

How can information lead to better conservation outcomes?

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Current tools



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BIOPAMA

Associação Brasileira de Produtores de Carne Bovina

Associação Brasileira de Produtores de Carne de Bovinos



1,411 Produções Anuais

1.411.000.000 kg

1,411 Trazidas do Exterior

1.411.000.000 kg

1,411 Trazidas das Matilhas

1.411.000.000 kg

1,411 Matilhas

1.411.000.000 kg



Pacific Islands

Protected Area Portal

[Home](#) [About](#) [Locations](#) [News](#) [History](#)



How can information lead to better conservation outcomes?

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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How can information lead to better conservation outcomes?

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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How can information lead to better conservation outcomes?

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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How can information lead to better conservation outcomes?

Focus on conservation targets



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How can information lead to better conservation outcomes?

Focus on conservation targets



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How can information lead to better conservation outcomes?

Example: Regional target for Intact Forest Landscapes



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BCPMA Regional Conservation Planning Tools

Home	
Map	
Tools	
Reports	
Help	



BCP Area Regional Conservation Planning Tools

- Home
- Tools
- Regions
- Frameworks for Nature Conservation and Planning Areas of the Pacific Islands Region
- Maldives Strategy
- Large Urban Reservoirs



BCPMA Regional Conservation Planning Tools



BCPAlex Regional Conservation Planning Tools

Year	Location
2014	Number of acres by logging (map shows)
2015	Number of acres by logging (map shows)
2016	Number of acres by logging (map shows)
2017	Number of acres by logging (map shows)
2018	Number of acres by logging (map shows)
2019	Number of acres by logging (map shows)
2020	Number of acres by logging (map shows)
2021	Number of acres by logging (map shows)
2022	Number of acres by logging (map shows)
2023	Number of acres by logging (map shows)
2024	Number of acres by logging (map shows)
2025	Number of acres by logging (map shows)
2026	Number of acres by logging (map shows)
2027	Number of acres by logging (map shows)
2028	Number of acres by logging (map shows)
2029	Number of acres by logging (map shows)
2030	Number of acres by logging (map shows)



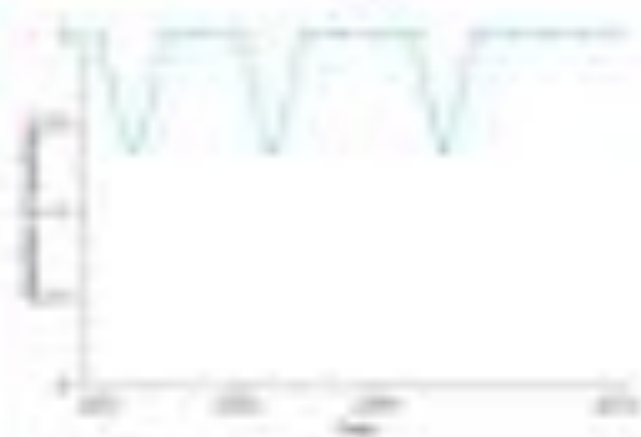
BCCPAWA Regional Conservation Planning Tools



Department for Natural Conservation and
Protected Areas and a major role in the region



Number of countries logging insect forests
2014



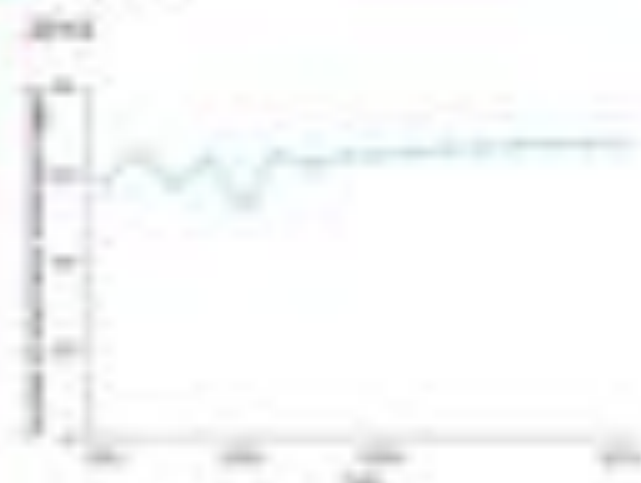
Information from the number of countries logging insect forests based on logging data of 2014



Department for Natural Conservation and
Protected Areas in a Pacific and the Region



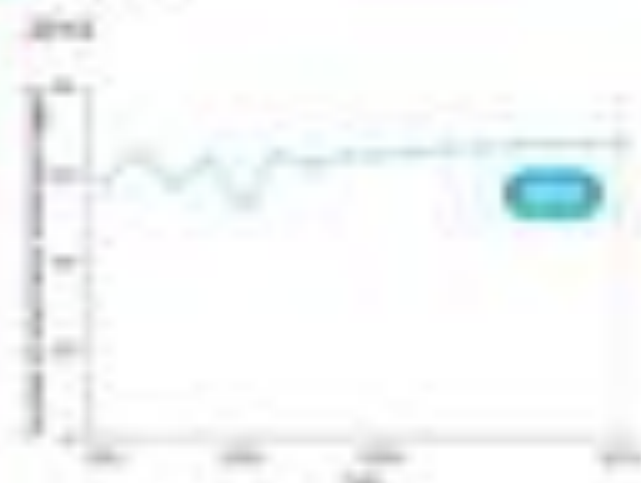
Area
Increase forest landscape logging in the last 10 years



Department for Natural Conservation and
Protected Areas in a Pacific and the Region



Area
Increase forest landscape logging in the last 10 years



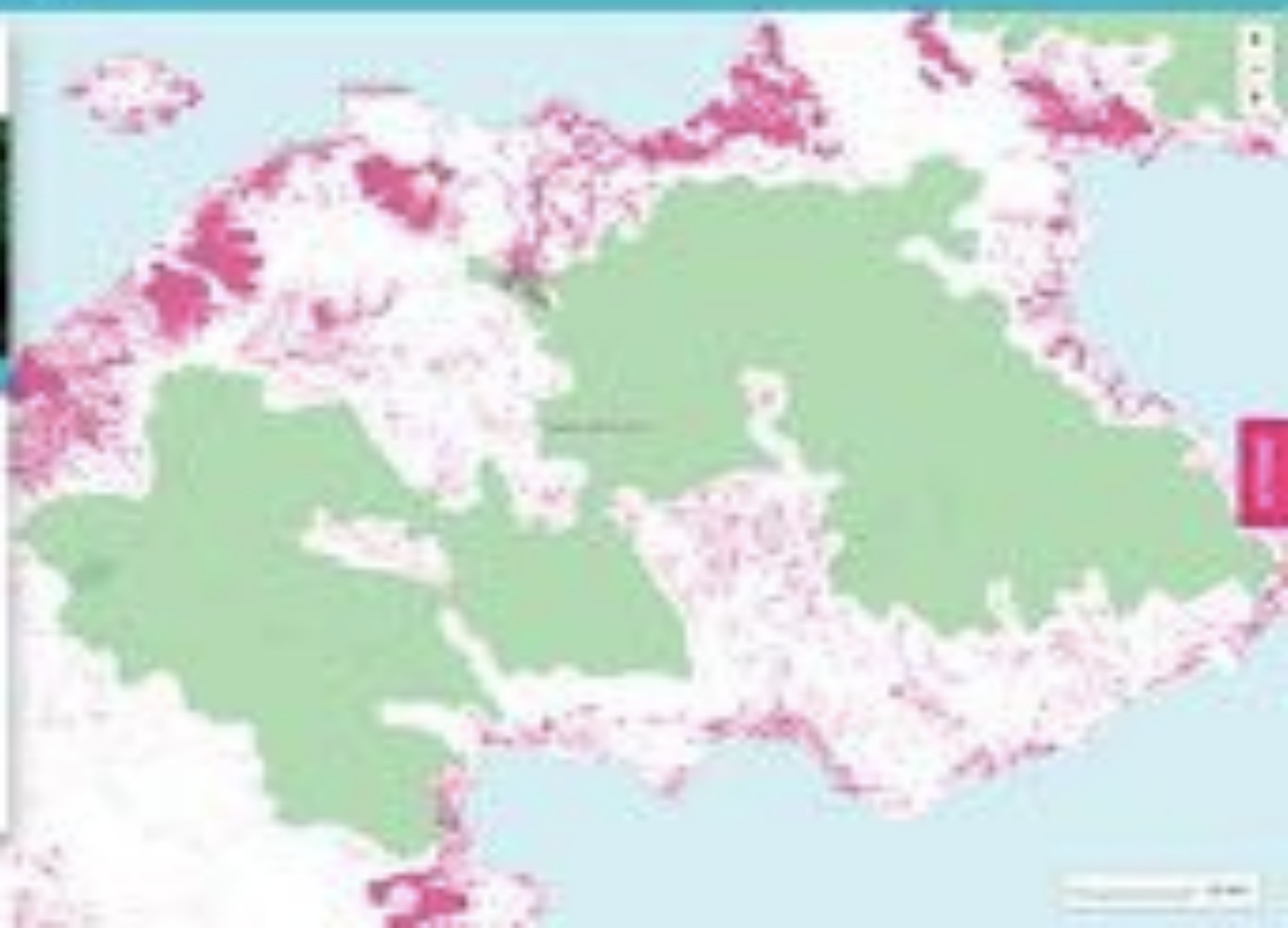
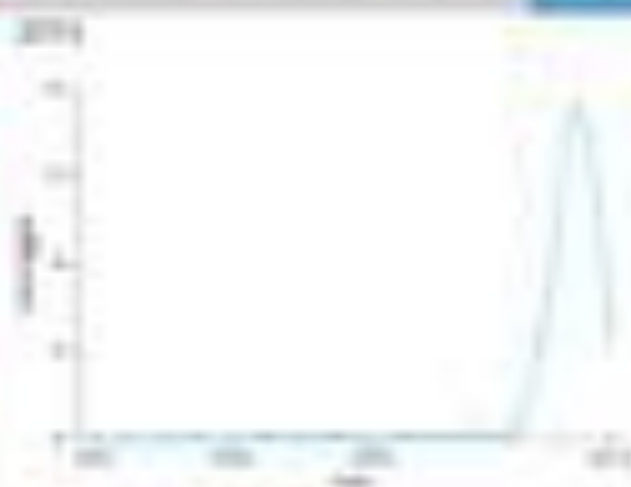
How do you use the data in the graph?



BDFP Area Regional Conservation Planning Tools



Department for Natural Conservation and Protected Areas of the Ministry of the Environment



BCPMA Regional Conservation Planning Tools



Department for Nature Conservation and Environmental Affairs of the North East and North West England



Objective 3



View the current data for this Objective 3



BCPMA Regional Conservation Planning Tools

Department for Natural Conservation and
Environmental Assessment and
Environmental Protection



View the current data for this tool by clicking on the map.



- Water
- Appraisal
- Land Cover Change Index
- Environmental Quality
- Species Distribution Modeling
- Urban
- High Nature
- Management Performance Index
- Open
- Protected area boundaries
- Open area
- Open area
- Open
- Open Area Type
- Open area

BOPMek Regional Conservation Planning Tools

Department for Natural Conservation and
Environmental and Forestry Services and
Regional Conservation Planning Tools

Objective 3

Conservation of natural resources and
ecosystems

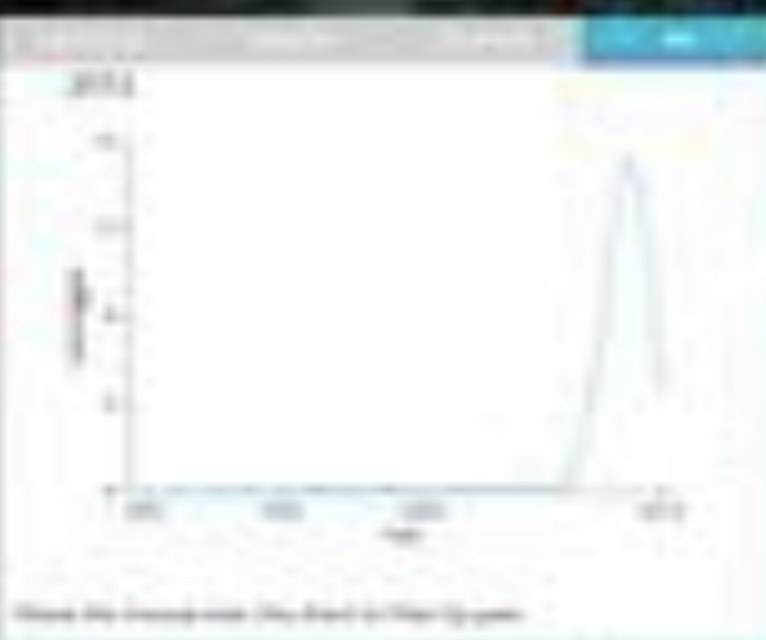


View the current data by clicking on the graph.

- Home
- Map viewer
- Land Cover Change analysis
- Wilderness mapping
- Species Distribution Modeling
- Home
- Wildlife Habitat
- Management Performance Data
- Home
- Protected area boundaries
- Land cover
- Species observations
- Home
- Fire Risk Type Mapping
- Fire-prone (hotbed) areas

BOPMx Regional Conservation Planning Tools

Department for Natural Resources and
Environmental Conservation



View the current data by clicking on the map.



- Home
- Map viewer
- Land Cover Change analysis
- Wilderness mapping
- Species Distribution Modeling
- Home
- Global Nature
- Management Performance Data
- Home
- Protected area boundaries
- Global data
- Species observations
- Home
- Open Access Data Explorer
- Open Access Data Explorer

BOPMVA Regional Conservation Planning Tools

Department for Biodiversity Conservation and
Sustainable Development
Environment and Heritage
Biodiversity Conservation
Biodiversity Conservation
Biodiversity Conservation

Objective 3

Investigate, assess and report on the
feasibility of establishing a new
conservation area in the region.



View the graph in the full report.

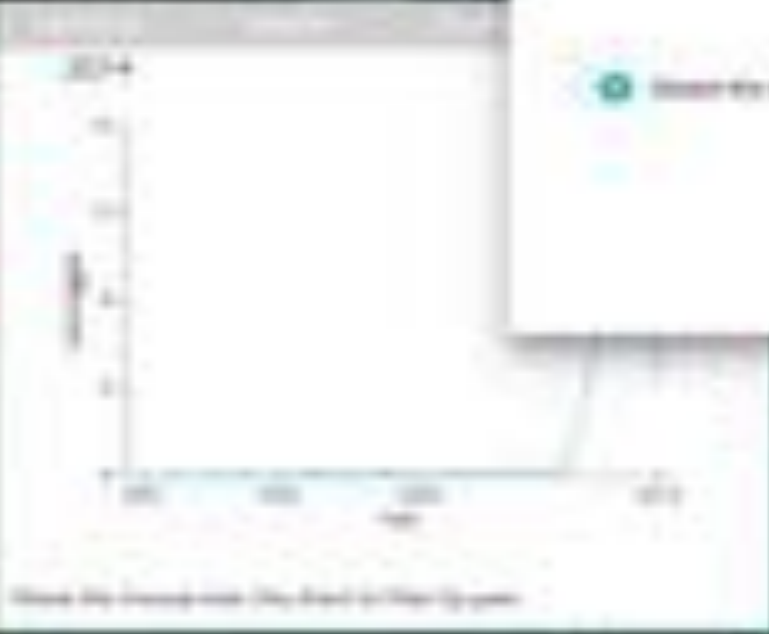
- Photos
- Reserve area boundaries
- Spinal data
- Spine observations
- ...
- State of the Environment Report
- Conservation Feasibility Report
- ...
- Heritage Assessment Report
- World Heritage Site
- Assessment Report
- ...
- Heritage Report
- ...
- Big Wetland Area



Department for Nature Conservation and Environmental Affairs
Environmental Affairs
Regional Conservation Planning Tools

Objective 3

Investigate, assess and plan for the impacts of development on the environment.



Contact enforcement agencies

Enter the enforcement agency:

Enter the enforcement area:

- Home
- Regional area boundaries
- Search data
- Search observations
- Home
- View planning proposals
- View planning permits project
- Home
- View enforcement agencies
- View enforcement body
- Search history
- Home
- Regional Report
- Home
- View enforcement area

How can information lead to better conservation outcomes?

Example: National target for PNG (CBD Target 11)



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BCPMA Regional Conservation Planning Tools

- Home
- Index
- Regional
- Planning**

-  **Brazil National Biodiversity Strategy and Action Plan**
2014-2020
-  **Papua New Guinea National Biodiversity Strategy and Action Plan**
2010-2020
-  **Southern Island National Biodiversity Strategy and Action Plan**
2014-2020



BCPMA Regional Conservation Planning Tools



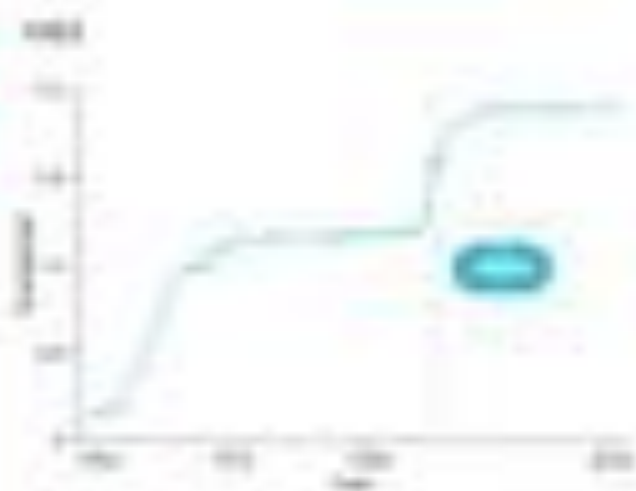
BCCPMA Regional Conservation Planning Tools



Approved as Strategic Priority



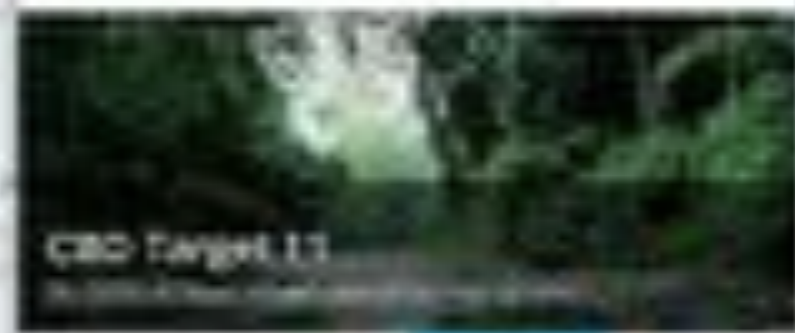
Proportion of protected sites coverage



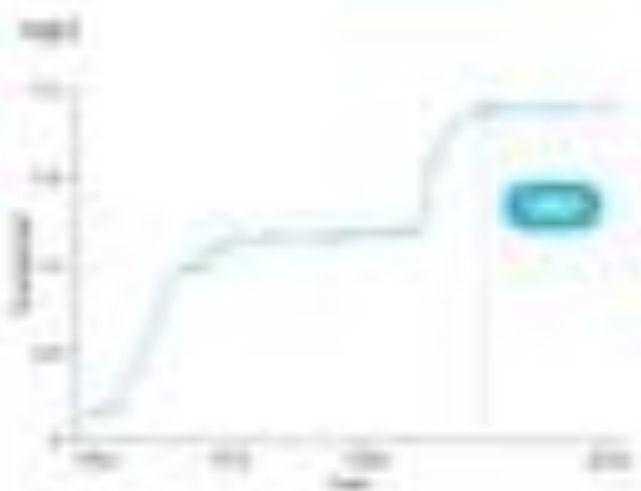
Source: BC Parks and Conservation. The data is based on the number of protected sites in BC, as of 2020. Coverage is a cumulative average of protected sites.



Approved as Strategic Priority



Proportion of protected area coverage



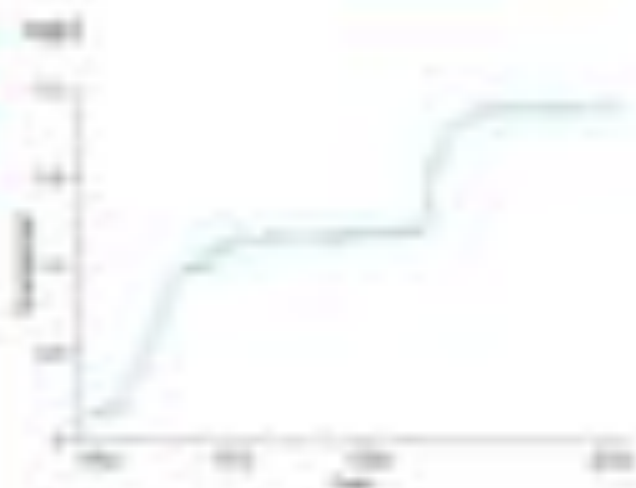
Source: World Bank (2010). The state of the world's forests 2010. Washington, DC: International Development Research Centre.



Admitted as Project Partner



Proportion protected area coverage



2020, and step-wise during the development of the...
 (Source: UNEP, 2018; UNEP, 2018; UNEP, 2018; UNEP, 2018; UNEP, 2018; UNEP, 2018; UNEP, 2018; UNEP, 2018; UNEP, 2018; UNEP, 2018)



- Home
- Appraisal
- Land Cover Change Index
- Environmental Policy
- Species Distribution Modeling
- Home
- Digital Nature
- Management Performance Indicators
- Home
- Protected Area Boundaries
- Land Use
- Species Observations
- Home
- Environmental Policy
- Environmental Policy

How can information lead to better conservation outcomes?

Example: Logging & coastal sedimentation (Ridge to Reef)



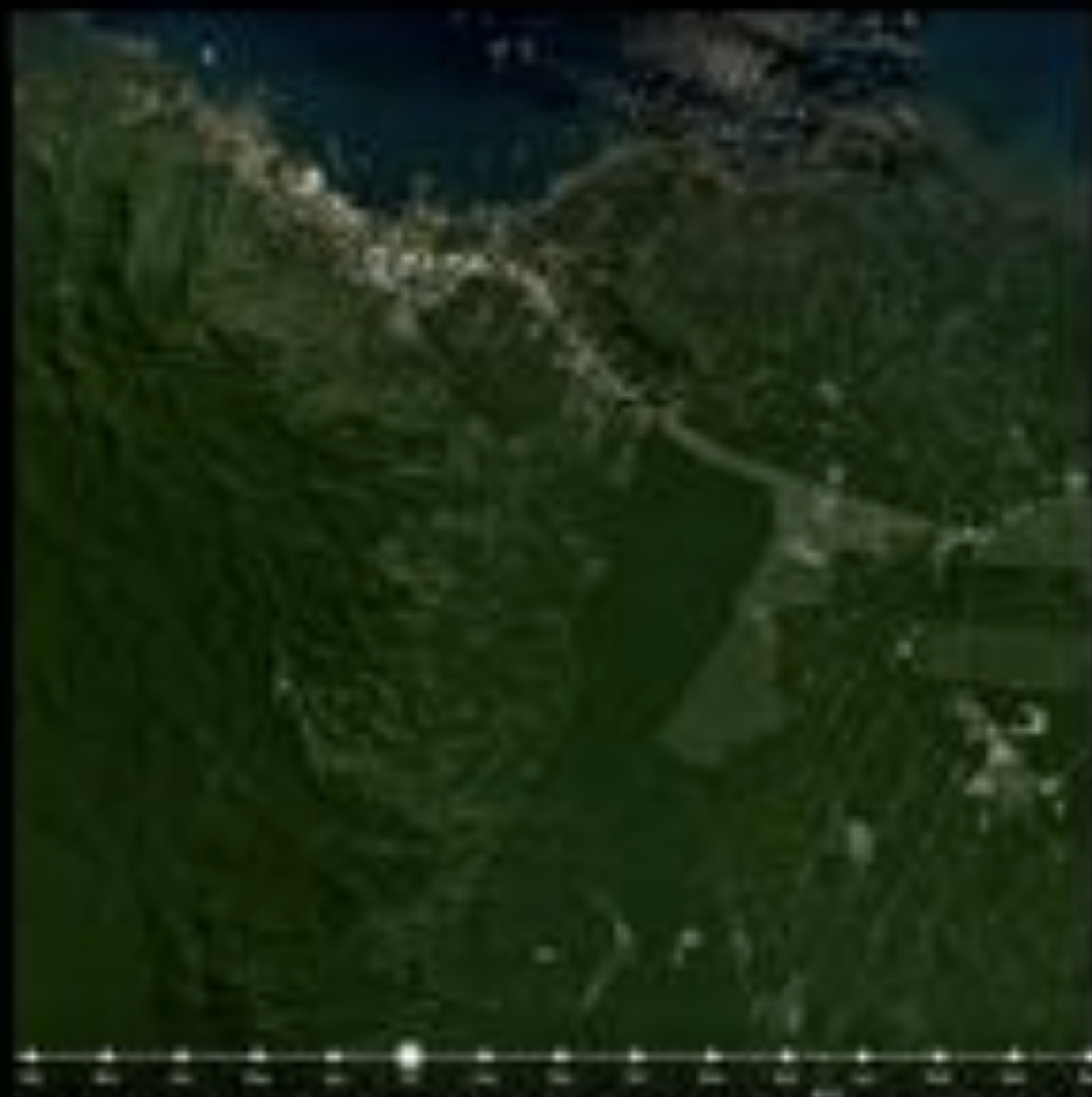
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Kimbe
West New Britain, PNG



Kimbe
West New Britain, PNG



Kimbe
West New Britain, PNG



Kimbe
West New Britain, PNG



Kimbe
West New Britain, PNG



planet

Kimbe
West New Britain, PNG

How can information lead to better conservation outcomes?

Reporting

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



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ACP Summary

Proportion of regional targets met



North Region Summary

Proportion of Regions targeted



Regional targets

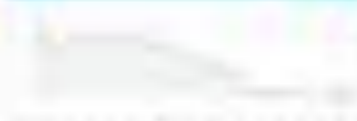


Guidance for national conservation programmes in the North region

2014-2015

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

Number of nature
parks established



Proportion of Countries targeted

Regional targets



Implications for future conservation and research: ACP in the fourth decade (2024-2030)

Objective 1: security, sustainable, sustainable, storage and access priority areas, habitats and ecosystems, including cultural sites

Timeline of actions
2024-2030



Proportion of Country targets met



Report this Subcommunity Summary

Report on of Energy Targets

Report on Energy



Energy targets



Consistent at budget targets

Consistent at budget targets

Target in the 2018-2021 period to be consistent with the 2018-2021 period and to be consistent with the 2018-2021 period. The 2018-2021 period is consistent with the 2018-2021 period and to be consistent with the 2018-2021 period. The 2018-2021 period is consistent with the 2018-2021 period and to be consistent with the 2018-2021 period.

Report on Energy

Report on Energy



Consistent at budget targets

Consistent at budget targets

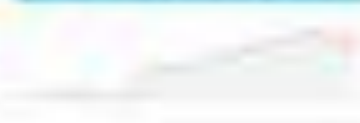
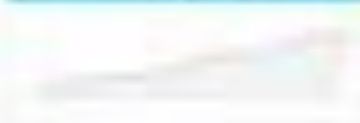
Country pages



Conservation in Biological Reserves

Country page for Germany, 2017-2020

Target 11: By 2030, at least 17 per cent of terrestrial and marine areas, including those of coastal and mountain areas, especially areas of particular significance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically sustainable and well-governed systems of protected areas and other effective area-based conservation measures, and integrated into the sustainable development plan.



Land and Ecosystem Goals

Country page for Germany, 2017-2020

Target 15: Sustainably manage forests, freshwater ecosystems, and other terrestrial ecosystems, halt and reverse land degradation, halt biodiversity loss



How can information lead to better conservation outcomes?

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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BOPMEX Regional Conservation Planning Tools

Map navigation controls including zoom in (+), zoom out (-), and a search bar.

-  All Full Full National Park
Official US National Park
-  State Parks and State Natural Areas
State Parks and State Natural Areas





Add target

- 1 Select your policy
- 2 Add your target
- 3 Describe your target

Fiji National Biodiversity Strategy and Action Plan

BACK

NEXT

How can information lead to better conservation outcomes?

Indicators - Sources

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



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How can information lead to better conservation outcomes?

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 Zelli | June 4, 2019



Planet, Paul G. Allen Philanthropies, & leading scientists team up to map & monitor world's corals in unprecedented detail

Read more about Planet's work in [protecting the world's oceans](#)



London

Street View

Layers

Map Tools

Map Settings





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](#)

How can information lead to better conservation outcomes?

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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How can information lead to better conservation outcomes?

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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How can information lead to better conservation outcomes?

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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How can information lead to better conservation outcomes?

Bad examples

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



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How can information lead to better conservation outcomes?

Bad examples

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



Not achievable



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How can information lead to better conservation outcomes?

Bad examples

- Increase mammal happiness by 50%



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How can information lead to better conservation outcomes?

Bad examples

- Increase mammal happiness by 50%



Not measurable



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How can information lead to better conservation outcomes?

Bad examples

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



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How can information lead to better conservation outcomes?

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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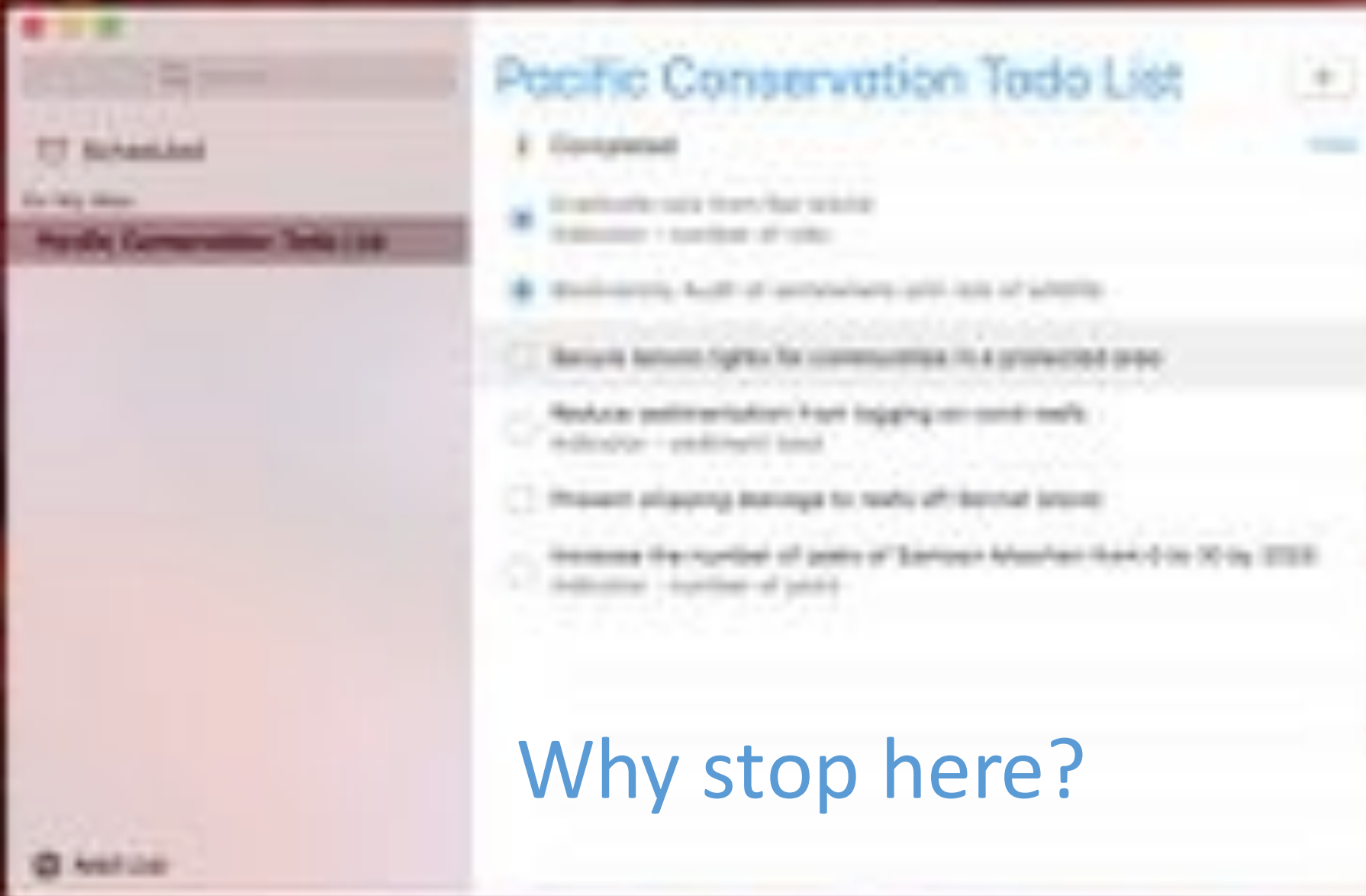


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The image shows a screenshot of a macOS-style application window titled "Pacific Conservation Todo List". The window has a title bar with standard macOS window controls (red, yellow, green buttons) and a search field. Below the title bar, there is a sidebar on the left with a "Scheduled" section and a "Pacific Conservation Todo List" section. The main content area displays a list of tasks, some of which are completed and some are pending. The tasks are:

- Completed** 1/10
- Eliminate use of herbicides**
Indicators: number of jobs
- Eliminate use of pesticides**
Indicators: number of jobs
- Secure forest rights for communities in a protected area**
- Reduce sedimentation from logging on road networks**
Indicators: sediment load
- Prevent logging damage to roads off forest areas**
- Increase the number of jobs of Forest Worker (W-4) to 10 by 2020**
Indicators: number of jobs

At the bottom left of the window, there is a copyright notice: © 2012 Apple Inc.



Why stop here?

How can information lead to better conservation outcomes?

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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How can information lead to better conservation outcomes?

Example: Systematic conservation planning



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How can information lead to conservation outcome?

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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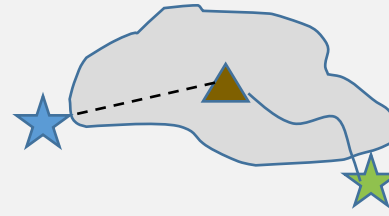


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How can information lead to conservation outcome?



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

We are all making decisions all the time

Stall 2: 3.99/kilo



- 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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How can information lead to conservation outcome?

“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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How can information lead to conservation outcome?

What is spatial prioritization?

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

Optimize poaching patrols

Do I manage now or monitor?

Integrated Land-sea management and planning for the future

Do I collect more data, or just start managing?

Allocate funding to different Pas/MPAs

Prioritizing across threatened species projects

Optimize invasive species management

Prioritize protected areas

Multi-objective planning



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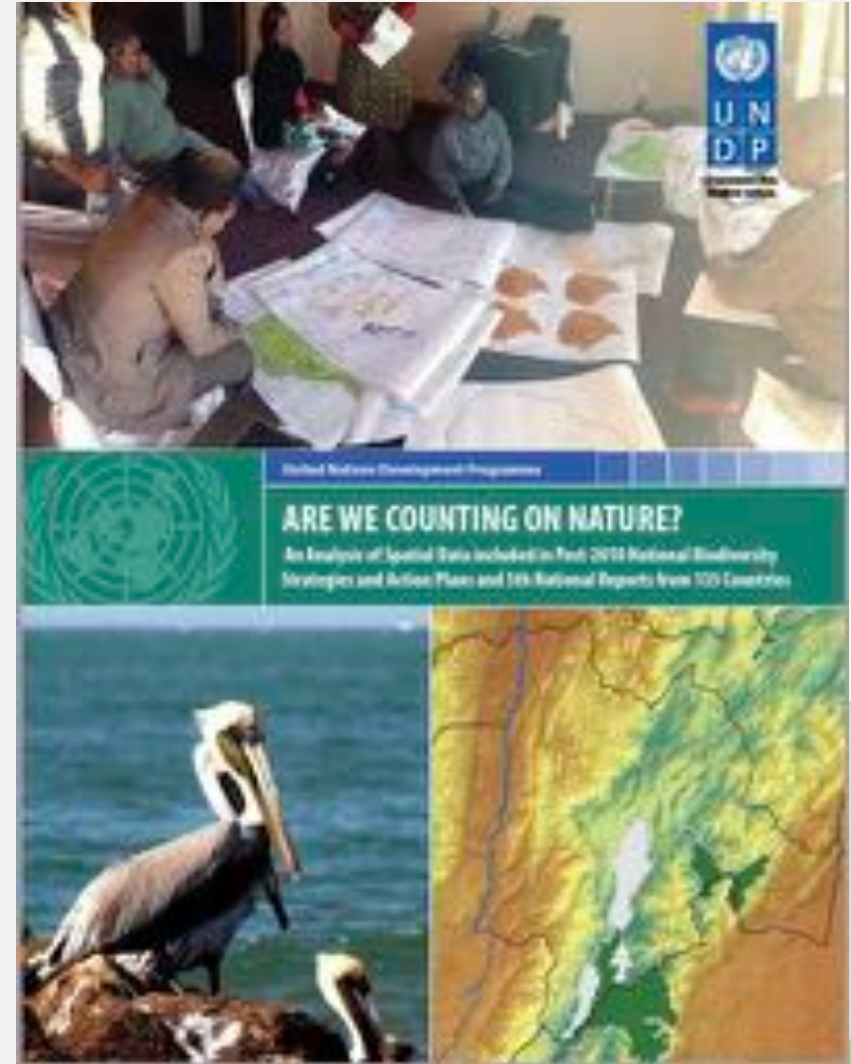


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How can information lead to conservation outcome?

- 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?



Integrated Marine and Coastal Regionalisation of Australia (IMCRA)

Geomorphological Features (% in strict no take marine reserves)



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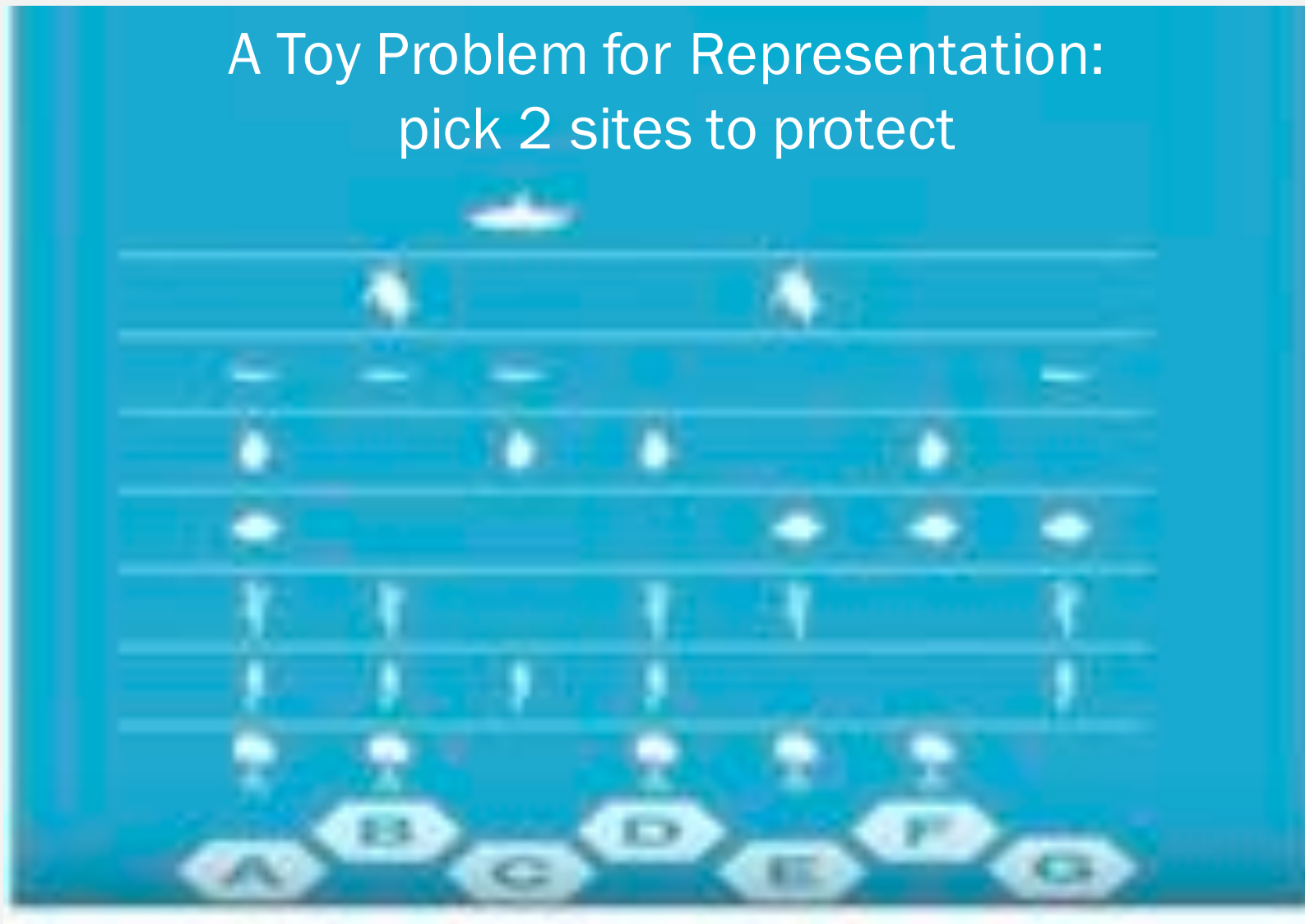
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Hotspots
approach:
species richness

A Toy Problem for Representation: pick 2 sites to protect



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Hotspot
approach:
species richness



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Hotspot
approach:
species richness



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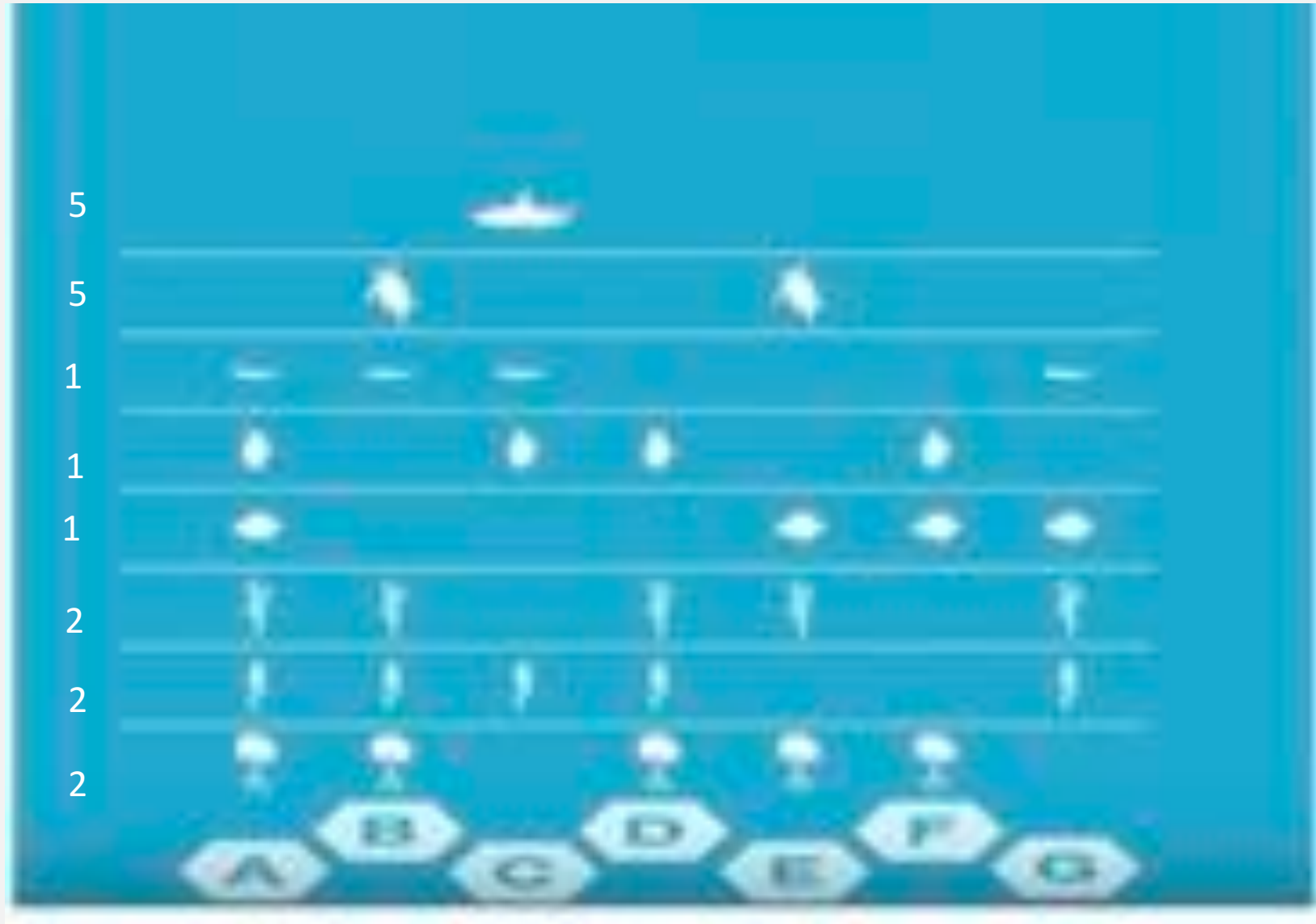


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Scoring and adding (expert elicitation)



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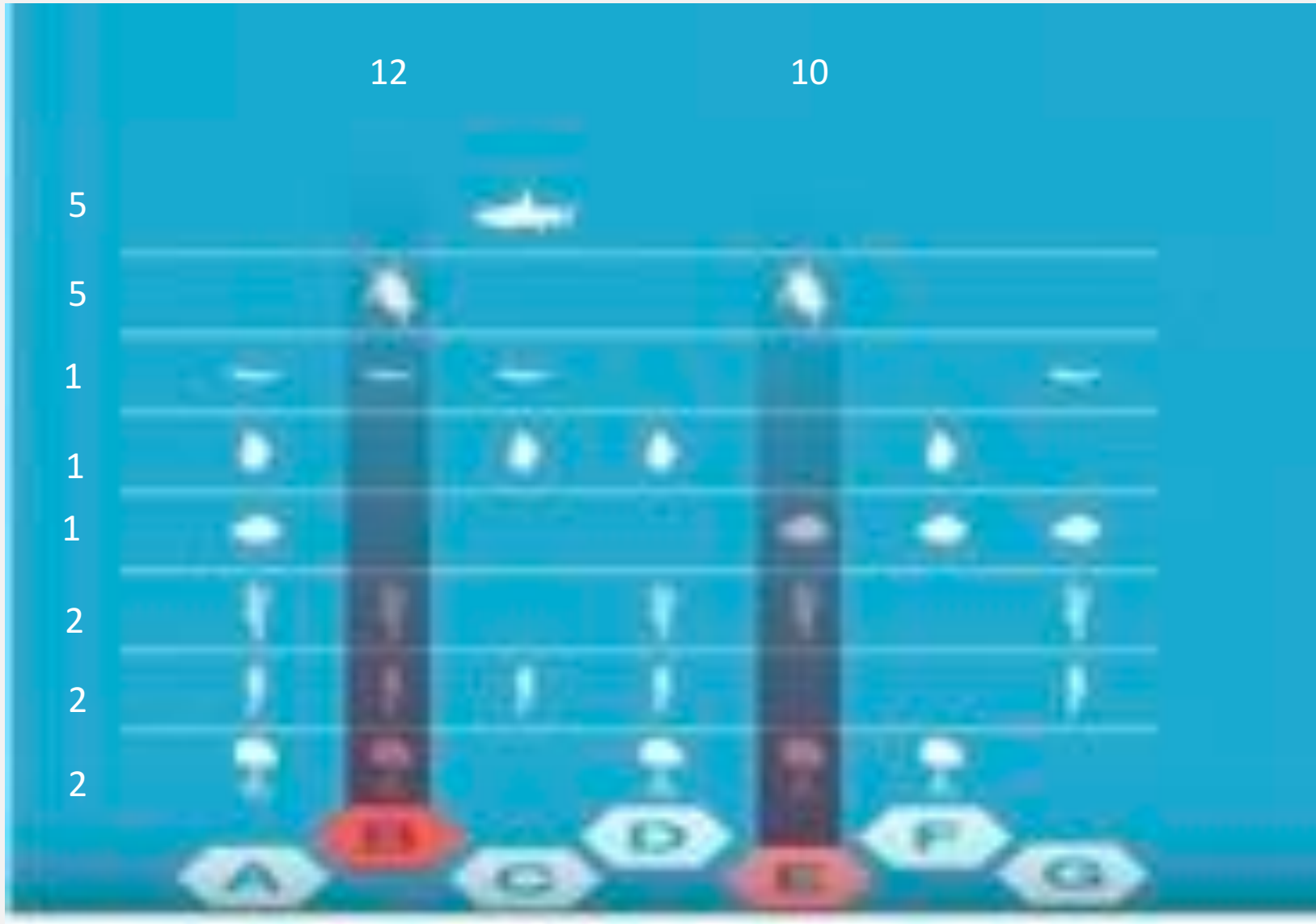


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Scoring and adding (expert elicitation)



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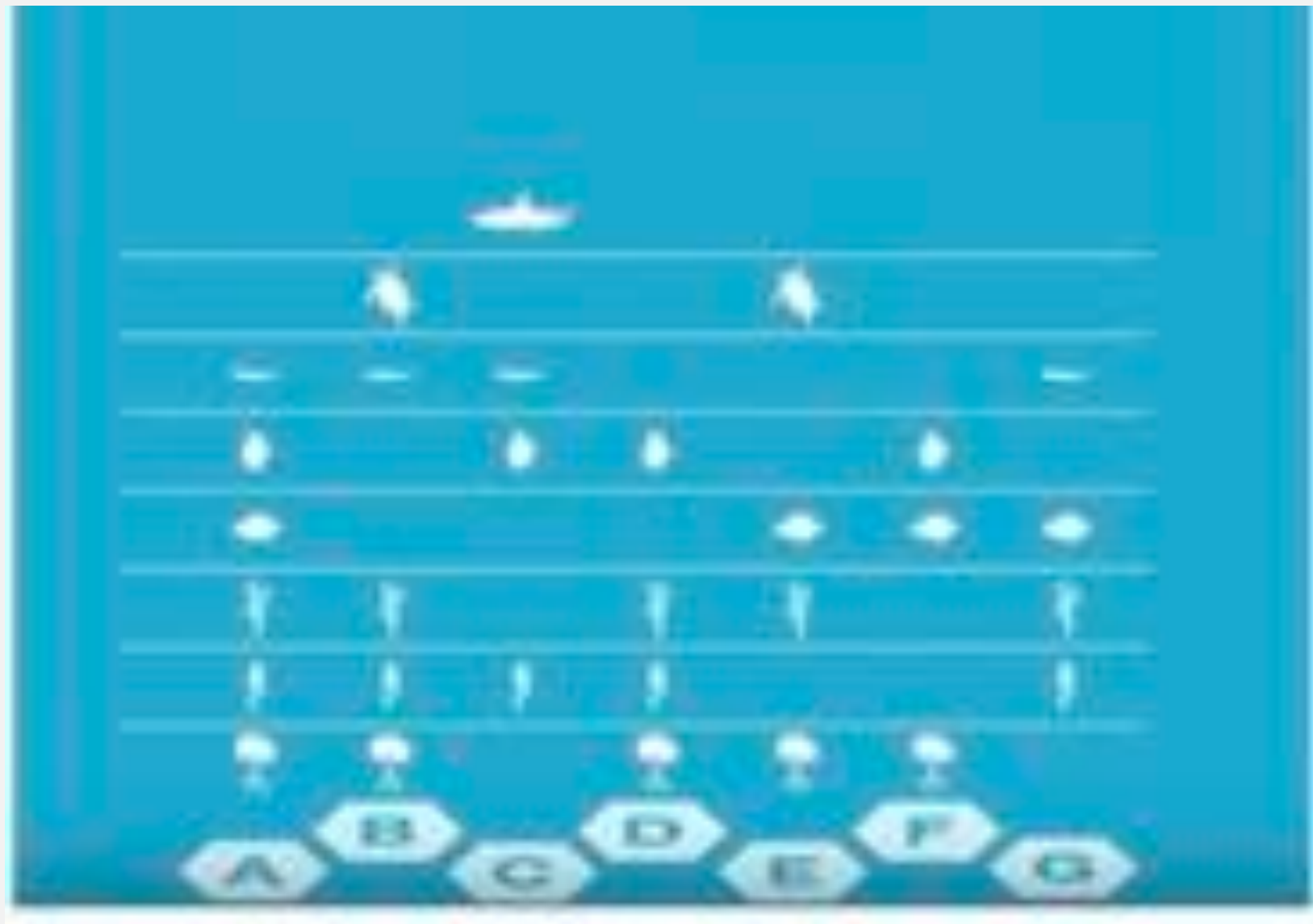


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Criteria-based:
Sea turtles
AND
(presence of **two**
or **more** corals,
or seagrass or
mangroves



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From Knowledge to Action for a Protected Planet

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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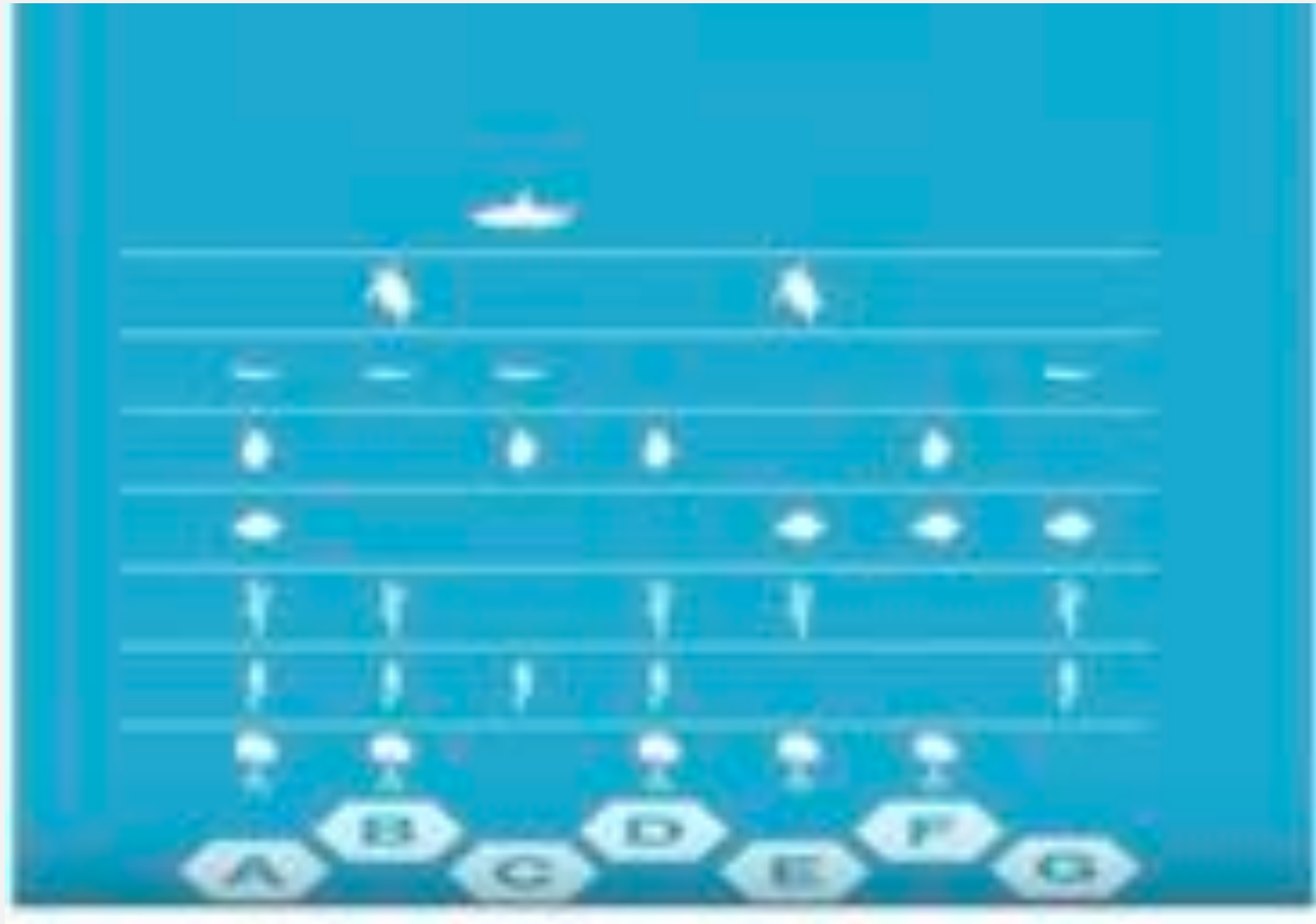
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Target-based approaches:

Represent all species at least once



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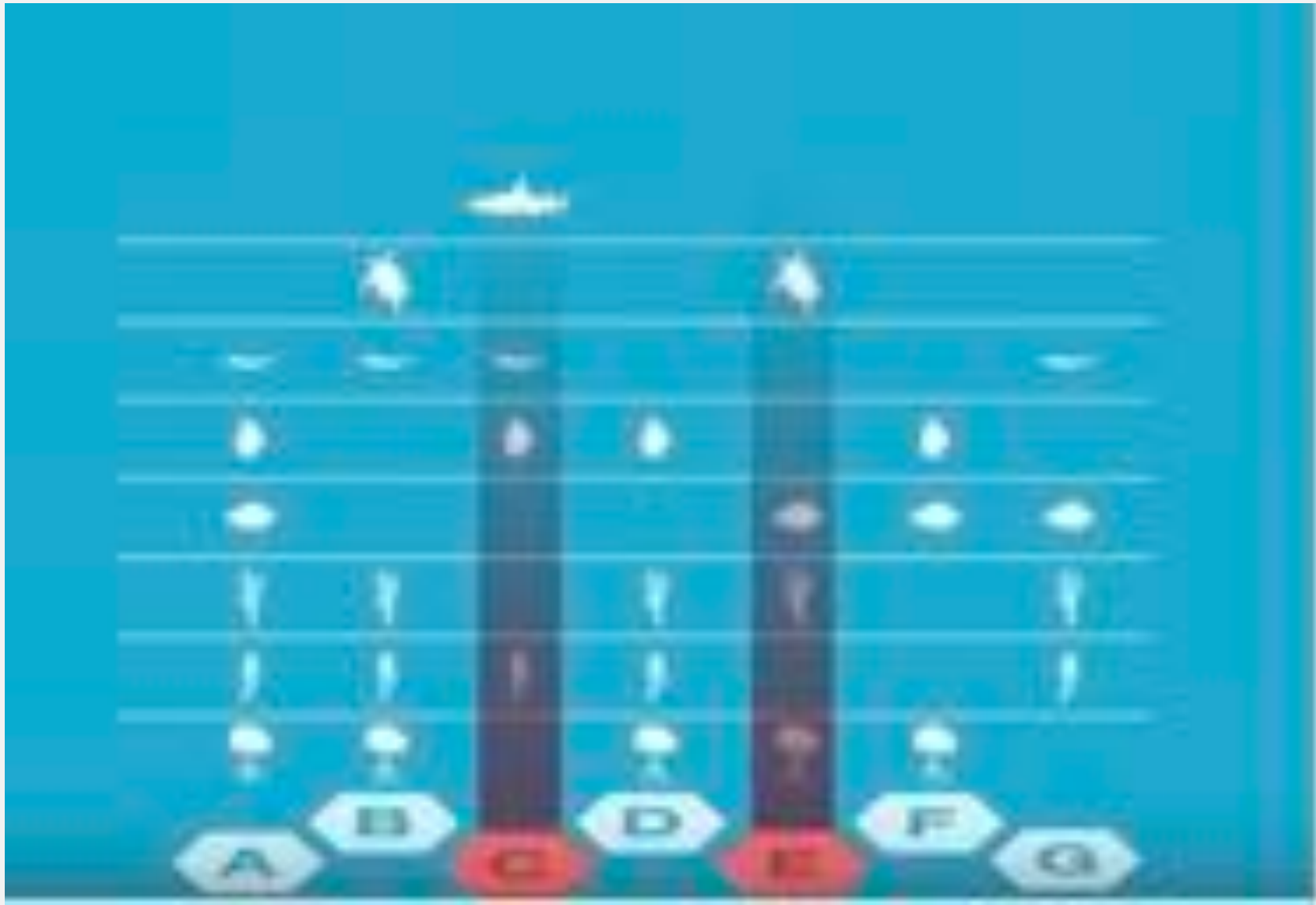
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Target-based approaches:

Represent all species at least once



Objective: Meet representation and impact as few people as possible



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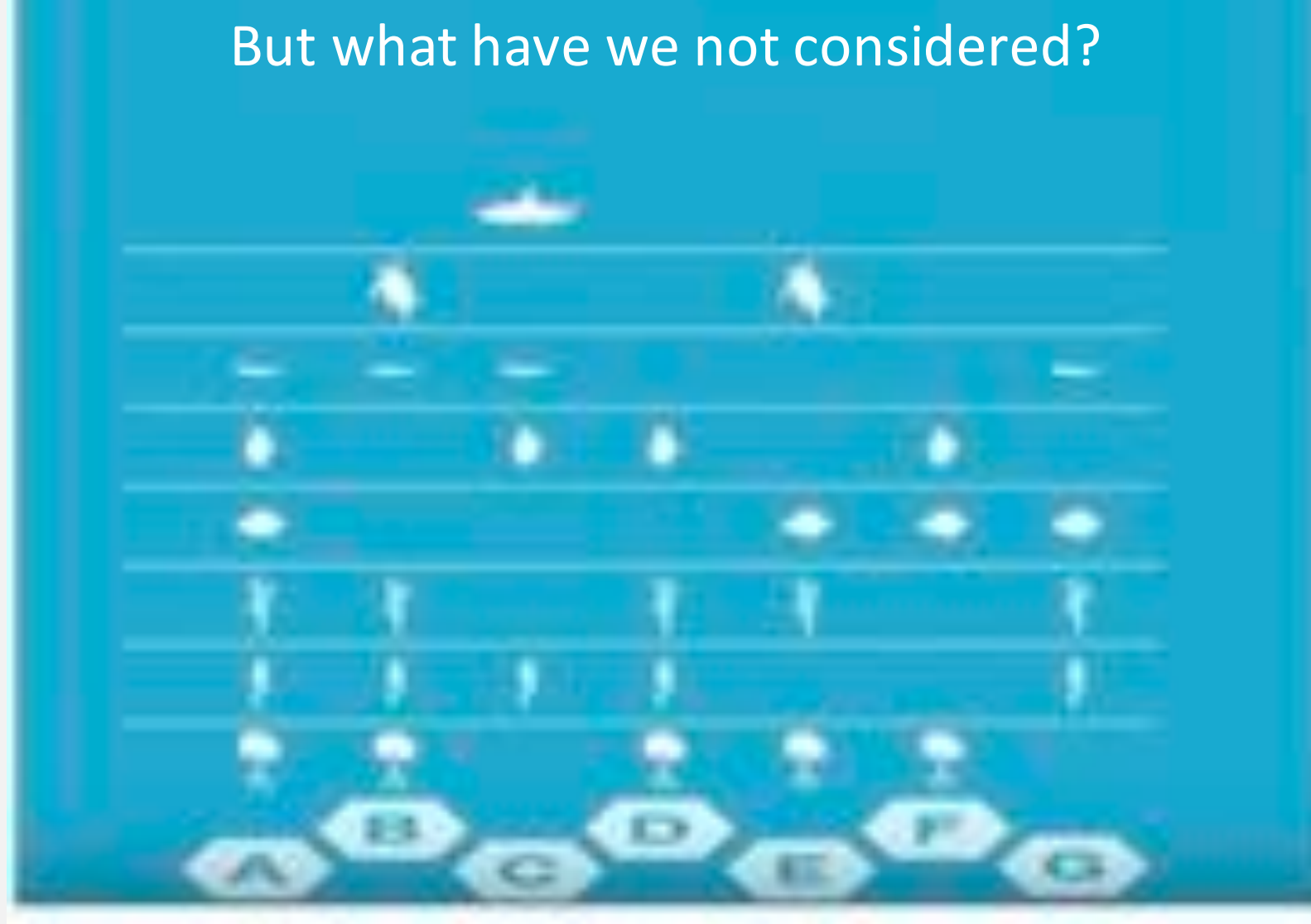


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But what have we not considered?



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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 on 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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Photo: S. Jupiter

Photo: E. Game

Photo: N. Petersen



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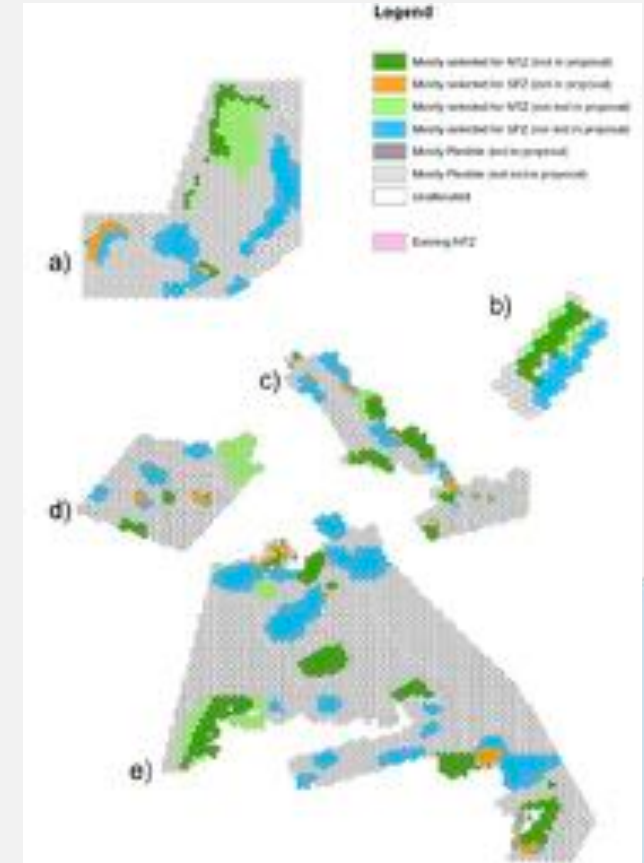
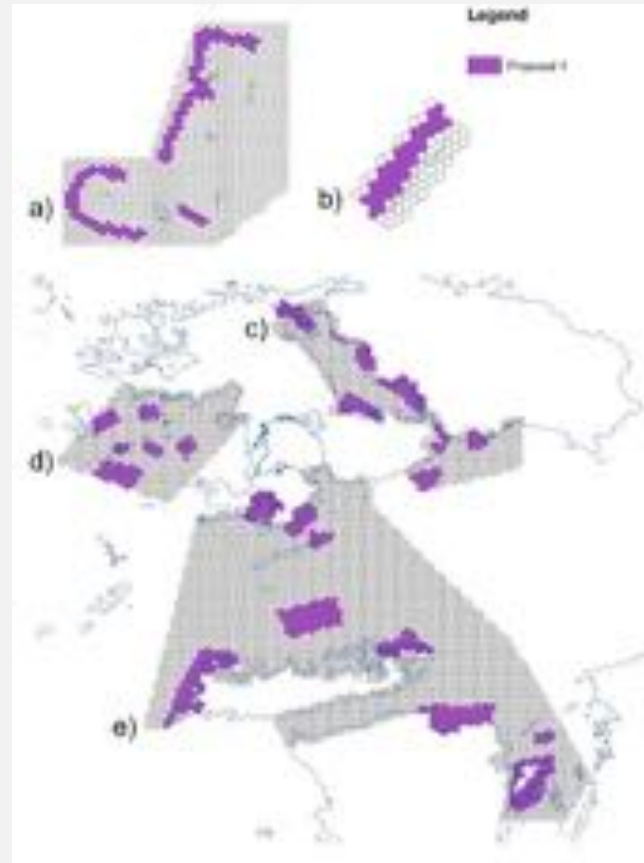
How can information lead to conservation outcome?

Community-built by pen and paper

Representative plan with community

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



Decision-support tool, not the decision maker!!



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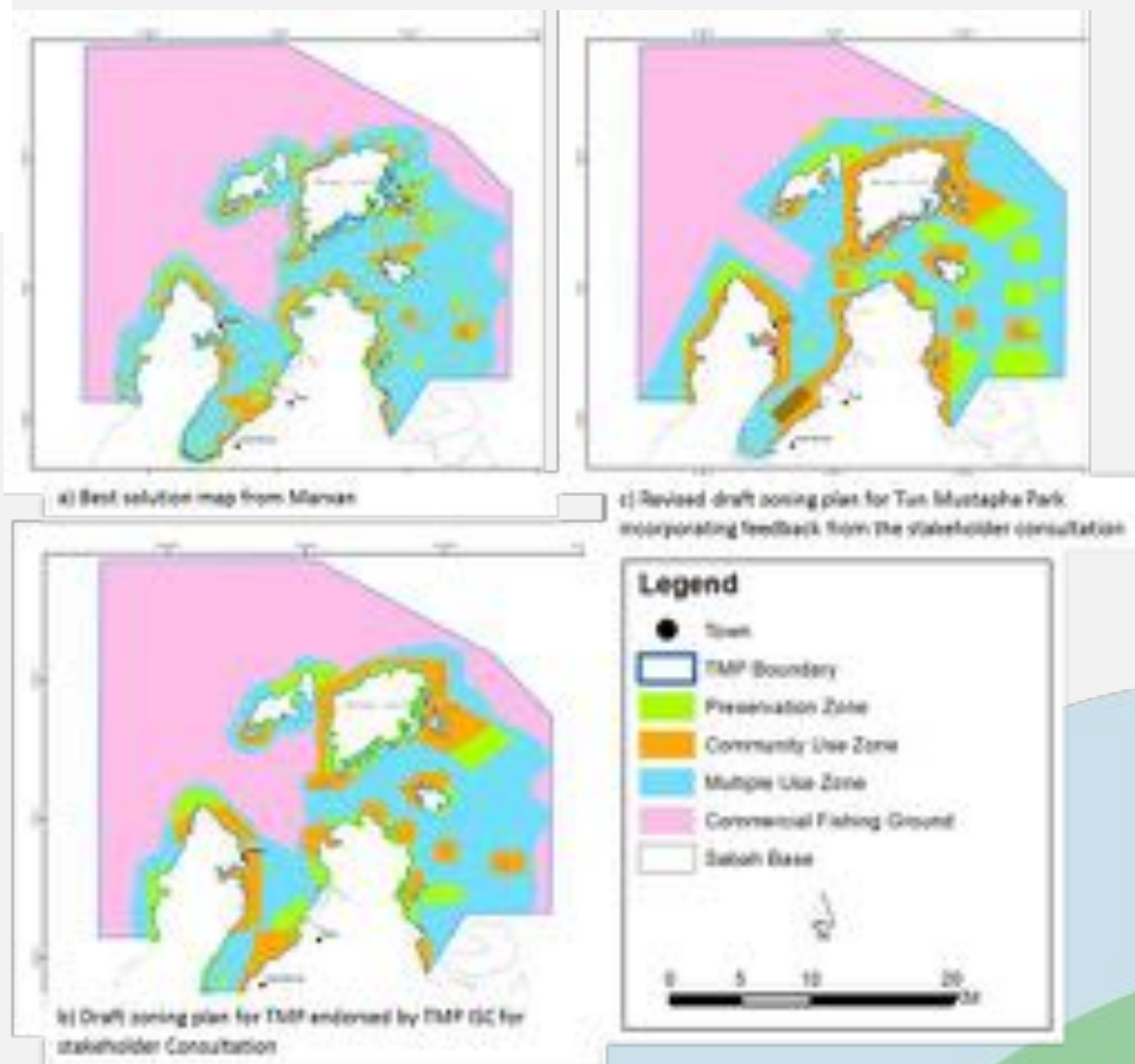
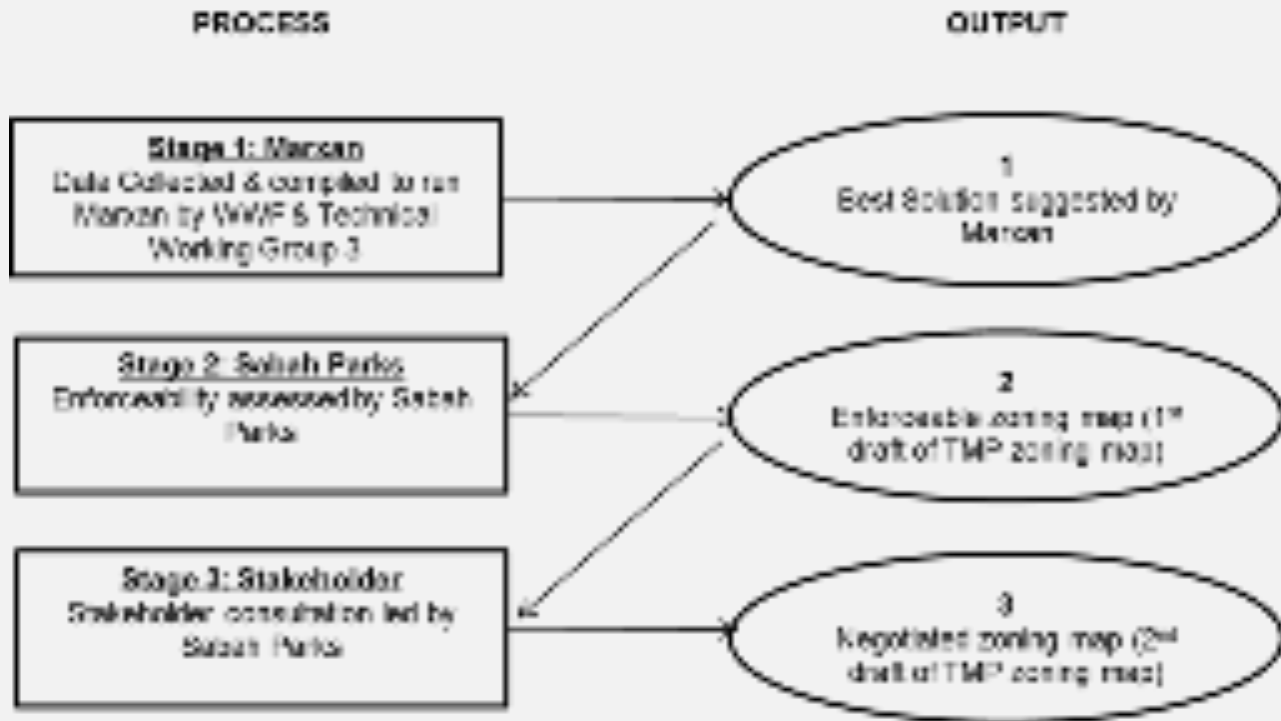
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From Marxan to management: ocean zoning with stakeholders for Tun Mustapha Park in Sabah, Malaysia

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!

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