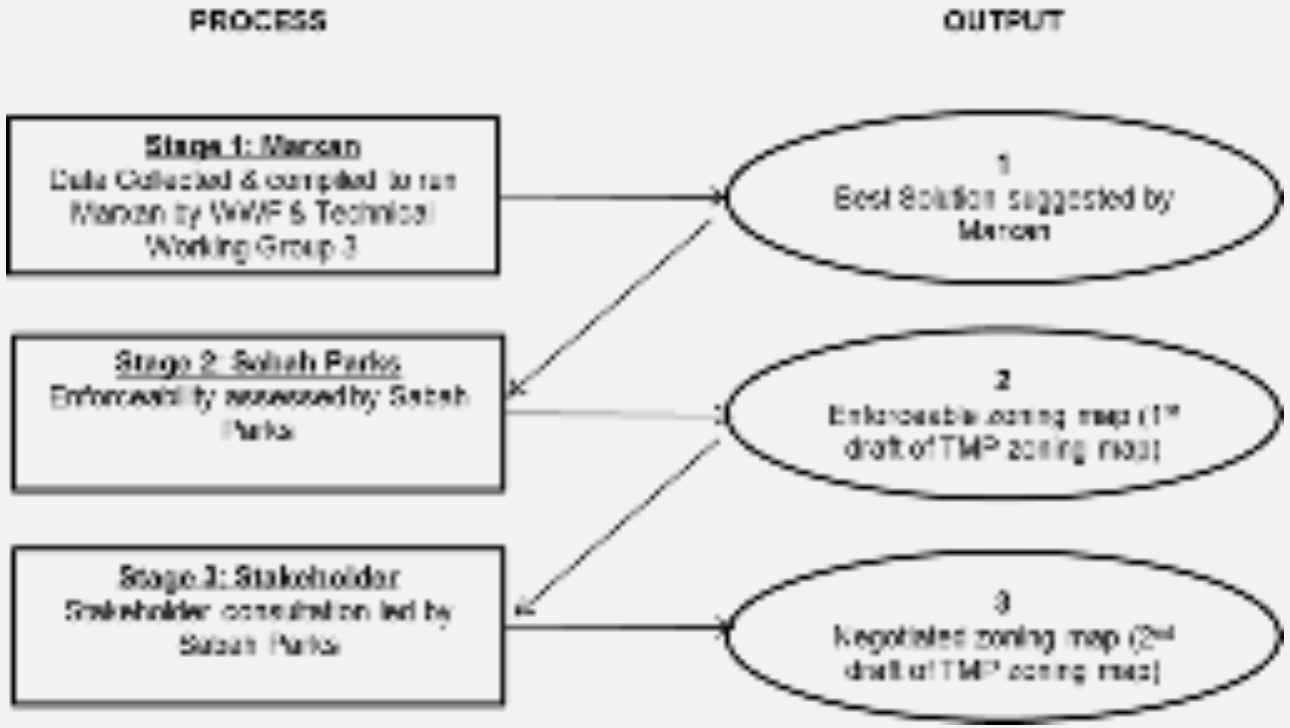
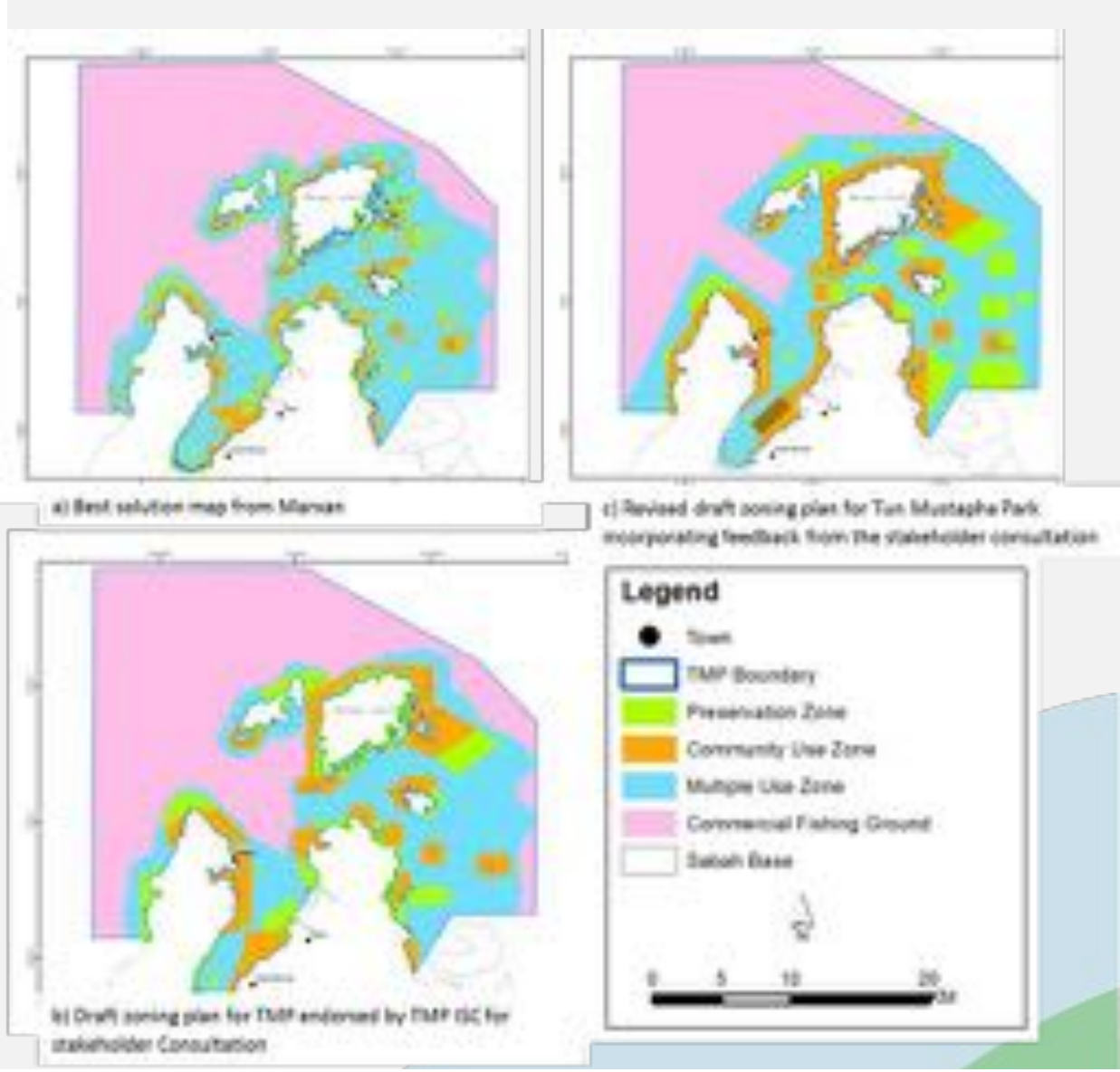
From Marxan to management: ocean zoning with stakeholders for Tun Mustapha Park in Sabah, Malaysia

Robecca Jumin, Augustine Binson, Jennifer McGowan, Sikula Magupin
Maria Beger, Christopher J. Brown, Hugh P. Possingham and Carissa Klein





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Steps for the future:

- Integrated decision-support with BIOPAMA regional observatories

Questions??

THANK YOU!

j.mcgowan@uq.edu.au

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