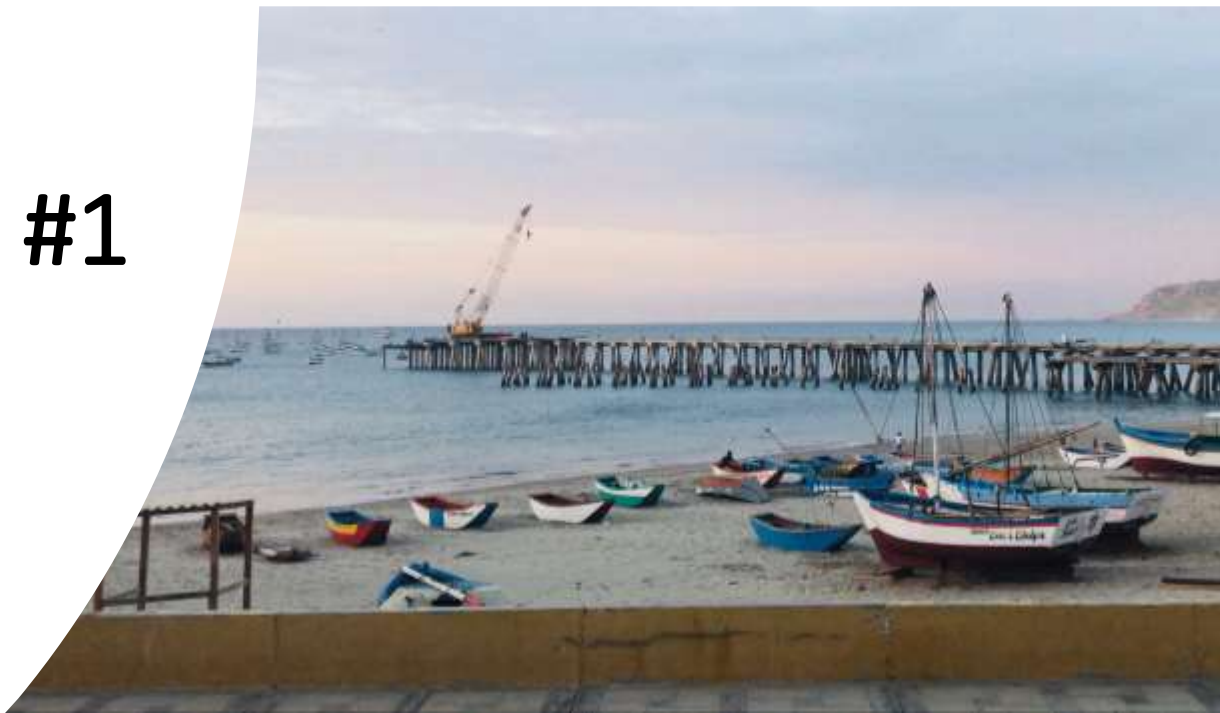




Creating Climate Resilient Multispecies Fisheries in Belize

Training Module #1

June 29, 2021



- Principles of climate resilient fisheries
- Importance of adaptive, science-based management in Belize
- Multispecies fishery management in Belize



Climate change starts a chain reaction



**Warming seas
cause fish to
migrate to
cooler waters**



**Simultaneously,
fish productivity
ebbs and flows**



**Fluctuating stock
causes intra-
and international
disputes**



**Overfishing
exacerbates
the dwindling
harvests**

What's at stake?



1B

people rely on
fish for essential
nourishment



100s

of millions of people
rely on fishing
for their livelihood



85%

of fisheries will be
depleted by 2030
if we fail to act

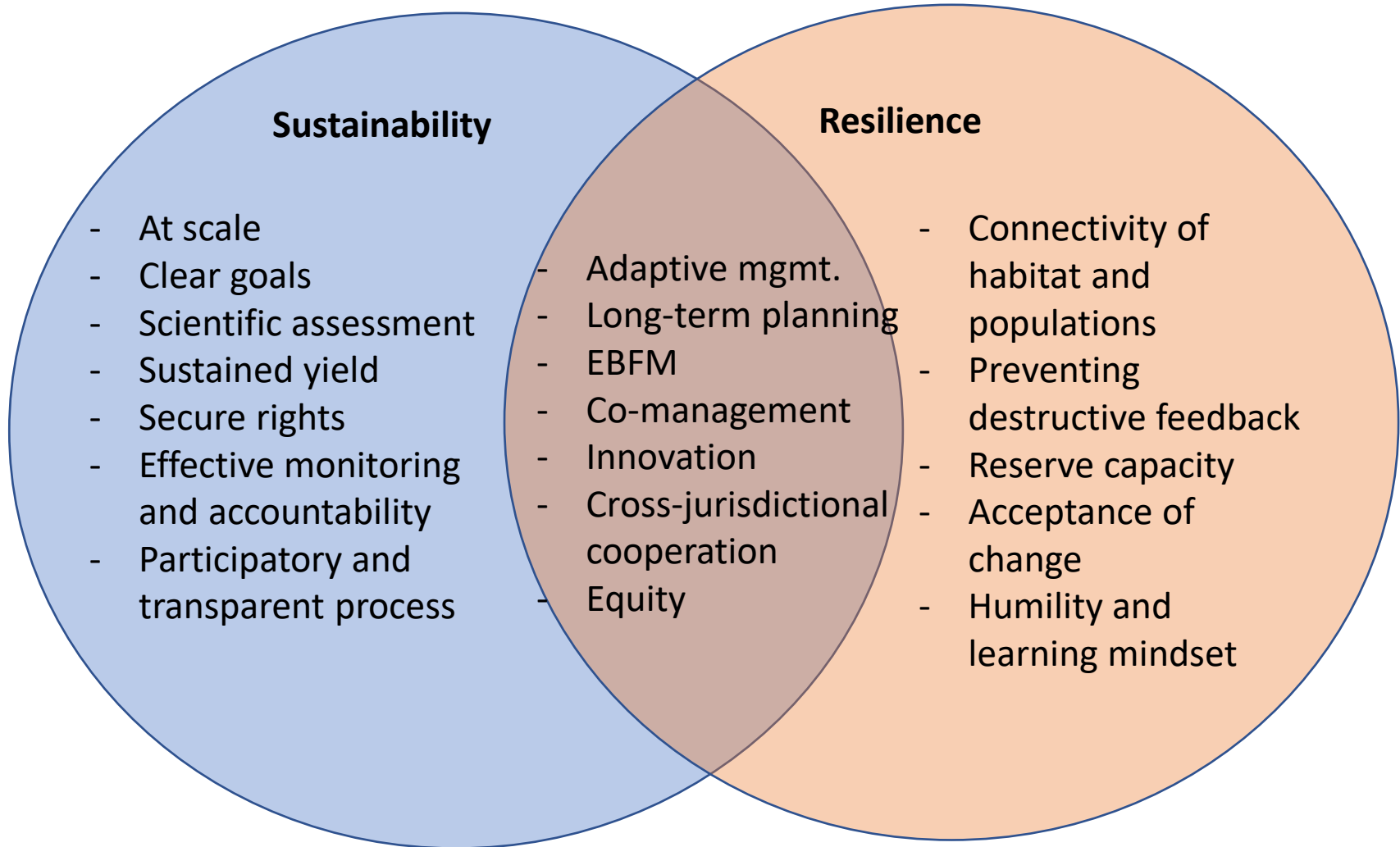
THERE IS HOPE

The single most important action we can take to help the oceans deal with climate change is to create thriving, resilient fisheries.

Pathways to climate-ready fisheries

To achieve our collective fishery sustainability goals, we must augment sustainability practice with resilience

Sustainability and resilience are related



Climate Resilience Pathways

1. **Effective management and governance**
2. Plan ahead for change
3. Enhance cooperation across boundaries
4. Improve ecosystem and institutional health
5. Uphold principles of fairness and equity



<https://www.resilientseas.org/>

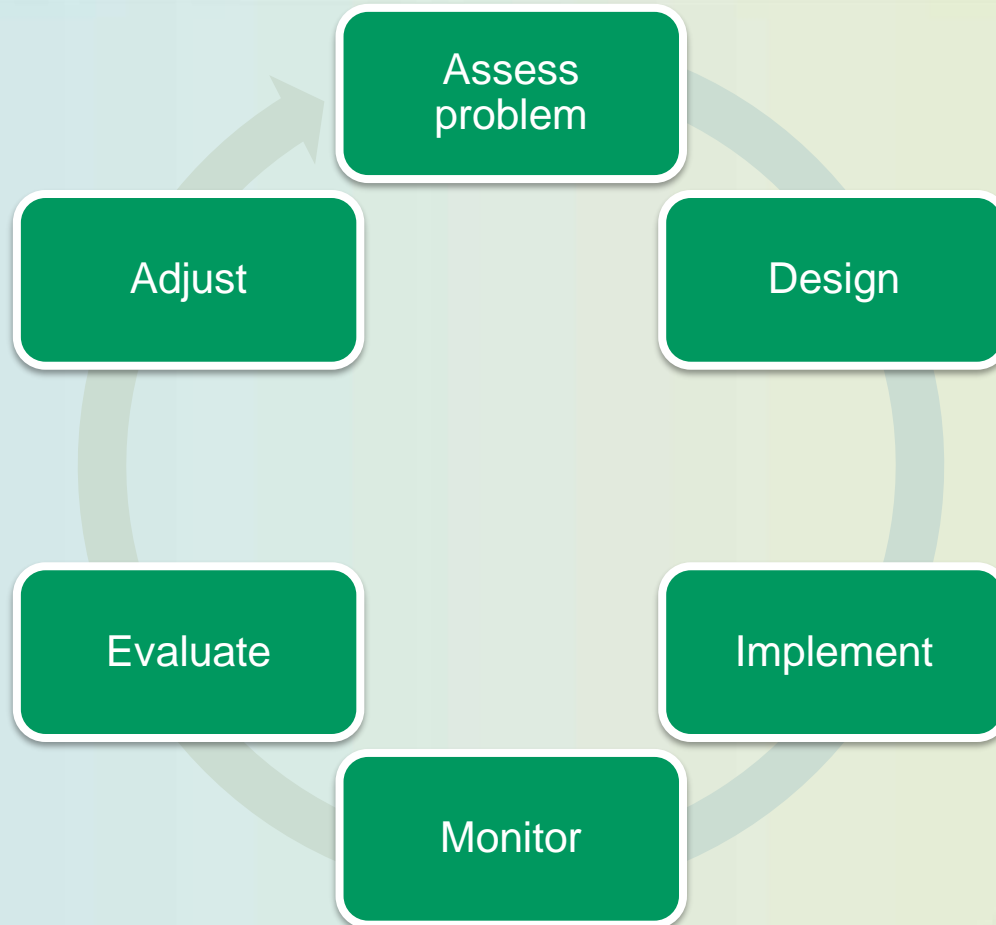
FAO. 2021. Adaptive management of fisheries in response to climate change.

A national adaptive management framework

Setting sustainable, science-based, adaptable Total Allowable Catch (TAC) limits for conch and lobster



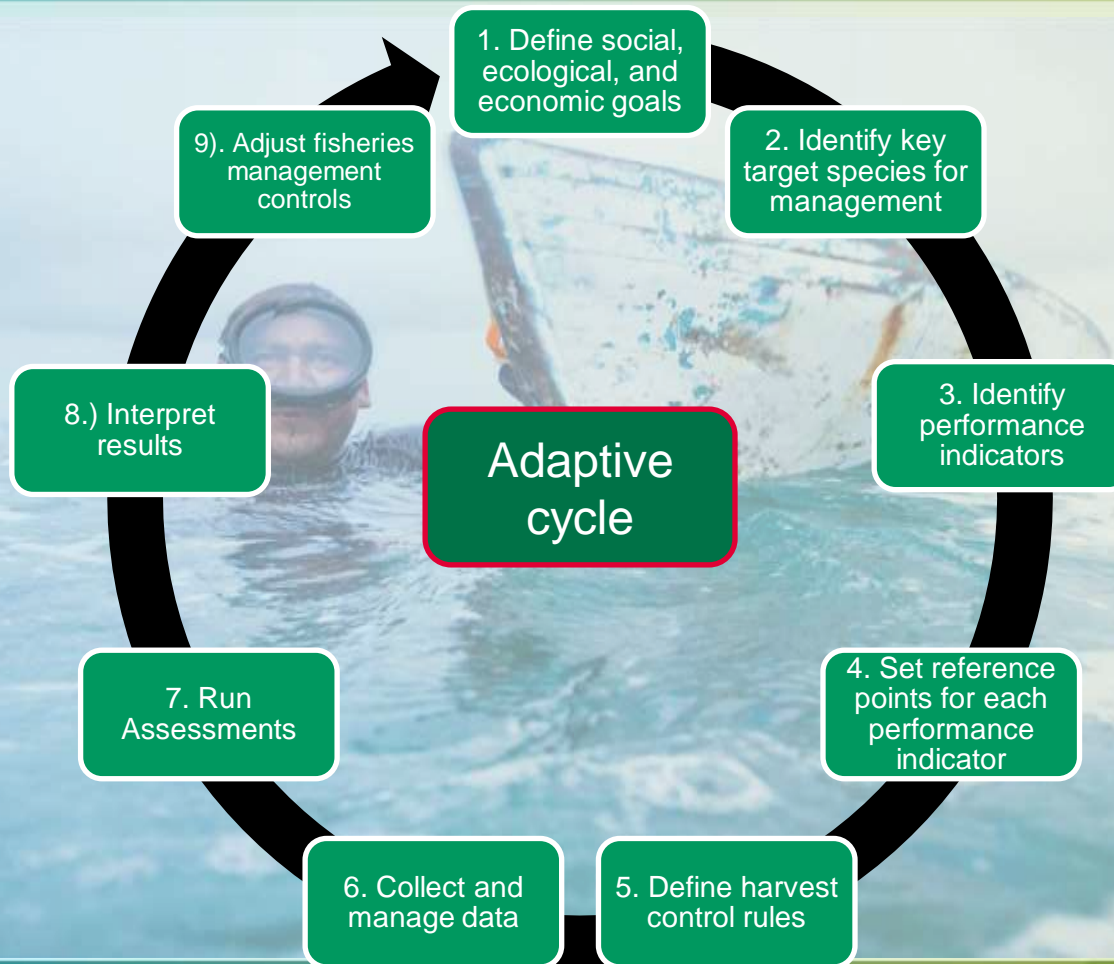
What is adaptive management?



Why is adaptive management important?

- Fisheries are dynamic systems
- Available data is often incomplete, uncertain, and accompanied by biases
- Full statistical stock assessments are often not possible

Adaptive Fishery Management in Belize



Key features of this framework

- Process of designing the framework is collaborative and stakeholder-driven
- Local stakeholder knowledge is incorporated during data interpretation
- Flexibility to use multiple performance indicators appropriate for species, available data, and technical capacity for data analysis

A national adaptive management framework

Setting sustainable, science-based, adaptable Total Allowable Catch (TAC) limits for conch and lobster



Why is adaptive management important in Belize?

- To maximize benefits of the managed access areas, must have good fisheries management inside each managed access area
- How can you manage if you don't know how many fish there are, or how hard they are being fished?

Belize has an extensive multispecies fishery



Multistakeholder collaborative work in Belize

Stakeholder outlined a triple-bottom-line set of goals to achieve conservation, livelihood, and food security goals:

- 1) sustainability and resilience of food security;
- 2) sustainable economic growth and improved livelihoods; and
- 3) abundant finfish populations to support healthy ecosystems.

Happy fishers, happy people, happy fish!

Belize has an extensive multispecies fishery



Single-species management

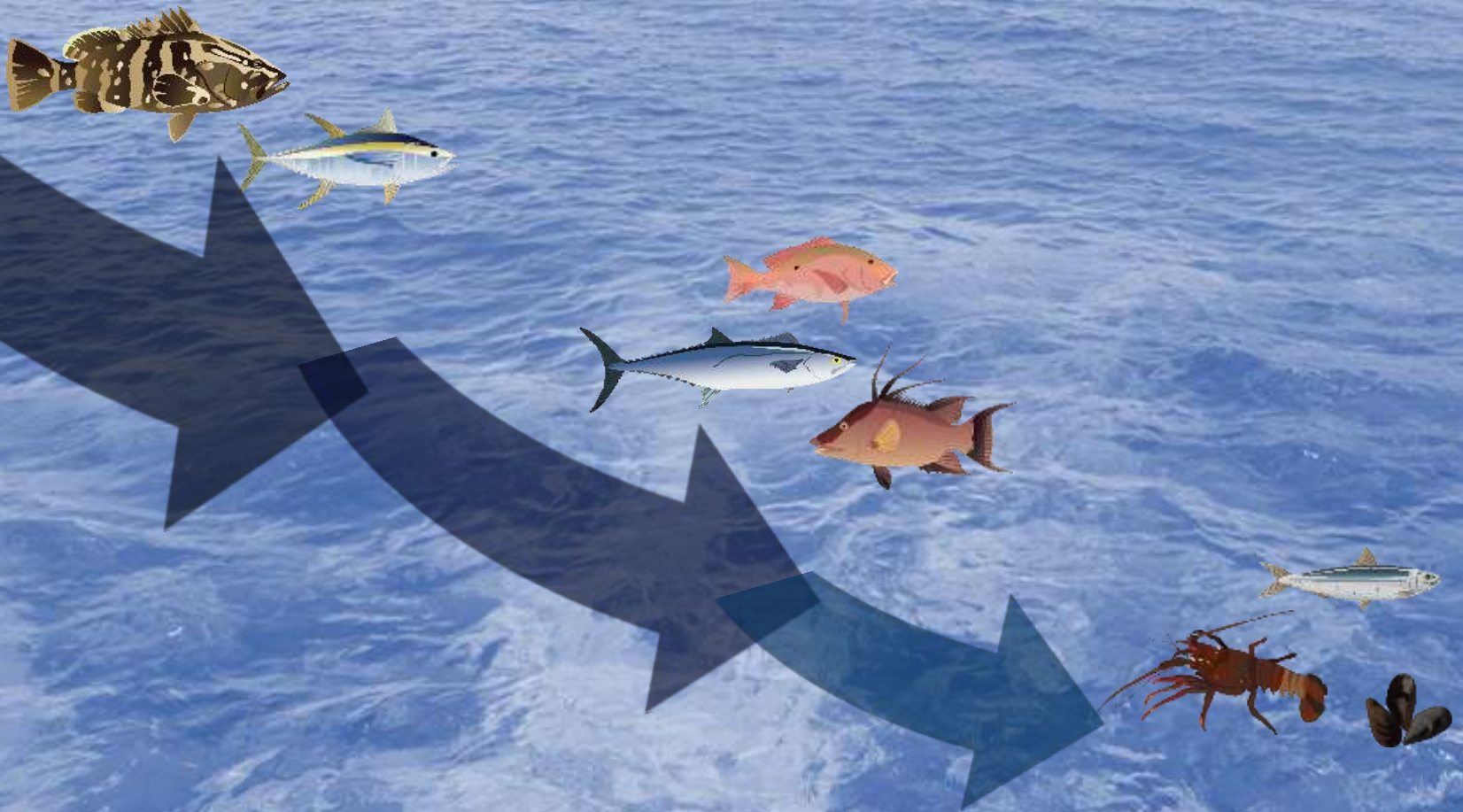


...but most fisheries are multispecies



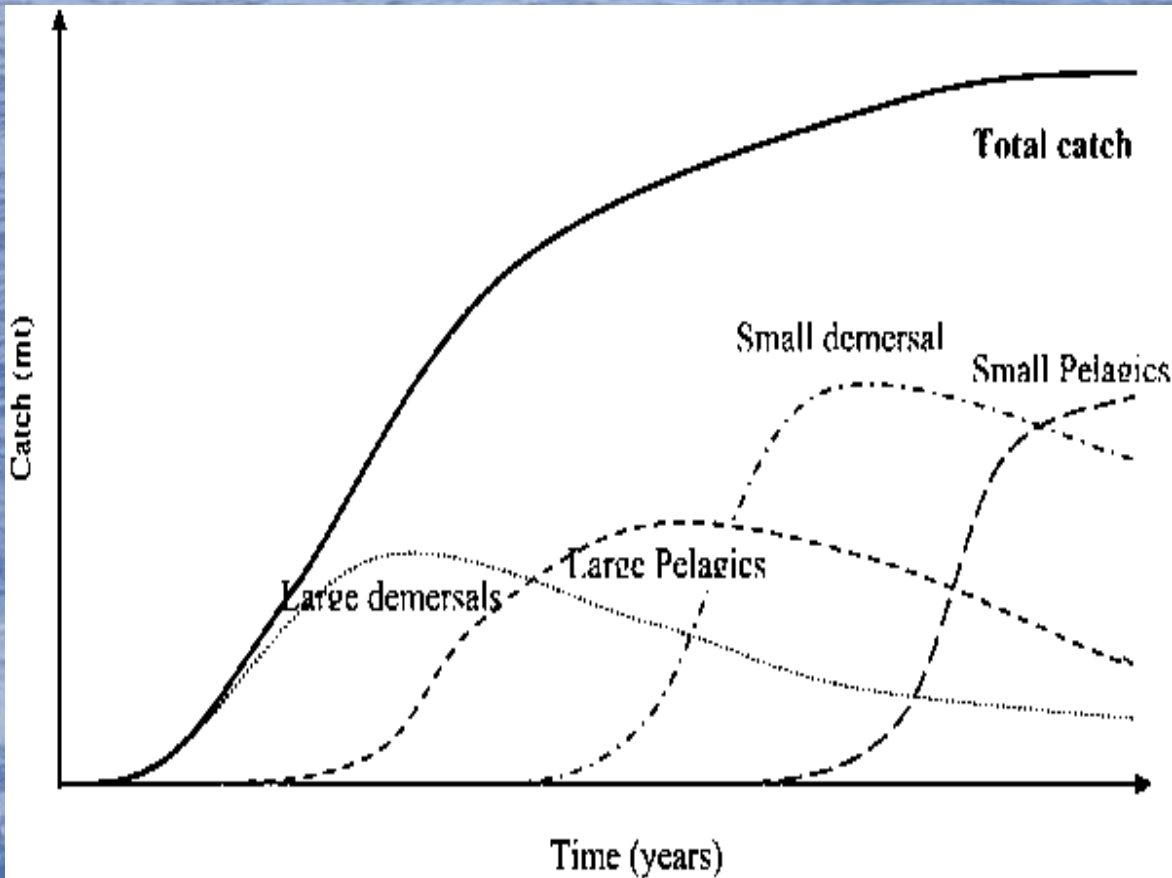
One approach: continue to manage single species

- Catch all species at same rate



One approach: continue to manage single species

Catch all species at the same rate

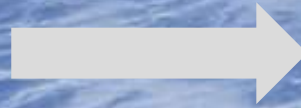


Susceptibility = High
Productivity = Low



Susceptibility = Low
Productivity = High

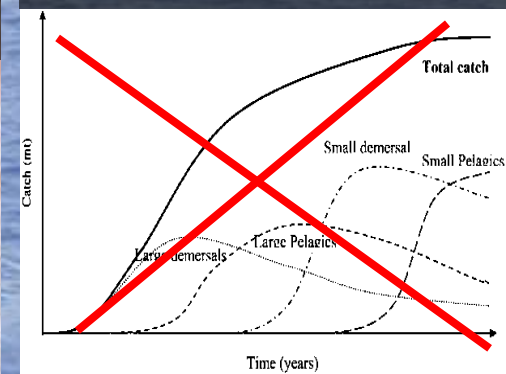
Serial depletion and ecosystem collapse



Multiple species, multiple goals



Avoid serial depletion



Protect ecosystems



Fish Baskets

- Create baskets of species with similar relative **vulnerability** to fishing and current **status**
- Fishing mortality targets for each basket
- Harvest control rules and measures to achieve the targets





Draft: Multistakeholder Collaborative Finfish Fish Baskets

	Low Vulnerability	Moderate Vulnerability	High Vulnerability
Healthy Status			
Moderate Status			
Unhealthy Status			



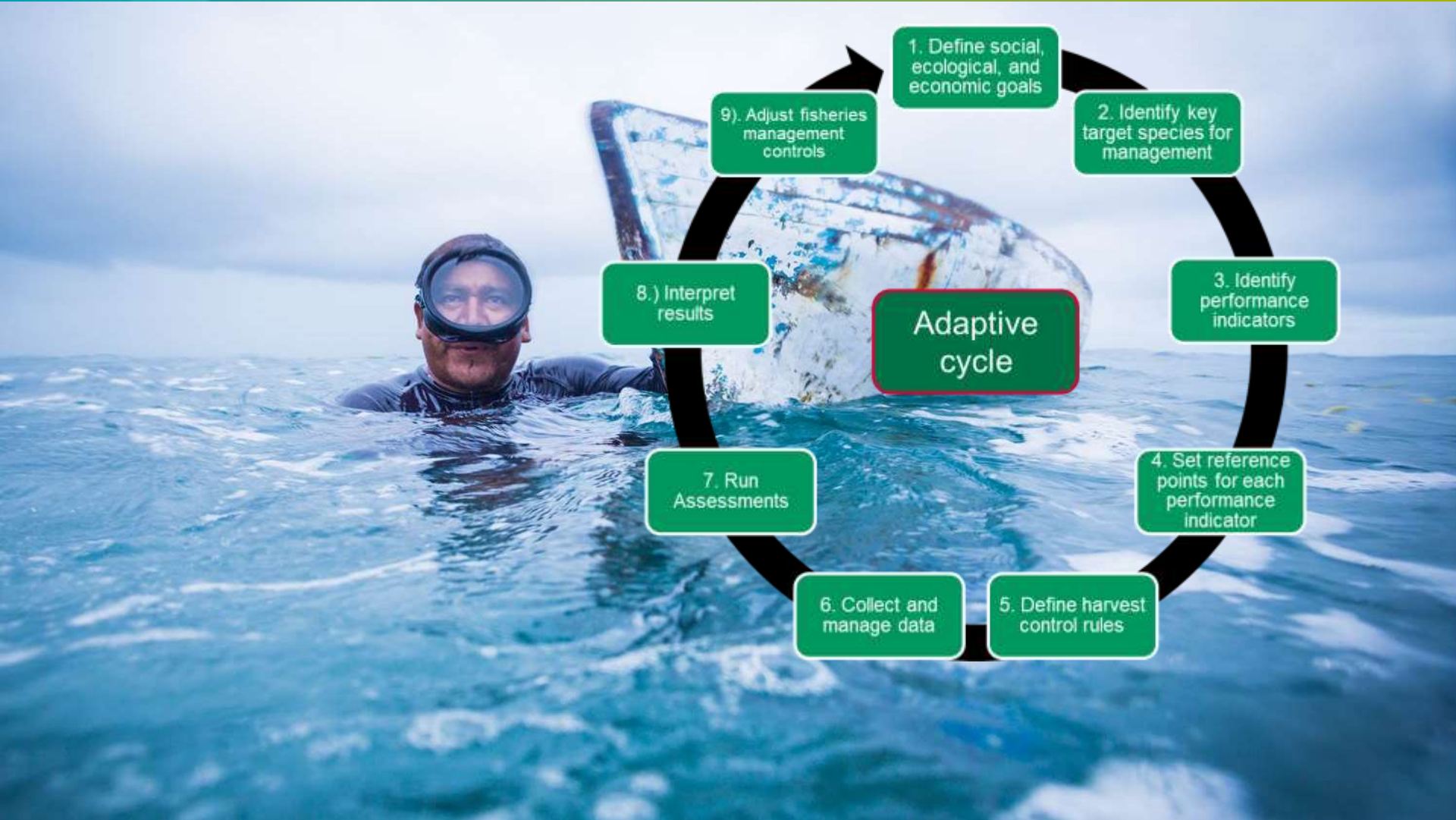
Collaborative work in Belize

- **Coral reef multispecies** biomass target to support management, moving towards broader ecosystem-scale management.
- Both single and multispecies **fish baskets**,
 - pelagic/migratory/gear, beach traps, opportunistic sling, emergent deep-slope fishery, forereef/open/handline, bait for other fisheries, habitat/traps/lines/nets, pelagic/migratory/gear – handline, large groupers, fished together, mutton needs to be managed, needs to be rebuilt, special considerations, resilient and rebuilt.

Collaborative work in Belize

- Management options on the table for these various species include:
 - Input control
 - Temporary ban, closed seasons, license limits, gear restrictions, and expansion of no-take zones.
 - Output controls
 - Catch limits, bag limits, size limits (minimum and/or slot),

Science to action



Questions?

